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Shared and Contested Values

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Shared and Contested Values

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About Natural Resources Wales

Natural Resources Wales' purpose is to pursue sustainable management of natural resources. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

Evidence at Natural Resources Wales

Natural Resources Wales is an evidence-based organisation. We seek to ensure that our strategy, decisions, operations and advice to Welsh Government and others are underpinned by sound and quality-assured evidence. We recognise that it is critically important to have a good understanding of our changing environment.

We will realise this vision by:

- Maintaining and developing the technical specialist skills of our staff;
- Securing our data and information;
- Having a well resourced proactive programme of evidence work;
- Continuing to review and add to our evidence to ensure it is fit for the challenges facing us; and
- Communicating our evidence in an open and transparent way.

This Evidence Report series serves as a record of work carried out or commissioned by Natural Resources Wales. It also helps us to share and promote use of our evidence by others and develop future collaborations. However, the views and recommendations presented in this report are not necessarily those of NRW and should, therefore, not be attributed to NRW.

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Annex 1: Stage 1 - Scenario analysis: Background information used to develop policy scenarios
 Stage 1 of the research aimed to develop scenarios on the future of natural resource policies in Wales. A number of policy and research data were used to develop these scenarios. Table 1 and Table 2 below provide summary of some of the information used to develop the scenarios

Table 1: Comparison of terminology used to describe ecosystem services / NCP across different assessments.

	SONARR	IPBES	UKNEA
Regulating	-	Habitat maintenance	-
	pollination	Pollination	pollination
	Air quality	Regulation of air quality	regulation of water, air and soil quality
	Climate	Regulation of climate	climate regulation
	Water quality	Regulation of ocean acidification	regulation of water, air and soil quality
	Water quality	Regulation of freshwater quantity	water cycling (FROM SUPPORTING SERVICES)
	Water quality	Regulation of freshwater quality	fresh water
	Soil quality	Formation of soils	soil formation (FROM SUPPORTING SERVICES)
	Hazard	Regulation of hazards	hazard regulation
	Disease and pests	Regulation of organisms detrimental to humans	disease and pest regulation
Supporting	-	-	nutrient cycling
	-	-	primary production
Provisioning / Materials & assistance	Noise	-	noise regulation
	-	Energy	-
	Crops	Food and feed	food
	Livestock/aquaculture	Food and feed	food
	Fish	Food and feed	food
	Trees, standing vegetation, peat	Materials and assistance	fibre
	-	Medicinal resources	genetic resources
	Water supply	-	-
	Wild species diversity	-	-
	Non-material / Cultural	Environmental settings: landscapes/seascapes	Learning and inspiration
Environmental settings: landscapes/seascapes		Learning and inspiration	aesthetic experience
Environmental settings: local places		Physical and psychological experiences	cultural heritage
Environmental settings: local places		Physical and psychological experiences	recreation and tourism
-		Supporting identities	-
Other	-	Maintenance of options	-



Annex 4: Stage 1 - Scenario analysis: Scenario matrix of policy issues.

Table 1: Scenarios matrix of policy issues

Category/ Issue	Definition of issue	Benefits definition	UK NEA Scenario links	Description of change between scenario	Specific question
Climate Change					
Climate change mitigation	There are a range of views in society over whether climate change exists at all, how severe a problem it is, how urgent the response should be, and what kind of response should be made.	Climate/ Regulation of climate	World markets vs green and pleasant land	The N@W scenario aims to reduce flood impacts by restoring and creating floodplains. The focus on building climate change resilience is through ecosystem-based adaptation. In the WM scenario, there is limited investment in climate change mitigation and the markets will solve the problems arising from climate change.	Is climate change so serious an issue that it should shape policies for how we use the natural environment?
Climate change adaptation	Environmental restoration can be seen as an investment in climate adaptation – but this view seems restricted to environmental groups. Other significant stakeholders (e.g. water sector) see climate change pressures as real, but their customers do not.	Resilience of a range of benefits – e.g. on river systems	World markets vs green and pleasant land	In the G&P scenario, climate change adaptation programs are focused on biodiversity and flood. The WM states will protect areas of high investment.	Is climate change adaptation so serious an issue that it should shape policies for how we use the natural environment?
Afforestation					
Afforestation – woodland extent	Sheep grazing is the dominant land use in Wales' upland and areas. Farmers and landowners are resistant to more trees. There is also a view that grazing landscape should be retained because important to continuation of the Welsh Language.	Afforestation has multiplied benefits. Climate	Go with the flow vs nature @work	WM is the only scenario where woodland extent decreases - as a result of increased urban development.	Should the extent of woodland cover in Wales increase significantly or remain at current levels? In N@W, woodland extent is 25%, while in GWTF is roughly 15% (see graph below).
Afforestation – woodland type	Mixed use woodland seems generally accepted as the best option amongst those who support afforestation (i.e. the 'right tree in the right place'). But the specifics of this may not be agreed on. A mixed use model (e.g. recreation/timber/habitat is possible) and a mix of benefits may justify greater	Recreation	National security vs nature @work	NS has more emphasis on planting conifer, due to its higher productivity. While N@W aims to have a mixture of conifer and broadleaf in order to provide a range of ecosystem services, such as	If the amount of woodland was increased in Wales, what should be the purpose of the woodland that was created (multiple reasons can be given)? <ul style="list-style-type: none"> - Conifer plantations for timber supplies - Recreation/ general accessible open space - New recreational facilities (e.g. mountain biking) - Support jobs - Carbon sequestration

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Crynodeb Gweithredol

Mae gan Cyfoeth Naturiol Cymru (CNC) gylch gwaith i gyfrannu'n sylweddol tuag at gyflwyno Deddf Llesiant Cenedlaethau'r Dyfodol (Cymru) 2015 a Deddf yr Amgylchedd (Cymru) 2016. Er mwyn cyflawni'r ymrwymadau hyn, mae gofyn i CNC sicrhau y rheolir adnoddau naturiol Cymru yn gynaliadwy i alluogi pobl i fyw bywydau iachach a mwy boddhaus. Fodd bynnag, mae CNC hefyd yn cydnabod y bydd grwpiau gwahanol o bobl, busnesau a sefydliadau yn cael eu heffeithio mewn ffyrdd gwahanol gan y senarios amgen arfaethedig ar gyfer rheoli amgylchedd naturiol Cymru yn y dyfodol. Mewn rhai achosion, bydd gan y rhanddeiliaid gwahanol werthoedd sy'n cael eu rhannu lle cytunir ar y canlyniadau, ond, mewn achosion eraill, bydd gan grwpiau gwahanol werthoedd gwrthwynebol sy'n cael eu 'herio'. Felly, mae CNC wedi comisiynu'r ymchwil hon i archwilio gwerthoedd sy'n cael eu rhannu a'u herio ar gyfer opsiynau rheoli adnoddau naturiol Cymru yn y dyfodol mewn ymdrech i ennill dealltwriaeth well o lwybrau cynaliadwy ar gyfer cynllunio polisiau yn y dyfodol.

Nod cyffredinol yr ymchwil hon yw archwilio gwerthoedd sy'n cael eu rhannu a'u herio sydd gan grwpiau gwahanol o bobl yng Nghymru ar gyfer senarios polisi amgen ar gyfer adnoddau naturiol, ac archwilio gweledigaethau a rennir ar gyfer cyfeiriad y polisiau hyn yn y dyfodol. Rhoddir sylw i'r nod hwn mewn pedwar cam ymchwil.

Roedd Cam 1 yn cynnwys ymarfer dadansoddi senarios pan wnaethom adolygu dogfennau polisi a fframweithiau asesu gwasanaethau ecosystemau. Nesaf, ymgynghorwyd â rhanddeiliaid polisi allweddol er mwyn nodi senarios polisi tebygol ar gyfer polisiau gwledig ac amgylcheddol yn y dyfodol yng Nghymru ac, yn bwysig, nodi effeithiau polisi posibl a allai effeithio ar wahanol grwpiau o bobl mewn gwahanol ffyrdd. Canlyniad yr ymarfer hwn oedd rhestr o faterion polisi a archwiliwyd ymhellach yn y camau diweddarach.

Roedd Cam 2 yn cynnwys arolwg Cymru gyfan ar raddfa fawr, wedi'i ategu gan arolwg o ffermwyr, a oedd yn archwilio dewisiadau pobl ar gyfer opsiynau polisi gwahanol. Canfyddiad allweddol o'r arolwg hwn oedd bod consensws cyffredinol (gwerthoedd a rennir) ynghylch pa rai yw'r meysydd polisi pwysicaf (h.y. roedd cefnogaeth eang ar gyfer polisiau sy'n lleihau effaith y newid yn yr hinsawdd), ac roedd rhai gwahaniaethau hefyd (gwerthoedd sy'n cael eu herio) rhwng grwpiau defnyddwyr gwahanol a grwpiau cymdeithasol-ddemograffig gwahanol. Mae hyn yn amlygu bod y manylion o ran sut y caiff polisiau eu targedu a'u gweithredu'n bwysig.

Yn ystod Cam 3, gwnaethom ailrolygu ein his-sampl o ymatebwyr o Gam 2 i archwilio a fyddai ystyried blaenoriaethau (gwerthoedd) rhanddeiliaid eraill yn arwain at weledigaeth a rennir yn fwy ar gyfer blaenoriaethau polisi yn y dyfodol. Er i un o bob tri o'r ymatebwyr nodi ei bod yn bwysig iddynt gadw at eu blaenoriaethau eu hunain, fe newidiodd tua hanner yr ymatebwyr eu blaenoriaethau i adlewyrchu hoffterau pobl eraill. Mae'r canfyddiad hwn yn nodi bod gan ystyriaeth gwerthoedd pobl eraill y potensial i fynd i'r afael â materion sy'n cael eu herio mewn perthynas â dyfodol polisi gwledig ac amgylcheddol yng Nghymru, a symud tuag at weledigaeth a rennir ar gyfer y polisiau hynny.

Yn ystod y cam olaf, cynhaliom weithdy gyda chynrychiolwyr o ystod o randdeiliaid gwledig ac amgylcheddol. Yn ystod y gweithdy, defnyddiom ddulliau ystyriol i ddatblygu gweledigaethau a rennir ar gyfer rheoli adnoddau naturiol yn gynaliadwy yng Nghymru. Trwy drafodaethau'r gweithdy, roedd yn glir y gallai cyfranogwyr ystyried gwerthoedd rhanddeiliaid eraill a datblygu gweledigaeth a rennir a oedd yn cysoni â'r gwerthoedd hyn. Ar ben hynny, amlygodd cyfranogwyr y gweithdy'r angen i ffurfio partneriaethau strategol ynghylch y rhanddeiliaid gwahanol er mwyn cydgyllunio polisïau a oedd yn cydnabod anghenion pobl eraill.

I gloi, yn gyffredinol mae ein hymchwil wedi nodi bod y rhan fwyaf o bobl yng Nghymru yn cytuno ar ba fathau o bolisi yw'r pwysicaf (gweledigaethau a rennir). Er enghraifft, roedd y polisïau a gefnogwyd ar draws grwpiau gwahanol o bobl yn cynnwys polisïau a oedd yn lleihau allyriadau sy'n achosi'r newid yn yr hinsawdd a pholisïau sy'n gwarchod cynefinoedd naturiol a rhywogaethau mewn perygl. Fodd bynnag, nodom hefyd fod gwahaniaethau o ran blaenoriaethau polisi gwirioneddol rhwng grwpiau gwahanol o bobl (materion sy'n cael eu herio). Er enghraifft, roedd ffermwyr yn blaenoriaethu polisïau a oedd yn cynnal incwm ffermwyr ac yn cefnogi cynhyrchu bwyd, tra oedd y polisïau hyn yn peri llai o bryder i'r cyhoedd a phobl a oedd yn hamddenwyr awyr agored neu'n aelodau o elusennau amgylcheddol. Felly, mae risg y gallai cyflwyno polisïau sy'n cefnogi ffermwyr achosi ychydig o wrthwynebiad. Er mwyn mynd i'r afael â hyn, archwiliom hefyd a allai trafodaethau a dysgu cymdeithasol ysgogi grwpiau gwahanol o bobl i ystyried barn pobl eraill ac i ddatblygu gweledigaeth a rennir o bolisi'r dyfodol. Yn ystod Cam 3, rydym yn dangos bod tua hanner ein hymatebwyr yn fodlon ystyried newid eu blaenoriaethau polisi er mwyn ystyried hoffterau pobl eraill. Mewn modd tebyg, yn ystod gweithdai Cam 4, rydym yn arddangos y gall trafodaeth arwain at ddatblygu gweledigaethau a rennir ar gyfer rheoli adnoddau naturiol mewn modd cynaliadwy yng Nghymru. Felly, ein hargymhelliad i'r rhai sy'n arfarnu a llunio polisïau megis 'Rheoli Adnoddau Naturiol yn Gynaliadwy' yng Nghymru yw, wrth ddatblygu a gwerthuso polisïau gwledig ac amgylcheddol, ei bod yn bwysig (i) ystyried anghenion / hoffterau / gwerthoedd grwpiau gwahanol o bobl, a (ii) dod â'r grwpiau gwahanol hyn at ei gilydd er mwyn datblygu gweledigaethau a rennir ar gyfer polisïau newydd. Yn bendant, mae'r argymhellion hyn yn cynnwys nifer o egwyddorion rheoli adnoddau naturiol yn gynaliadwy, gan gynnwys 'cydweithio ac ymgysylltu', 'cyfranogiad y cyhoedd', 'tystiolaeth' a 'buddion lluosog'.

Executive summary

Natural Resources Wales (NRW) has a remit to significantly contribute towards the delivery of the Well-being of Future Generations Act (Wales) 2015 and The Environment Act (Wales) 2016. To fulfil these commitments, NRW is required to ensure the sustainable management of Wales' natural resources to enable people to live healthier and more fulfilled lives. However, NRW also recognises that different groups of people, businesses and organisations will be affected in different ways by proposed alternative scenarios for the future management of Wales' natural environment. In some cases, the different

stakeholders will have shared values where there is agreement on the outcomes, while in other cases different groups will have opposing ‘contested’ values. NRW has thus commissioned this research to explore shared and contested values for future management options for Wales’ natural resources in an attempt to gain a better understanding of sustainable pathways for future policy design.

The overall aim of this research is to explore shared and contested values that different groups of people in Wales have for alternative natural resource policy scenarios and to explore shared visions for the future direction of these policies. This aim is addressed in four research Stages.

In Stage 1 first involved a scenario analysis exercise in which we reviewed policy documents and ecosystem services assessment frameworks. Next, key policy stakeholders were consulted to identify plausible policy scenarios for the future of rural and environmental policies in Wales and importantly to identify possible policy impacts that might affect different groups of people in different ways. The outcome of this exercise was a list of policy issues that were further explored in the later stages.

Stage 2 involved a large-scale, all-Wales survey, supplemented by a survey of farmers, that explored people’s preferences for different policy options. A key finding from this survey was that although there is general consensus (shared values) as to what are the most important policy areas (i.e. there was widespread support for policies that reduced the impact of climate change), there were also some differences (contested values) between different user groups and different sociodemographic groups. This highlights that the detail of how policies are targeted and implemented is important.

In Stage 3 we re-surveyed a subsample of respondents from Stage 2 to explore whether consideration of the priorities (values) of other stakeholders would lead to a more shared vision for future policy priorities. Although one-third of respondents indicated that it was important for them to stick to their own priorities, around half of the respondents did change their priorities to reflect the preferences of others. This finding indicates that consideration of other people’s values has the potential to address contested issues relating to the future of rural and environmental policy in Wales, and to move towards a shared vision for those policies.

In the final stage, we held a workshop with representatives from across a range of rural and environmental stakeholders. During the workshop we utilised deliberative methods to develop shared visions of sustainable management of natural resources in Wales. Through the workshop discussions, it was clear that participants were able to consider the values of other stakeholders and developing a shared vision that reconciled these values. Further, workshop participants highlighted the need to form strategic partnerships among the different stakeholders to co-design policies that recognised each other’s needs.

In conclusion, our research has identified that people in Wales generally agree on what types of policy are most important (shared visions). For example, policies that had general

support across different groups of people included policies that reduced emissions that cause climate change and policies that protect natural habitats and endangered species. However, we also identified that there were differences in terms of actual policy priorities between different groups of people (contested issues). For example, farmers prioritised policies that maintained farmer's incomes and supported food production, while these policies were of less concern to the general public and people who were outdoor recreationists or members of environmental charities. As such, there is a risk that the introduction of policies that support farmers could meet with some resistance. To address this, we also explored whether deliberation and social learning could stimulate different groups of people to consider the views of others and to develop a shared vision of future policy. In Stage 3 we illustrate that around half of our respondents were willing to consider changing their policy priorities to account for the preferences of others. Similarly, in the Stage 4 workshops we demonstrate that deliberation can result in the development of shared visions for natural resource management in Wales. Thus, our recommendation to those who appraise and make policy such as the 'Sustainable Management of Natural Resources' (SMNR) in Wales is that when developing and evaluating rural and environmental policies, it is important to (i) consider the needs / preferences / values of different groups of people, and (ii) bring these different groups together to develop shared visions for new policies. Indeed, these recommendations support a number of the principles of SMNR, including 'Collaboration and engagement', 'public participation', 'evidence' and 'multiple benefits' (NRW)

1 Introduction

Natural Resources Wales (NRW) has a remit to significantly contribute to the delivery of the Well-being of Future Generations Act (Wales) 2015 and The Environment Act (Wales) 2016. For the former, NRW is required to ensure the sustainable management of Wales' natural resources to help people live healthier and more fulfilled lives.

The Environment Act (Wales) 2016 defines sustainable management as *“using natural resources in a way and at a rate that maintains and enhances the resilience of ecosystems and the benefits they provide. In so doing, meeting the needs of current generations without compromising the ability of future generations to meet their needs, and contribute to the achievement of the well-being goals.”* To meet these objectives NRW is required to assess the degree to which natural resource use in Wales is sustainable. However, NRW also recognises that different groups of people, businesses and organisations will benefit in different ways to alternative scenarios for the future management of Wales' natural environment. In some cases, the different stakeholders will have shared values where there is agreement on the outcomes, while in other cases different groups will have opposing 'contested' values. There are a range of approaches in which these values may be identified and measured including quantitative and qualitative indicators and monetary valuation. Often these different indicators of values are incommensurate (i.e. they may be difficult to directly compare and aggregate). Often, policy makers will attempt to compare the monetary values through cost-benefit analysis. However, this might not be possible in the case of incommensurate values. A possible solution to the issue of contested values is through the use of deliberative techniques which attempts to gain, through deliberation, a common understanding of issues and the development of a set of 'shared values' for future management options. NRW has thus commissioned this research to explore shared and contested values for future management options for Wales' natural resources in an attempt to gain a better understanding of approaches to achieving a sustainable pathway for future policy design.

1.1 Research aims and objectives

The overall aim of this research is to explore shared and contested values that different groups of people in Wales have for alternative natural resource policy scenarios. This aim is addressed through the following research objectives:

- Objective 1: To identify scenarios for the future direction of natural resource policies in Wales, and to identify a list of potentially contested issues.
- Objective 2: To undertake a large-scale survey of people in Wales to identify their shared and contested values for alternative natural resource policy scenarios.
- Objective 3: To further explore the values of a sub-set of respondents whose values are in conflict, to identify whether accounting for other's values leads to shared solutions.
- Objective 4: To explore whether deliberation and reflection of contested issues leads to solutions that can be used to design future natural resource policy.

1.2 Research approach

To address these objectives, we organised our research (and this report) into four stages. Stage 1 involved ‘scenario analysis’, which aimed to identify scenarios for the future direction of natural resource policies in Wales, and to identify a list of potentially contested issues. Specifically, we utilised the UK NEA (2011) framing of ecosystem services to identify the range potential natural resource policy outcomes. These outcomes were then discussed with experts to identify which were most important and which were likely to be contested. Based on this analysis, we identified a number of potential shared and contested policy issues.

Stage 2 then involved a large-scale survey to explore the extent to which people in Wales have shared or contested values for the policy issues identified in Stage 1. Data for Stage 2 were collected as part of the ‘All Wales Omnibus’ survey (N=1002). Given the importance of the farming / landowning community for implementing natural resource policies and also the fact that only a small number of farmers / landowners were included in the Omnibus survey sample, we supplemented our data with a survey of famers. Analysis of these surveys were used to identify policy outcomes that were widely supported by different groups of people in Wales (shared values) and those policies where there was disagreement (contested values).

A self-selected sub-sample of respondents from the Stage 2 surveys were then asked to complete a follow-on ‘reflective’ survey (Stage 3). Within this survey, respondents were asked to indicate their policy priorities both before and after information was presented to them of other groups of people’s preferences. The aim here was to explore whether knowledge of other people’s policy priorities changed people’s preferences to more ‘shared’ policy preferences.

Finally, Stage 4 involved deliberative workshops in which participants representing different groups of people in Wales discussed each other’s preferences to come up with a shared vision for the future of natural resources policies in Wales.

In this report, we present the methods and results of each of these stages in turn.

2 Stage 1: Scenario analysis

2.1 Stage 1 method: Scenario analysis

Stage 1 aimed to identify scenarios for the future direction of natural resource policies in Wales, and from these to identify a list of potentially contested issues associated with these scenarios (Objective 1). The approach used in the scenario analysis involved a review of policy documents to generate a structured list of natural resource policy outcomes, and then (where possible) mapping these against the UK NEA (2011) scenarios within a simple matrix. This matrix was then discussed with key policy stakeholders and further refined. Based on this analysis, we identified 13 potentially contested policy issues to be further considered in Stage 2 and beyond.

2.1.1 Stage 1 method: review of policy documents

The first task of the Stage 1 scenario analysis was to review a wide range of literature and policy documents to identify sets of contested values that would most usefully feed into future rural and environmental policy making in Wales. This task required the consideration of scenarios that reflected the (then) current pressures and policy choices. Our approach therefore focussed on developing scenarios based on those defined in the UK NEA follow-on work and translated by Environmental Systems (Haines-Young et al, 2017), but with updates to key variables within these to ensure they are relevant to:

- The range of possible post-Brexit (or CAP reform) policy outcomes. These Brexit outcomes had been developed by eftec within the ongoing ERAMPP¹ contract, based on expected international trade arrangements and their impacts on prices of inputs and outputs to key land use sectors (agriculture and forestry).
- Policy implementation needs and timescales, such as for the State of Natural Resources Report (SoNaRR) required by the Environment Act (Wales) 2016, and the Sustainable Management of Natural Resources (SMNR) which incorporates the sustainable development principle as delineated in the Wellbeing of Future Generations (Wales) Act 2015.
- Potential use of novel policy instruments, such as payments for ecosystem service mechanisms.

To make our analysis relevant to Wales, we drew on the synergies and trade-offs between the benefits identified as priorities within the SoNaRR report. Table 1 shows where conflicts may arise between those that prioritise specific ecosystem services. It excludes wholly marine issues (aquaculture and fish) as the project is primarily terrestrial (note that freshwater fish are reflected within the species diversity category). The trade-offs and synergies shown in Table 1 should be regarded as indicative and based on expert judgment of the project team. They aim to reflect current environmental practice in Wales (e.g. for

¹ Led by the Centre for Ecology and Hydrology in Bangor which is modelling environmental outcomes within potential Brexit policy scenarios for Wales.

crops and livestock) and attempt to characterise direct relationships between actions to deliver different benefits, rather than covariance with actions undertaken for other purposes. For example, it is argued that tree planting for timber or climate purposes could have benefits for most regulating services (e.g. air quality, soil quality). Thus, in Table 1 we show that there is synergy between climate and soil and air quality using the ‘++’ or ‘+’ symbols respectively. Similarly, we show the large trade-offs (e.g. between Livestock and Water supply) using the ‘--’ or ‘-’ symbols. Where we find no covariance, suggesting that there is no direct link between actions (e.g. links between air quality and soil quality), we using the ‘0’ symbol (no relationship). Finally, we indicate where conflicting evidence was found using ‘+/-’ symbol.

Table 1: SoNaRR benefits synergies and trade-offs

	Water supply	Trees, standing vegetation, peat	Crops	Livestock	Wild species diversity	Climate	Hazard	Disease and pests	Pollination	Noise	Water quality	Soil quality	Air quality	Environmental settings: local places
Trees, standing vegetation, peat	+													
Crops	-	--												
Livestock	--	--	-											
Wild species diversity	+	++	--	--										
Climate	+	++	--	--	+/-									
Hazard	+	++	--	--	+/-	+								
Disease and pests	0	+	-	-	++	+	0							
Pollination	0	+	--	-	++	+	0	+						
Noise	0	+	0	-	0	+	0	0	0					
Water quality	+/-	+	--	--	+	+	0	0	0	0				
Soil quality	+	++	-	-	+	+	0	0	+	0	+			
Air quality	0	++	-	-	0	++	0	0	0	0	+	0		
Environmental settings: local places	0	+/-	+/-	+/-	++	0	+	+	+	+	+	0	+	
Environmental settings: landscapes/seascapes	0	+/-	+/-	+/-	++	0	+	+	+	0	+	0	0	+

The SoNaRR ecosystem service benefit categories are similar to, but differ slightly from, some other environmental benefits typologies. In **Error! Reference source not found.** in Annex 1 we compare the terminology being used from SoNaRR to the terminology in the UK NEA (2011) (from which other evidence used in this analysis is drawn), and the more recent and broader IPBES ‘Natures Contributions to People’ (NCP) typology (Diaz et al, 2018).

Based on the above analysis, a set of policy scenarios were generated that reflect a range of possible issues associated with future management options for Wales’ natural resources. The links between scenarios and issues were summarised in a draft matrix (not shown in this report), which then formed the basis of interview discussions with policy makers.

2.1.2 Policy maker interviews

The links between the scenarios and issues (the draft matrix described above) formed the basis for interviews with Welsh environmental policy makers on what they considered to be the most important contested issues for the research to cover. Telephone interviews (of approximately 1 hour) were held with five experienced staff in different environmental management and policy areas in NRW and the Welsh Government. We also obtained responses from members the project steering group.

The interviews took a semi-structured approach based on an interview structure shown in Annex 2. After establishing the role and other details of the interviewee, a series of open questions were posed on key areas of environmental change in Wales. This was followed up with specific questions on the areas of expertise of the interviewee and on key areas identified from the draft matrix. As a result, not all questions shown in the script were asked to all respondents. The notes from the interviews are summarised in Annex 3. The data collected during the interviews were combined with that from the review of policy documents to develop a ‘scenario matrix’ (**Error! Reference source not found.**), found in Annex 4.

2.2 Stage 1 results: Scenario analysis

The review of policy documents, combined with the responses from the stakeholder interviews, enabled us to develop a matrix of policy scenarios and associated potentially contested policy issues: see **Error! Reference source not found.** in Annex 4 for the ‘Scenario matrix’ and Table 2 for a summary list of potentially contested policy issues. Our aim in developing the scenarios and associated issues was to select policy issues that:

- Were realistic in terms of potentially being adopted in the near future (we excluded policies that were unlikely to be adopted, e.g. rewilding);
- Had genuine variations, rather than simply differences in understanding (e.g. the potential of peatland and grassland to store and accumulate carbon); and
- Are likely to be widely understood by the general public (which excluded species-specific issues for poorly-known species).

We also aimed to define the policy issues at different spatial scales (e.g. farm or landscape), and different specificity (e.g. specific management practices such as livestock species used, or more general outcomes, such as increase in tree cover, which could involve native or plantation woodland or agro-forestry). However, we were also keen to keep the scenarios and issues relatively flexible to allow them to be adapted to subsequent policy or project requirements.

Table 2 below describes 13 potential contested policy issues that were identified in our scenario analysis. These issues were broadly grouped into issues associated with: climate change; afforestation; other ecosystem services and cross-cutting policies. The definition of the issues is based on benefits identified in SoNaRR (See Table 1), but also making reference to “Nature’s Contributions to People” as defined in IPBES (Diaz et al., 2018), and other benefits typologies where needed (see **Error! Reference source not found.** in Annex 1). The types of environmental change and resulting differences in benefits are defined with reference to the UK NEA (2011) scenarios (see Table 19 in Annex 1). These definitions were also refined to reflect latest thinking on environmental management and potential post-Brexit environmental changes (the latter in broad terms due to the then ongoing uncertainty). These potential issues identified for investigation are described in Table 2 and in more detail in **Error! Reference source not found.** in Annex 4, which also suggests research questions linked to each issue. These questions reflect different future scenarios for the UK environment, and the trade-offs that might arise between different benefits.

Table 2: List of potentially contested policy issues

Potentially contested policy issues	Definition of issue
Climate Change	
Climate change mitigation	There are a range of views in society over whether climate change exists at all, how severe a problem it is, how urgent the response should be, and what kind of response should be made.
Climate change adaptation	Environmental restoration can be seen as an investment in climate adaptation – but this view seems restricted to environmental groups. Other significant stakeholders (e.g. water sector) see climate change pressures as real, but their customers do not.
Afforestation	
Afforestation – woodland extent	Sheep grazing is the dominant land use in Wales' upland and areas. Farmers and landowners are resistant to more trees. There is also a view that grazing landscape should be retained because important to continuation of the Welsh Language.
Afforestation – woodland type	Mixed use woodland seems generally accepted as the best option amongst those who support afforestation (i.e. the 'right tree in the right place'). But the specifics of this may not be agreed on. A mixed use model (e.g. recreation/timber/habitat is possible) and a mix of benefits may justify greater Government subsidy support. It is unclear if farmer and rural community objections to woodlands relate to timber plantations or any kind of woodland - are farmers more open-minded to mixed use rather than large afforestation?
Afforestation – woodland location/size	If new woodland is to be created, where should it be created and how big should the blocks be? Different size and location of planting may be implicit given the purpose of woodland (see above). More generally, small areas of woodland can have large benefits (e.g. along watercourses, or the edge of towns), or alternatively large mixed use areas can be created. A 'National Forest for Wales' could be established in a part of the country providing a brand with which to attract visitors.
Afforestation – why?	Different groups have completely different priorities (e.g. even amongst environmental NGOs). There are trade-offs between mitigation and biodiversity/ forestry plantations. Do priorities depend on age, cultural background (note age of workforce is above average in Welsh Government, so lack of younger views internally). Are differences down to natural environmental views in general, climate change views, age, cultural background, other?
Other ecosystem services	
Landscape Visual Amenity	There are different views of what constitutes an attractive landscape. Some people regard existing land uses as traditional and therefore the landscape they create as part of cultural heritage. Others are concerned with biodiversity loss and climate change mitigation/ adaptation and see the current landscape as part of the problem.
Water Quality	31% of rivers in Wales are of good status (as defined under the EU Water Framework Directive). Should all rivers be raised to 'good status' and should industries causing pollution be more strictly regulated, or supported in changing practice with government funding?
Biodiversity	Data shows that UK biodiversity is in decline. Much of the farmland in Wales has low wildlife value and iconic species such as the Curlew have undergone serious declines. However, some species are specialists in the available habitats (e.g. acid grassland plants)?
Recreational access to land	Access to the natural environment provides significant value to people in terms of recreational enjoyment, and in some places visitor and tourism sector spending. The medical view is increasingly recognising the importance of accessible green space for public health, whereas landowners often regard access as a nuisance. Political decision-makers can have mixed views of the importance of the recreation/ health value of the environment.
Cross-cutting Policies	
Wellbeing of future generations (WBFGE)	The WBFGE is now an established law, but its implications for the environment have not been fully worked through. If the WBFGE Act objectives were applied to the environment it supports a need for policies that give longer term protection to natural resource (e.g. of soil / water) to maintain their extent and condition for future generations.
Regulatory baseline	What is the real regulatory baseline or minimum standard below which the polluter pays, and above which the beneficiary pays? (see water quality)

<i>Potentially contested policy issues</i>	Definition of issue
Who pays?	There is an element of public sympathy to support farms, but they need to provide public goods to justify it. Are current taxpayers willing to pay for continuing support to agriculture and forestry? Is this support to maintain them as sectors, or linked to benefits such as for conservation of biodiversity or benefits for future generations?

The information above were then used to form the basis for the key threats and policy priorities in rural and environmental policies in Wales, which we explored in more detailed in Stage 2 and beyond. Key issues that were identified from our analysis and that were also thought to be valued differently by different groups within Welsh society included:

- Whether current environmental protections are adequate, or whether payments should be made to farmers to raise environmental protection standards.
- Whether taxpayers should fund payments to improve the environment (in whatever way) relative to its current state.
- Afforestation, which contains a range of issues which can be summarised as priorities across:
 - The type of woodland: mixed (and therefore multi-use) woodland or conifer plantations which prioritise timber production.
 - The role of woodland creation in mitigating climate change: whether trees should be used to sequester carbon or should livestock numbers be reduced to curb carbon emissions. Both have socio-economic implications for communities and for the size of the livestock sector.
 - The style of woodlands: whether to promote smaller woodlands across the landscape or larger forests?
- Wildlife priorities in terms of protecting specific species or protecting habitats within which species can (but do not always) survive.
- Perceived trade-offs between increases in agricultural output and protection of the natural environment.

3 Stage 2: Omnibus survey of Welsh population and farmers survey

The aim of Stage 2 was to undertake a large-scale survey of people in Wales to identify their shared and contested values for alternative natural resource policy scenarios (Objective 2). This aim was addressed through inclusion of questions into the all-Wales Omnibus survey, supplemented with a targeted survey of farmers / landowners.

3.1 Stage 2 methods: Omnibus survey of Welsh population and farmers survey

The Beaufort Wales Omnibus survey (a face-to-face survey of 1000 Welsh people), combined with a survey of farmers (n=17), was used to capture Welsh people's preferences for the various contested ecosystem services identified in the Scenario Analysis (Section 2.2).

3.1.1 Omnibus survey

Omnibus surveys are a cost-effective, well-established method of conducting market and social research. The Wales omnibus survey is based upon a representative quota sample, consisting 1,000 residents of Wales. Survey interviews were conducted at 68 locations throughout Wales, where the sample is drawn to reflect the demographic profile of Welsh residents according to the latest 2011 Census. All interviews are conducted face to face in the homes of respondents utilising CAPI (Computer Aided Personal Interviewing) technology. Fieldwork for the survey took place between 11 November and 8 December 2019. Beaufort Research adhere to a range of quality assurance standards, including ISO20252, the international quality standard for market research.

3.1.2 Farmer's survey

Although the Omnibus survey captures a representative cross section of the Welsh population, it is likely that many of the potential conflicts associated with the natural resource scenarios will impinge on the farming community. Farming accounts for 84% (1,559,558 hectares) of the total land area in Wales (Welsh Government Statistics, 2013). Therefore, capturing farmers opinions is crucial for the success of future natural resource management policies. As it is unlikely that the Omnibus survey will include a large enough sample of farmers for rigorous analysis further targeting of farmer responses is required. To increase the number of farmer responses a purposive sampling method was used to identify active farmers. The questionnaire used in the Omnibus survey was sent to various farming and land-owning organisations. The survey was distributed using an online survey tool to allow the organisations to circulate the survey via their membership and media channels. Unfortunately, we attained a disappointing response rate (n=17), which was partly due to some concerns raised by farming Unions

3.1.3 The survey questionnaire

The omnibus and farmer's surveys aimed to identify policy choices/preferences of different groups of respondents in order to identify contested areas and to consider likely impact of policy uptake. A copy of the project-specific questions posed in the Omnibus survey can be found in Annex 5. Key questions in these surveys asked respondents to identify the factors that they considered to be the greatest threats to the Welsh rural environment (Q1), and also to identify their priority for future rural and environmental policies in Wales (Q2). Next, respondents were presented with a series of contested policy issues (as identified in the scenario analysis – Section 2.2) and asked to identify (on a scale 1 – 5) which aspects of the policy issue they preferred (Q3). In addition to these research specific questions, we also had access to the socio-economic questions that were included in the Omnibus survey (these questions were reproduced in the farmers survey). Survey data from both the Omnibus and Farmer's surveys were analysed to identify: (i) 'clusters' of individuals with similar preferences for policy options; and (ii) different 'clusters' that have conflicting preferences. This analysis was used to identify 'contested issues' for more in-depth analysis in Stages 3 and 4.

3.2 Stage 2 results: Omnibus survey of Welsh population and farmers survey

3.2.1 Stage 2 results: Characteristics of the survey samples

The Omnibus survey was administered to a representative sample of 1002 people across Wales, with an additional 17 farmers/landowners also sampled. Table 3 summarizes the different 'user' groups in the sample. Respondents were asked (Q4) whether they are a) farmers/landowners b) regularly participating in outdoor recreational activities c) members of a nature conservation charity d) none of the above i.e. the general public. The analysis of this question revealed that some individuals in the sample belonged to more than one group. To be able to compare between groups we classified:

- Farmers: individuals that responded (a);
- Members of an environmental charity: individuals that responded (c) and are not farmers (a);
- Outdoor recreationists: individuals who responded (b) but are not farmers (a) or members of a nature charity (c) ².
- Members of the public: individuals who responded only (d).

Overall, there were 44 farmers in the Omnibus sample, 373 people that take part in outdoor recreational activities, 164 people that are members of a nature conservation charity and

² Please note that:

- 18 individuals in the sample responded that they belong to groups a) and b)
- 6 individuals in the sample responded that they belong to groups a) and c)
- 4 individuals in the sample responded that they belong to groups a), b) and c)
- 106 individuals in the sample responded that they belong to groups b) and c)

421 people that can be classified as general public (Table 3). The socioeconomic profile of the sample of the different groups is presented in Table 4. Given the low number of farmers (N=44) in the Omnibus survey, an online version of the Omnibus questionnaire was created and distributed to farmers via the farmers' unions. 17 farmers completed this Farmers online survey. The socioeconomic profile of the respondents of the farmers' survey is also presented in Table 4.

Table 3: User groups in the Omnibus survey sample

Group	Frequency (No)	Percent %
Farmers	44	4.39
Outdoor recreation	373	37.23
Environmental charity	164	16.37
General public	421	42.02
Total	1002	100

Table 4: Sociodemographic information of the sample

		Omnibus survey					Farmers' survey
		All	Farmers	Outdoor recreation	Environmental Charity	General public	
Gender	Male	534	29	177	74	188	15
	Female	468	15	196	90	233	2
Age	16-34	308	9	137	37	125	3
	35-54	280	10	114	46	110	3
	55+	414	25	122	81	186	11
Rural/Urban	Rural	319	30	139	39	111	14
	Urban	683	14	234	125	310	2
Region	North Wales	199	12	74	35	78	5
	Mid and SW	372	26	163	41	142	9
	The Valleys and SE	431	6	136	88	201	3
Social Grade	ABC1	516	20	204	120	172	
	C2DE	486	24	169	44	249	

3.2.2 Stage 2 results: Greatest threat to the Welsh Rural Environment by user group

Respondents were first asked to indicate what they perceive to be the greatest threat to the Welsh rural environment (Q1). Table 5 presents the results per user group (excluding people (N=9) replying 'don't know') and the Farmers survey, while Table 6 tabulates the biggest threat by age. Across all respondents, *climate change* was perceived as the main threat for the Welsh Rural Environment (30.3% of respondents stated *climate change* was the biggest threat). Members of Environmental charities (36.0%) and young people (36.3%) were most likely to consider climate change as the biggest threat. *Pollution of rivers, lakes or groundwater* was considered the next greatest threat (18.9%), followed by Loss of natural habitats (15%). A Chi-square test indicated that preferences were significantly different across User groups (Table 5), but not different across Age groups (Table 6).

Table 5: Biggest threat to the Welsh Rural Environment by user group

Threat	Omnibus survey					Farmers survey
	Farmers	Outdoor recreation	Environmental Charity	General public	Total	
Intensive Farming Practices	5 (11.4%)	26 (7%)	23 (14%)	21 (5.1%)	75 (7.6%)	0 (0%)
Loss of Natural Habitats	4 (9.1%)	59 (15.9%)	25 (15.2%)	62 (15%)	150 (15%)	1 (6%)
Loss of Plant and Animal Species	5 (11.4%)	25 (6.7%)	9 (5.5%)	47 (11.45)	86 (8.7)	0 (0%)
Climate Change	10 (22.8)	122 (32.8%)	59 (36%)	110 (26.6%)	301 (30.3%)	6 (35%)
Pollution of rivers, lakes or groundwater	4 (9.1%)	77 (20.7%)	29 (17.7%)	78 (18.9%)	188 (18.9%)	1 (6%)
Flooding	7 (15.9%)	47 (12.6%)	12 (7.3%)	57 (13.8%)	123 (12.4%)	2 (12%)
Too many people visiting the countryside	5 (11.4%)	7 (1.9%)	2 (1.22%)	8 (1.9%)	22 (2.2%)	1 (6%)
Other	4 (9.1%)	7 (1.9%)	4 (2.44%)	26 (6.3%)	41 (4.1%)	4 (24%)
None of the above	0 (0%)	2 (0.5%)	1 (0.61%)	4 (0.97%)	7 (0.7%)	2 (12%)
Total	44	372	164	413	993	17
<i>Pearson Chi2= 66.32, p-value= 0.000</i>						

Table 6: Biggest threat to the Welsh Rural Environment by age group (Omnibus survey)

Threat	16-34	35-54	55+
Intensive Farming Practices	15 (4.9%)	22 (7.9%)	38 (9.3%)
Loss of Natural Habitats	41 (13.4%)	47 (16.9%)	62 (15.2%)
Loss of Plant and Animal Species	31 (10.13%)	20 (7.2%)	35 (8.6%)
Climate Change	111 (36.3%)	84 (30.2%)	106 (25.9%)
Pollution of rivers, lakes or groundwater	59 (19.3%)	55 (19.8%)	74 (18.1%)
Flooding	28 (9.15%)	32 (11.5%)	63 (15.4%)
Too many people visiting the countryside	9 (2.9%)	4 (1.44%)	9 (2.2%)
Other	9 (2.9%)	12 (4.32%)	20 (4.9%)
None of the above	3 (0.98%)	2 (0.72%)	2 (0.5%)
<i>Pearson chi2 = 23.1452 p-value = 0.110</i>			

3.2.3 Stage 2 results: Priorities for future rural and environment policies

Respondents were then asked what they think should be the priority for future rural and environmental policies in Wales (Q2). Table 7 summarizes the answers for the different

User groups from the Omnibus survey and the Farmers survey, while Table 8 for different Age groups from the Omnibus survey. With the exception of farmers who highlighted the importance of *Maintaining farmers' income* (27.3% Omnibus survey and 41% in the Farmers survey), all other user groups considered *Reducing emissions that cause climate change* as the top priority (28.5%). Although all age groups identified *climate change* mitigation as their top policy priority, more younger people (33.7%) identified *climate change* as top priority compared to older people (24.7%). Significant differences in policy priorities were found across different User groups and Age groups.

Table 7: Priorities for future rural and environmental policies in Wales by User group

Policy Priority	Omnibus survey					Farmers survey
	Farmers	Outdoor recreation	Environmental Charity	General public	Total	
Maintaining farmers' income	12 (27.3%)	37 (10%)	20 (12.2%)	38 (9.2%)	107 (10.8%)	7 (41%)
Supporting food production	9 (20.5%)	45 (12.2%)	12 (7.32%)	34 (8.3%)	100 (10.1%)	3 (18%)
Protecting endangered species	6 (13.6%)	34 (9.2%)	9 (5.5%)	65 (15.8%)	114 (11.5%)	0 (0%)
Protecting natural habitats	5 (11.4%)	50 (13.5%)	25 (15.2%)	75 (18.2%)	155 (15.7%)	1 (6%)
Reduce emissions that cause climate change	5 (11.4%)	114 (30.8%)	63 (38.4%)	100 (24.3%)	282 (28.5%)	2 (12%)
Protect water quality	2 (4.6%)	40 (10.8%)	17 (10.4%)	42 (10.2%)	101 (10.2%)	1 (6%)
Reduce flooding	1 (2.3%)	26 (7%)	11 (6.7%)	39 (9.5%)	77 (7.8%)	0 (0%)
Increase outdoor recreation opportunities	4 (9.1%)	19 (5.14%)	5 (3%)	12 (2.9%)	40 (4%)	1 (6%)
Other	0 (0%)	2 (0.5%)	2 (1.2%)	1 (0.24%)	5 (0.5)	2 (12%)
None of the above	0 (0%)	3 (0.8%)	0 (0%)	6 (1.5%)	9 (0.9)	0 (0%)
Total	44	370	164	406	990	17
Pearson chi2= 64.7218 Pr= 0.000						

Table 8: Priorities for future rural and environmental policies in Wales by age group (Omnibus survey)

Policy Priority	16-34	35-54	55+
Maintaining farmers' income	29 (9.5%)	25 (9.1%)	53 (13%)
Supporting food production	21 (6.9%)	28 (10.2%)	51 (12.5%)
Protecting endangered species	55 (18%)	25 (9.1%)	34 (8.3%)
Protecting natural habitats	46 (15%)	44 (16%)	65 (15.9%)
Reduce emissions that cause climate change	103 (33.7%)	78 (28.4%)	101 (24.7%)
Protect water quality	32 (10.5%)	33 (12%)	36 (8.8%)
Reduce flooding	14 (4.6%)	22 (8%)	41 (10.25)
Increase outdoor recreation opportunities	5 (1.6%)	14 (5.1%)	21 (5.1%)
Other	0 (0%)	3 (1.1%)	2 (0.5%)
None of the above	1	3	5

	(0.3%)	(1.1%)	(1.2%)
Total	306	275	409
Pearson chi2 = 47.6628 Pr = 0.000			

3.2.4 Stage 2 results: Priorities for alternative policy options

It was then explained to respondents that in designing and implementing rural and environmental policies, policy makers are required to make choices between alternative policy options. Subsequently, they were then presented with a series of policy options and were asked to indicate their preferred policy alternative (Q3). The policy options were presented on a scale of 1 to 5, where (1) represented one policy extreme and (5) the opposite extreme. Table 9 and Table 10 respectively summarize the mean results per User and by Age group. Individuals replying 'don't know' were excluded from the analysis. The full tabulation of the number of respondents indicating each point on the 1 – 5 scale is presented in Annex 6.

Table 9: Policy preferences by Omnibus 'user' group and Farmers survey

	Omnibus survey					Farmers survey
	Farmers	Outdoor recreation	Environmental Charity	General public	Total	
	Mean Score (scale: 1-5) (St deviation)					
Policies for farmers should: (1) aim to maintain and potentially increase agricultural output vs (5) aim to maintain and potentially enhance the natural environment	3 (1.27)	3.5 (1.08)	3.6 (1.26)	3.3 (1.13)	3.4 (1.15)	2.9 (0.9)
Policies for farmers should: (1) Retain the current level of environmental protection vs (5) Pay farmers to raise the level of environment protection	3.7 (1.4)	3.7 (1.17)	4.1 (1.07)	3.2 (1.3)	3.6 (1.26)	3.6 (0.99)
Conservation policies should: (1) protect the most endangered plant and animal species vs (5) protect habitats in the wider countryside	3.4 (1.4)	3.5 (1.19)	3.9 (1.2)	3.1 (1.2)	3.4 (1.24)	3.5 (1.12)
Climate change should be mitigated by: (1) planting more trees to increase the amount of carbon captured vs (5) reducing livestock numbers to reduce their carbon emissions	2.1 (1.4)	2.2 (1.26)	2.3 (1.35)	2.1 (1.29)	2.2 (1.29)	2.3 (0.72)
What type of trees would you prefer? (1) Plant fast-growing conifers to maximize carbon capture vs (5) Plant mixed woodlands to benefit biodiversity and landscape	4 (1.4)	3.9 (1.23)	4.3 (1.09)	3.6 (1.41)	3.9 (1.31)	3.5 (1.46)
What type of trees would you prefer? (1) Create small woodlands near urban areas vs (5) create large multifunctional forests	2.7 (1.6)	2.8 (1.3)	2.8 (1.4)	2.9 (1.38)	2.8 (1.36)	2.9 (1.3)
Who should pay for environmental policies? (1) Tax payers should not pay more tax to improve the natural environment vs (5) Tax payers should pay more tax to improve the natural environment	3 (1.33)	2.8 (1.33)	3.2 (1.34)	2.4 (1.37)	2.7 (1.38)	3.8 (1.18)
(1) Policies should not reduce the well-being of the current generation vs (5) Policies should not reduce the well-being of future generations	3.4 (1.15)	3.5 (1.13)	3.8 (1.09)	3.3 (1.32)	3.5 (1.22)	3.4 (1.42)

Table 10: Policy preferences by age group

Age group	16-34	35-54	55+
	Mean score (Scale 1-5) (St Deviation)		
Policies for farmers should: (1) aim to maintain and potentially increase agricultural output vs (5) aim to maintain and potentially enhance the natural environment	3.6 (1.1)	3.3 (1.16)	3.4 (1.17)
Policies for farmers should: (1) Retain the current level of environmental protection vs (5) Pay farmers to raise the level of environment protection	3.7 (1.22)	3.5 (1.21)	3.5 (1.32)
Conservation policies should: (1) protect the most endangered plant and animal species vs (5) protect habitats in the wider countryside	3.2 (1.19)	3.4 (1.2)	3.5 (1.3)
Climate change should be mitigated by: (1) planting more trees to increase the amount of carbon captured vs (5) reducing livestock numbers to reduce their carbon emissions	2.3 (1.28)	2.1 (1.19)	2.1 (1.18)
What type of trees would you prefer? (1) Plant fast-growing conifers to maximize carbon capture vs (5) Plant mixed woodlands to benefit biodiversity and landscape	3.7 (1.29)	3.8 (1.35)	4.1 (1.28)
What type of trees would you prefer? (1) Create small woodlands near urban areas vs (5) create large multifunctional forests	2.9 (1.32)	2.9 (1.34)	2.7 (1.4)
Who should pay for environmental policies? (1) Tax payers should not pay more tax to improve the natural environment vs (5) Tax payers should pay more tax to improve the natural environment	2.8 (1.41)	2.6 (1.32)	2.7 (1.4)
(1) Policies should not reduce the well-being of the current generation vs (5) Policies should not reduce the well-being of future generations	3.4 (1.19)	3.5 (1.24)	3.5 (1.24)

Based on an analysis of the data in Table 9 and Table 10, we draw the following conclusions:

- The majority of respondents in all user and age groups preferred policies that aim to maintain and potentially enhance the natural environment.
- All user and age groups showed a preference towards policies that support farmers to raise the level of environmental protection.
- When asked about their preferences between policies that target endangered species and policies that target habitats in the wider countryside, all groups tended to support policies aiming to protect habitats in the wider countryside.
- All groups revealed a preference for climate change mitigation by planting more trees rather than reducing livestock.
- When asked about type of trees, people in all user and age groups preferred mixed woodlands to benefit biodiversity and the landscape.
- Differences were noted as to who should be asked to pay for environmental policies. The general public opposed to taxpayers being asked to pay more for environmental policies. Farmers and members of environmental charities were more supportive.
- There was low support for increases in taxes across all age groups.
- All groups argued that policies should account for the well-being of the future generations. This was particularly supported by members of environmental charities. All age groups stressed the importance of considering the well-being of future generations.

3.2.5 Stage 2 results: Conclusions

The Omnibus survey was based on a representative sample of 1000 people in Wales. In the survey we asked respondents to state what they considered to be the biggest threats to the rural environment (Q1) and also what their policy preferences were (Q 2 and 3). Generally, there were high levels of agreement in terms of what were the biggest threats and policy preferences across respondent groups (therefore evidence of 'shared' values). For example, policies to reduce climate change was a high priority across all user groups, while policies for increasing outdoor recreation was a low priority. However, there was some variation in the actual ordering of preferences or the relative level of support between user groups and age groups. In particular, farmers tended to have different preferences to other groups, e.g. farmers indicated higher priorities for *maintaining farmer's income* and *supporting food production*, while lower priorities for *reducing climate change*. Thus, there is some evidence of contested values.

4 Stage 3: Reflective survey

4.1 Stage 3 method: Reflective survey

Respondents of both the Omnibus and Farmer's surveys were asked whether they would be willing to participate in a follow-up reflective survey. The aim of this reflective survey was to further explore the values of a sub-set of respondents whose values are in conflict (Objective 3). In particular, we asked respondents to state their policy priorities 'before and after' they were presented with information on the preferences of different groups of people. In the reflective survey we focussed on eight policies. The reflective survey was implemented using an online survey tool – see Annex 7. The survey was structured as follows:

- Respondents were presented with a series of eight policy options and were asked to allocate 100% of a hypothetical budget between these eight policy options (Q1).
- Next, respondents were presented with the key results from the Stage 2 surveys including the overall ranking of policies, and the ranking of different 'user' groups and different age groups – See Annex 7 for details.
- Respondents were then asked to repeat the allocation task (Q3).
- Next, respondents were asked to state the extent to which they took into account the preferences of others in the repeated allocation task (Q4) and if so, who's preferences did they consider (Q5).
- Finally, they were asked to provide socio-economic data about themselves (Q6 – 10).

Analysis of the Stage 3 reflective survey aimed to explore whether people were open to change their preference after considering the preferences of others and thus leading to a shared vision of values. The analysis also helps to identify who changed their values and to which values they changed to. It is envisaged that the output from this study will help policy makers identify alternative scenarios for the future management of Wales natural resources.

4.2 Stage 3 results: Reflective survey

4.2.1 Socio-economics of respondents of reflective survey

The Reflective survey was sent to the 375 respondents of the Omnibus survey who stated that they would be willing to take part in a follow-on survey and all of the respondents of the farmers survey. Of these, we received 117 respondents: 108 from the Omnibus survey (29% response rate) and 9 responses from the Farmers survey (53% response rate).

A comparison of the type of user who replied to the Original Omnibus survey and the follow-on Reflective survey indicated that there were no significant differences in the proportion of User types between the two surveys (Chi-square = 1.438, $p = 0.69$). All respondents to the farmer's follow-on survey indicated they were farmers. Table 11 summarizes the type of 'user' responding to the two surveys.

Table 11: Type of User in Omnibus and Farmers surveys

Group	Omnibus Survey		Farmers survey	
	Frequency (No)	Percent %	Frequency (No)	Percent %
Farmers/landowners	4	3.7	9	100
Outdoor recreational activities	46	42.6	0	0
Nature conservation charity	18	16.7	0	0
General public	40	37.0	0	0
Total	108	100	9	100

The sociodemographic profile of the Omnibus follow-on reflective survey sample and of the different User groups is presented in Table 12. Comparing the socio-economic data of the original Omnibus survey and the follow-on survey, there was no difference in gender (Chi-square = 0.096: $p=0.756$), age (Chi-square = 3.564: $P=0.168$), or Rural / Urban (Chi-square = 2.733: $p=0.098$). However, there was a difference in the region (Chi-square = 10.472: $P=0.005$), with a higher proportion of people in North Wales returning responses to the follow-on survey and a lower proportion from The Valleys and SE.

In the Farmers sample, there was no significant difference in socio-economics between the respondents of the original Farmers survey and the follow-on survey in terms of gender (chi-square = 0.449, $p=0.503$), age (chi-square = 4.321, $p=0.115$), Rural / urban (chi-square = 2.212, $p=0.137$), or region (chi-square = 1.809, $p=0.405$).

Table 12: Sociodemographic information of follow-on survey (Omnibus sample)

		Omnibus survey sample					Farmers survey sample
		All	Farmers	Outdoor recreation	Environmental Charity	General public	
Gender	Male	54	3	30	8	13	8
	Female	54	1	16	10	27	1
Age	16-34	37	2	17	2	16	3
	35-54	21	1	8	4	8	4
	55+	50	1	21	12	16	2
Rural/Urban	Rural	43	2	18	7	16	9
	Urban	65	2	28	11	24	0
Region	North Wales	33	2	13	5	13	3
	Mid and SW	44	2	22	5	15	6

	The Valleys and SE	31	0	11	8	12	0
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4.2.2 Does information on other people’s preferences change option choices?

In Questions 1 and 3, survey respondents were asked to allocate a (100%) hypothetical budget between eight policy options. Table 13 provides a summary of respondents’ allocation. Note that in the analysis that follows, we combine the responses of farmers from the two surveys. If respondents allocated their budgets equally across all eight policies, each policy would be allocated 12.5% of the hypothetical budget. In the tables below we (arbitrarily) highlight in **green** those policies that receive 5% more of the budget (i.e. 17.5% or above), and in **red** those policies with 5% less of the budget (i.e. 7.5% or below).

Based on their own preferences (Q1 - which was posed before information on other’s preferences: Table 13), survey respondents allocated most of their budgets to *Reducing carbon emissions* (18.78% of the budget). This was consistently the highest allocation across most User groups other than the farmers who prioritised *Maintaining farm income* (23.85%) and *Support efficient food production* (21.15%). *Increase outdoor recreation opportunities* received the lowest allocation (6.65% across all respondents). *Reduce flooding* also received a low allocation of the budget (9.54%), particularly by the farming group (1.73%). These results are largely consistent with those found in the original Stage 2 Omnibus survey.

Following the presentation of the results from the original Omnibus survey, all User groups allocated a higher proportion of their budgets to *Reduce carbon emissions* (a 3.98% increase from 18.79% (before) to 22.77% (after) across all respondents: Table 13). Other notable increases were farmers who allocated an extra 2.61% of their budget to *Maintain farm income*, and members of environmental groups who increased their budget for *enhanced water quality* by 1.67%. Budgets allocated to the other services generally reduced, with the budget allocated to *Support efficient food production* reducing by 1%, *Increase outdoor recreation* reducing by 0.88%, *Maintain farm income* reducing by 0.65% and *Reduce flooding* by 0.54% (Table 13).

Table 13: Changes to Respondent’s allocation of a hypothetical budget on policies by User group

	Farmers (n=13)	Outdoor recreation (n=44)	Environmental Charity (n=18)	General public (n=40)	All respondents (n=115)
Q1 - Before					
Maintain farm income	23.85	11.84	10.94	14.00	13.81
Support efficient food production	21.15	11.16	10.83	12.88	12.83
Protect endangered species	7.15	12.97	14.89	15.63	13.53
Protect natural habitats	9.15	13.72	18.89	12.88	13.72
Reduce carbon emissions	16.46	20.73	18.33	17.63	18.79
Enhance water quality	16.50	9.97	10.61	10.87	11.12
Reduce flooding	1.73	12.39	8.72	9.33	9.54
Increase outdoor recreation	4.00	7.23	6.78	6.80	6.65
All	100	100	100	100	100
Q3 - After					
Maintain farm income	26.46	11.18	9.56	12.63	13.16
Support efficient food production	21.08	10.02	10.28	11.50	11.83
Protect endangered species	6.69	13.38	14.61	14.88	13.33
Protect natural habitats	9.38	13.75	18.72	11.50	13.25
Reduce carbon emissions	17.92	23.52	23.06	23.38	22.77
Enhance water quality	14.54	10.40	12.28	9.62	10.89
Reduce flooding	1.92	11.02	6.78	10.08	9.00
Increase outdoor recreation	2.00	6.73	4.72	6.43	5.77
All	100	100	100	100	100
Difference					
Maintain farm income	2.61	-0.66	-1.38	-1.37	-0.65
Support efficient food production	-0.07	-1.14	-0.55	-1.38	-1.00
Protect endangered species	-0.46	0.41	-0.28	-0.75	-0.20
Protect natural habitats	0.23	0.03	-0.17	-1.38	-0.47
Reduce carbon emissions	1.46	2.79	4.73	5.75	3.98
Enhance water quality	-1.96	0.43	1.67	-1.25	-0.23
Reduce flooding	0.19	-1.37	-1.94	0.75	-0.54
Increase outdoor recreation	-2.00	-0.50	-2.06	-0.37	-0.88

Table 14 analyses the changes in budgets by Gender, Age and Rural/Urban. Before the additional information was provided all sub-groups prioritised *Reduce carbon emissions*, and had lowest priority for *Increase outdoor recreation*. After information on other people's preferences were presented, all sub-groups increased the proportion of their budgets to *Reduce carbon emissions*, with highest increases seen by the oldest age group (+ 6.15%) and Females (+5.06%). All groups reduced the budget to *Support efficient food production*,

with both Males and the youngest age group reduced the budget by around 1.8%. Again, there is strong evidence that all Gender, Age and Rural/urban groups moved budgets away from other policies to support *Reduce carbon emissions*; this was particularly evident for Females and the oldest Age group.

Table 14: Changes to Respondent's allocation of a hypothetical budget on policies by Gender and Age

	Male	Female	16-34	35-54	55+	Rural	Urban
Q1 - Before							
Maintain farm income	12.60	15.23	13.89	14.60	13.37	16.88	11.36
Support efficient food production	13.65	11.89	13.84	12.80	12.12	15.61	10.63
Protect endangered species	11.69	15.70	12.86	11.20	15.15	13.84	13.29
Protect natural habitats	13.35	14.15	11.51	15.00	14.71	13.14	14.18
Reduce carbon emissions	21.23	15.94	19.38	18.00	18.75	17.45	19.86
Enhance water quality	11.29	10.92	12.29	11.00	10.33	8.83	12.95
Reduce flooding	9.01	10.17	9.07	8.12	10.58	8.05	10.73
Increase outdoor recreation	7.20	6.00	7.16	9.28	5.00	6.20	7.00
All	100	100	100	100	100	100	100
Q3 - After							
Maintain farm income	12.45	13.98	14.68	14.00	11.63	16.69	10.34
Support efficient food production	11.84	11.81	11.97	12.60	11.35	14.22	9.92
Protect endangered species	12.19	14.68	12.64	11.00	14.96	13.20	13.45
Protect natural habitats	13.66	12.77	11.89	15.40	13.21	12.29	14.02
Reduce carbon emissions	24.27	21.00	21.26	20.60	24.90	21.63	23.67
Enhance water quality	11.15	10.58	11.59	11.00	10.33	8.90	12.48
Reduce flooding	8.55	9.53	9.00	8.32	9.33	7.80	9.95
Increase outdoor recreation	5.89	5.64	6.95	7.08	4.29	5.27	6.17
All	100	100	100	100	100	100	100
Difference							
Maintain farm income	-0.15	-1.25	0.79	-0.60	-1.74	-0.19	-1.02
Support efficient food production	-1.81	-0.08	-1.87	-0.20	-0.77	-1.39	-0.71
Protect endangered species	0.50	-1.02	-0.22	-0.20	-0.19	-0.64	0.16
Protect natural habitats	0.31	-1.38	0.38	0.40	-1.50	-0.85	-0.16
Reduce carbon emissions	3.04	5.06	1.88	2.60	6.15	4.18	3.81
Enhance water quality	-0.14	-0.34	-0.70	0.00	0.00	0.07	-0.47
Reduce flooding	-0.46	-0.64	-0.07	0.20	-1.25	-0.25	-0.78
Increase outdoor recreation	-1.31	-0.36	-0.21	-2.20	-0.71	-0.93	-0.83

To gain a better understanding of why respondents changed their preferences, we asked a number of follow-on questions. Q4 ask whether the information on other people's priorities influenced the way they allocated their hypothetical budget. Overall, one-third of respondents did not change their priorities as they felt '*it was more important to stick to my own priorities*', while a further 19% felt that their priorities '*already reflected the priorities of others*' (Table 15). Across all respondents, 46.8% indicated that they changed their priorities for some options to '*reflect the preferences of others*'. However, members of Environmental charities were more likely to change their preferences: two-thirds changed some of their preferences to reflect the priorities of others. Interestingly, around 8% of farmers '*totally changed their preferences to fully reflect the priorities of others*'.

Table 15: Did information on other's priorities change your priorities by User group?

	Farmers (n=13)	Outdoor recreation (n=42)	Environment al Charity (n=18)	General public (n=38)	All (n=115)
I did not change my priorities as I felt it was more important to stick to my own priorities	38.5%	31.0%	22.2%	36.8%	32.4%
I did not change my priorities as I felt they already reflected the priorities of others	15.4%	23.8%	11.1%	18.4%	18.9%
I changed my priorities for some options to reflect the priorities of others	38.5%	45.2%	66.7%	42.1%	46.8%
I totally changed my priorities to fully reflect the priorities of others	7.7%	0.0%	0.0%	2.6%	1.8%
N	13	42	18	38	111

Table 16 provides similar analysis for different socio-economic groups. Females, younger people and people who live in rural areas where more likely to change their priorities to reflect the priorities of others.

Table 16: Did information on other's priorities change your priorities by socio-economics?

	Male	Female	16-34	35-54	55+	Rural	Urban
I did not change my priorities as I felt it was more important to stick to my own priorities	37.3%	26.9%	23.7%	28.0%	41.7%	28.0%	36.1%
I did not change my priorities as I felt they already reflected the priorities of others	20.3%	17.3%	10.5%	40.0%	14.6%	18.0%	19.7%
I changed my priorities for some options to reflect the priorities of others	40.7%	53.8%	60.5%	32.0%	43.8%	50.0%	44.3%
I totally changed my priorities to fully reflect the priorities of others	1.7%	1.9%	5.3%	0.0%	0.0%	4.0%	0.0%
N	59	52	38	25	48	50	61

Table 17 provides a summary of whose policy priorities influenced respondents to change their own priorities. The table summarises the responses of only those respondents who stated that they did change their priorities (n=51). First, looking across all respondents, 41% changed their priorities to reflect the priorities of members of environmental groups, 29% to reflect the priorities of farmers and 15% to reflect the priorities of young people. Respondents who were farmers predominantly changed their priorities to reflect the priorities of other farmers (83.3%) and to a lesser extent the priorities of members of environmental groups (16.7%). All other User groups tended to be most influenced by the priorities of members of environmental groups. There was also general support (particularly from members of environmental groups) to change their priorities to reflect the priorities of younger people.

Table 17: How respondents changed their responses to account for other's people's priorities by User group

	Farmers (n=6)	Outdoor recreation (n=18)	Environmental Charity (n=13)	General public (n=14)	All (n=51)
I changed my priorities to reflect the priorities of farmers	83.3%	33.3%	7.7%	21.4%	29.4%
I changed my priorities to reflect the priorities of people who do outdoor recreation activities	0.0%	16.7%	0.0%	7.1%	7.8%
I changed my priorities to reflect the priorities of members of environmental groups	16.7%	38.9%	53.8%	42.9%	41.2%
I changed my priorities to reflect the priorities of younger people	0.0%	11.1%	30.8%	14.3%	15.7%
I changed my priorities to reflect the priorities of older people	0.0%	0.0%	7.7%	14.3%	5.9%

Table 18 provides a similar analysis for different socio-economic groups. There was little different between genders and rural / urban groups in terms of who influenced their preferences. The younger age group (16 – 34 years old) were mostly influenced by the preferences of farmers (38.1% of young people), members of environmental groups (38.1%) and people who took part in outdoor recreation (19.0%). The middle age group (35 - 54) were strongly influenced by the preferences of farmers (44.4%) and younger people (33.3%). The eldest age group (Over 55 years old) were influenced by the preferences of members of environmental groups (57.1%) and younger people (19.0%).

Table 18: How respondents changed their responses to account for other’s people’s priorities by socio-economics

	Male	Female	16-34	35-54	55+	Rural	Urban
I changed my priorities to reflect the priorities of farmers	29.2%	29.6%	38.1%	44.4%	14.3%	31.8%	27.6%
I changed my priorities to reflect the priorities of people who do outdoor recreation activities	8.3%	7.4%	19.0%	0.0%	0.0%	9.1%	6.9%
I changed my priorities to reflect the priorities of members of environmental groups	37.5%	44.4%	38.1%	11.1%	57.1%	36.4%	44.8%
I changed my priorities to reflect the priorities of younger people	16.7%	14.8%	4.8%	33.3%	19.0%	13.6%	17.2%
I changed my priorities to reflect the priorities of older people	8.3%	3.7%	0.0%	11.1%	9.5%	9.1%	3.4%

4.3 Stage 3 conclusions: Reflective survey

The Reflective survey assesses whether people in Wales were willing to change their preferences following consideration of the preferences of other people in Wales. Around one-third of respondents stated that it was important to stick to their own priorities (Table 15), with a further 19% stated that they felt that their priorities already reflected the priorities of others. Importantly, half of the respondents stated that they were willing to change their views on the future of Welsh rural/environmental policies to account for the needs of others. In particular, these respondents change their priorities to reflect the priorities of members of environmental groups (41%), farmers (29%) and young people (15%). These findings indicate that deliberation (i.e. consideration of the needs of others) has the potential to address contested issues relating to the future of rural and environmental policy in Wales, and to move towards a shared vision for those policies.

5 Stage 4: Deliberation and future scenario planning

5.1 Stage 4 methods: Deliberation and future scenario planning

The final objective of this research was to explore whether more in-depth reflection and deliberation of the contested issues identified in Stages 1 to 3 could be reconciled to develop equitable solutions for the future management of natural resources in Wales. To address this objective, we utilised Kenter et al.'s (2016) Deliberative Value Formulation (DVF) methodology (Figure 1). The DVF model promotes deliberation and social learning within a workshop setting to help participants better understand their own values, the values of other participants, and the uncertainty within them, as well as building a fuller understanding of the complexity of the economic-social-ecological-hydrological system under investigation. The DVF model was thus used to explore whether our participants (natural resource stakeholders) held a common set of deeper held values that may help them to come to a consensus on a shared vision for the future management of Wales' natural resources.

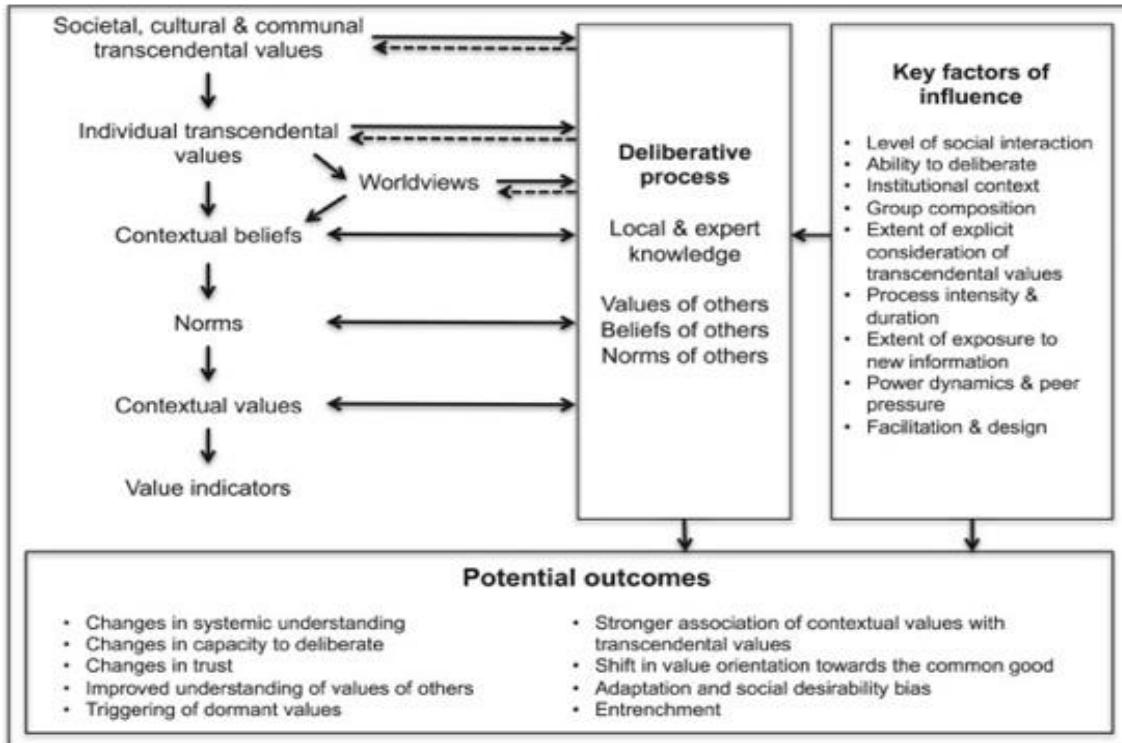


Figure 1: An outline of the Deliberative Value formation model. Source: Kenter et al., 2016.

To administer the DVF method, we ran a stakeholder workshop that comprised 16 representatives from across a range of landowning, environmental, outdoor recreation and general public interest groups. Due to covid restrictions, the workshops were first delayed and then eventually conducted online on the 18th March 2021 using MS Teams video conferencing software. The workshop ran for 2.5 hours and centred around a mix of plenary presentations of our results from Stages 1 to 3 and breakout group discussions. To promote online interaction between participants, we utilised ‘Mural’ (a digital ‘post-it’ note workspace for visual collaboration: <https://www.mural.co/>). We also recorded the breakout group sessions and produced transcripts of the discussions.

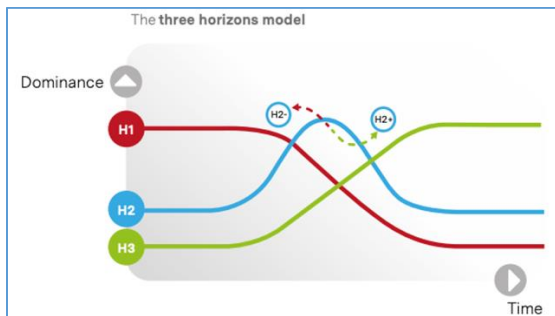
Figure 2 provides an outline of key activities undertaken during the workshop. A copy of the Agenda for the workshop can be found in Annex 8, while the PowerPoint slides used to guide the workshop and to present information during the workshop can be found in Annex 8.

- **Task 1:** Reflections on changes to natural resources over the past 30 years
- **Presentation 1:**
 - NRW’s Vision 2050;
 - Summary of results on ‘Shared and contested values’ from Stages 1 - 3;
 - The Three-Horizons approach for future vision planning.
- **Task 2:** Developing a shared vision for the natural resources in Wales for 2050.
- **Presentation 2:** Roadmap to Vision 2050
- **Task 3:** Developing a roadmap to Vision 2050

Figure 2: Outline of key activities undertaken during the Stage 4 workshop

Task 1: The first task asked participants to reflect on the extent of changes that have been made to natural resource policies over the past 30 years and thus stimulate them to consider the potential extend of changes that could be made when developing new visions for natural resource policy over the next 30 years. As this was a reflective task, we do not report the findings here.

Presentation 1: was used to provide some background information to prepare participants for Task 2. In this presentation (see Annex 9), we outlined NRW’s Vision 2050 for natural resources in Wales to provide participants with a contextual policy background for the task. This was followed by a presentation of the key findings from Stages 1 – 3, i.e. the shared and contested values that different groups had for natural resources in Wales (See Sections 3.2 and 4.2 above). Finally, we introduced the ‘Three-Horizons’ model (Sharpe, 2013) that was used to identify three ‘horizons’ or trajectories for future options for natural resource policies (Figure 3).



H1: The *'power holder'* - Right now. Current trends and issues

H2: The *'innovator'* - Emerging trends

H3: The *'Visionary'* – Trends that might dominate the future, competing visions.

Figure 3: The Three-Horizons model. Source: Sharpe (2013).

Task 2: required participants to draw on the Three-Horizons model to identify potential scenarios and visions for the future management of natural resources in Wales. Specifically, participants were asked to consider the following:

- H1: Identify key trends that suggest the way Wales' natural resources are currently managed is not sustainable and therefore needs to change;
- H2: Identify current projects that aim to improve the current state of natural resources in Wales; and
- H3: Provide a vision for the sustainable management of Wales' natural resources in 2050.

When undertaking this task, participants were asked to consider: the values of other stakeholders (including the shared and contested values identified in Stages 1 – 3 of this research); opportunities for incremental vs transformative change; as well as the opportunities presented from Covid recovery and Brexit policies.

Presentation 2: introduced a road mapping framework that could be used to plan the implementation of a H3 vision for natural resources in 2050 – See Annex 9.

Task 3: then used the road mapping framework to explore pathways to implementing the H3 visions identified in Task 2. Specifically, participants were asked to consider:

- What does success look like?
- What needs to change (both in short and long term)?
- Who are the stakeholders?
- What behaviour needs changing (Institutions and people)?
- How would you measure success?

5.2 Stage 4 results: Deliberation and future scenario planning

Sixteen stakeholders participated in the Stage 4 workshop. Participants were selected to be representatives of key landowning, outdoor recreation, environmental and general public interest groups. During the tasks, participants were split into two breakout groups ('Blue' group and 'Green' group). The stakeholder workshops centred around three key tasks (See Section 5.1). Below we summarise the key findings Tasks 2 and 3.

Task 2: Three-Horizon planning – a 2050 vision for natural resources in Wales

Task 2 required participants to consider the Three-Horizon model to explore three possible trajectories (H1 – H3) for the future management of natural resources in Wales and in doing so help identify sustainable visions for 2050.

H1: Key trends that suggest the way Wales' natural resources are currently managed is not sustainable and therefore needs to change.

Participants of the two breakout groups focussed on different threats to natural resources in Wales. The key threats identified by the Blue group largely reflected the range of threats highlighted in the Stage 2 public Omnibus survey (Table 5), and included climate change, biodiversity / habitat loss, water quality, food production, population change and challenges related to more people using the countryside. The Green group focussed more on the impact of farming on the sustainable use of natural resources. The group initially viewed farming practices as part of the problem rather than part of the solution. However, there was recognition that agriculture could make a positive contribution to reducing biodiversity loss and meeting environmental targets. At the same time, the group highlighted that it would be difficult for some agricultural sectors to be more sustainable and retain profitable without government support. There were also concerns that some of the terminology currently used by policy makers regarding sustainable farm practices (e.g. 're-wilding') may alienate some farmers. Concerns were also raised that young people were leaving rural areas and that there was a lack of understanding by the general public as to how the countryside works.

H2: Identify projects currently in progress that aims to improve the current state of natural resources in Wales

Participants identified a wide range of projects that are currently addressing environmental concerns in the countryside. A prominent theme in the Blue group was the uptake of technology and sustainable management practices in agriculture. Examples included: the development of high sugar grasses to increase the efficiency of food production; precision farming to increase crop production efficiency; management to loosen compacted soils in cropland and pasture to reduce nitrous oxide emissions; gene manipulation for disease resistance in crops; the use of additives to reduce methane emissions from ruminants. The group also identified projects where multiple stakeholders are working together such as one led by a River Trust that is working with farmers, suppliers and retailers to develop more

sustainable farming practices. Other projects highlighted by the group included renewable energy projects and flood alleviation schemes.

The Green group also highlighted the importance of sustainable agriculture and specifically identified the new Sustainable Farming Scheme as a policy that could contribute to nature's recovery through, for example, the establishment and maintenance of functioning ecological networks. The group also highlighted the importance of supporting the younger generation of farmers, which was considered necessary to sustain both agriculture and the Welsh language. Despite highlighting a range of projects, one respondent felt that there was little in the way of innovation within these projects. Further, the planning system was identified as a barrier to enabling innovation as it restricts what changes farmer could make. It was also felt that the planning system was failing to keep up with regulations.

H3: A vision for the sustainable management of Wales' natural resources in 2050.

Having discussed current trends and concerns, participants were asked about their aspiration for the Welsh natural environment in 2050.

The Blue group recognised the need for a natural environment that improves the health and well-being of people now, and importantly of future generations. Participants highlighted the importance of long-term policies that would protect the environment and natural capital, maintain water quality and provide natural flood protection. They also noted the special role of agriculture as part of the solution and stressed that there needs to be a balance between agricultural policies and environmental policies. Participants from all four interest groups agreed that different stakeholders would need to work together to avoid conflict, and to collaborate towards the common aim of protecting the natural environment. They also stressed the importance of policy makers listening to all different views in developing an integrated approach to natural resource policy.

The Green group also highlighted the special role of farming in protecting and enhancing natural resources. The group stressed the importance of maintaining a thriving farming industry, where the next generation of farmers could be supported to produce food sustainably, protect the environment and be carbon neutral. There was general agreement that farmers should be properly rewarded for providing public goods (which was considered not to always have been the case in the past). There was also an aspiration to support rural communities, which would require supporting the full range of farm sizes that exist. The role of Young Farmers groups was highlighted as being important in terms of their work on intergenerational projects and for maintaining Welsh culture within rural communities. It was felt important that visitors to rural areas learn from people living and working in the countryside and thus develop an understanding of the pressures of looking after the environment. Workshop participants also recognised that it would be essential to regard Nature as a stakeholder in future discussions about sustainable use of natural resources.

In terms of examples of best practice that have helped to achieve sustainable natural resources management, participants highlighted the NFU's vision for reaching net zero by 2040 and the New Zealand model of how farming and the environment is integrated.

Task 3: develop a roadmap to implement the H3 visions identified in Task 2.

The final Task asked participants to draw up a roadmap for achieving their H3 vision for the future of natural resources in Wales.

The Blue group explored a roadmap to achieving 'carbon net zero' in agriculture. Their vision of success was a viable farming industry that produced food efficiently with zero net carbon inputs. In the short terms, they suggested the use of feed additives to reduce methane emissions from ruminant livestock and increasing the coverage of hedgerows to capture carbon. In the longer term, they suggested that policies need to be targeted to support sustainable production that addresses environmental concerns, as well as promoting the use of technology such as anaerobic digestion to convert animal waste and other by-products into renewable energy. To achieve this vision, strategic partnerships between the farming industry, the government and academia would need to develop solutions to environmental concerns. It was also recognised that members of the public and other interest groups would also need to be consulted. In terms of behavioural change, it was noted that farmers, environmental NGOs and the government would need to work together to co-design policies, and to recognise each other's needs such as the need for farming to remain profitable and for farmers to better understand the environmental concerns of the public. Success in achieving these goals could be measured through the introduction of new agricultural / environmental policies that are designed specifically to address the challenges faced in Wales.

The Green group also explored a roadmap for sustainable farming, in which farmers would be rewarded for delivering high environmental standards and producing high quality food. Success could be measured in terms of a diverse and profitable sustainable farming sector that comprised a range of farm sizes and enterprises. In the short term, there was a recognition that public policy would be required to enable change and that the total level of funding would need to reflect the scale of ambition of the Welsh Government rather than simply being based on historical funding levels. In the longer term it was felt that markets would need change to support sustainable production and focus on voluntary environmental schemes rather than regulations. There was also a recognition that a wide range of stakeholders would need to be involved in developing these policies, including the Welsh Government, farmers, environmental NGOs, the public and food markets. In terms of behaviour changes, it was suggested that governments need to better follow the science and that environmental NGOs need to better recognise a host of issues that farmers have to handle their day to day farming. There were also calls for better education of the public to value their food more in terms of both how food is produced and the environmental and welfare impacts of different production processes. It was also felt that the media needed to change to provide more balanced arguments. Success could be measured in terms of the

level of uptake of sustainable farming schemes, along with statistics on environmental indicators (e.g. biodiversity cover, nature restoration), as well as farm business profitability.

5.3 Reflection on Stage 4: Deliberation and future scenario planning

In this final stage of the research, we combined Kenter's (2016) Deliberative Value Formulation (DVF) methodology with Sharpe's (2013) Three-Horizons model to explore how deliberation and social learning can help develop sustainable visions for natural resources in Wales. It should be noted that objective of this exercise was less about coming up with actual policy solutions, but more to demonstrate how deliberation and social learning may be used to reconcile contested values to develop a shared vision for the future. With this in mind, we would wish to highlight a couple key observations from the above process.

At the start of the process (Task 2, H1) there was evidence of conflicting values between different stakeholder groups. For example, some participants initially viewed farming practices as part of the problem; others thought that the language used by policy makers may alienate farmers; and others thought that the public lacked an understanding of how the countryside works.

When asked to discuss a vision for the future of natural resources in Wales (Task 2, H3 and Task 3), participants were able to come to a consensus within their groups to develop a shared vision of future policies. Within their shared visions, both groups recognised the importance of supporting a vibrant and profitable farming community, and the need for farmers to receive government support to deliver public goods such as carbon reductions and nature conservation. Also considered important was the need to take on board the views of the public and to educate them on the issues facing farmers. Thus, through the workshop discussions, it was clear that participants were considering the values of other stakeholders and developing a shared vision that reconciled these values. This observation was further confirmed in Task 3 where participants highlighted the need to form strategic partnerships among the different stakeholders to co-design policies that recognised each other's needs.

6 Concluding comments.

The overall aim of this research is to explore shared and contested values that different groups of people in Wales have for alternative natural resource policy scenarios and to explore shared visions for the future direction of these policies. This aim is addressed through the following research objectives, which were addressed in four research Stages.:

- Objective 1: To identify scenarios for the future direction of natural resource policies in Wales, and to identify a list of potentially contested issues;
- Objective 2: To undertake a large-scale survey of people in Wales to identify their shared and contested values for alternative natural resource policy scenarios.

- Objective 3: To further explore the values of a sub-set of respondents whose values are in conflict to identify whether accounting for other's values led to shared solutions.
- Objective 4: To explore whether the more in-depth reflection of contested issues leads to solutions that can be used to design future natural resource policy.

In Stage 1 we undertook a scenario analysis exercise in which we reviewed policy documents and ecosystem services assessment frameworks and then consulted with key policy stakeholders to identify plausible policy scenarios for the future of rural and environmental policies in Wales and importantly to identify possible policy impacts that might affect different groups of people in different ways. The outcome of this exercise was a list of policy issues that were further explored in the later stages.

Stage 2 then involved a large-scale all-Wales survey, supplemented by a survey of farmers, that explored people's preferences for different policy options. The findings from this survey were that although there is general consensus (shared values) as to what are the most important policy areas (i.e. there was widespread support for policies that reduced the impact of climate change), there were also some differences between different user groups and different sociodemographic groups (contested values). This highlights that the detail of how policies are targeted and implemented is important.

In Stage 3 we re-surveyed a sample of respondents from Stage 2 to explore whether consideration of the priorities (values) of others would lead to a more shared vision of policy priorities. Although one-third of respondents indicated that it was important for them to stick to their own priorities, around half of the respondents did change their priorities to reflect the preferences of others. This finding indicates that deliberation (i.e. consideration of the needs of others) has the potential to address contested issues relating to the future of rural and environmental policy in Wales, and to move towards a shared vision for those policies.

Finally, Stage 4 drew on the insights from Stages 1 – 3 and ask rural and environmental stakeholders to develop a shared vision for the future of natural resources in Wales. As with the other stages, the stakeholders initially demonstrated conflicting views e.g. some suggested that farmers were the problem, while others indicated that they were part of the solution. Following presentation and discussion of the results from Stages 1 – 3, participants started to reflect on the views of others and recognised that solutions could only be developed where different interests work in partnership to co-design policy solutions: they examples developed in the workshop related to how farmers could work with other stakeholders to both deliver high quality food and environmental goods.

In conclusion, our research has identified that people in Wales generally agree on what types of policy are most important (shared visions). For example, policies that had general support across different groups of people included policies that reduced emissions that cause climate change and policies that protect natural habitats and endangered species. However, we also identified that there were differences in terms of actual policy priorities between different groups of people (contested issues). For example, farmers prioritised policies that maintained farmer's incomes and supported food production, while these

policies were of less concern to the general public and people who were outdoor recreationists or members of environmental charities. As such, there is a risk that the introduction of policies that support farmers could meet with some resistance. To address this, we also explored whether deliberation and social learning could stimulate different groups of people to consider the views of others and to develop a shared vision of future policy. In Stage 3 we illustrate that around half of our respondents were willing to consider changing their policy priorities to account for the preferences of others. Similarly, in the Stage 4 workshops we demonstrate that deliberation can result in the development of shared visions for natural resource management in Wales. Thus, our recommendation to those who appraise and make policy such as the 'Sustainable Management of Natural Resources' (SMNR) in Wales is that when developing and evaluating rural and environmental policies, it is important to (i) consider the needs / preferences / values of different groups of people, and (ii) bring these different groups together to develop shared visions for new policies. Indeed, these recommendations support a number of the principles of SMNR, including 'Collaboration and engagement', 'public participation', 'evidence' and 'multiple benefits' (NRW).

7 References

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Annexes

Annex 1: Stage 1 - Scenario analysis: Background information used to develop policy scenarios

Stage 1 of the research aimed to develop scenarios on the future of natural resource policies in Wales. A number of policy and research data were used to develop these scenarios. Table 1 and Table 2 below provide summary of some of the information used to develop the scenarios

Table 1: Comparison of terminology used to describe ecosystem services / NCP across different assessments.

	SONARR	IPBES	UKNEA
Regulating	-	Habitat maintenance	-
	pollination	Pollination	pollination
	Air quality	Regulation of air quality	regulation of water, air and soil quality
	Climate	Regulation of climate	climate regulation
	Water quality	Regulation of ocean acidification	regulation of water, air and soil quality
	Water quality	Regulation of freshwater quantity	water cycling (FROM SUPPORTING SERVICES)
	Water quality	Regulation of freshwater quality	fresh water
	Soil quality	Formation of soils	soil formation (FROM SUPPORTING SERVICES)
	Hazard	Regulation of hazards	hazard regulation
	Disease and pests	Regulation of organisms detrimental to humans	disease and pest regulation
Supporting	-	-	nutrient cycling
	-	-	primary production
Provisioning / Materials & assistance	Noise	-	noise regulation
	-	Energy	-
	Crops	Food and feed	food
	Livestock/aquaculture	Food and feed	food
	Fish	Food and feed	food
	Trees, standing vegetation, peat	Materials and assistance	fibre
	-	Medicinal resources	genetic resources
	Water supply	-	-
	Wild species diversity	-	-
	Non-material / Cultural	Environmental settings: landscapes/seascapes	Learning and inspiration
Environmental settings: landscapes/seascapes		Learning and inspiration	aesthetic experience
Environmental settings: local places		Physical and psychological experiences	cultural heritage
Environmental settings: local places		Physical and psychological experiences	recreation and tourism
-		Supporting identities	-
Other	-	Maintenance of options	-

Table 19: Impacts of UK NEA (2011) scenarios on ecosystem services.

Impacts of scenarios on human welfare

	NEA					
	Green and Pleasant land	Nature @ Work	World Markets	National Security	Local Stewardship	Go with the flow
Timber	+	++	-	++	++	-
Water supply	+	+	-	-	+	-/+
Fish	+	+	--	+	+	-
Trees, standing vegetation, peat	+	+	-	-/+	+	+
Crops	-/+	-	++	+	-	+
Livestock/aquaculture						
Wild species diversity	+	++	--	+	-	-/+
Climate	+	+	-	+	+	+
Hazard	+	+	-	+	+	+
Disease and pests	+	+	-	-	+	+
Pollination	+	+	-	-		+
Noise	-/+	-/+	-	-	-/+	-/+
Water quality	++	++	-	-	+	+
Soil quality	+	+	-	-	+	+
Air quality	+	+	-	-	+	+
Recreation	+	+	--	--	+	+
Historical	++		--	-	++	+
Environmental settings: local places						
Environmental settings: landscapes/seascapes						

Annex 2: Stage 1 - Scenario analysis: Outline Interview Script.

INTRODUCTION

- Name, role, etc.
- Policy interests
- Major changes anticipating in Welsh Env
- Which are contested?
- Which parts of landscape do these most affect (upland, grazing areas, lowland arable, urban?)

FRAMING OF RESEARCH

- Aim: NRW has thus commissioned this research to explore shared and contested values for future management options for Wales natural resources in an attempt to gain a better understanding of sustainable pathways for future policy design.
- Objectives:
 - o Explore shared and contested values that may not be well represented in CBA
 - o Deliberative approaches to work back from contested outcomes to root issues

- Issues that are hard to value with conventional approaches, but still widespread
- Purpose of this interview: The research will focus on sets of contested values that are most useful for future rural and environmental policy making in Wales. This means that they need to reflect current pressures and policy choices relating to the environment.

Context information:

- UKNEA, CEH Brexit scenarios
- Range of issues identified
- Support aim for sustainable use of resources
- Consulting with policy experts (you) to select policy-relevance for valuation research

DISCUSSION POINTS

- 1. What is a key issue to explore for shared/ contested values? [open question]**
 - Policy implementation needs and timescales, such as for the State of Natural Resources Report (sonarr) required by the Environment Act (Wales), and Wellbeing of Future Generations Act.
 - Potential use of novel policy instruments, such as payments for ecosystem service mechanisms.
- 2. List of potential issues/themes (relevant/useful/contested) [to send in advance] to use in survey:**
 - Climate change
 - Accepting it exists? Yes/No
 - Who is responsible? Who should pay? How urgent a problem?
 - Aim for net zero? Yes: in 2050/sooner/later. No: other objective
 - Carbon sequestration/ Reducing carbon emissions – Should this influence land use?
 - Re-wetting peatland
 - Climate adaptation – to what extent is this a landscape issue: e.g. Flood risk
 - Livestock grazing sector – maintain current extent?
 - Traditional landscapes – valued for cultural heritage and/or domestic food production?
 - Afforestation: tree cover/woodland planting objectives
 - Landscape, carbon & timber, wildlife, recreation?
 - Recreational access to land
 - Wildlife:
 - Scarce/specialist species
 - Widespread species/health of countryside
 - New land-based industries: agro-forestry, leisure and tourism
 - Payments for land management:
 - To farmers, to all, for benefits in return, for new initiatives?
 - Who pays? How much (as currently, less?)

CONCLUSION

- Summarise key issues

Annex 3: Stage 1 - Scenario analysis: Notes from Expert Consultation Interviews

Policy interests:

High level of uncertainty of environmental changes due to uncertainty over the UK's terms of exit from the EU and design of future sustainable farm payment scheme.

Where is the regulatory baseline? What is Willingness to Pay (WTP) to have it, for farmers - relationship between regulation driven actions, and those going beyond minimum standards, question of who/polluter pays?

Climate Change (CC) Mitigation

Generally CC is accepted as happening

Responsibility: key thing is that individuals see their contributions as small, but major penalty on their lifestyle of changes.

Value of collective action. e.g. On car use – there could be shared value for collective action, and potential intergenerational differences.

Differences linked to views on climate change? **Mainly embedded in livelihoods/ community context.**

- Foresters: begrudging acknowledgement to not plant on peat. But also an attitude of 'another rotation of sitka before CC prevents' – **a contested view over the type of forestry that is suitable.**
- Farming: sector representatives see the reasons for action in line with UK Climate Impact Programme predictions. Farming union representatives will accept issues, but individual members will vary hugely in acceptance and capability to implement measures.

Climate change adaptation

There is less of awareness of adaptation, so less of an intergenerational divide. **Best example is flood 'defence' (rather than realignment).** Still short term thinking present.

Also less well understood as a reason for tree planting. Public sector needs to lead. Environmental stakeholder groups are supportive. Others are not. Who should costs fall on – those causing risk (polluters), those managing land, or the beneficiaries?

Has a very long term investment horizon. What are values for impacts in 100 years time?

This also depends on what value is put on negative impacts on citizens of overseas developing countries?

Major changes anticipating in Welsh environment due to impacts of climate change. e.g.:

- River flows and temperatures... consequences for species (e.g. Salmonids).
- Extreme weather/ low flows.

Water: **are stakeholders accepting that CC risk exists? A mix.** Rivers trust agree with forecasts of CC impacts... river flows need mitigating. At water sector level it is generally accepted that CC impacts are real (although not as well known compared to flood risk).

Afforestation – Forest Extent vs Grazing

A major topic is **tree planting vs upland sheep grazing**. For natural resources policy there is a pro-trees view. There is a proposal for a **National Forest for Wales** and potential for **more widespread Farm woodlands/ agro-forestry**.

There is potential for planting on grade 3b agricultural land with fast-rotation biomass, currently offers a good market return, but some resistance is due to plantations from the past having been unsympathetically positioned in the landscape.

Values for mixed woodland could be very different, replacing open grassland agriculture – this will change the landscape, including by creating areas that can be used for recreation. Access is important – communities see a risk they could be losing green space and its local community value: would newly created woodland be less accessible or more than the land uses it replaces?

Which issues are contested? **switching cattle to tree planting: farmers won't plant trees or sell to foresters**. Which parts of landscape do these most affect? upland grazing areas, lowland arable, urban-edge.

People like trees for different reasons (Carbon sequestration, timber/jobs, climate adaptation/ biodiversity – trade-offs).

Cultural barriers exist: landowners don't have the skills, and tenants lack long term interest, to engage on tree planting, and see tree roots as damaging the land.

Large scale afforestation has previously encountered barriers: in the past a 3,000 ha planting option was looked at in Snowdonia – this ran into landscape objections. **It was designed to shield industrial activity, but the community was deeply opposed as they regarded this as a historic landscape, which they liked**. Objections also highlighted issues with timber lorries. The resident community do not see upland grassland landscapes as degraded/ potentially benefitting from tree planting.

Another worry is the cultural threat that clusters of farms which become unviable/ not taken on when incumbent retires.

However, planting doesn't have to be large areas. Can be individual farm holdings. Can be clusters of farms contributing a proportion of land for multi-use woodlands - not necessarily a huge area. e.g. an example in Conwy of under 100 ha has mountain biking and other activities in it.

Afforestation is also seen as a potential threat to the Welsh language culture within the grazing community - keeping them on the land and intact is a way to preserve language. On the other hand industries like steel/ ship building/ etc have not had support for this reason.

Some experts consider a 20% livestock reduction as quite moderate – uncertainty as to what will be any funded under new agri-environment proposals?

Afforestation – Type of Forestry

Stakeholders agree on idea of ‘Right tree in right place....’ But this means slightly different things to different people. Some see forestry as a suitable land use to replace large areas of acid grassland with low environmental value.

Forestry sector seems well aware: it is attuned to arguments for tree planting relating to CC, domestic timber supply. Within diversified planting, conifers are needed to give timber for construction... important part of economy, but should be part of a mixed use model e.g. recreation/timber/habitat benefits to justify subsidy. Fiscal incentives needed to make this viable.

Currently there are low rates of afforestation in Wales – so there is little experience of planting at scale.

Visitor access such as biking opportunities can have positive use alongside productive timber activity.

Afforestation opposition remains in the livestock sector. It is unclear if this is a more widespread view.

In addition it is unclear who should pay to support afforestation - productive users or all users? There may be a need to have more creative ‘Payments for Ecosystem Services’ approaches for different benefits, doesn’t have to be for ‘productive’ benefits.

Is there a shared value for a mixed-use landscape? **There seems to be agreement on the idea of a mix, but contested issues on the priorities for that mix.**

Farmers more open-minded to mixed use rather than large-scale afforestation.

Afforestation - Location

Old plantation forestry cover is being removed. In upland areas support is towards restocking/ regeneration (potentially toward a more sustainable mixed-use model?)

In urban areas: expansion is linked to need to serve an increase population (linked to housebuilding targets) with access green space. This brings pressure on greenfield land.

Why Afforestation?

When you discuss drivers for actions – **different groups have completely different priorities** – for example 10 representatives of environment NGOs can all have different priorities... reflecting different trade-offs between CC mitigation and biodiversity/ forestry plantations.

Relative priorities seem to depend on age: with different values/ priorities on cultural heritage (this may link to fact that Welsh Govt has an older workforce, so lack of younger views being represented). The younger generation has CC as a higher priority, whereas older people more concerned with aesthetics e.g. wind turbines.

Is the contested space on livestock vs trees an environmental difference, or a generational one, or linked to CC views?

Water Quality/ Agricultural Pollution

Nitrification in Flintshire and Pembrokeshire, particularly a problem in smaller intensively managed coastal areas.

Agricultural change is happening anyway due to economics (and possibly due to CC in longer term), e.g.:

- Dairy: continued lowland **intensification, which is contentious in clashing with water quality.**
- Also **poultry, some in upland areas**, impacts air and water quality.
- **There are potential impacts on bathing waters.** Bathing waters are generally performing well, but have risks from agricultural impacts, CSOs and CC. A few LA's are concerned though, due to risks to recreation: angling, bathing waters, canoeists.

Some experts don't think that stock reduction will really influence water quality.

A common example of a contentious issue is between the rivers trusts and agri sector over **what is minimum standard for an agricultural operator... The regulatory baseline may be equivalent to a whole of Wales Nitrate Vulnerable Zone.**

WFD good status is a standard regulators agree with, but the public are not well informed, and most economic sectors disagree... they see the need for flexibility and to apply disproportionate cost and technical feasibility exemptions regularly. This problem is related to a poor level of knowledge and a lack of investment over time. Better management and equipment are needed, but there is a **disagreement on who should pay for it** (Polluter pays vs public subsidy).

Wildlife and Biodiversity:

Should the priority be specialist species or the health of the wider environment?

Environmental stakeholders want both. The general population thinks about national parks/ landscapes rather than biodiversity designations.

Specialists see a need for greater ecosystem diversity and function, which is different to a general perception of an aesthetic 'green' environment.

Greater habitat diversity can contribute to CC resilience and adaptation – this is now being raised with respect to flood protection and other resilience (e.g. "slow the flow"). There is potential for agri-env support to this, especially in flashy catchments.

Biodiversity damage by farmers or foresters is often because of poorly motivated actions.

Wellbeing of future generations

The Area Statements are not linking issues to this: For example creating Green Infrastructure in towns or the uplands. Policy is trying to influence private land use, without legislating... so needs a mechanism to compromise public and private interest, at present this not well developed. **The main engagement that happens is not with landowners (who are at work), but with public representatives who are seen as having naive views on farming.**

The need for long term protection (e.g. of soil/ water) for future generations, can be seen as a constraint on current activity. **i.e. Unclear if there is agreement on WCFG act objectives.**

Recreational access to land

The public not be so aware of land use options. But the public think someone knows what is being done... but who actually does?

While the **medical view is that this is increasing in importance, but the landowner view is still of it being a nuisance**, and political acceptance of recreation/ health values is limited.

Technical Policy Design Questions

Other ecosystem resilience – and if you get ecosystems right, will biodiversity recover?

Conversation on welsh natural resources not well developed... and its hard to be polite talking about other peoples' land.

Who pays?

Will the public pay? Yes in Wales. CAP payments will transition to a public goods regime. How much will be paid (same as currently, or less?)

Broadly bodies like **National Trust and RSPB members have broad support to pay for conservation & biodiversity gain... they also have sympathy/ support for farms**, but farming needs to provide public goods to justify it.

	Who should pay?	Respondent WTP?
Maintain current standards		
Enhancement above them		



Annex 4: Stage 1 - Scenario analysis: Scenario matrix of policy issues.

Table 1: Scenarios matrix of policy issues

Category/ Issue	Definition of issue	Benefits definition	UK NEA Scenario links	Description of change between scenario	Specific question
Climate Change					
Climate change mitigation	There are a range of views in society over whether climate change exists at all, how severe a problem it is, how urgent the response should be, and what kind of response should be made.	Climate/ Regulation of climate	World markets vs green and pleasant land	The N@W scenario aims to reduce flood impacts by restoring and creating floodplains. The focus on building climate change resilience is through ecosystem-based adaptation. In the WM scenario, there is limited investment in climate change mitigation and the markets will solve the problems arising from climate change.	Is climate change so serious an issue that it should shape policies for how we use the natural environment?
Climate change adaptation	Environmental restoration can be seen as an investment in climate adaptation – but this view seems restricted to environmental groups. Other significant stakeholders (e.g. water sector) see climate change pressures as real, but their customers do not.	Resilience of a range of benefits – e.g. on river systems	World markets vs green and pleasant land	In the G&P scenario, climate change adaptation programs are focused on biodiversity and flood. The WM states will protect areas of high investment.	Is climate change adaptation so serious an issue that it should shape policies for how we use the natural environment?
Afforestation					
Afforestation – woodland extent	Sheep grazing is the dominant land use in Wales' upland and areas. Farmers and landowners are resistant to more trees. There is also a view that grazing landscape should be retained because important to continuation of the Welsh Language.	Afforestation has multiplied benefits. Climate	Go with the flow vs nature @work	WM is the only scenario where woodland extent decreases - as a result of increased urban development.	Should the extent of woodland cover in Wales increase significantly or remain at current levels? In N@W, woodland extent is 25%, while in GWTF is roughly 15% (see graph below).
Afforestation – woodland type	Mixed use woodland seems generally accepted as the best option amongst those who support afforestation (i.e. the 'right tree in the right place'). But the specifics of this may not be agreed on. A mixed use model (e.g. recreation/amberhabitat is possible) and a mix of benefits may justify greater	Recreation	National security vs nature @work	NS has more emphasis on planting conifer, due to its higher productivity. While N@W aims to have a mixture of conifer and broadleaf in order to provide a range of ecosystem services, such as	If the amount of woodland was increased in Wales, what should be the purpose of the woodland that was created (multiple reasons can be given)? <ul style="list-style-type: none"> - Conifer plantations for timber supplies - Recreation/ general accessible open space - New recreational facilities (e.g. mountain biking) - Support jobs - Carbon sequestration



Category/ Issue	Definition of issue	Benefits definition	UK NEA Scenario links	Description of change between scenario	Specific question
	Government subsidy support. It is unclear if farmer and rural community objections to woodlands relate to timber plantations or any kind of woodland - are farmers more open-minded to mixed use rather than large afforestation?			timber, recreation and biodiversity.	<ul style="list-style-type: none"> - Climate adaptation (e.g. flood prevention) - Biodiversity
Afforestation - woodland location/size	<p>If new woodland is to be created, where should it be and how big should the blocks be? Different size and location of planting may be implicit given the purpose of woodland (see above).</p> <p>More generally, small areas of woodland can have large benefits (e.g. along watercourses, or the edge of towns), or alternatively large mixed use areas can be created. A 'National Forest for Wales' could be established in a part of the country providing a brand with which to attract visitors.</p>	Health and wellbeing	Local stewardship	In N@W, woodland area expands close to conurbations to maximise ecosystem services, such as recreation, shade provision and hazard regulation.	<p>If the amount of woodland was increased in Wales, where should it be located (multiple reasons can be given)?</p> <ul style="list-style-type: none"> - In small blocks where it can provide local benefits - In a specific area - a National Forest for Wales - Near cities to have greater recreation benefits - In remote areas where land is cheapest
Afforestation - why?	Different groups have completely different priorities (e.g. even amongst e-ngos). There are trade-offs between mitigation and biodiversity/forestry plantations. Do priorities depend on age, cultural background (note age of workforce is above average in Welsh Govt, so lack of younger views internally). Are differences down to natural environmental views in general, climate change views, age, cultural background, other?	Use typology	Mixture		See WBFG
Other Services					
Landscape Visual Amenity	There are different views of what constitutes an attractive landscape. Some people regard existing land uses as traditional and therefore the landscape they create as part of cultural heritage. Others are concerned with biodiversity loss and climate change mitigation/ adaptation and see the current landscape as part of the problem.	Environmental settings Learning and inspiration	World markets vs green and pleasant land	In G&P, conserving landscapes is a priority, with policy focused on maintaining and enhancing the ascetic diversity of the landscape. While WM have more homogenous landscapes	<p>Would you described grazed upland landscapes in Wales as 'traditional' or 'barren'?</p> <p>Should former industrial areas be shielded from view or retained in views as part of heritage?</p>
Water Quality	31% of rivers in Wales are of good status (as defined under the Water Framework Directive). Should all rivers be raised to 'good status' and should industries causing	Freshwater quality: WFD condition - can	National security vs nature @work	Water quality in NS declines due to arable area increasing, with high levels of pesticides and fertiliser use.	Is lower water quality (fresh and bathing waters) acceptable in return for higher domestic agricultural output?



Category/ Issue	Definition of issue	Benefits definition	UK NEA Scenario links	Description of change between scenario	Specific question
	pollution be more strictly regulated, or supported in changing practice with government funding?	be hard to communicate		Alternatively, in N@W sustainable land management technologies allow for crops to be grown with less pesticides and fertilisers. There are high fines for those that pollute.	
Biodiversity	Can bring in data from State of UK biodiversity on declines. Much of the farmland in Wales has low wildlife value and iconic species such as the Curlew have undergone serious declines. However, some species are specialists in the available habitats (e.g. acid grassland plants)?	Wild species diversity	Go with the flow vs nature @work	In GWTF, biodiversity in farmland and mountain habitats have improved. However, biodiversity declines due to climate change as well as from competition from invasive species. While in N@W, biodiversity is improving, despite climate change. Although legislation is focused on ecosystem function rather than biodiversity.	Should action be taken to reverse declines in formerly widespread species of wildlife? What should wildlife priorities be – to increase populations of: <ul style="list-style-type: none"> - Iconic species, such as the curlew - Rare specialist species - Widespread or potentially widespread species - All species
Recreational access to land	Access to the natural environment provides a huge value to people in terms of recreational enjoyment, and in some places visitor and tourism sector spending. The medical view is increasingly recognising the importance of accessible green space for public health, whereas landowners often regard access as a nuisance. Political decision-makers can have mixed views of the importance of the recreation/health value of the environment.	Local physical experiences.	National security vs nature @work	In NS, individuals have less time to enjoy the outdoors and are more likely to spend time in their immediate surroundings, e.g. gardens. While in N@W, outdoor recreation is increasingly popular in urban and rural areas. People are willing to spend the time to go to the countryside for a weekend. The predicted annual value of visits in NS is £94 million (high case), while N@W sees a vast increase at £568 million.	Should access to green space be provided to all communities so that people have safe outdoor areas to walk and relax to help them lead healthy lives? Should access to the wider countryside be improved to encourage recreation and tourism?
<i>Cross-cutting Policies</i>					
Wellbeing of future generations (WBFG)	The WBFG is now an established law, but its implications for the environment have not been fully worked through. If the WBFG objective was applied to the environment it supports a need for policies that give longer term protection to natural resource (e.g. of	Soil quality, water quality	Go with the flow vs nature @work	In N@W, legislation is strongly linked to EU and global obligations, while in GWTF legislation is balanced	Are you familiar with purpose of the wellbeing of future generations act? Do you agree with its aims? Do you think these aims should be applied to the management of natural resources and the natural environment?



Category/ Issue	Definition of issue	Benefits definition	UK NEA Scenario links	Description of change between scenario	Specific question									
	soil/ water) to maintain their extent and condition for future generations.			between EU goals and stronger national goals.	Example: should woodland planting be carried out in order to provide benefits to future generations? (see woodland type question, above) <u>This is seen as the top priority issue.</u>									
Regulatory baseline	What is the real regulatory baseline or minimum standard below which the polluter pays, and above which the beneficiary pays? (see water quality)	e.g. freshwater. Biodiversity.	Go with the flow nature @work		<table border="1"> <thead> <tr> <th></th> <th>Who should pay?</th> <th>Respondent WTP?</th> </tr> </thead> <tbody> <tr> <td>Maintain current standards</td> <td></td> <td></td> </tr> <tr> <td>Enhancement above them</td> <td></td> <td></td> </tr> </tbody> </table>		Who should pay?	Respondent WTP?	Maintain current standards			Enhancement above them		
	Who should pay?	Respondent WTP?												
Maintain current standards														
Enhancement above them														
Who pays?	There is an element of public sympathy to support farms, but they need to provide public goods to justify it. Are current taxpayers WTP for continuing support to agriculture and forestry? Is this support to maintain them as sectors, or linked to benefits such as for conservation of biodiversity or benefits for future generations?	Public goods concept	Go with the flow nature @work	In N@W, farmers are paid to provide ecosystem services based on locally determined market prices. In GWTF, agricultural environmental schemes are popular, paid for by the Government.	Do you support continuation of public payments for the outcomes you support (e.g. government subsidies for the right woodland type).									

Annex 5: Project specific questions included in the All-Wales Omnibus survey and farmers survey.

I would now like to talk to you about the Welsh countryside, and your preferences for potential future rural and environmental policies in Wales.

SHOWCARD A

Q1. Firstly, which of these factors do you consider to be the greatest threats to the Welsh rural environment?

Please tell me which you consider to be the first, second and third biggest threats.

Q1a) SELECT BIGGEST THREAT

Q1b) SELECT SECOND BIGGEST THREAT

Q1c) SELECT THIRD BIGGEST THREAT

1. Intensive farming practices
2. Loss of natural habitats
3. Loss of plant and animal species that leaves them endangered
4. Climate change
5. Pollution of rivers, lakes or groundwater resulting in poor water quality
6. Flooding
7. Too many people visiting the countryside for outdoor pursuits or tourism
8. Other, please specify
9. None of the above
10. Don't know

SHOWCARD B

Q2. And now looking at SHOWCARD B, which of these do you think should be a priority for future rural and environmental policies in Wales?

Please tell me which you consider to be the most, second most and third most important priorities.

Q2a) SELECT MOST IMPORTANT

Q2b) SELECT SECOND MOST IMPORTANT

Q2c) SELECT THIRD MOST IMPORTANT

1. Maintaining the income of farmers
2. Supporting efficient food production
3. Protecting endangered / threatened plant and animal species
4. Protecting and enhancing natural habitats
5. Reducing emissions that cause climate change

6. Protecting and enhancing water quality in rivers, lakes or groundwater
7. Reducing the impact of flooding by diverting flood waters into fields
8. Increasing opportunities for outdoor recreation and tourism
9. Other, please specify
10. None of the above
11. Don't know

Q3. Future policy to protect and enhance the Welsh rural environment will often require choices to be made between different policy options.

With this in mind, I am now going to show you pairs of possible policy options.

Please indicate on the 1 to 5 scales which policy choices you prefer.

SHOWSCREEN

a. Agricultural Policy:

Policies for farmers should ...

Aim to maintain and potentially increase <i>agricultural output</i> .	1 – 2 – 3 – 4 – 5 'Don't know'	Aim to maintain and potentially enhance the <i>natural environment</i> .
<i>Retain the current level of environmental protection.</i>	1 – 2 – 3 – 4 - 5 'Don't know'	Pay farmers to <i>raise the level of environmental protection.</i>

b. Nature conservation policies:

Conservation policies should to targeted to ...

Protect the most <i>endangered / threatened plant and animal species.</i>	1 – 2 – 3 – 4 - 5 'Don't know'	Protect <i>habitats</i> (e.g. forests, wetlands, moors) in the wider countryside.
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c. Climate change:

Climate change should be mitigated by ...

<i>Planting more trees to increase the amount of carbon captured.</i>	1 – 2 – 3 – 4 - 5 'Don't know'	<i>Reducing livestock numbers to reduce their carbon emissions.</i>
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d. Woodland:

The government has plans to plant more trees. What type of trees would you prefer?

Plant fast-growing conifers to maximise carbon capture.	1 – 2 – 3 – 4 - 5 'Don't know'	Plant mixed woodlands to benefit biodiversity and landscape.
Create <i>small woodlands near urban areas</i> to provide local outdoor recreation opportunities.	1 – 2 – 3 – 4 - 5 'Don't know'	Create <i>large multi-functional forests</i> which would attract tourists to Wales

e. Who pays?

Who should pay for environmental policies?

Taxpayers <i>should not</i> pay more tax to improve the natural environment	1 – 2 – 3 – 4 - 5 'Don't know'	Taxpayers <i>should pay more</i> tax to improve the natural environment
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d. Who benefits?

Should we consider the impacts of policy on future generations.

Policies should not reduce the well-being of the current generation	1 – 2 – 3 – 4 - 5 'Don't know'	Policies should not reduce the well-being of future generations.
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SHOWCARD C

Q4. Which, if any, of the categories on this card apply to you? Any others?

CODE ALL MENTIONED

1. I am a land owner, farmer, farm worker or forester
2. I regularly (e.g. at least once a month) participate in outdoor recreation activities (e.g. walking, hiking, cycling, horse-riding, kayaking, bird watching, fishing, shooting etc.)
3. I am a member of a nature conservation / environment charity (e.g. RSPB, Wildlife Trust, National Trust, WWF, Friends of the Earth etc.)
4. None of the above

Q5a. Thank you for providing this information which will inform policy makers when they plan future policies. Natural Resources Wales, through consultants working on their behalf, are keen to collect more detailed information about the way different groups of people in Wales use and benefit from the natural environment.

Would you be prepared to help with this by taking part in an online survey in December?

1. Yes
2. No

IF YES AT Q5a

Q5b. Please provide us with an email address so that we can send you a link to the survey.

Annex 6: Detailed analysis of the Omnibus survey

Table 20: Agricultural policy preferences (1) by group

Agricultural Policy	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Policies for farmers should					
Aim to maintain and potentially increase agricultural output	7	23	15	24	69
1					
2	7	27	11	72	117
3	14	137	51	152	354
4	9	110	34	86	239
Aim to maintain and potentially enhance the natural environment	6	75	53	76	210
5					
Total	43	372	164	410	989
Mean Score ³	3	3.5	3.6	3.3	3.4

Pearson chi2 = 50.6413 **Pr = 0.000**

Table 21: Agricultural policy preferences by age group

Agricultural Policy	Age		
	16-34	35-54	55+
Policies for farmers should			
Aim to maintain and potentially increase agricultural output	12	24	33
1			
2	38	36	43
3	94	104	156
4	90	62	87
Aim to maintain and potentially enhance the natural environment	71	50	89
5			
Total	305	276	408
Mean Score	3.6	3.3	3.4

Pearson chi2 = 17.2460 **Pr = 0.028**

Table 22: Agricultural policy preferences (2) by group

Agricultural Policy	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Policies for farmers should					
Retain the current level of environmental protection	5	27	8	53	93
1					
2	4	24	3	74	105
3	7	97	31	102	237
4	9	114	48	102	273

³ The mean score does not include individuals who replied 'don't know' and were coded as 6 in the dataset.

Pay farmers to raise the level of environmental protection 5	18	110	74	81	283
Total	43	372	164	412	991
Mean Score	3.7	3.7	4.1	3.2	3.6

Pearson chi2 = 86.8913 **Pr = 0.000**

Table 23: Agricultural policy preferences (2) by age group

Agricultural Policy	Age		
	16-34	35-54	55+
Policies for farmers should			
Retain the current level of environmental protection 1	24	20	49
2	28	39	38
3	65	70	102
4	96	78	99
Pay farmers to raise the level of environmental protection 5	94	69	120
Total	307	276	408
Mean Score	3.7	3.5	3.5

Pearson chi2= 16.0461 **Pr = 0.042**

Table 24: Nature conservation policy preferences by group

Conservation policies should	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Protect the most endangered plant and animal species 1	6	34	10	47	97
2	4	18	10	76	108
3	13	145	41	150	349
4	8	79	35	66	188
Protect habitats in the wider countryside 5	13	95	67	74	249
Total	44	371	163	413	991
Mean Score	3.4	3.5	3.9	3.1	3.4

Pearson chi2= 77.2544 **Pr = 0.000**

Table 25: Nature conservation policy preferences by age group

Conservation policies should	Age		
	16-34	35-54	55+
Protect the most endangered plant and animal species 1	30	24	43
2	42	29	37
3	120	91	138

4	54	70	64
Protect habitats in the wider countryside	58	63	128
5			
Total	304	277	410
Mean Score	3.2	3.4	3.5

Pearson chi2 = 26.1727 Pr = 0.001

Table 26: Climate change policy preferences by group

Climate change should be mitigated by	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Planting more trees to increase the amount of carbon captured	24	142	63	183	412
1					
2	5	78	27	86	196
3	7	105	47	94	253
4	5	18	9	31	63
Reducing livestock numbers to reduce their carbon emissions	2	27	17	18	64
5					
Total	43	370	163	412	988
Mean Score	2	2.2	2.3	2.1	2.2

Pearson chi2= 23.0531 Pr = 0.027

Table 27: Climate change policy preferences by age group

Climate change should be mitigated by	Age		
	16-34	35-54	55+
Planting more trees to increase the amount of carbon captured	101	122	189
1			
2	81	41	74
3	70	81	102
4	23	20	20
Reducing livestock numbers to reduce their carbon emissions	30	22	22
5			
Total	305	407	407
Mean Score	2.3	2.1	2.1

Pearson chi2 = 31.6578 Pr = 0.000

Table 28: Type of trees (1) by group

What type of trees would you prefer?	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total

Plant fast-growing conifers to maximize carbon capture 1	5	21	5	55	86
2	2	28	9	31	70
3	6	81	23	88	198
4	5	64	24	75	168
Plant mixed woodlands to benefit biodiversity and landscape 5	26	179	102	164	471
Total	44	373	163	413	993
Mean Score	4	3.9	4.3	3.6	3.9

Pearson chi2=42.3665 **Pr = 0.000**

Table 29: Type of trees (1) by age group

What type of trees would you prefer?	Age		
	16-34	35-54	55+
Plant fast-growing conifers to maximize carbon capture 1	26	27	33
2	28	23	19
3	81	49	68
4	57	53	58
Plant mixed woodlands to benefit biodiversity and landscape 5	115	125	231
Total	307	277	231
Mean Score	3.7	3.8	4.1

Pearson chi2 = 32.6593 **Pr = 0.000**

Table 30: Type of tree (2) by group

What type of trees would you prefer?	Group				Total
	Farmers	Outdoor recreation	Environmental Charity	General public	
Create small woodlands near urban areas 1	15	75	43	99	232
2	6	69	27	58	160
3	10	130	49	116	305
4	3	40	16	72	131
Create large multifunctional forests 5	10	57	29	64	160
Total	44	371	164	409	988
Mean Score	2.7	2.8	2.8	2.9	2.8

Pearson chi2 = 22.9154 **Pr = 0.028**

Table 31: Type of tree (2) by age group

What type of trees would you prefer?	Age		
	16-34	35-54	55+
Create small woodlands near urban areas 1	59	54	119
2	53	55	52
3	98	80	127
4	46	39	46
Create large multifunctional forests 5	50	47	63
Total	306	275	407
Mean Score	2.9	2.9	2.7

Pearson chi2= 18.1861 **Pr = 0.020**

Table 32: Payment by group

Who should pay for environmental policies?	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Tax payers should not pay more tax to improve the natural environment 1	10	96	30	171	307
2	3	52	19	45	119
3	16	108	34	103	261
4	9	71	45	54	179
Tax payers should pay more tax to improve the natural environment 5	6	41	32	36	115
Total	44	368	160	409	981
Mean Score	3	2.8	3.2	2.4	2.7

Pearson chi2 = 61.2100 **Pr = 0.000**

Table 33: Payment by age group

Who should pay for environmental policies?	Age		
	16-34	35-54	55+
Tax payers should not pay more tax to improve the natural environment 1	89	85	133
2	35	35	49
3	76	82	103
4	60	45	74
Tax payers should pay more tax to improve the natural environment 5	40	25	50

Total	300	272	409
Mean Score	2.8	2.6	2.7

Pearson chi2 = 5.5900 Pr = 0.693

Table 34: Benefits by group

Should we consider the impact of policy on future generations?	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Policies should not reduce the well-being of the current generation	3	25	8	62	98
1					
2	4	22	3	35	64
3	20	148	58	134	360
4	7	82	36	82	207
Policies should not reduce the well-being of future generations	10	95	56	95	256
5					
Total	44	372	161	408	985
Mean Score	3.4	3.5	3.8	3.3	3.5

Pearson chi2= 39.0739 Pr = **0.000**

Table 35: Benefits by age group

Should we consider the impact of policy on future generations?	Age		
	16-34	35-54	55+
Policies should not reduce the well-being of the current generation	29	25	44
1			
2	19	23	22
3	128	90	142
4	57	60	90
Policies should not reduce the well-being of future generations	73	77	106
5			
Total	306	275	404
Mean Score	3.4	3.5	3.5

Pearson chi2 = 8.6782 Pr = 0.370

Annex 5: Project specific questions included in the All-Wales Omnibus survey and farmers survey.

I would now like to talk to you about the Welsh countryside, and your preferences for potential future rural and environmental policies in Wales.

SHOWCARD A

Q1. Firstly, which of these factors do you consider to be the greatest threats to the Welsh rural environment?

Please tell me which you consider to be the first, second and third biggest threats.

Q1a) SELECT BIGGEST THREAT

Q1b) SELECT SECOND BIGGEST THREAT

Q1c) SELECT THIRD BIGGEST THREAT

11. Intensive farming practices
12. Loss of natural habitats
13. Loss of plant and animal species that leaves them endangered
14. Climate change
15. Pollution of rivers, lakes or groundwater resulting in poor water quality
16. Flooding
17. Too many people visiting the countryside for outdoor pursuits or tourism
18. Other, please specify
19. None of the above
20. Don't know

SHOWCARD B

Q2. And now looking at SHOWCARD B, which of these do you think should be a priority for future rural and environmental policies in Wales?

Please tell me which you consider to be the most, second most and third most important priorities.

Q2a) SELECT MOST IMPORTANT

Q2b) SELECT SECOND MOST IMPORTANT

Q2c) SELECT THIRD MOST IMPORTANT

12. Maintaining the income of farmers
13. Supporting efficient food production
14. Protecting endangered / threatened plant and animal species
15. Protecting and enhancing natural habitats
16. Reducing emissions that cause climate change
17. Protecting and enhancing water quality in rivers, lakes or groundwater
18. Reducing the impact of flooding by diverting flood waters into fields

19. Increasing opportunities for outdoor recreation and tourism
20. Other, please specify
21. None of the above
22. Don't know

Q3. Future policy to protect and enhance the Welsh rural environment will often require choices to be made between different policy options.

With this in mind, I am now going to show you pairs of possible policy options.

Please indicate on the 1 to 5 scales which policy choices you prefer.

SHOWSCREEN

f. Agricultural Policy:

Policies for farmers should ...

Aim to maintain and potentially increase <i>agricultural output</i> .	1 – 2 – 3 – 4 – 5 'Don't know'	Aim to maintain and potentially enhance the <i>natural environment</i> .
Retain the current level of environmental protection.	1 – 2 – 3 – 4 - 5 'Don't know'	Pay farmers to <i>raise the level</i> of environmental protection.

g. Nature conservation policies:

Conservation policies should to targeted to ...

Protect the most <i>endangered / threatened plant and animal species</i> .	1 – 2 – 3 – 4 - 5 'Don't know'	Protect <i>habitats</i> (e.g. forests, wetlands, moors) in the wider countryside.
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h. Climate change:

Climate change should be mitigated by ...

<i>Planting more trees</i> to increase the amount of carbon captured.	1 – 2 – 3 – 4 - 5 'Don't know'	<i>Reducing livestock numbers</i> to reduce their carbon emissions.
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i. Woodland:

The government has plans to plant more trees. What type of trees would you prefer?

Plant fast-growing conifers to maximise carbon capture.	1 – 2 – 3 – 4 - 5 'Don't know'	Plant mixed woodlands to benefit biodiversity and landscape.
Create <i>small woodlands near urban areas</i> to provide local outdoor recreation opportunities.	1 – 2 – 3 – 4 - 5 'Don't know'	Create <i>large multi-functional forests</i> which would attract tourists to Wales

j. Who pays?

Who should pay for environmental policies?

Taxpayers <i>should not pay more tax</i> to improve the natural environment	1 – 2 – 3 – 4 - 5 'Don't know'	Taxpayers <i>should pay more tax</i> to improve the natural environment
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e. Who benefits?

Should we consider the impacts of policy on future generations.

Policies should not reduce the well-being of the current generation	1 – 2 – 3 – 4 - 5 'Don't know'	Policies should not reduce the well-being of future generations.
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SHOWCARD C

Q4. Which, if any, of the categories on this card apply to you? Any others?

CODE ALL MENTIONED

5. I am a land owner, farmer, farm worker or forester
6. I regularly (e.g. at least once a month) participate in outdoor recreation activities (e.g. walking, hiking, cycling, horse-riding, kayaking, bird watching, fishing, shooting etc.)
7. I am a member of a nature conservation / environment charity (e.g. RSPB, Wildlife Trust, National Trust, WWF, Friends of the Earth etc.)
8. None of the above

Q5a. Thank you for providing this information which will inform policy makers when they plan future policies. Natural Resources Wales, through consultants working on their behalf, are keen to collect more detailed information about the way different groups of people in Wales use and benefit from the natural environment.

Would you be prepared to help with this by taking part in an online survey in December?

3. Yes
4. No

IF YES AT Q5a

Q5b. Please provide us with an email address so that we can send you a link to the survey.

Annex 6: Detailed analysis of the Omnibus survey

Table 36: Agricultural policy preferences (1) by group

Agricultural Policy	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Policies for farmers should					
Aim to maintain and potentially increase agricultural output					
1	7	23	15	24	69
2	7	27	11	72	117
3	14	137	51	152	354
4	9	110	34	86	239
Aim to maintain and potentially enhance the natural environment					
5	6	75	53	76	210
Total	43	372	164	410	989
Mean Score ⁴	3	3.5	3.6	3.3	3.4

Pearson chi2 = 50.6413 Pr = 0.000

Table 37: Agricultural policy preferences by age group

Agricultural Policy	Age		
	16-34	35-54	55+
Policies for farmers should			
Aim to maintain and potentially increase agricultural output			
1	12	24	33
2	38	36	43
3	94	104	156
4	90	62	87
Aim to maintain and potentially enhance the natural environment			
5	71	50	89
Total	305	276	408
Mean Score	3.6	3.3	3.4

Pearson chi2 = 17.2460 Pr = 0.028

Table 38: Agricultural policy preferences (2) by group

Agricultural Policy	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Policies for farmers should					
Retain the current level of environmental protection					
1	5	27	8	53	93
2	4	24	3	74	105
3	7	97	31	102	237
4	9	114	48	102	273

⁴ The mean score does not include individuals who replied 'don't know' and were coded as 6 in the dataset.

Pay farmers to raise the level of environmental protection 5	18	110	74	81	283
Total	43	372	164	412	991
Mean Score	3.7	3.7	4.1	3.2	3.6

Pearson chi2 = 86.8913 **Pr = 0.000**

Table 39: Agricultural policy preferences (2) by age group

Agricultural Policy	Age		
Policies for farmers should	16-34	35-54	55+
Retain the current level of environmental protection 1	24	20	49
2	28	39	38
3	65	70	102
4	96	78	99
Pay farmers to raise the level of environmental protection 5	94	69	120
Total	307	276	408
Mean Score	3.7	3.5	3.5

Pearson chi2= 16.0461 **Pr = 0.042**

Table 40: Nature conservation policy preferences by group

Conservation policies should	Group				Total
	Farmers	Outdoor recreation	Environmental Charity	General public	
Protect the most endangered plant and animal species 1	6	34	10	47	97
2	4	18	10	76	108
3	13	145	41	150	349
4	8	79	35	66	188
Protect habitats in the wider countryside 5	13	95	67	74	249
Total	44	371	163	413	991
Mean Score	3.4	3.5	3.9	3.1	3.4

Pearson chi2= 77.2544 **Pr = 0.000**

Table 41: Nature conservation policy preferences by age group

Conservation policies should	Age		
	16-34	35-54	55+

Protect the most endangered plant and animal species 1	30	24	43
2	42	29	37
3	120	91	138
4	54	70	64
Protect habitats in the wider countryside 5	58	63	128
Total	304	277	410
Mean Score	3.2	3.4	3.5

Pearson chi2 = 26.1727 **Pr = 0.001**

Table 42: Climate change policy preferences by group

Climate change should be mitigated by	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Planting more trees to increase the amount of carbon captured 1	24	142	63	183	412
2	5	78	27	86	196
3	7	105	47	94	253
4	5	18	9	31	63
Reducing livestock numbers to reduce their carbon emissions 5	2	27	17	18	64
Total	43	370	163	412	988
Mean Score	2	2.2	2.3	2.1	2.2

Pearson chi2= 23.0531 **Pr = 0.027**

Table 43: Climate change policy preferences by age group

Climate change should be mitigated by	Age		
	16-34	35-54	55+
Planting more trees to increase the amount of carbon captured 1	101	122	189
2	81	41	74
3	70	81	102
4	23	20	20
Reducing livestock numbers to reduce their carbon emissions 5	30	22	22
Total	305	407	407
Mean Score	2.3	2.1	2.1

Pearson chi2 = 31.6578 **Pr = 0.000**

Table 44: Type of trees (1) by group

What type of trees would you prefer?	Group
--------------------------------------	-------

	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Plant fast-growing conifers to maximize carbon capture 1	5	21	5	55	86
2	2	28	9	31	70
3	6	81	23	88	198
4	5	64	24	75	168
Plant mixed woodlands to benefit biodiversity and landscape 5	26	179	102	164	471
Total	44	373	163	413	993
Mean Score	4	3.9	4.3	3.6	3.9

Pearson chi2=42.3665 **Pr = 0.000**

Table 45: Type of trees (1) by age group

What type of trees would you prefer?	Age		
	16-34	35-54	55+
Plant fast-growing conifers to maximize carbon capture 1	26	27	33
2	28	23	19
3	81	49	68
4	57	53	58
Plant mixed woodlands to benefit biodiversity and landscape 5	115	125	231
Total	307	277	231
Mean Score	3.7	3.8	4.1

Pearson chi2 = 32.6593 **Pr = 0.000**

Table 46: Type of tree (2) by group

What type of trees would you prefer?	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Create small woodlands near urban areas 1	15	75	43	99	232
2	6	69	27	58	160
3	10	130	49	116	305
4	3	40	16	72	131
Create large multifunctional forests 5	10	57	29	64	160
Total	44	371	164	409	988
Mean Score	2.7	2.8	2.8	2.9	2.8

Pearson chi2 = 22.9154 **Pr = 0.028**

Table 47: Type of tree (2) by age group

What type of trees would you prefer?	Age		
	16-34	35-54	55+
Create small woodlands near urban areas	59	54	119
1			
2	53	55	52
3	98	80	127
4	46	39	46
Create large multifunctional forests	50	47	63
5			
Total	306	275	407
Mean Score	2.9	2.9	2.7

Pearson chi2= 18.1861 Pr = 0.020

Table 48: Payment by group

Who should pay for environmental policies?	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Tax payers should not pay more tax to improve the natural environment	10	96	30	171	307
1					
2	3	52	19	45	119
3	16	108	34	103	261
4	9	71	45	54	179
Tax payers should pay more tax to improve the natural environment	6	41	32	36	115
5					
Total	44	368	160	409	981
Mean Score	3	2.8	3.2	2.4	2.7

Pearson chi2 = 61.2100 Pr = 0.000

Table 49: Payment by age group

Who should pay for environmental policies?	Age		
	16-34	35-54	55+
Tax payers should not pay more tax to improve the natural environment	89	85	133
1			
2	35	35	49
3	76	82	103
4	60	45	74
Tax payers should pay more tax to improve the natural environment	40	25	50

5			
Total	300	272	409
Mean Score	2.8	2.6	2.7

Pearson chi2 = 5.5900 Pr = 0.693

Table 50: Benefits by group

Should we consider the impact of policy on future generations?	Group				
	Farmers	Outdoor recreation	Environmental Charity	General public	Total
Policies should not reduce the well-being of the current generation	3	25	8	62	98
1					
2	4	22	3	35	64
3	20	148	58	134	360
4	7	82	36	82	207
Policies should not reduce the well-being of future generations	10	95	56	95	256
5					
Total	44	372	161	408	985
Mean Score	3.4	3.5	3.8	3.3	3.5

Pearson chi2= 39.0739 Pr = 0.000

Table 51: Benefits by age group

Should we consider the impact of policy on future generations?	Age		
	16-34	35-54	55+
Policies should not reduce the well-being of the current generation	29	25	44
1			
2	19	23	22
3	128	90	142
4	57	60	90
Policies should not reduce the well-being of future generations	73	77	106
5			
Total	306	275	404
Mean Score	3.4	3.5	3.5

Pearson chi2 = 8.6782 Pr = 0.370

Annex 7: Reflective survey.

Survey of your views for the future of rural / environmental policies in Wales

You may recall that you recently took part in the 'All-Wales Omnibus' survey. During that survey, you indicated that you would be willing to take part in a follow-on survey that explores further your preferences for rural / environmental policies in Wales. We would therefore appreciate if you could take 10 minutes to complete this follow-on survey.

Your priorities for rural / environmental policy

1. Below is a list of eight rural / environmental policies. **In this question, we would like you to tell us how you would like to see a hypothetical budget for these policies allocated between the different policy options.** To do this, we would like you to allocate 100% of this hypothetical budget between the eight options. So, for example, you could allocate 50% of the budget to 'Protecting and enhancing natural habitats', 30% to 'Reducing emissions that cause climate change', 20% to 'Reducing the impact of flooding by diverting flood waters into fields' and 0% to the other five options.

	Your allocation of the budget to policy options (%) The total should add up to 100%
a. Maintaining the income of farmers	
b. Supporting efficient food production	
c. Protecting endangered / threatened plant and animal species	
d. Protecting and enhancing natural habitats	
e. Reducing emissions that cause climate change	
f. Protecting and enhancing water quality in rivers, lakes or groundwater	
g. Reducing the impact of flooding by diverting flood waters into fields	
h. Increasing opportunities for outdoor recreation and tourism	

What do other people think?

In the original Omnibus survey, we asked a wide range of people in Wales about their priorities for rural / environmental policies. Our analysis of that survey suggests that although people in Wales generally agree on the types of policies that they would like to see being implemented in Wales, different groups of people had different priorities. Below we present some of our key findings from our original survey.

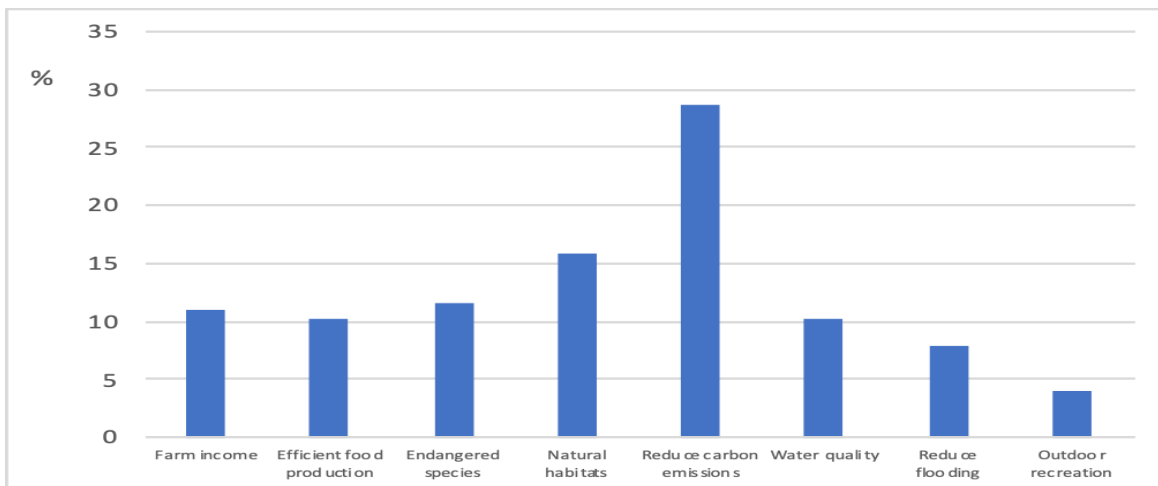
We ask that you read the information below, before proceeding to the next page of the survey.

Most important rural / environmental policy priority: All survey respondents

Figure 1 below reports the proportion of our original survey respondents that indicated the different rural / environmental policies as their top priority.

- The most popular policies were: 'Reduce carbon emissions' (29% of survey respondent) and 'Natural habitats' (16%)
- Less popular policies were: 'Outdoor recreation' (4%) and 'Reduce flooding' (8%).

Figure 1: Top policy priorities across all of our original survey respondents.



Most important rural / environmental policy priority of different 'user' groups

We also asked different 'user' groups to indicate their top priority (Figure 2).

Farmers

- Most popular: 'Farm income' (27%) and 'Efficient food production' (20%)
- Less popular: 'Reduce flooding' (2%) and 'Water quality' (5%).

People who participate in outdoor recreation

- Most popular: 'Reduce carbon emissions' (38%) and 'Natural habitats' (14%)
- Less popular: 'Outdoor recreation' (5%) and 'Reduce flooding' (7%).

Members of nature conservation groups

- Most popular: 'Reduce carbon emissions' (38%) and 'Natural habitats' (15%)
- Less popular: 'Outdoor recreation' (3%) and 'Endangered species' (5%).

People who are none of the above

- Most popular: 'Reduce carbon emissions' (24%) and 'Natural habitats' (18%)
- Less popular: 'Outdoor recreation' (3%) and 'Efficient food production' (8%).

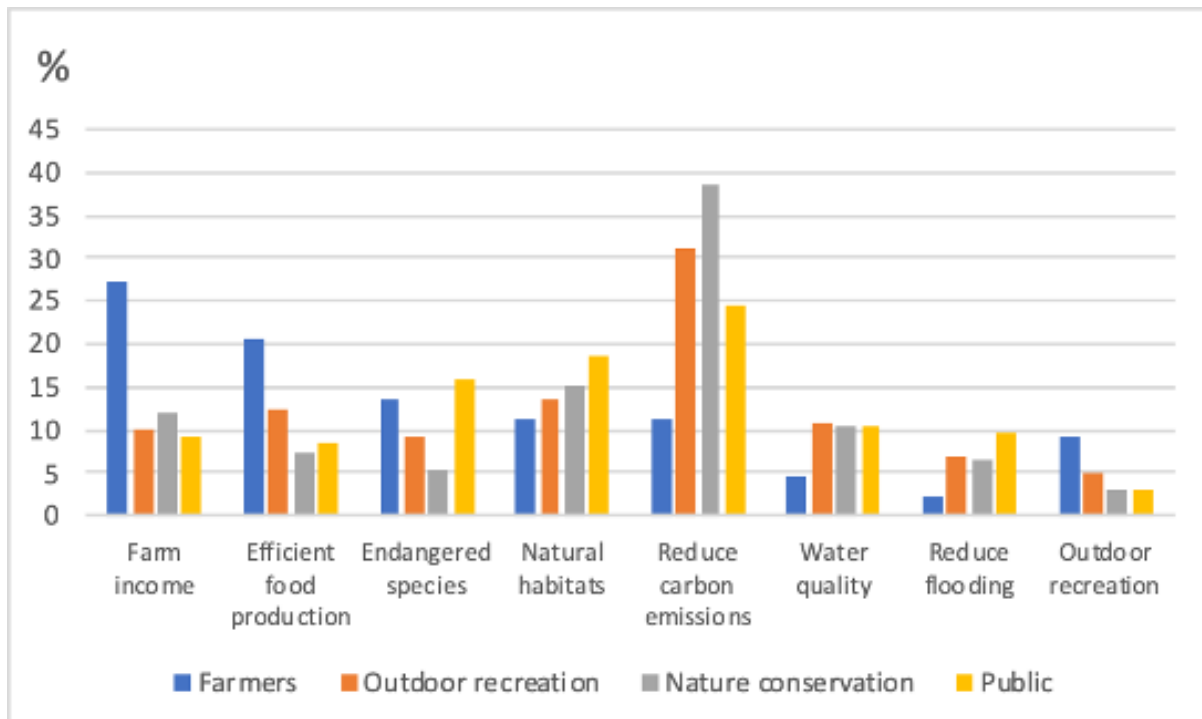


Figure 2: Top policy priorities of different user groups.

Most important rural / environmental policy priority of different 'age' groups

Finally, we also analysed policy priorities for different 'age' groups (Figure 3)

16-34 year olds

- Most popular: 'Reduce carbon emissions' (34%) and 'Endangered species' (18%)
- Less popular: 'Outdoor recreation' (2%) and 'Reduce flooding' (4%).

35-64 year olds

- Most popular: 'Reduce carbon emissions' (29%) and 'Natural habitats' (16%)
- Less popular: 'Outdoor recreation' (5%) and 'Reduce flooding' (8%).

Over 65 year olds

- Most popular: 'Reduce carbon emissions' (38%) and 'Natural habitats' (16%)
- Less popular: 'Outdoor recreation' (5%) and 'Reduce flooding' (8%).

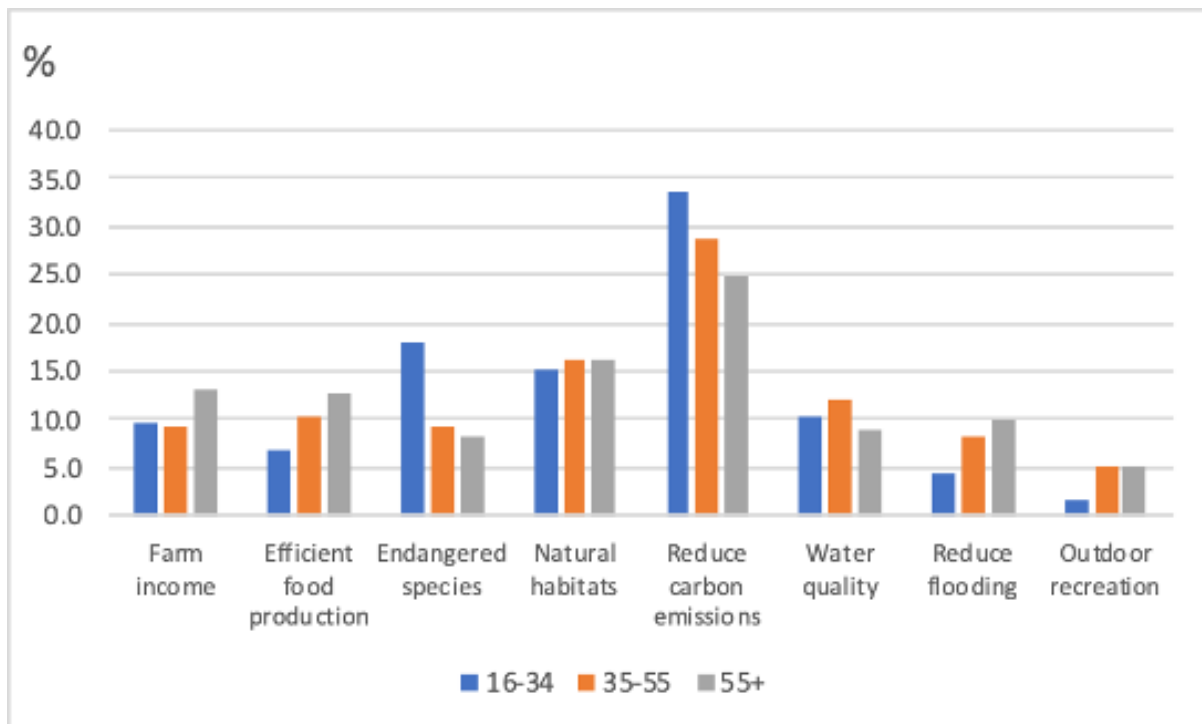


Figure 3: Top policy priorities of different age groups.

2. Please confirm that you have read the information presented above.

I have read the information above

[]

3. Given the information presented above, we would like you to repeat the task that you did in Q1 and allocate again the 100% hypothetical budget between the eight policy options. This time when allocating your budget, you should consider both your own priorities, as well as the priorities of the different groups of people highlighted above. The aim of this exercise is to identify compromise solutions that both meet your own priorities but also account for potential impacts on other groups. *(If you wish, you can press the 'Previous' button to see your original allocations and the information on priorities of other groups).*

	Your allocation of the budget to policy options (%) The total should add up to 100%
a. Maintaining the income of farmers	
b. Supporting efficient food production	
c. Protecting endangered / threatened plant and animal species	
d. Protecting and enhancing natural habitats	
e. Reducing emissions that cause climate change	
f. Protecting and enhancing water quality in rivers, lakes or groundwater	
g. Reducing the impact of flooding by diverting flood waters into fields	
h. Increasing opportunities for outdoor recreation and tourism	

4. How did the information on other people's priorities influence the way you allocated the hypothetical budget in Question 2?

- I did not change my priorities as I felt it was more important to stick to my own priorities []
- I did not change my priorities as I felt they already reflected the priorities of others []
- I changed my priorities for some options to reflect the priorities of others []
- I totally changed my priorities to fully reflect the priorities of others []

5. If you changed your priorities to account for other people's priorities, who's priorities did you change to?

- I did not change my priorities []
- I changed my priorities to reflect the priorities of farmers []
- I changed my priorities to reflect the priorities of members of environmental groups []
- I changed my priorities to reflect the priorities of people who do outdoor recreation activities []
- I changed my priorities to reflect the priorities of younger people []
- I changed my priorities to reflect the priorities of older people []

About you

Finally, we would like to collect some background information about you.

6. Which, if any, of the categories apply to you?

- I am a land owner, farmer, farm worker or forester []
- I regularly (e.g. at least once a month) participate in outdoor recreation activities (e.g. walking, hiking, cycling, horse-riding, kayaking, bird watching, fishing, shooting etc.) []
- I am a member of a nature conservation / environment charity (e.g. RSPB, Wildlife Trust, National Trust, WWF, Friends of the Earth etc.) []

- None of the above

[]

7. Are you?

- Male
- Female

8. How old are you?

- 16-24
- 25-34
- 35-44
- 45-54
- 55-65
- 65+

9. Where do you live?

- Rural area
- Urban area

10. Which region of Wales do you live?

- North Wales
- Mid and SW Wales
- The Valleys and SE Wales

Thank you for providing this information which will inform policy makers when they plan future policies.

Annex 8: Agenda for the Stage 4 Deliberative stakeholder workshops.

NRW Shared and Contested Values – Deliberative stakeholder workshop

18 March 21

14:30 Plenary: Introduction to workshop (5 min) **[Mike]**

14:35 Plenary:

- Task 1: Reflections on changes to natural resources over the past 30 years - '[Mural](#)' link. (5 mins) **[Mike]**
- Task 1 Feedback (5 mins) **[Mike]**

14:45 Plenary

- Presentation: [Mike]
 - NRW's Vision 2050 (5 mins)
 - 'Shared and contested values' research (15 mins)
 - Developing a future vision for natural resources in Wales – 3 Horizons (10 mins)

15:15 **Breakout:** Task 2: 3-Horizon planning for Vision 2050 (30 mins) [Kyriaki and Wyn]

- [Green group 'Mural'](#)
- [Blue group 'Mural'](#)

15:45 Break

16:00 Plenary

- Task 2 feedback (10 mins) [Kyriaki and Wyn]
- Plenary: Roadmap to Vision 2050 (5 mins) [Mike]

16:15 **Breakout:** Task 3: Roadmap to Vision 2050 (30 mins) [Kyriaki and Wyn]

- [Green group 'Mural'](#)
- [Blue group 'Mural'](#)

16:45 Plenary

- Task 3 feedback (10 mins) [Kyriaki and Wyn]
- Concluding comments (5 mins) [Mike]

17:00 **Close**

Annex 9: PowerPoint slides used in the Stage 4 Deliberative stakeholder workshops.

The slides below were used to both guide the discussions in the Stage 4 deliberative workshops, as well as to provide information to participants (i.e. the results from the previous stages) to allow them to develop a shared vision for the future of natural resources in Wales.

NRW 'Shared and Contested Values' Stakeholder Workshop

2:30 – 5:00pm
18 March 2021

Prof Mike Christie
 Dr Kyriaki Remoundou
 Dr Wyn Morris
 Aberystwyth Business School



1

Background to the research project on Shared and Contested Values

The Project

- NRW-funded project to explore 'shared' and 'contested' values that different groups of people in Wales have for alternative natural resource management policies.

The research was organised in 4 stages:

- **Stage 1: Scenario analysis:** this involved the review of policy documents and interviews with policy stakeholders to identify policy scenarios for the future management of natural resources in Wales.
- **Stage 2: Omnibus survey** (supplemented by a survey of farmers) to investigate people's view on different policies. Their shared and contested values were explored.
- **Stage 3: Follow-on (reflective) survey:** a sub-sample of respondents from Stage 2 took part in a survey aiming to explore whether consideration of the priorities (values) of others leads to a more shared vision of policy priorities.
- **Stage 4: Stakeholders' workshops (today):** to develop a 'shared vision for the natural environment in Wales for 2050' that accounts for the views of people in Wales.

2



Overview of today's workshop

Shared and Contested Values



14:30 Plenary: Introduction to workshop

14:35 Plenary:

- Task 1: Reflections on changes to natural resources over the past 30 years.

14:45 Plenary:

- Presentation of Vision 2050 + 'Shared and contested values' research Horizon planning for Vision 2050

15:15 Breakout: Task 2 Horizon planning for Vision 2050

15:45 Break

16:00 Plenary:

- Feedback Task 2 Horizon planning for Vision 2050
- Presentation Roadmap to Vision 2050

16:15 Breakout: Roadmap to Vision 2050

16:45 Plenary:

- Breakout feedback
- Concluding comments

17:00 Close

Vision

Task 1: Your vision for the future of natural resources in Wales

■ Vision 2050

- In this Workshop, we will aim to ‘*Develop a shared vision for the natural environment in Wales for 2050*’.

■ Using Post-it notes on the ‘[Mural](#)’ link:

■ Task 1: *Reflection on the past 30 years.*

- To consider the extent of change that could happen over the 30-year timeline to 2050, think back and consider:
 - What has been the most significant change you have seen over the *past 30 years*.
 - What has facilitated this change to happen?

4

Vision

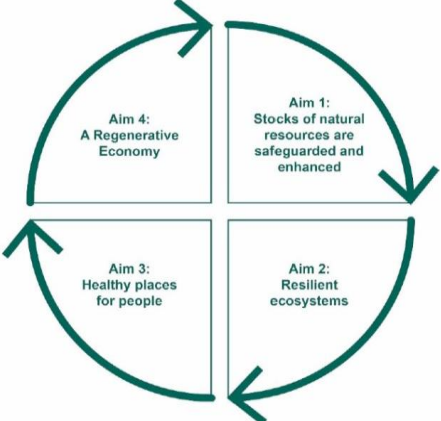
Task 1: Your vision for the future of natural resources in Wales

■ Feedback on Task 1: ‘[Mural](#)’ link

■ Task 1: *Reflection on the past 30 years.*

- To consider the extent of change that could happen over the 30-year timeline to 2050, think back and consider:
 - What has been the most significant change you have seen over the *past 30 years*.
 - What has facilitated this change to happen?

5



■ Vision 2050

- NRW is committed to ‘Develop a shared vision for the natural environment in Wales for 2050’⁽¹⁾.
- The aims of Sustainable Management of Natural Resources (SMNR) will be central ⁽²⁾.
- Our research on Shared and Contested Values hopes to feed into NRW’s Vision 2050

¹ Corporate plan
² SoNaRR 2020

6

Shared and
Contested
Values

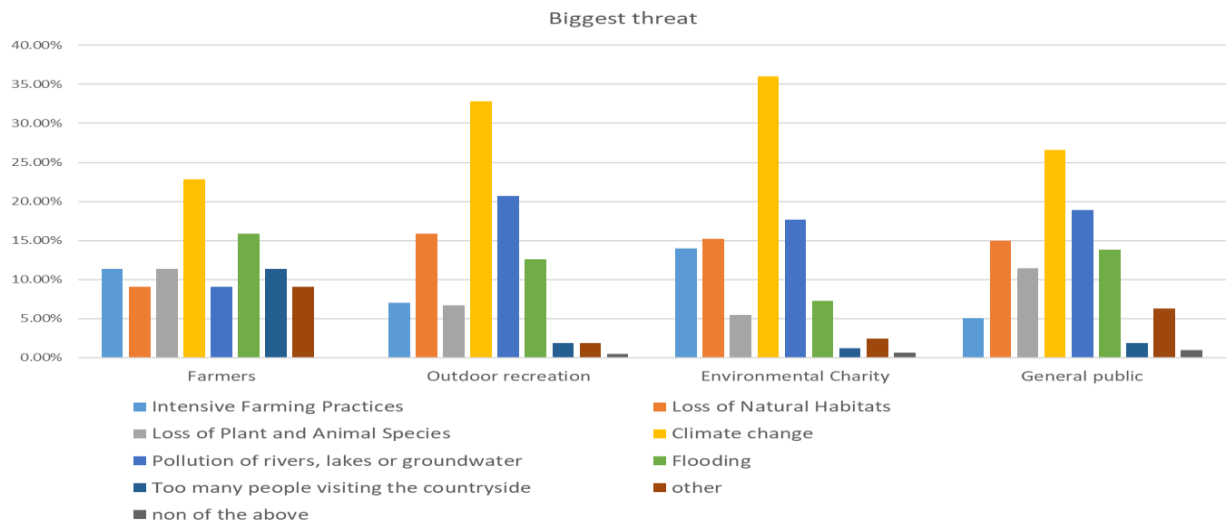
Stage 1:
Omnibus survey

- Survey of people in Wales to elicit their views on the biggest threats to the Welsh rural environment and on different countryside management policies.
- Sample: N = 1002
- Interest groups:
 - Farmer = 44;
 - Outdoor recreation = 373;
 - Environmental charity member = 164,
 - General public=421
- Rural = 319; Urban = 683

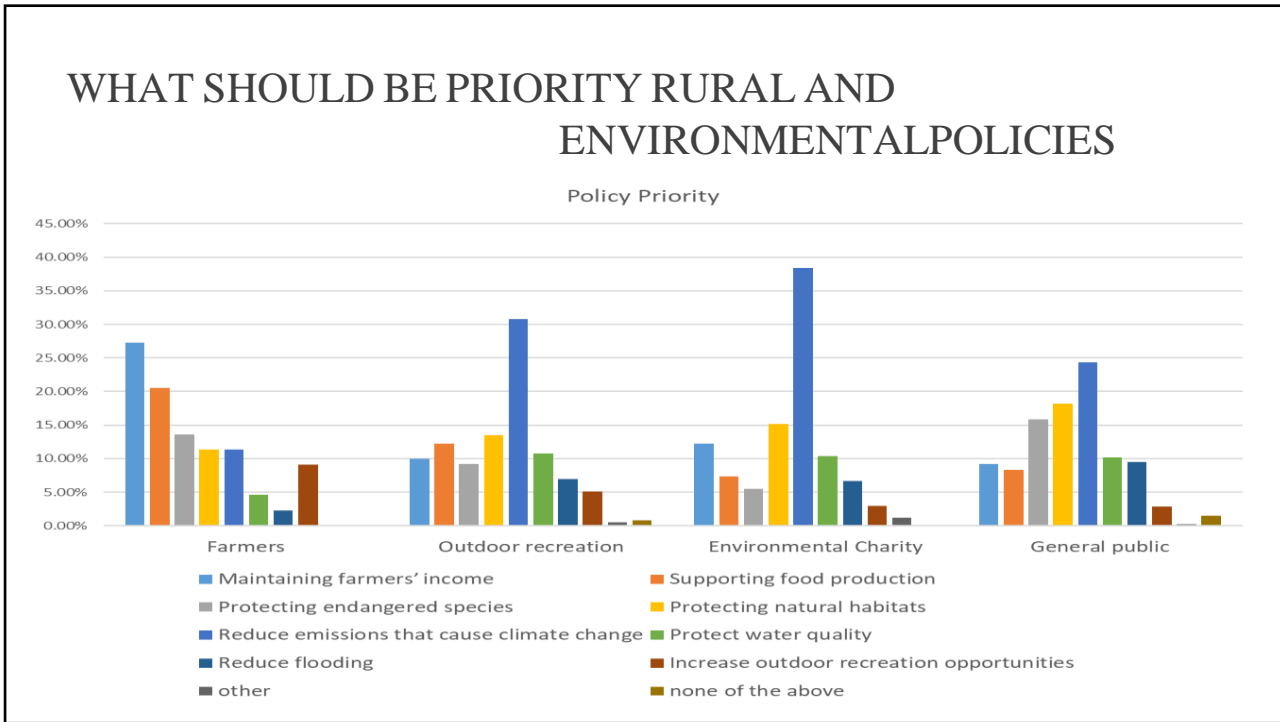
7



GREATEST THREATS TO THE WELSH RURAL ENVIRONMENT



8



9

OMNIBUS SURVEY: POLICY PREFERENCES

	Farmers	Outdoor recreation	Environmental Charity	General public
Policies for farmers should:				
(1) aim to maintain and potentially increase agricultural output vs (5) aim to maintain and potentially enhance the natural environment	3.0	3.5	3.6	3.3
(1) Retain the current level of environmental protection vs (5) Pay farmers to raise the level of environmental protection.	3.7	3.7	4.1	3.2

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OMNIBUS SURVEY: POLICY PREFERENCES

	Farmers	Outdoor recreation	Environ- mental Charity	General public
Conservation policies should: (1) protect the most endangered plant and animal species vs (5) protect habitats in the wider countryside	3.4	3.5	3.9	3.1
Climate change should be mitigated by: (1) planting more trees to increase the amount of carbon captured vs (5) reducing livestock numbers to reduce their carbon emissions	2.1	2.2	2.3	2.1

OMNIBUS SURVEY: POLICY PREFERENCES

	Farmers	Outdoor recreation	Environmental Charity	General public
What type of trees would you prefer? (1) Plant fast-growing conifers to maximize carbon capture vs (5) Plant mixed woodlands to benefit biodiversity and landscape	4.0	3.9	4.3	3.6
What type of trees would you prefer? (1) Create small woodlands near urban areas vs (5) create large multifunctional forests	2.7	2.8	2.8	2.9

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OMNIBUS SURVEY: POLICY PREFERENCES

	Farmers	Outdoor recreation	Environmental Charity	General public
Who should pay for environmental policies? (1) Tax payers should not pay more tax to improve the natural environment vs (5) Tax payers should pay more tax to improve the natural environment	3.0	2.8	3.2	2.4
(1) Policies should not reduce the well-being of the current generation vs (5) Policies should not reduce the well-being of future generations	3.4	3.5	3.8	3.3

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REFLECTIVE SURVEY: KEY FINDINGS

- Generally, there were **high levels of agreement** ('Shared' values) in terms of:
 - Biggest threats (Climate change, river pollution and loss of habitat), and
 - Policy preferences (Reduce emissions that cause climate change)
 - **Therefore, evidence of 'shared' values.**
- However, there was some **variation in the actual ordering of preferences.**

- **Key differences** ('contested' issues) included:
 - The general public opposed to taxpayers being asked to pay more for environmental policies, while farmers and members of environmental

REFLECTIVE SURVEY: KEY FINDINGS

- The results of the reflective survey (N=117) suggested that **½ of our respondents were willing to change their views on the future of Welsh rural / environmental policies to account for the needs of others.**
- Of these, responses changed to reflect the priorities of:
 - members of environmental charities (41%)
 - farmers (29%), and
 - young people (15%).
- These findings indicate that deliberation (i.e. consideration of the needs of others) has the potential to address contested issues relating to the future of rural and environmental policy in Wales, and to move towards a shared vision for those policies.

Developing a future vision for natural resources in Wales



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Developing a future Vision:

Example from Well-being of Future Generations Act



- How to develop a future vision?
 - ‘The Wales We Want’ was a ‘National Conversation’ that helped develop the Well-being of Futures Generations Bill.
 - It asked people to discuss the Wales that they want to leave behind for their children and grandchildren, considering the challenges, aspirations and ways to solve long-term problems to create a Wales that they want by 2050.
 - This process helped to shape Wales’ six well-being goals.
- Today, we want to ask a similar question, but for the future of our natural resources.

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Vision 2050

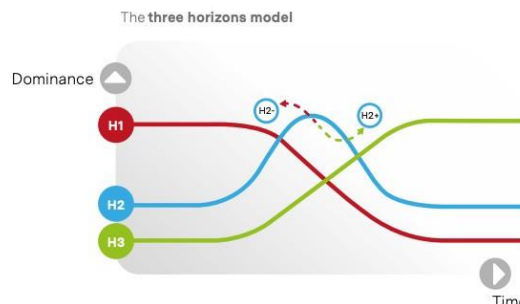
- Steps to developing a vision:
 - Step 1: Gather intelligence about the future
 - Step 2: Exploring possible future(s)
 - Step 3: **Visioning** - helps create a collaborative shared vision for the future
 - **Three Horizons**
 - **Road-mapping**
 - Step 4: Presenting the Vision

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Vision

Exploring
 possible futures:
Three Horizons

■ Three Horizons



- A framework that helps people to think and plan for the longer term:
 - H1: The *'power holder'* - Right now. Current trends and issues
 - H2: The *'innovator'* - Emerging trends
 - H3: The *'Visionary'* – trends that might dominate the future, competing visions.

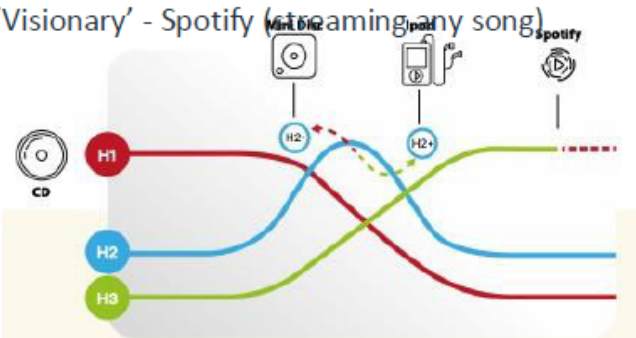
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Vision 2050

Exploring
possible futures

- Three
Horizons

- Three Horizons – example of music in early 1990s
 - H1: ‘Power holder’ - CD is dominant
 - H2-: ‘Innovator 1’ - Minidisc (smaller & more robust)
 - H2+: ‘Innovator 2’ - iPod (1000s of digital songs)
 - H3: ‘Visionary’ - Spotify (streaming any song)



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Vision 2050

Breakout:
Task 2 -
Developing a
2050 Vision for
the future of
natural resources
in Wales

[Green_group ‘Mural’](#)
[Blue_group ‘Mural’](#)

TASK 2: Using the 3 Horizons framework, identify the potential futures for natural resources in Wales.

When considering this, think about:

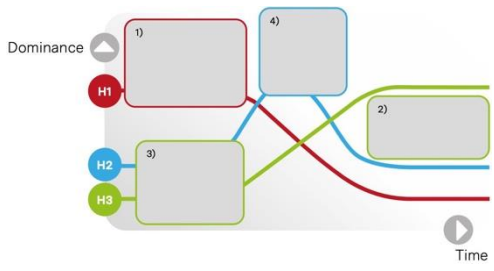
- Values of all stakeholders
- Shared and contested values
- Incremental vs transformative change
- Opportunities from Covid recovery and Brexit

1) **Present concerns.** What makes you think the current situation needs to change?

2) **Future aspirations.** What would you like this to look and feel like in 2050?

3) **Inspirational practice.** Where is the 2050 vision happening already?

4) **Innovations in play.** What projects, ideas or initiatives are in play or in sight that aim to change the status quo?



Identify a **key trends** that make you think that the situation in Wales related to the natural environment will need to change and next to it explain **why** that makes you think things **need to change**.

Can you give some **specifics** about what the situation related to the natural environment would **ideally look like in 2050** – perhaps referencing the trends you identified.

Identify **one or two examples**, from anywhere in the world, where the 2050 vision is **happening now**, even in just a small way.

In Wales only, identify **three projects in progress** at the moment that aims to improve the current situation.

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You have 30 mins for Task 2
 (Until 3:45)
 This is followed by a 15 min
 coffee break.
 Return to plenary at 4pm

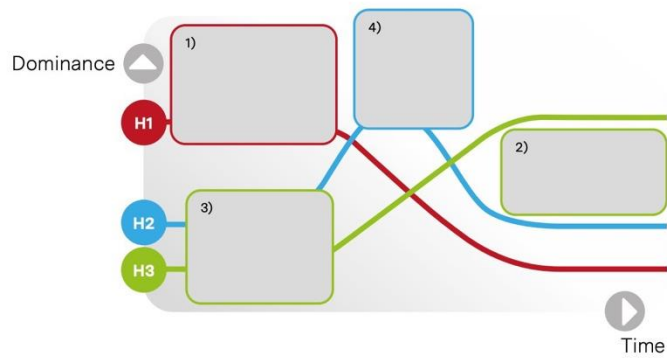


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Vision

Breakout 1:
Task 2:
 Developing a
 2050 Vision for
 the future of
 natural resources
 in Wales

■ Task 2 - Feedback



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Vision

Break out Task 3: Visioning

Implementing a
shared vision for the
future

- The next step is to plan how you would implement your vision:
 - What does success look like?
 - What needs to change
 - Short term quick fixes
 - Longer term
 - Who are the stakeholders
 - What behaviour needs changing
 - Institutions
 - People
 - How you would measure success

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Choosing ONE policy that you identified in your previous task, you now need to plan how you would implement your vision by address each of the questions in the columns.

Policy	What does success look like?	What needs to change		Who are the stakeholders	What behaviour needs changing		How you would measure success
		Short term quick fixes	Longer term		Institutions	People	

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Vision

Break out Task 3: Visioning

Implementing a
shared vision for the
future

Green group
'Mural'

- Finally, you should spend 5 mins reflecting on the task.
 - What have you learnt?
 - What new insights have you attained?

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Vision

Break out 2 Task :Visioning

Implementing a
shared vision for the
future

- Breakout 2 feedback

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Vision 2050

NEXT STEPS

- We will take the information gathered today, along with the data from the other project surveys, to provide evidence to NRW (and partners) to develop pathways to their 2050 Vision for natural resources in Wales that:
 - Maximizes shared values across stakeholders,
 - Minimizes contested values,
 - Considers both incremental and transformative change.
- Finally, covid recovery and Brexit provide an opportunity to do things differently. ... its now time for all of us to seize this opportunity and take steps to protect the long term sustainability of Wales' natural resources.


Prof Mike Christie
Kyriaki Remoundou
Wyn Morris
Aberystwyth Business School

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NRW 'Shared and Contested Values' Stakeholder Workshop

Thank you

Prof Mike Christie
Dr Kyriaki Remoundou
Dr Wyn Morris
Aberystwyth Business School



Annex 10 Workshop Survey had we been able to meet

Notes:

Questions in blue are those where we should 'live' results on the screen.

Green is verbal instructions

Red is optional questions that may be deleted

Survey of your views for the future of rural / environmental policies in Wales

In this workshop, we would like to explore **your** preferences for rural / environmental policies in Wales.

SECTION A: About you

First, we would like to collect some background information about you.

Q1. Where do you live?

- Rural area []
- Urban area []

Q2. Which, if any, of the categories apply to you?

- I am a land owner, farmer, farm worker or forester []
- I regularly (participate in outdoor recreation activities (e.g. walking, hiking, cycling, horse-riding, kayaking, bird watching, fishing, shooting etc.) []
- I am a member of a nature conservation / environment charity (e.g. RSPB, Wildlife Trust, National Trust, WWF, Friends of the Earth etc.) []
- None of the above []

SECTION B: Your preferences for rural and environmental policy in Wales

Q3. Firstly, which of these factors do you consider to be the greatest threats to the Welsh rural environment?

- Intensive farming practices
- Loss of natural habitats
- Loss of plant and animal species that leaves them endangered
- Climate change
- Pollution of rivers, lakes or groundwater resulting in poor water quality
- Flooding
- Too many people visiting the countryside for outdoor pursuits or tourism
- Other, please specify
- None of the above
- Don't know

Q4. Which of these do you think should be a priority for future rural and environmental policies in Wales?

- Maintaining the income of farmers
- Supporting efficient food production
- Protecting endangered / threatened plant and animal species
- Protecting and enhancing natural habitats
- Reducing emissions that cause climate change
- Protecting and enhancing water quality in rivers, lakes or groundwater
- Reducing the impact of flooding by diverting flood waters into fields
- Increasing opportunities for outdoor recreation and tourism
- Other, please specify
- None of the above
- Don't know

The Welsh government is committed to promoting and implementing policies that protect and enhance the rural environment and economy. However, it also recognises that its budget for such work is limited. It is therefore keen to establish whether, within its current budget, it is spending on the policies that people want. In the following exercise, we would like you to consider different combinations of rural and environmental policies and tell us which policy 'bundle' you prefer. Below is an example of the task we would like you to do. We will consider eight rural and environmental policies that are currently funded by the Welsh government. On the far right, we show the current policy bundle, where there would be no change in the current level of spend on the different rural and environmental policies. Policy bundles A and B represent two alternative policy 'bundles', which reallocate current spend between the policy options. For Bundles A and B, the spend on some policies would increase, while the spend on others would decrease or remain unchanged. Your task is therefore to choose the policy bundle you prefer: the current policy bundle, or policy bundle A or B.

Example policy choice task

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Increased	No change	No change
Protecting species and natural habitats	Increased	No change	No change
Reducing emissions that cause climate change	No change	Decrease	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Increased	Increased	No change
Reducing the impact of flooding by diverting flood waters into fields	Decrease	No change	No change

Increasing opportunities for outdoor recreation and tourism	Increased	Increased	No change
My preferred policy bundle is...	[]	[]	[]

Q5: You will now be presented with a series of 6 policy choice tasks. For each task, you should indicate whether you prefer the current policy bundle, or policy bundle A or B.

Q5a: Policy Choice Task 1

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Increase	Decrease	No change
Protecting species and natural habitats	No change	No change	No change
Reducing emissions that cause climate change	Increase	Decrease	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Decrease	Increase	No change
Reducing the impact of flooding by diverting flood waters into fields	Decrease	Increase	No change
Increasing opportunities for outdoor recreation and tourism	No change	No change	No change
My preferred policy bundle is...	[]	[]	[]

Q5ba: Policy Choice Task 2

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Decrease	Increase	No change
Protecting species and natural habitats	Increase	Decrease	No change
Reducing emissions that cause climate change	No change	No change	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	No change	No change	No change
Reducing the impact of flooding by diverting flood waters into fields	Decrease	Increase	No change
Increasing opportunities for outdoor recreation and tourism	Increase	Decrease	No change
My preferred policy bundle is...	[]	[]	[]

Q5c: Policy Choice Task 3

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Increase	Decrease	No change
Protecting species and natural habitats	Decrease	Increase	No change
Reducing emissions that cause climate change	No change	No change	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Increase	Decrease	No change
Reducing the impact of flooding by diverting flood waters into fields	No change	No change	No change
Increasing opportunities for outdoor recreation and tourism	Decrease	Increase	No change
My preferred policy bundle is...	[]	[]	[]

Q5d: Policy Choice Task 4

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Decrease	Increase	No change
Protecting species and natural habitats	Decrease	Increase	No change
Reducing emissions that cause climate change	Increase	Decrease	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	No change	No change	No change
Reducing the impact of flooding by diverting flood waters into fields	Increase	Decrease	No change
Increasing opportunities for outdoor recreation and tourism	No change	No change	No change
My preferred policy bundle is...	[]	[]	[]

Q5e: Policy Choice Task 5

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	No change	No change	No change
Protecting species and natural habitats	No change	No change	No change
Reducing emissions that cause climate change	Decrease	Increase	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Increase	Decrease	No change
Reducing the impact of flooding by diverting flood waters into fields	Increase	Decrease	No change
Increasing opportunities for outdoor recreation and tourism	Decrease	Increase	No change
My preferred policy bundle is...	[]	[]	[]

Q5f: Policy Choice Task 6

	Policy bundle A	Policy bundle B		Current policy bundle
Supporting efficient food production	No change	No change		No change
Protecting species and natural habitats	No change	No change		No change
Reducing emissions that cause climate change	No change	No change		No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Decrease	Increase		No change
Reducing the impact of flooding by diverting flood waters into fields	No change	No change		No change
Increasing opportunities for outdoor recreation and tourism	Increase	Decrease		No change
My preferred policy bundle is...	[]	[]		[]

Q6: Could you tell us your thought process when you made the policy choices.?

- I always choose the 'current policy bundle' as I'm happy with the way the government current funds rural / environmental policies
- I choose the policy bundle that had greatest benefits to farming.
- I choose the policy bundle that had greatest benefits for the nature.

- I choose the policy bundle that had greatest benefits for climate change.
- I choose the policy bundle that had greatest benefits for water quality and flooding.
- I choose the policy bundle that had greatest benefits for outdoor recreation.
- I randomly choose an option

SECTION C: What other people think about rural and environmental policy in Wales

Rural and environmental policies will impact people in different ways. In some cases, there may be general agreement on the most important policies, while in other cases there may be disagreement. The Welsh government is keen to ensure that the policies it implements does not adversely impact certain groups of people. To address this, we would now like you to discuss, as a group, your individual policy preferences and then identify the policy priorities as a group.

Q7. There are often different ways in which a policy could be designed meet its policy goals. Further, there often has to be compromises to be made. With this in mind, I am now going to show you pairs of possible policy options.

Please indicate on the 1 to 5 scales which policy choices you prefer.

a. Agricultural Policy:

Policies for farmers should ...

Aim to maintain and potentially increase <i>agricultural output</i> .	1 – 2 – 3 – 4 – 5 'Don't know'	Aim to maintain and potentially enhance the <i>natural environment</i> .
Retain the current level of environmental protection.	1 – 2 – 3 – 4 - 5 'Don't know'	Pay farmers to <i>raise the level of</i> environmental protection.

b. Nature conservation policies:

Conservation policies should to targeted to ...

Protect the most <i>endangered / threatened plant and animal species</i> .	1 – 2 – 3 – 4 - 5 'Don't know'	Protect <i>habitats</i> (e.g. forests, wetlands, moors) in the wider countryside.
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c. Climate change:

Climate change should be mitigated by ...

<i>Planting more trees</i> to increase the amount of carbon captured.	1 – 2 – 3 – 4 - 5 'Don't know'	<i>Reducing livestock numbers</i> to reduce their carbon emissions.
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d. Woodland:

The government has plans to plant more trees. What type of trees would you prefer?

Plant fast-growing conifers to maximise carbon capture.	1 – 2 – 3 – 4 - 5 'Don't know'	Plant mixed woodlands to benefit biodiversity and landscape.
Create <i>small woodlands near urban areas</i> to provide local outdoor recreation opportunities.	1 – 2 – 3 – 4 - 5 'Don't know'	Create <i>large multi-functional forests</i> which would attract tourists to Wales

e. Who pays?

Who should pay for environmental policies?

Taxpayers <i>should not</i> pay more tax to improve the natural environment	1 – 2 – 3 – 4 - 5 ‘Don’t know’	Taxpayers <i>should pay more</i> tax to improve the natural environment
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f. Who benefits?

Should we consider the impacts of policy on future generations.

Policies should not reduce the well-being of the current generation	1 – 2 – 3 – 4 - 5 ‘Don’t know’	Policies should not reduce the well-being of future generations.
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Before this workshop, we undertook a series of surveys which asked people in Wales about their priorities for future rural / environmental policies in Wales. Our analysis of the survey data suggests that although people in Wales generally agree on the types of policies that they would like to see being implemented in Wales, different groups of people had different priorities. Potentially this could lead to conflict or certain groups of people being disadvantaged. To address this concern, we now would like to present to you our findings from our original study and importantly see whether an understanding of other people’s priorities and concerns can lead to compromise solutions that everyone is happy with.

Below we present some of our key findings from our original survey. First, we present the findings from across all our respondents (Figure 1). We then present the priorities of different ‘User’ groups (Figure 2) and different ‘Age’ group (Figure 3). Note that the original survey was administered below Christmas and therefore before the floods that are currently affecting people in Wales.

Across all respondents (Figure 1)

- HIGH PRIORITY: ‘*Reduce carbon emissions*’ (29%) and ‘*Natural habitats*’ (16%)
- LOW PRIORITY, ‘*Outdoor recreation*’ (4%) and ‘*Reduce flooding*’ (8%).

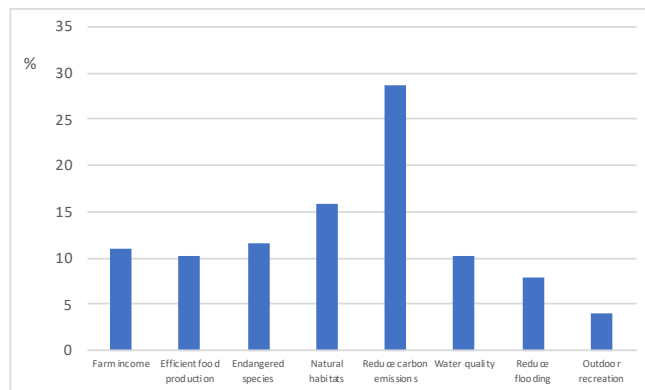


Figure 1: All respondents

Different 'user' groups (Figure 2)

Farmers

- HIGH PRIORITY: '*Farm income*' (27%) and '*Efficient food production*' (20%)
- LOW PRIORITY: '*Reduce flooding*' (2%) and '*Water quality*' (5%).

People who participate in outdoor recreation

- HIGH PRIORITY: '*Reduce carbon emissions*' (38%) and '*Natural habitats*' (14%)
- LOW PRIORITY, '*Outdoor recreation*' (5%) and '*Reduce flooding*' (7%).

Members of nature conservation groups

- HIGH PRIORITY: '*Reduce carbon emissions*' (38%) and '*Natural habitats*' (15%)
- LOW PRIORITY: '*Outdoor recreation*' (3%) and '*Endangered species*' (5%).

People who are none of the above

- HIGH PRIORITY: '*Reduce carbon emissions*' (24%) and '*Natural habitats*' (18%)
- LOW PRIORITY: '*Outdoor recreation*' (3%) and '*Efficient food production*' (8%).

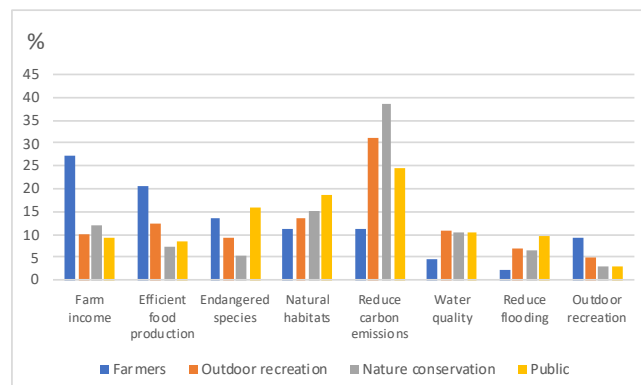


Figure 2: Different 'user' groups

Different Age groups

16-34 year olds

- HIGH PRIORITY: '*Reduce carbon emissions*' (34%) and '*Endangered species*' (18%).
- LOW PRIORITY: '*Outdoor recreation*' (2%) and '*Reduce flooding*' (4%)

35-55 year olds

- HIGH PRIORITY: '*Reduce carbon emissions*' (29%) and '*Natural habitats*' (16%)
- LOW PRIORITY, '*Outdoor recreation*' (5%) and '*Reduce flooding*' (8%).

Over 65 year olds

- HIGH PRIORITY: '*Reduce carbon emissions*' (38%) and '*Natural habitats*' (16%)
- LOW PRIORITY: '*Outdoor recreation*' (5%) and '*Endangered species*' (8%).

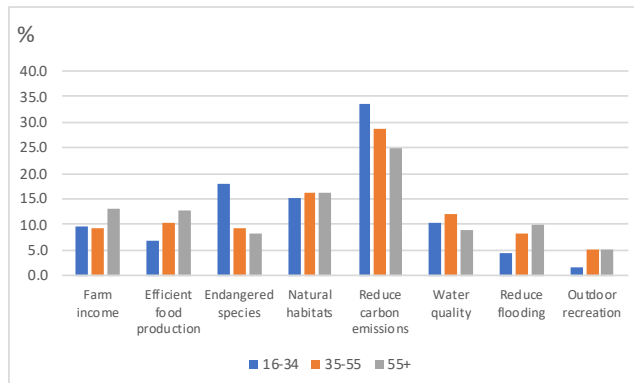


Figure 3: Different age groups

We would now like to get you to consider the policy priorities of others and then reflect on whether an understanding of other people's preferences influences your preferences. To do this, we will split you into groups, and you will be given 20 minutes to address undertake the following task.

- Each person to write on a Post-it note what they consider to be **their main policy priority** for the Welsh rural environment (Note, you can choose a policy not already discussed).
- Each person should then place the Post-it on the wall and describe why this policy important to them.
- Next, have a group discussion about the various priority policies. In particular, focus on where there may be agreement / disagreements within the group. Try to establish why a policy may be of importance to some people, but not others.
- As a group, identify the top 5 policies and write them on the poster.
- One member of each group will then present the top 5 policies and summarise the discussions that were held to come up with this priority list

Now, bringing the whole group together can you tell us how considering other people's viewpoints influenced your views.

Q8. Given the information presented above and your discussions, we would like you to repeat the task that you did in Q7 where you choose between alternative bundles of policies. For each task you are asked to state whether you prefer the current policy bundle, or policy bundle A or B.

Q8a: Policy Choice Task 1

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	No change	No change	No change
Protecting species and natural habitats	Decrease	Increase	No change
Reducing emissions that cause climate change	Increase	Decrease	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Increase	Decrease	No change
Reducing the impact of flooding by diverting flood waters into fields	Decrease	Increase	No change
Increasing opportunities for outdoor recreation and tourism	No change	No change	No change
My preferred policy bundle is...	[]	[]	[]

Q8ba: Policy Choice Task 2

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Increase	Decrease	No change
Protecting species and natural habitats	Decrease	Increase	No change
Reducing emissions that cause climate change	Decrease	Increase	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Decrease	Increase	No change
Reducing the impact of flooding by diverting flood waters into fields	Increase	Decrease	No change
Increasing opportunities for outdoor recreation and tourism	Increase	Decrease	No change
My preferred policy bundle is...	[]	[]	[]

Q8c: Policy Choice Task 3

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Increase	Decrease	No change
Protecting species and natural habitats	Increase	Decrease	No change
Reducing emissions that cause climate change	Decrease	Increase	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	No change	No change	No change
Reducing the impact of flooding by diverting flood waters into fields	No change	No change	No change
Increasing opportunities for outdoor recreation and tourism	Decrease	Increase	No change
My preferred policy bundle is...	[]	[]	[]

Q8d: Policy Choice Task 4

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Decrease	Increase	No change
Protecting species and natural habitats	Increase	Decrease	No change
Reducing emissions that cause climate change	Increase	Decrease	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Decrease	Increase	No change
Reducing the impact of flooding by diverting flood waters into fields	Increase	Decrease	No change
Increasing opportunities for outdoor recreation and tourism	Decrease	Increase	No change
My preferred policy bundle is...	[]	[]	[]

Q8e: Policy Choice Task 5

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	Decrease	Increase	No change
Protecting species and natural habitats	No change	No change	No change
Reducing emissions that cause climate change	Decrease	Increase	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	Increase	Decrease	No change
Reducing the impact of flooding by diverting flood waters into fields	No change	No change	No change
Increasing opportunities for outdoor recreation and tourism	Increase	Decrease	No change
My preferred policy bundle is...	[]	[]	[]

Q8f: Policy Choice Task 6

	Policy bundle A	Policy bundle B	Current policy bundle
Supporting efficient food production	No change	No change	No change
Protecting species and natural habitats	Increase	Decrease	No change
Reducing emissions that cause climate change	No change	No change	No change
Protecting and enhancing water quality in rivers, lakes or groundwater	No change	No change	No change
Reducing the impact of flooding by diverting flood waters into fields	Decrease	Increase	No change
Increasing opportunities for outdoor recreation and tourism	No change	No change	No change
My preferred policy bundle is...	[]	[]	[]

Q9: How did the information of other people's priorities influence the way you choose your preferred policy bundle?

- I did not change my priorities as I felt it was more important to stick to my own priorities []
- I did not change my priorities as I felt they already reflected the priorities of others []
- I changed my priorities for some options to reflect the priorities of others []
- I totally changed my priorities to fully reflect the priorities of others []

Q10: If you changed your priorities to account for other people's priorities, who's priorities did you change to?

- I did not change my priorities []
- I changed my priorities to reflect the priorities of farmers []
- I changed my priorities to reflect the priorities of members of environmental groups []
- I changed my priorities to reflect the priorities of people who do outdoor activities []
- I changed my priorities to reflect the priorities of younger people []
- I changed my priorities to reflect the priorities of older people []

Q11. Are you?

- Male
- Female

Q12. How old are you?

- 16 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65+

Q13. Are you a member of any of the following organisations.

- List the organisations that were invited.

Thank you for providing this information which will inform policy makers when they plan future policies.

Appendices

Data Archive Appendix

No data outputs were produced as part of this project.

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