Environment and Rural Affairs Monitoring & Modelling Programme (ERAMMP)

ERAMMP Report-111: SLM Theory-of-Change Development of Sustainable Land Management Monitoring and Evaluation Framework, Indicators and Targets

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(see Annex-1 for a breakdown of contribution by organisation)

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Abbreviations used in this Report

AES	Agri-environment schemes
AHDB	Agriculture and Horticulture Development Board
AMU	Anti-microbial use
AONB	Areas of Outstanding Natural Beauty
APS	Annual Population Survey
BECCS	Bioenergy with carbon capture and storage
BPS	Basic Payment Scheme
BRES	Business Register and Employment Survey
BSFP	British Survey of Fertiliser Practice
CAP	Common Agricultural Policy
CCRI	Countryside and Community Research Institute
CAAP	Clean Air Advisory Panel
CoAP	Control of Agricultural Pollution
CVO	Chief Veterinary Office
CLMS	Copernicus Land Monitoring Service
CPI	Consumer Price Index
DA	Devolved Administration
DECCA	Diversity, Extent, Condition, Connectivity and Adaptability
EO	Earth Observation
ERAMMP	Environment and Rural Affairs Monitoring and Modelling Programme
EU	European Union
EUSO	European Union Soil Observatory
FBS	Farm Business Survey
FRS	Family Resources Survey
FUW	Farmers' Union of Wales
FWAG	Farming and Wildlife Advisory Group
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GMEP	Glastir Monitoring and Evaluation Programme
GWP	Global Warming Potential
HBAI	Households Below Average Income
HEA	Historic Environment Assets
HENEB	The Trust for Welsh Archaeology
HER	Historic Environment Record
IDBR	Inter-Departmental Business Register
IEEP	Institute for European Environmental Policy
IPCC	Intergovernmental Panel for Climate Change
IUCN	International Union for Conservation of Nature
LULUCF	Land Use Land Use Change and Forestry
MIND	UK Mental Health Charity
NFU	National Farmers' Union
NP	National Park
NRW	Natural Resources Wales

NSW	National Survey for Wales
OECD	Organisation for Economic Co-operation and Development
OFWAT	Water Services Regulation Authority
PaNS	People and Nature Survey for Wale
PoS	Purpose of Support
PPP	Plant Protection Products
PFAS	per- and poly- fluoroalkyl substances
PROW	Public Rights of Way
RABI	Royal Agricultural Benevolent Institution
RBPS	River Basin Management Plans
RPW	Rural Payments Wales
SFS	Sustainable Farming Scheme
SIC	Standard Industrial Classification
SLM	Sustainable Land Management
SWF	Small Woody Features (in Copernicus earth observation portfolio)
TEG	Technical Expert Group
ToC	Theory of Change
UAA	Utilised Agricultural Area
UKCEH	UK Centre for Ecology & Hydrology
VMD	Veterinary Medicines Directorate
WEMWBS	The Warwick-Edinburgh Mental Well-being Scale
WFBS	Wales Farm Business Survey
WFD	Water Framework Directive
WFPS	Welsh Farm Practice Survey
WIMD	Welsh Index of Multiple Deprivation
WGSSD	Welsh Government Statistical Services Division

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Executive Summary

The purpose of this report is to develop the monitoring and evaluation architecture for the Welsh Government's (WG) Sustainable Land Management (SLM) Framework, building upon the existing monitoring, reporting and evaluation framework contained within the Agriculture (Wales) Act 2023. Its function is to provide an overarching structure to inform the monitoring and evaluation of whether or not the SLM Framework and the policy mechanisms[1] and actions put in place to deliver its objectives, are having the effects anticipated. It also provides recommendations to inform WG decisions on the choice of impact indicators and targets to determine the extent to which progress is being made against achieving the SLM objectives and outcomes.

This report is an independent evaluation of options for indicators and targets by independent ERAMMP scientists that have been informed by discussions with stakeholders, experts and WG officials. It is WG who will make all final decisions.

Monitoring and evaluation architecture

An overarching monitoring and evaluation architecture is proposed, informed by the Theory of Change for the SLM Framework. It provides a structured set of evaluation questions and factors of success set out under five evaluation criteria (relevance, effectiveness and impact, efficiency, coherence and legacy). The evaluation criteria chosen draw extensively on the monitoring and evaluation architecture that is currently in place for the EU's Common Agricultural Policy, as well as work carried out by the OECD and other literature but applied to the Welsh situation and the SLM Framework. Impact indicators (including targets or a pre-defined direction of travel) are then proposed to track progress in policy implementation and assess whether policy objectives have been met. Other indicators and evaluation methods for assessing the evaluation criteria are not in scope of this report.

Impact indicators

With respect to developing individual impact indicators, the approach taken was to review current indicators already available and/or used both by WG and Defra against their suitability for reporting on impact outcomes for the four SLM Objectives and 15 Purposes of Support (PoS). It is important to recognise the SLM indicators developed in this study relate to outcomes and impact and not activities.

A total of over 700 existing indicators were considered for their suitability to assess progress towards achieving the SLM Objectives and PoS. From this, a subset of 50 indicators were selected for discussion as to their suitability with a Technical Expert Group (TEG) drawn from 11 organisations as well as via two stakeholder workshops and a final workshop with WG policy leads and officials. The result of this process is a total of 35 proposed indicators, of which 15 are existing indicators, 5 are modified existing indicators, 3 are newly created and 12 are identified for their potential for further development. All PoS have at least one indicator which could be immediately deployed with the exception of one - achieving high standards of animal health and welfare. Of these indicators, 22 indicators have recent data

[1] The term 'policy mechanism' is used to refer to any type of policy lever that is put in place whose actions support the achievement of the SLM objectives as set out in the Theory of Change – this could include support schemes, regulation, market-based instruments etc.

which can provide a baseline and 16 have recent trends for the last 5-10 years. For each proposed impact indicator, possible SLM actions which could help deliver impact outcomes are identified.

SLM Objective 1 - Produce food and other goods in a sustainable manner

The production of food in an environmentally sustainable manner (**PoS 1.1**) is indicated by **Average Agriculture Output (all farms (£)) (1.1A)** when considered alongside, and relative to, indicators relating to maximising resource use efficiency **(PoS 1.5)** where it is proposed the following indicators are included: **Utilised Agricultural Area (1.5A)**, **Total Agricultural Workforce (1.3D)**, T**otal Inputs of Inorganic Fertiliser and Feed (1.5B)**, **Organic Manures (1.5C)** and **Plant Protection Product Use in Agriculture (1.5D**). Ideally, these indicators should be brought together to calculate and report on Total Factor Productivity for Agriculture in Wales going forward as this is only available at the UK level currently. Ongoing development of **1.5B** will also be required as no nationally robust data were identified for animal feed for Wales. Data could be disaggregated from UK data if a method is agreed. There are also no nationally robust data **Plant Protection Product Use in Agriculture (1.5D).** Currently UK data could be disaggregated and potential future more direct impact indicators are suggested. For **Organic Manure Use (1.5C)**, disaggregation of UK data is unlikely to lead to robust data for Wales and additional data collection is recommended. The data underpinning the Wesh Food and Drink Economic Appraisal – 2024 may also provide potential future indicators but there was insufficient time to develop this suggestion from WG.

As soil health is fundamental to all food production, a new **Soil Health Alert indicator (1.1B)** has been developed which exploits the investment by WG in its national monitoring programme by ERAMMP and could ensure healthy and productive soils to support ongoing sustainable food production for future generations. Further consultation is required to explore if the new approach is acceptable.

To track impacts which help rural communities to thrive and strengthen links between agricultural businesses and their communities (**PoS 1.2**) **the Proportion of the Rural Community below the Median Income (1.1.2B)** and the **Proportion of Rural community reported Mental Health and Wellbeing Issues, number of Deaths by Suicide and reported incidences of Self-harm in Rural Communities (1.2C)** are proposed**.** The **Strength of Supply Chain between Farmers and their Communities (upstream & downstream) (1.2A)** is proposed but its development involving the integration of a range of potential data sources will be necessary before this can be used. The area of **Land used for Horticulture (1.2D)** is proposed because it is particularly amenable to short supply chains and community engagement and in Wales, horticulture enterprises are typically small scale and use local supply chains.

Improving the resilience of agricultural businesses (**PoS 1.3**) could be partially tracked using **Average Net Farm Income (with and without public funding) (1.3B)** as this provides some measure of farming viability but also the reliance on public funding. The number of people agriculture supports is also an important consideration and this is indicated by **Agricultural Workforce Numbers (1.3C)** alongside recruitment of the next generation / new entrants which is essential for the future of farming indicated by the **Agricultural Workforce Age (1.3D).** The well-being of this workforce is indicated by the **Number/proportion of reported Mental Health and Wellbeing Issues, number of Deaths by Suicide and reported incidences of Self-harm by Farmers/Farm Workers (1.3E).**

The Levels of Diversification in Farm Products and Adoption of Climate Adaptation Techniques (1.3A) (i.e. not B&B) could increase resilience and data are available but currently not published by WG. When available this could be used as an indicator although the recommendation is to split these two issues into two separate indicators.

Agriculture outputs should be achieved alongside high standards of **Animal Health and Welfare (1.4A) (PoS 1.4)** however no nationally robust statistics were identified although work is ongoing in this area.

SLM Objective 2 - Mitigate and adapt to climate change

Reducing emissions of Greenhouse Gases (GHG) (**PoS 2.1**) is best assessed through monitoring **Annual Greenhouse Gas Emissions from Agriculture** (**2.1A**) (reported by the Wales Agriculture GHG Inventory). This is an existing indicator. For maximising carbon sequestration and storage (**PoS 2.2**), we propose two approaches to assessment. One is an existing indicator and is the calculation of the **Annual rate of Carbon Sequestration and Storage** (**2.2A**), as captured in the Land Use, Land Use Change and Forestry GHG Inventory. Discussions with stakeholders suggest a farm-level indicator is also important, and a **Farm Level Carbon and/or Greenhouse Gas Reporting Tool** (**2.2B**) could be used but it is recognised that no standard tool is currently available although there is a commitment to create this by the WG Sustainable Farming Scheme (SFS) team.

For Mitigating flood and drought risk (**PoS 2.3**) a new indicator is envisaged, the **Area of Farmland subject to Prolonged Flood / Drought from Earth Observation (EO) (where not intentional)** (**2.3A**). This indicator will require some further thought and should combine existing data and remote sensing. To assess this PoS in the meantime, the best existing indicator is felt to be **Quantity of Water Abstraction Licenses for Agriculture** (**2.3B**) using data collected by Natural Resources Wales (NRW).

For encouraging agricultural businesses to manage energy effectively, including renewables (**PoS 2.4**), the best existing indicator is **Installed Capacity of Renewable Electricity Locally Owned by Welsh farms, Estates and Communities** (**2.4A**). Another indicator that arose through the workshops was capacity of anaerobic digestion using primarily waste (not using crops), but this did not have sufficient support to proceed.

SLM Objective 3 - Maintain and enhance the resilience of ecosystems and the benefits they provide

Impact indicators are required that provide a robust national picture of ongoing trends in the five characteristics that Maintain and Enhance Resilience of Ecosystems **(PoS 3.1).** The characteristics that confer resilience are Diversity, Extent, Condition, Connectivity and Adaptability, all known as the DECCA framework. Two indicators are proposed which directly report on these characteristics. The first is a new **Ecosystem Health and Resilience Indicator (3.1A)** which summarises trends for 58 measurements captured across 19 broad habitats and landscape features in Wales and recently reported by ERAMMP. The measurements cover all elements of the DECCA framework and the indicator is therefore proposed to be an improvement on the current WFG indicator which only reports on the extent of semi-natural ecosystems. The second indicator is the change in **Abundance of All Species (%) (3.1B)**. This was reported in 2024 in the State of Nature Report and includes the status of 380 terrestrial and freshwater species. Both of these indicators have nationally robust baseline and trend data sources available but both in time should be improved through the inclusion of marine measurements and species. It is proposed the two indicators would report on the percentage change for abundance which remained in decline (rather than stable or improved) between reporting periods moving to tracking those improving in time.

Improving Air Quality (**PoS 3.2**) is also relevant for this objective. This will have a co-benefit for the ecosystem and species indicators above (**3.1A and 3.1B**) as air pollution is a major cause of species and ecosystem change and loss in Wales (as for UK and globally) but also human health benefits. Two indicators are proposed. The first is the **Area of Land where Ammonia Concentrations (defined as 1ug/m3) Exceed the Tolerance of Sensitive Species (3.2A)**. Both the source of ammonia and its impact is concentrated in the rural environment with agriculture contributing 85% of ammonia emissions in Wales. The value of this indicator is that it explicitly focuses on the contribution of ammonia on the degradation of our species and ecosystems and thus the WG commitment for the delivery of the 30 by 30 framework for protecting 30% of land, freshwater and sea for people and nature by 2030 . The current target in Wales of decreasing ammonia emissions by 16% by 2030 from a 2005 baseline is not as explicitly focussed on reporting biodiversity impacts but could be used instead. It should be noted that new work commissioned for this report estimates that 55% of ammonia deposited is emitted in Wales, and therefore SLM actions here in Wales on reducing emissions will have the intended biodiversity impact. A second indicator is the **Woodland Area which Removes Air Pollution (3.2B)** out of the atmosphere. All vegetation types act as a deposition surface for particulates and other forms of pollutants from the air, but trees have a high leaf surface area per unit ground area and therefore remove more air pollution. For example, trees account for the removal of about 75% of particulates in Wales and their value for this benefit is estimated at £75 million/year with respect to human health impacts. Any increase in woody cover will remove many types of air pollution including particulates as air masses move over the landscape although it is recognised that woodland planted upwind of urban centre will make a greater contribution. This spatial element could be included in time.

Improving water quality (**PoS 3.3**) is also relevant to this objective. **The Percentage of Freshwater Bodies in Good Ecological Condition in Areas dominated by Agriculture (3.3A**) was identified in 2018 by the Wales Land Management Forum. A sub-group identified 47 catchments where agricultural activity was the main reasons these areas were not at good status. Using this as a starting point and baseline could form the basis for a new indicator. The **number of Pathogens from Agriculture in Fresh and Coastal Waters (3.3B)** is also considered as an indicator with 'future potential' as currently it is not possible to attribute pathogen sources.

A final proposed new indicator is the **Percentage of Soils in Arable and Improved Grassland which exceed Trigger Points for Phosphorus Leaching (3.3C**). This exploits the investment by WG in the ERAMMP national soil monitoring programme which recently reported an increase in the number of soils which exceed this trigger point suggesting an increased risk of phosphorous leaching to water courses. For nitrogen, the number of non-compliant farms with respect to the Water Resources (Control of Agricultural Pollution or COAP) (Wales) Regulations 2021 covers nitrogen in manures but data which do indicate a majority or non-compliant farms have currently only been collected on farms with high-risk activities and this is therefore not representative of the national picture. However, this will come in time and could be added as an additional indicator for risks to water quality.

Finally, Maximising Resource Use Efficiency (**PoS 3.4**) is critical for this PoS as inefficient use of land and other resources will result in either land unavailable for other services and benefits and / or leakage of fertilisers, manures and chemicals into the wider environment causing damage - see Indicators **1.5A-D**.

SLM Objective 4 - Conserve and enhance the countryside and cultural resources and promote public access to and engagement with them, and to sustain the Welsh language and promote and facilitate its use.

Sustaining the Welsh language and promoting its use (**PoS 4.1**) is central to this objective and is also part of the Well-being for Future Generations (WFG) goals. The indicator proposed is the **Number and proportion of Welsh speakers in Rural Areas and within the Agricultural Sector (4.1A).** The value of this indicator is that it is a modification of an existing indicator and linked to the ambition to have one million Welsh speakers by 2050.

Conserving and enhancing landscapes and historic environment (**PoS 4.2**) is based around two indicators. The **Condition of designated landscapes (NPs and AONBs) (4.2A)** is a future potential indicator as there are no current data, but potential sources exist. **Historic Environment Assets & Scheduled Ancient Monuments (4.2B)** would be able to utilise existing data on Scheduled Ancient Monuments (SAMs) by CADW and other data sources on historic environment assets.

Access and engagement to countryside and heritage (**PoS 4.3**) is represented by three indicators. **Public rights of way open and signed (4.3A)** is based on existing data and is regularly reported on. To cover engagement, it is proposed to utilise the forthcoming **People and Nature Survey Wales engagement statistics (4.3B)** as a potential future indicator**.** Finally, we suggest developing an indicator around the **Open farm Sunday, farm visits and school groups (4.3C).** Again, this is a future potential indicator as the data do not exist currently in a consistent way.

Targets

It is the responsibility of WG to set targets for each of the indicators selected to measure the progress made by the mix of policy mechanisms and actions put in place to deliver against the four SLM objectives. As set out in Section 6 of the Agriculture (Wales) Act 2023, the SLM indicators will be reported on every five years.

Where appropriate, values for targets for the proposed impact indicators have been suggested based on an assessment of relevant existing targets and current trends for the data underpinning the target. Three different values are provided:

- Minimal goal – equivalent to maintaining the status quo / existing trends.
- Moderate goal – a moderate or sustainable improvements in current trends.
- Ambitious goal – a transformational change, compared to current trends.

Possible options for target values were discussed with the TEG and at the in-person stakeholder meeting in June 2025. The information provided is based solely on an assessment of the baseline data and trends for each of the shortlisted indicators as well as reflecting stakeholder input.

The outcome of these deliberations is that 16 indicators have suggested targets but 19 have no targets identified as there is no current WG policy or ambition in the public domain, targets only make sense when considered as part of a narrative describing a suite of indicators, or there is a need to avoid prejudice of a future consultation.

It is important to reiterate that the values proposed are indicative values to indicate the three levels of ambition set out above. They are not based on any data linked to the potential uptake of schemes or budget availability. As such they are offered only as 'food for thought' to WG to provide input into the target setting process.

Four summary tables bring together all proposed indicators, their baseline and trends and proposed targets where these have been provided together with other comments which WG should consider going forward.

Conclusions and recommendations

This has been an extremely rapid piece of work relating to a very complex piece of legislation. The ERAMMP team is grateful to the TEG and Stakeholders for their patience and time as we navigated a very large number of potential indicators (> 700) and potential data sources.

Overall, it is clear that Wales is a data-rich nation due to the investment and commitment of WG to ensure policy is grounded in evidence. The ERAMMP team have therefore been able to identify at least one indicator with robust national data sources which can be used as an impact indicator for all PoS set out in the Agriculture (Wales) Act 2023 with one exception – animal health and welfare. It should be noted however that stakeholders were extremely concerned about the potential for a very small set of impact indicators being adopted which did not reflect the full complexity and potential co-benefits and trade-offs of different indicators.

However, it should be recognised there are some surprising gaps in data covering important areas for SLM going forward. A series of recommendations are provided which prioritise some of the most urgent data and indicator needs if the impacts of SLM are to be reported effectively. Furthermore, it is recognised that nearly all indicators and targets will need to be developed and reviewed at regular intervals.

The 19 recommendations, set out in Chapter 9 of the report, relate to four key areas:

1. **Data needs**: Commissioning the capture of ten priority data streams currently not available for Wales which will be essential to track SLM impact going forward (recommendations 1 – 10).

2. **Development of new indicators:** Whilst three new impact indicators have been developed for this report, this was done for areas where the team had access to, and were familiar with, relevant data streams. Time and resource limitations were not available for the development of several other proposed indicators (recommendations 11-17). Commissioning research to develop new methodologies for creating five new indicators in other key areas of SLM involving the integration of several data streams (e.g. farm carbon / GHG tool) and / or the use of new technologies (e.g. remote sensing to report unintentional flood and drought on

agricultural land) is recommended together with further consultation on the three new impact indicators proposed.

3. **Reporting progress**: Reporting progress of indicators and targets should always include context and a narrative for each SLM Objective and PoS as stakeholders were very concerned that trends in data alone may not illustrate the complexity of co-benefits and trade-offs within and between PoSs and Objectives (recommendation 18).

4. **Regular review:** All indicators and targets should be regularly reviewed alongside the ToC and M&E frameworks to ensure they remain fit for purpose. It should also be noted that the absence of targets for some indicators does not mean trends in baseline data should not be reported until targets can be agreed (see recommendation 19).

1 Introduction and Purpose

The purpose of this report is to develop the monitoring and evaluation architecture for the Welsh Government's Sustainable Land Management (SLM) Framework, building upon the existing monitoring, reporting and evaluation architecture contained within the Agriculture (Wales) Act 2023. This provides an overarching structure to assess whether or not the SLM Framework and the policy mechanisms[2] and actions put in place to deliver its objectives, are having the impacts anticipated. The report also provides recommendations to inform WG decisions on the choice of impact indicators and targets to determine the extent to which progress is being made against achieving the SLM objectives and outcomes. Section 2 of the Act sets out how Welsh Ministers are required to exercise a series of functions in relation to the SLM framework "in the way that they consider best contributes to achieving the sustainable land management objectives so far as consistent with the proper exercise of their functions". For convenience, this is referred to here as the "SLM duty".

Section 4 of the Act stipulates that Welsh Ministers must set out a statement setting out indicators and targets for measuring progress towards achieving the SLM objectives in accordance with the SLM duty (at least one for each of the four SLM objectives). This must be done by 31 December 2025. The Act specifies that there must be at least one distinct indicator (and related target) for each of the four SLM objectives (Section 4, subsection 2), but further indicators and targets may also be included for one or more of the SLM objectives (Section 4, subsections 4 and 5). The statement may also be reviewed and revised at any time (Section 4, subsection 9). Once these have been put in place, Welsh Ministers are required to report every five years on progress made towards achieving the four SLM objectives, with reference to the agreed set of indicators and targets (Section 6).

The indicators and targets, and broader monitoring and evaluation architecture, will replace previous monitoring architectures in place to monitor the Common Agricultural Policy (CAP). To inform the Welsh Government's (WG) decisions on the indicators to use and to support the development of targets for each of these, this report sets out an overarching monitoring and evaluation architecture for the SLM framework (Chapter 2) as well as proposals for a suite of indicators that could be used to measure progress against achieving each of the four SLM objectives (Chapter 3) and information to inform target setting (Chapter 4).

The monitoring and evaluation architecture is informed by the Theory of Change (see Hart et al., 2025, ERAMMP Report-108) which set out the main actions and enabling conditions that should be in place to achieve the four SLM objectives and the purposes for which support may be provided in pursuit of these objectives, known as the 'Purposes of Support[3]'. The detailed indicators and guidance for target setting have been developed in collaboration with a Technical Expert Group (TEG) which met three times between January and June 2025, two stakeholder events, one in person (5 June 2025) and one online (4 August 2025) and written inputs on the proposed indicators from stakeholder during August 2025.

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[2] The term 'policy mechanism' is used to refer to any type of policy lever that is put in place whose actions support the achievement of the SLM objectives as set out in the Theory of Change – this could include support schemes, regulation, market-based instruments etc.

[3] These are set out in Section 8 of the Agriculture (Wales) Act 2023. The list is non-exhaustive and can be amended or added to over time.

2 Sustainable Land Management monitoring and evaluation architecture

A well-designed monitoring and evaluation architecture is fundamental to the success of public policy. As highlighted in the Explanatory Memorandum to the Agriculture (Wales) Act 2023, '*effective monitoring and reporting is essential to ensure effective accountability for the implementation of SLM, as well as appropriate engagement with and scrutiny by the Senedd, interest groups, and others. Effective monitoring and reporting are also essential to assess policy effectiveness and to provide an important and developing evidence base for ongoing policy development, through improving knowledge, innovation and identifying trends*' (Section 3.73)[4].

The monitoring and evaluation architecture provides a structured set of questions, indicators (including targets or a pre-defined direction of travel) and methods used to track progress in policy implementation and assess whether policy objectives have been met. It is informed by the ToC produced for the SLM Framework (Hart et al., 2025, ERAMMP Report-108). However, as noted in the ToC, policy operates in a dynamic environment and the achievement of the SLM objectives may be influenced by changes in the factors and assumptions made. This could relate to the resources available to fund, manage and/or deliver the SLM policy mechanisms put in place or it could relate to the need to respond to crises of one form or another (e.g. climate, geopolitical or disease related). A monitoring and evaluation architecture enables the ongoing implementation of SLM policy mechanisms to be kept under review and should help inform decisions on whether or not policy mechanisms[5] (whether existing or to be put in place in the future) require adapting if they are not delivering what is expected.

The intention of this study is not to provide a fully operational monitoring and evaluation Architecture. Rather, what is provided is the overarching architecture for assessing progress towards meeting the four SLM objectives as set out in section 1 of the Agriculture (Wales) Act 2023. This architecture is intended to help inform WG decisions on how to evaluate the mix of policy mechanisms that are put in place to achieve the four SLM objectives and contribute to the seven Well-being of Future Generations goals as set out in the Well-being of Future Generations Act (Wales) 2015.

It should also be noted that different types of indicators, data and methodical approaches can be used to answer the evaluation questions identified. For example, in terms of indicators, these can be: financial indicators (the amount of funding provided to a particular activity or schemes); activity or output indicators (e.g. areas of land or number of livestock units under agreement); and impact or outcome indicators (e.g. change in GHG emissions).

However, this study does not provide all the relevant data sources or methodical approaches to evaluate all the evaluation criteria in the monitoring and evaluation architecture developed. Its purpose is only to identify potential **impact indicators** that could be used to

[4] Agriculture (Wales) Act 2023 Explanatory Memorandum

[5] The term 'policy mechanism' is used to refer to any type of policy lever that is put in place whose actions support the achievement of the SLM objectives as set out in the Theory of Change – this could include support schemes, regulation, market-based instruments etc.

assess the effectiveness and impact of the policy mechanisms put in place to deliver the SLM objectives in line with the requirements of the Agriculture (Wales) Act 2023.

2.1 SLM objectives and Theory of Change

As set out in the Agriculture (Wales) Act 2023 the four SLM objectives are:

1. To produce food and other goods in a sustainable manner
2. To mitigate and adapt to climate change
3. To maintain and enhance the resilience of ecosystems and the benefits they provide
4. To conserve and enhance the countryside and cultural resources and promote public access to and engagement with them, and to sustain the Welsh language and promote and facilitate its use

All objectives include a requirement to meet the needs of the present without compromising the ability of future generations to meet their own needs, and to contribute to achieving the well-being goals in section 4 of the Well-being of Future Generations (Wales) Act 2015.

The Agriculture (Wales) Act also provides more detailed information about objectives 1, 3 and 4 as follows:

- **Objective 1**: For the purposes of the first objective, factors relevant to whether food and other goods are produced in a sustainable manner include, among other things, the resilience of agricultural businesses within the communities in which they operate and their contribution to the local economy (section 1(6));

- **Objective 3:** For the purposes of the third objective, factors relevant to the resilience of ecosystems include, among other things—

  (a) diversity between and within ecosystems;
  (b) the connections between and within ecosystems;
  (c) the scale of ecosystems;
  (d) the condition of ecosystems (including their structure and functioning);
  (e) the adaptability of ecosystems (section 1(7))

- **Objective 4:** For the purposes of the fourth objective, “cultural resources” include, among other things, cultural heritage and the historic environment (section 1(8)).

The Explanatory Memorandum also stresses that Objective 3 is central to the achievement of the other objectives, recognising that ecosystem resilience is fundamental to wider sustainability. It states that, ‘The third objective compliments the other SLM objectives by seeking to maintain and enhance a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological sustainability and the capacity to adapt to change. This recognises that healthy functioning ecosystems are a foundation of economic and social/cultural sustainability’ (see section 3.59 of the Agriculture (Wales) Act 2023 Explanatory Memorandum).

These can be broken down into more detailed sub-objectives, or purposes for which Welsh Ministers have powers to provide support under section 8 of the Agriculture (Wales) Act 2023. The Purposes of Support (PoS) identified in the Agriculture Act are as follows:

a) encouraging the production of food in an environmentally sustainable manner;

b) helping rural communities to thrive and strengthening links between agricultural businesses and their communities;
c) improving the resilience of agricultural businesses;
d) sustaining the Welsh language and promoting and facilitating its use;
e) reducing emissions of greenhouse gases;
f) maximising carbon sequestration and storage;
g) maintaining and enhancing the resilience of ecosystems;
h) conserving and enhancing landscapes and the historic environment;
i) improving air quality;
j) improving water quality;
k) maintaining and enhancing public access to and engagement with the countryside and the historic environment;
l) mitigating flood and drought risks;
m) achieving and promoting high standards of animal health and welfare;
n) maximising resource efficiency;
o) encouraging agricultural businesses to manage energy effectively (including by adopting energy efficiency and energy saving practices and generating renewable energy on their land).

It is important to note that the four SLM objectives should not be seen in isolation. Rather they are intended to be mutually reinforcing. This is evident from the fact that many of the PoS contribute to the achievement of more than one of the four main objectives (see Table 2-1). The links between the PoS and the SLM objectives identify the main contributions (direct and indirect) identified. This should not be seen as definitive as it is possible that other less obvious links may exist.

Table 2-1: Potential direct and indirect links between Purposes of Support and the SLM objectives

Purposes of Support	SLM Obj 1	SLM Obj 2	SLM Obj 3	SLM Obj 4
a) encouraging the production of food in an environmentally sustainable manner	*	~	~	~
b) helping rural communities to thrive and strengthening links between agricultural businesses and their communities	*			~
c) improving the resilience of agricultural businesses	*			~
d) sustaining the Welsh language and promoting and facilitating its use				*
e) reducing emissions of greenhouse gases	~	*		
f) maximising carbon sequestration and storage	~	*	~	
g) maintaining and enhancing the resilience of ecosystems	~	~	*	~

Purposes of Support	SLM Obj 1	SLM Obj 2	SLM Obj 3	SLM Obj 4
h) conserving and enhancing landscapes and the historic environment		~	~	*
i) improving air quality	~		*	
j) improving water quality	~		*	
k) maintaining and enhancing public access to and engagement with the countryside and the historic environment				*
l) mitigating flood and drought risks	~	*	~	~
m) achieving and promoting high standards of animal health and welfare	*	~	~	
n) maximising resource efficiency	*	*	*	~
o) encouraging agricultural businesses to manage energy effectively (including by adopting energy efficiency and energy saving practices and generating renewable energy on their land)	~	*		

*Legend: * = direct link;* *~ = indirect link*

Source: Theory of Change (Hart et al., 2025 – ERAMMP Report-108)

In the development of the monitoring and evaluation architecture, the PoS and their associated evaluation questions and indicators have been grouped and re-numbered under the main SLM objective to which they contribute. This has been done to make the architecture less complex and simpler to operationalise.

As noted above, it is important to recognise **the SLM indicators developed in this study relate to outcomes and impact and not activities**.

2.2 SLM monitoring and evaluation architecture

The overarching monitoring and evaluation architecture for the SLM Framework consists of a set of evaluation questions for five distinct evaluation criteria (relevance, effectiveness/impact, efficiency, coherence and legacy). For each evaluation question a 'Factor of Success' is identified. These are essentially the judgement criteria that explain how the evaluation questions will be answered and help inform the choice of metrics to be used[6].

The evaluation questions are drafted in a way that focus on assessing the mix of policy mechanisms that are put in place to achieve the SLM objectives, rather than single

[6] See for example: European Commission, Directorate-General for Agriculture and Rural Development - Unit A.3 (2023): Use of Factors of Success in Evaluation

mechanisms. Each individual scheme (e.g. the Sustainable Farming Scheme - SFS) will have its own monitoring and evaluation programme, which nest beneath this overarching architecture.

The evaluation criteria chosen draw extensively on the monitoring and evaluation architecture that is currently in place for the EU's Common Agricultural Policy[7] and applied to the Welsh situation and the SLM Framework put in place under the Agriculture (Wales) Act 2023. However, it has also been informed by the work of the OECD (OECD, 2019) and Markiewicz and Patrick (2016).

2.3 SLM core M&E questions

The core evaluation questions and factors of success developed for the SLM Framework are set out under five evaluation criteria (relevance, effectiveness and impact, efficiency, coherence and legacy) below.

2.3.1 Relevance

Under the 'relevance' evaluation criterion, analysis examines the extent to which the objectives and design of the SLM policy mechanisms remain relevant to the current and future needs and problems in Wales, including wider Welsh policy goals and priorities. Relevance assessment involves looking at differences and trade-offs between priorities or needs. It requires analysing any changes in the context and assessing the extent to which SLM policy mechanisms can be (or have been) adapted to remain relevant.

There are two main overarching evaluation questions for relevance in relation to the SLM Framework:

- To what extent do the PoS under the SLM Framework still reflect the current and predicted future needs of the agri-food sector, environment, climate and rural communities in Wales?

- To what extent are the policy mechanisms in place to address the SLM objectives and PoS adaptable and relevant considering future needs and evolving policy priorities?

The following table sets out the overarching evaluation questions and their associated sub-questions. For each sub-question it describes factors of success, which would inform how the evaluation questions would be answered and help inform the choice of metrics to be used.

[7] See EU level CAP evaluation framework | EU CAP Network

Table 2-2: Evaluation questions and Factors of Success for Relevance

Evaluation criterion: Relevance		
Overarching questions	**Sub-questions**	**Factors of Success**
To what extent do the Purposes of Support under the SLM Framework still reflect the current and predicted future needs of the agri-food sector, environment, climate and rural communities in Wales? To what extent are the policy mechanisms in place to address the SLM PoS adaptable and relevant considering future needs and evolving policy priorities?	How have the initially identified needs evolved over time and are they still consistent with initial assumptions and projections?	The general context and needs identified for agriculture, or other activities carried out on land used for agriculture and ancillary activities have evolved according to initial assumptions and projections.
	To what extent do stakeholders perceive the SLM Purposes of Support and mechanisms as relevant to their needs?	Farmers, land managers, rural communities and actors involved in ancillary activities report alignment between their needs and the SLM Purposes of Support.
	To what extent do the needs identified when the SLM Purposes of Support were introduced remain valid?	The SLM Purposes of Support remain relevant for addressing current, future and changing needs.
	To what extent are the SLM Purposes of Support still relevant in the light of identified future needs and changing priorities which may occur during their implementation?	The policy mechanisms in place to address the SLM Purposes of Support remain relevant in addressing current needs.

2.3.2 Effectiveness/Impact

An assessment of effectiveness identifies the extent to which the mix of SLM policy mechanisms in place to deliver the SLM objectives have achieved these objectives and the PoS to which they have been linked through their intervention logics. Effectiveness analyses should also consider the process through which the objectives were met, what factors informed the achievement of the objectives and whether there were any unintended effects. In relation to the overall SLM framework assessing effectiveness is about forming an evidence-based judgement on the changes that have taken place and identifying the role of the various SLM policy mechanisms in driving these aggregate changes.

Assessing impact takes a longer-term perspective and examines the contribution made by the mix of SLM policy mechanism in achieving the broader policy goals to which the SLM Framework is intended to contribute as set out in the ToC. The end outcomes are the seven Well-being of Future Generations goals.

The following table sets out the overarching evaluation questions and their associated sub-questions. There is one main overarching evaluation question for effectiveness in relation to the SLM Framework which assesses the extent to which the SLM policy mechanisms are addressing the SLM objectives and PoS.

Under this, the four sub-questions are directly related to the SLM objectives on sustainable agriculture, climate, ecosystems, and culture, and each of these has its own factor of success, which would inform how the evaluation questions would be answered and help inform the choice of metrics to be used. A set of more detailed sub-questions (each with their own factor of success) represent each of the PoS and are organised to align with the SLM objectives to which they have a direct link (as described in the ToC).

Below, a separate table maps out the same process for the evaluation criterion impact, in relation to the overarching research question: to what extent have the SLM policy mechanisms contributed to the Well-being of Future Generations outcomes? For impact, the sub-questions are directly related to the long-term goals of the policy in relation to the outcomes of the Well-being of Future Generations Act. The questions here are intended to understand what particular features or aspects of the SLM policy mechanisms have contributed to the overarching goal of the Well-being of Future Generations Act to meet the needs of the present without compromising the ability of future generations to meet their own needs.

In the case of effectiveness and impact, the indicators developed in this report would be relevant to use.

Table 2-3: Evaluation questions and Factors of Success for effectiveness

Evaluation criterion: Effectiveness				
Overarching question	**Sub-questions (SLM Objectives)**	**Factors of Success**	**More detailed sub-questions (SLM Purposes of Support)**	**Factors of Success**
To what extent are the SLM policy mechanisms addressing the SLM Objectives / Purposes of Support?	1.To what extent have the SLM policy mechanisms ensured food and other goods are produced in a sustainable manner.	Food, fuel and fibre are produced more sustainably because of SLM policy mechanisms.	To what extent have the policy mechanisms encouraged the production of food in an environmentally sustainable manner?	The environmental sustainability of food, fuel and fibre production in Welsh agribusinesses is increasing due to SLM policy mechanisms.
			To what extent have the policy mechanisms helped rural communities to thrive and strengthen links between agricultural businesses and their communities?	Welsh agribusinesses have stronger supply chains with, and are more embedded in, local rural communities due to SLM policy mechanisms.

Evaluation criterion: Effectiveness				
Overarching question	**Sub-questions (SLM Objectives)**	**Factors of Success**	**More detailed sub-questions (SLM Purposes of Support)**	**Factors of Success**
				Rural communities are thriving to a greater extent due to SLM policy mechanisms.
			To what extent have the policy mechanisms improved the resilience of agricultural businesses?	The resilience of Welsh agribusinesses to adverse experiences and shocks is increasing due to SLM policy mechanisms.
			To what extent have the policy mechanisms achieved and promoted high standards of animal health and welfare?	Animal welfare has improved due to SLM policy mechanisms.
	2. To what extent have the policy mechanisms ensured climate change is mitigated and adapted to?	Climate change mitigation and adaptation has improved due to SLM policy mechanisms.	To what extent have the policy mechanisms reduced emissions of greenhouse gases?	Greenhouse gas emissions from Welsh agribusinesses have decreased due to SLM policy mechanisms.
			To what extent have the policy mechanisms maximised carbon sequestration and storage?	Carbon sequestration and storage by Welsh agribusinesses has been maximised due to SLM policy mechanisms.
			To what extent have the policy mechanisms mitigated flood and drought risks?	Flood and drought risks have been mitigated due to SLM policy mechanisms.
			To what extent have the policy	Resource efficiency (yield

Evaluation criterion: Effectiveness				
Overarching question	**Sub-questions (SLM Objectives)**	**Factors of Success**	**More detailed sub-questions (SLM Purposes of Support)**	**Factors of Success**
			mechanisms maximised resource efficiency?	relative to inputs) has been maximised due to SLM policy mechanisms.
			To what extent have the policy mechanisms encouraged agricultural businesses to manage energy effectively (including by adopting energy efficiency and energy saving practices, and generating renewable energy on their land?	Renewable energy generation has increased due to SLM policy mechanisms.
				Energy efficiency on farms has increased due to SLM policy mechanisms.
	3. To what extent have the policy mechanisms ensured the resilience of ecosystems and the benefits they provide are maintained and enhanced.	The resilience of ecosystems and the benefits they provide are maintained and enhanced due to SLM policy mechanisms.	To what extent have the policy mechanisms maintained and enhanced the resilience of ecosystems?	The resilience of ecosystems is increasing or, at least, stable due to SLM policy mechanisms.
			To what extent have the policy mechanisms improved air quality?	Air quality is improving due to SLM policy mechanisms.
			To what extent have the policy mechanisms improved water quality?	Water quality is improving due to SLM policy mechanisms.
			To what extent have the policy mechanisms maximised resource efficiency?	Resource efficiency (yield relative to inputs) has been maximised due to SLM policy mechanisms.
	4. To what extent have the policy mechanisms ensured that the countryside and	Countryside and cultural resources, public access, and the Welsh language are conserved,	To what extent have the policy mechanisms promoted and facilitated the use of Welsh language?	The use of Welsh language has been promoted and facilitated in rural areas by

Evaluation criterion: Effectiveness				
Overarching question	**Sub-questions (SLM Objectives)**	**Factors of Success**	**More detailed sub-questions (SLM Purposes of Support)**	**Factors of Success**
	cultural resources, public access, and the Welsh language are conserved, enhanced and promoted?	enhanced and promoted due to SLM policy mechanisms.		SLM policy mechanisms.
			To what extent have the policy mechanisms conserved and enhanced landscapes and the historic environment?	Designated landscapes and the historic environment have been conserved and enhanced.
			To what extent have the policy mechanisms maintained and enhanced public access to and engagement with the countryside and the historic environment?	Access to, and accessibility of, the countryside and historic environments has been improved by SLM policy mechanisms.
	5. What unintended effects (positive or negative) have emerged from the implementation of SLM policy mechanisms?	Unintended effects are identified, monitored, and addressed through adaptive management		
	6.To what extent have lessons from implementation informed adaptation of SLM mechanisms?	Evidence of iterative learning and policy refinement based on monitoring and stakeholder feedback.		
	7.To what extent were SLM mechanisms implemented in a timely manner to respond to emerging needs or crises?	Timely delivery of support and responsiveness to external shocks (e.g. climate events, market disruptions).		

Table 2-4: Evaluation questions and Factors of Success for impact

Evaluation criterion: Impact		
Overarching questions	**Sub-questions**	**Factors of Success**
To what extent have the SLM policy mechanisms contributed to the Well-being of Future Generations outcomes	To what extent do the SLM policy mechanisms contribute to a prosperous Wales?	The SLM policy mechanisms have made an attributable contribution to achieving a prosperous Wales.
	To what extent do the SLM policy mechanisms contribute to a resilient Wales?	The SLM policy mechanisms have made an attributable contribution to a resilient Wales.
	To what extent do the SLM policy mechanisms contribute to a healthier Wales?	The SLM policy mechanisms have made an attributable contribution to a healthier Wales.
	To what extent do the SLM policy mechanisms contribute to a more equal Wales?	The SLM policy mechanisms have made an attributable contribution to a more equal Wales.
	To what extent do the SLM policy mechanisms contribute to a Wales of cohesive communities?	The SLM policy mechanisms have made an attributable contribution to a Wales of cohesive communities.
	To what extent do the SLM policy mechanisms contribute to a Wales of vibrant culture and thriving Welsh language?	The SLM policy mechanisms have made an attributable contribution to a Wales of vibrant culture and thriving Welsh language.
	To what extent do the SLM policy mechanisms contribute to a globally responsible Wales?	The SLM policy mechanisms have made an attributable contribution to a globally responsible Wales.

2.3.3 Efficiency

The efficiency evaluation criterion assesses the extent to which the mix of SLM policy mechanisms have achieved or are expected to contribute to achieving the SLM objectives in a cost-effective and timely manner. Analysis should consider efficiency from the point of view of both the beneficiary and the administration. It can also explore the potential for reducing administrative burden, again both for the beneficiary and the administration. In the context of the SLM Framework, an important element to examine would be the efficiency in terms of the mix of different SLM policy mechanisms used to achieve the SLM objectives.

The following table sets out the overarching evaluation questions and their associated sub-questions. There are two main overarching evaluation questions for efficiency in relation to the SLM Framework:

- To what extent was the SLM programme delivered in an efficient manner?

- To what extent do the mix of SLM policy mechanisms generate cost effectiveness and value for money?

For each sub-question, the table describes a factor of success, which would inform how the evaluation questions would be answered and help inform the choice of metrics to be used.

Table 2-5: Evaluation questions and Factors of Success for efficiency

Evaluation criterion: efficiency		
Overarching questions	**Sub-questions**	**Factors of Success**
To what extent were the mix of SLM policy mechanisms put in place to achieve the SLM objectives delivered in an efficient manner?	To what extent are the costs of the SLM policy mechanisms justified and proportionate given the effects they have achieved?	Implementation of the mix of SLM policy mechanisms is efficient and cost-effective.
To what extent do the mix of SLM policy mechanisms generate cost effectiveness and value for money?	To what extent have the costs for the delivery of the SLM policy mechanisms been limited to those that are absolutely necessary?	The costs of the delivery of the mix of SLM policy mechanisms that are not strictly necessary to reach the SLM objectives are minimised, both for beneficiaries and administrations.

2.3.4 Coherence

There are two elements to the coherence criterion. Internal coherence examines the extent to which complementarity or synergy can be found between the mix of SLM policy mechanisms used to achieve the SLM objectives. An analysis of internal coherence analysis can highlight areas where there are synergies that improve overall performance in relation to achieving the SLM objectives or identify tensions, for example potentially contradictory or overlapping objectives or approaches to policy implementation that are causing inefficiencies. External coherence examines the extent to which the SLM policy mechanisms work alongside other policies in place (outside the SLM framework) to achieve the SLM objectives. Coherence analysis can help answer some of the questions in an effectiveness analysis about how and why certain effects or impacts are observed.

The following table sets out the overarching evaluation question for coherence: to what extent are the SLM policy mechanisms internally coherent, complementing and synergising with each other to address the SLM objectives? The associated sub-questions address the overarching internal coherence, internal coherence with the 4 SLM objectives, and external coherence of the SLM policy mechanisms. Factors of success are described to inform how the evaluation questions would be answered and help inform the choice of metrics to be used.

Table 2-6: Evaluation questions and Factors of Success for coherence

Evaluation criterion: coherence		
Overarching questions	**Sub-questions**	**Factors of Success**
To what extent are the SLM policy mechanisms internally coherent to address the SLM objectives?	To what extent do the SLM policy mechanisms complement and create synergies with each other to ensure food and other goods are produced in a sustainable manner?	SLM policy mechanisms complement each other and work synergistically to ensure food, fuel and fibre are produced more sustainably.
	To what extent do the SLM policy mechanisms complement and create synergies with each other to ensure climate change is mitigated and adapted to?	SLM policy mechanisms complement each other and work synergistically to ensure climate change mitigation and adaptation has improved.
	To what extent do the SLM policy mechanisms complement and create synergies with each other to ensure the resilience of ecosystems and the benefits they provide are maintained and enhanced?	SLM policy mechanisms complement each other and work synergistically to ensure the resilience of ecosystems and the benefits they provide are maintained and enhanced.
	To what extent do the SLM policy mechanisms complement and create synergies with each other to ensure that the countryside and cultural resources, public access, and the Welsh language are conserved, enhanced and promoted?	SLM policy mechanisms complement each other and work synergistically to ensure countryside and cultural resources, public access, and the Welsh language are conserved, enhanced and promoted.
	To what extent do the SLM policy mechanisms complement and create synergies with each other to address the multiple SLM objectives?	SLM policy mechanisms that aim to improve sustainable production are coherent with those that aim to address climate mitigation and adaptation, the resilience of ecosystems as well as cultural resources, access and the Welsh Language.
		SLM policy mechanisms that aim to address climate mitigation and adaptation, the resilience of ecosystems as well as cultural resources, access and the Welsh Language are coherent with those that aim to improve sustainable production.
To what extent are the SLM policy mechanisms externally coherent, complementing and consistent with wider Welsh government, UK-wide or international strategic goals & policy?	To what extent do the SLM policy mechanisms complement and are consistent with other Welsh government policies, initiatives and international obligations?	SLM policy mechanisms, throughout the whole period, complement, and are consistent with, other Welsh instruments, funds and international obligations, including the SDGs.
	To what extent are SLM mechanisms coherent with UK-wide and international commitments and obligations?	SLM mechanisms align with UK and international commitments and obligations (e.g. climate agreements)

2.3.5 Legacy

This evaluation criterion is suggested by the OECD (OECD, 2019) where it is called 'sustainability'. Its intention is to assess the extent to which the benefits of the policy mechanisms, identified through the effectiveness analysis, are likely to continue in the longer term. This would include examining the 'financial, economic, social, environmental and institutional capacities of the systems needed to sustain net benefits over time' (OECD, 2019).

For the purposes of the SLM Framework, the overarching evaluation question developed for legacy looks at the ways in which the legacy has been considered within policy mechanisms design to assess the potential for benefits to last.

The overarching question for legacy is: In what ways has the legacy impact beyond the implementation of the SLM policy mechanisms been considered in their design?

The following table maps out the overarching evaluation question and associated sub-questions. For each sub-question it describes factors of success, to inform how the evaluation questions would be answered and help inform the choice of metrics to be used.

Table 2-7: Evaluation questions and Factors of Success for legacy

Evaluation criterion: legacy		
Overarching questions	**Sub-questions**	**Factors of Success**
In what ways has the legacy impact beyond the implementation of the SLM policy mechanisms been considered in their design?	Beyond the implementation of the SLM policy mechanisms, in what way has their legacy impact on the sustainable production of food, fuel and fibre been considered in their design?	The SLM policy mechanisms are designed to have a positive impact on food, fuel and fibre sustainability beyond their implementation, and steps to reflect on and minimise perverse outcomes have been taken.
	Beyond the implementation of the SLM policy mechanisms, in what way has their legacy impact on climate mitigation and adaptation been considered in their design?	The SLM policy mechanisms are designed to have a positive impact on climate mitigation and adaptation beyond their implementation, and steps to reflect on and minimise perverse outcomes have been taken.
	Beyond the implementation of the SLM policy mechanisms, in what way has their legacy impact on ecosystems been considered in their design?	The SLM policy mechanisms are designed to have a positive impact on ecosystems beyond their implementation, and steps to reflect on and minimise perverse outcomes have been taken.
	Beyond the implementation of the SLM policy mechanisms, in what way has their legacy impact on the countryside and cultural resources, public access, and the Welsh language been considered in their design?	The SLM policy mechanisms are designed to have a positive impact on countryside and cultural resources, public access and Welsh language beyond their implementation, and steps to reflect on and minimise perverse outcomes have been taken.

3 Background and process for selecting impact indicators and options for targets

This section sets out the background and process followed for identifying relevant impact indicators and suggestions for possible targets that could be set for these. As noted above, the focus of this report is to identify impact indicators only. These will be complemented by activity indicators (result and output indicators) by Welsh Government in due course.

3.1 Background to proposed impact indicators

The principles behind the selection of impact indicators were established in discussions with the WG steering group. Several issues were considered such as:

- *Relevance*: indicators should measure things that matter for the well-being of people and the environment in Wales;
- *Clarity*: They should be easy to understand and communicate to the public;
- *Measurable*: There should be clear data available to measure progress;
- *Timely*: The indicators should be updated regularly to provide a picture of current progress;
- *Comparable*: They should be able to be compared over time to track long-term progress; and
- *Affordable*: ensure that data gathering is good value for money.

The monitoring and evaluation architecture developed for SLM must consider how indicators fit together both within the SLM Framework and in the wider policy context, notably the Well-being of Future Generations goals. This chapter outlines the process and thinking behind the selection of the impact indicators identified as being the most appropriate for the four SLM objectives and each of the 15 PoS.

3.1.1 Process for selecting impact indicators

The first step in selecting indicators was to break down the four SLM Objectives into different SLM themes reflecting the component parts of the Objectives, which were referenced in either the Agriculture (Wales) Act 2023 or its explanatory memorandum. These themes included:

- Sustainable Food
- Rural Communities
- Animal Welfare
- Greenhouse gases & Carbon
- Flood/Drought & Soil Health
- Resource Efficiency in Agriculture
- Ecosystems (including both terrestrial and water)
- Air Quality
- Welsh Language & Culture
- Landscapes
- Green Spaces

A thorough review was carried out of the indicators that already exist on these themes in various Welsh, UK and international legislation and policy. Over 700 existing indicators were identified through this process and graded in terms of how well they matched the SLM themes. The quality of data and frequency of reporting was also taken into account. Through this process we identified a long list of 50 indicators, which were presented to a Technical Expert Group (TEG) (see Annex 1) for further shortlisting over three meetings.

The members of the TEG were selected in discussion with Welsh Government and included individuals from 12 organisations covering academia, farming organisations, environmental NGOs, NRW and Welsh Government Statistics. They were selected for their expertise in one SLM theme as well as broader knowledge across SLM. Note that whilst water quality was initially included as a subsection of the ecosystems theme, a TEG member with specific expertise on water was involved. For Welsh Language & Culture and Animal Welfare the Welsh Language Commissioner's Office, CADW and the Office of the Chief Veterinary Officer were consulted outside of the TEG.

In the initial TEG Meeting each TEG member reviewed the indicators allocated by theme providing recommendations on which were most appropriate and any that they felt were missing. These recommendations were then discussed by the whole group.

The shortlist of indicators was then mapped against the Purposes of Support (PoS) based on the TEG discussion and refined by the TEG at a further two meetings. The third meeting also considered the potential ways to determine targets for these indicators. Although there was broad agreement on the appropriateness of most indicators, there was not consensus on all. Following these discussions and further research, the project team refined the indicator shortlist further, and indicators and their relevant PoS were grouped under the four SLM objectives.

This refined shortlist of indicators was subsequently shared with stakeholders and discussed at an in-person stakeholder workshop with around 50 attendees on 5 June 2025. Stakeholders were selected in discussion with Welsh Government and included TEG members, regular ERAMMP contributors and others that were identified based on the stakeholder list in the ToC.

At the workshop, stakeholders were split into four groups within which the indicators assigned to each of the four SLM objectives were discussed in turn. They were asked to provide feedback on each and vote on their preferred indicators for each SLM Objective and each PoS and were given the opportunity to suggest other indicators that should be considered. There was little consensus from stakeholders on which were the best indicators to use and additional indicators were suggested, with many noting the need for one explicitly focussed on food production quantity whilst others were clear this should be focussed on sustainable food production. Following the workshop, stakeholders were invited to submit written notes if they wished.

Due to the lack of consensus, the broad and complex nature of the SLM Framework and the need to consider additional indicators, Welsh Government decided to extend the timescale for the work to enable further stakeholder engagement.

A second workshop was held online on 4 August which over 50 stakeholders attended along with several members of Welsh Government. In advance of the workshop, stakeholders were sent details of the 40 indicators we had shortlisted and on which written feedback was sought. This included the rationale for its inclusion, information on stakeholder feedback to date and relevant data found. The workshop included a presentation followed by breakout groups, in which the indicators associated with each of the four SLM Objectives were discussed in turn. The focus was on ensuring that participants had all the information needed to submit written feedback, using the spreadsheet provided, but there was also a chance for verbal feedback and discussion.

Participants were given around three weeks to respond to the shortlist of proposed indicators via an excel spreadsheet in which they were asked to rate the indicator as Green (acceptable); Amber (acceptable with caveats) Red (showstopper) or note where they did not know. They were also given space to share comments, which have been summarised under each indicator section. A list of organisations who attended the workshops can be found in Annex 1.

Note that, for ease of navigation, each PoS has been allocated to one SLM Objective and indicators have been grouped underneath these. The PoS have been renumbered in this process. However, as shown in the Theory of Change (Hart et al., 2025, ERAMMP Report-108) and illustrated in Table 2-1, in reality each PoS will contribute either directly or indirectly to multiple objectives. Therefore, the indicators associated with each PoS will not exclusively be linked to only one SLM objective.

Ultimately, Welsh Government will make the final decision on the list of impact indicators to be proposed based on the collective feedback from the TEG, stakeholders and ERAMMP team captured in this report and the priorities of WG.

3.2 Background to proposals to inform target setting

It is the responsibility of WG to set targets for each of the indicators chosen to measure the impact of the mix of policy mechanisms and actions put in place to deliver against the four SLM objectives. These targets are numerical goals that set the ambition in relation to a specific indicator. They play an important role in planning the content and implementation of specific schemes as well as monitoring progress towards achieving the desired outcomes.

A good target (see, for example Markiewicz and Patrick, 2026 and Poppy et al., 2014) should be:

- SMART: Specific, Measurable, Achievable, Relevant, Time-bound.
- Informed by data: it should be grounded in robust and reliable data, such as baseline data and current trends.
- Flexible: it may require adapting if baseline conditions or evidence changes.
- Ambitious but realistic: a target should be stretching, but feasible.
- Coherent with other policy goals: for example, broader food security, climate and environmental goals.

The resources (funding and people) necessary to measure progress against the targets is a further consideration that will need to be taken into account when deciding on the final set of indicators and target values for these.

Within the context of the SLM Framework the indicators will be reported on every five years (Section 6 of the Agriculture (Wales) Act 2023). Therefore, the proposals for targets in the sections below relate to this five-year period and not a longer time horizon.

The process for determining possible values for targets for each of the impact indicators, was first to review whether or not there were existing targets in relevant Welsh legislation or strategies and if these existed. Second, the current trends for the data underpinning the indicator were identified. Finally, a series of potential values for targets were identified to show the potential contribution the activities funded under the SLM Framework could make to each indicator. Three different values are provided as follows:

- Minimal goal – equivalent to maintaining the status quo / existing trends.
- Moderate goal – a value that would lead to moderate or sustainable improvements in relation to current trends. Here we define sustainable as being an improvement that will continue into the next reporting cycle.
- Ambitious goal – a value that would lead to transformational change, delivering substantial improvement compared to current trends.

Possible options for target values were discussed with the TEG and at the in-person stakeholder meeting in June 2025. However, the lack of consensus on which were the most appropriate indicators to use made a discussion on possible target values challenging and whilst there were many useful comments, no clear proposals were developed.

As a result, the information provided on possible target values in the sections below is based on an assessment of the baseline data and trends for each of the shortlisted indicators as well as reflecting stakeholder input where this was provided by the ERAMMP team. Not all the indicators identified have target values associated with them as in a number of cases there no current WG policy or ambition in the public domain could be identified, or targets would only make sense when considered as part of a narrative describing a suite of indicators.

It is important to reiterate that the values proposed are indicative values to indicate the three levels of ambition set out above. They are not based on any data linked to the potential uptake of schemes or budget availability. As such they are offered only as ‘food for thought’ to WG to provide input into the target setting process.

4 Proposed indicators for SLM Objective-1

SLM Objective-1: **Produce food and other goods in a sustainable manner.**

SLM Objective 1 includes, among other things: the resilience of agricultural businesses within the communities in which they operate and their contribution to the local economy.

There are five PoS which are of direct relevance to this SLM Objective:

- Encouraging the production of food in an environmentally sustainable manner;
- Helping rural communities to thrive and strengthening links between agricultural businesses and their communities;
- Improving the resilience of agricultural businesses;
- Achieving and promoting high standards of animal health and welfare; and
- Maximising resource efficiency;

The final set of proposed indicators are coded by SLM Objective number and PoS (A-C where more indicators are proposed) and highlighted in bold with the indicator title and units e.g. (**Average Agricultural Output (all farms) (£) (1.1A**).

The proposed indicators for SLM Objective 1 are set out in the table below.

Table 4-1: Proposed indicators relating to SLM Objective 1, by Purpose of Support

Purposes of Support relevant for SLM Objective 1	Indicator	Indicator status
1.1 Encouraging the production of food in an environmentally sustainable manner	1.1A. Average agricultural output by farm (£) (to be assessed as part of total factor productivity)	Existing
	1.1B. Soil Health Alert Indicator	New
1.2 Helping rural communities to thrive and strengthening links between agricultural businesses & their communities	1.2A. Strength of supply chains between farmers & their local communities (upstream & downstream)	Potential future
	1.2B. Number of / proportion of rural households beneath median income (WFG)	Existing
	1.2C. Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm in rural communities	Modified existing
	1.2D. Land used for horticulture (hectares)	Existing
1.3 Improving the resilience of agricultural businesses	1.3A. Levels of diversification in farm products and adoption of climate adaptation techniques	Potential future
	1.3B. Net farm income (showing levels of public funding)	Existing
	1.3C. Agricultural workforce numbers	Existing
	1.3D Agricultural workforce age	Modified existing

Purposes of Support relevant for SLM Objective 1	Indicator	Indicator status
	1.3E Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm by farmers/farm workers	Modified existing
1.4 Achieving high standards of animal health and welfare	1.4A. Animal Health & Welfare Indicator	Potential Future
1.5 Maximising resource efficiency	1.5A. Utilised Agricultural Area (ha) (to be assessed as part of total factor productivity)	Existing
	1.5B. Total Inorganic Fertiliser and Feed Use (all farms; all crops and grass) (kt) (to be assessed as part of total factor productivity) (feed to be added when available)	Existing
	1.5C. Organic Manure Use (% dressing cover all crops and grass) (to be assessed as part of total factor productivity)	Potential future
	1.5D. Plant Protection Product Use in Agriculture (to be assessed as part of total factor productivity)	Potential future

4.1 Narrative for suite of indicators for SLM Objective 1

Encouraging the Production of Food in an Environmentally Sustainable Manner (PoS 1.1) is indicated in part by the indicator **Average Agricultural Output by farm (£) (1.1A).** However, it is recognised this will only indicate sustainable production when considered alongside indicators relating to maximising resource use efficiency with respect to land, workforce, fertilisers, manures and plant protection products use as part of total factor productivity which is currently only available at a UK level (see **Indicators 1.3C and 1.5A-D** below). It should be noted that inflation will contribute to the ongoing increase in value of this economic indicator proposed without consideration alongside other indicators as recommended above. A move to total factor productivity would change this economic indicator to one of combined volume of output. SLM actions that could contribute to improvements in this integrated indicator would include access to improved training and advice relating to improving production efficiency and adaptation to climate change.

There was general support from stakeholders for an indicator relating to the maintenance, and ideally improvement of soil health if food is to be produced in an environmentally sustainable manner since soil is the fundamental asset on which all agricultural production is based. Wales is unique in the UK in having robust national data which has reported ongoing trends in topsoil health and performance over the last ten years. Whilst average national values provide one approach to tracking change in soil health (as reported in ERAMMP Report-105, Emmett et al., 2025), it is proposed issues which require investigation need to more explicitly focus on the number of soil which exceed trigger points highlighting potential problems. It is proposed, this is by reporting on the proportion of soils which under-perform relative to established soil trigger points for efficient production in improved land, and habitat support in unimproved land. Therefore, a new approach has been developed to create a single soil health alert indicator which reports on the number of locations where there is at least one under-performance relative to a trigger point (ERAMMP Report-94; Feeney et al., 2025, see Annex 2). The proposed new approach for this new **Soil Health Alert Indicator (1.1B)** for Wales follows the principles used by the EU for their Soil Observatory Dashboard (see EUSO Dashboard) however, the actual trigger points used are different to make them more relevant to the situation in Wales and critically, they are bespoke for each dominant broad habitat present in Wales reflecting their different use. The approach by the EU aims to make soil health monitoring obligatory, provides guiding principles for sustainable soil management and addresses situations where soil contamination poses unacceptable health and environment risks with the ultimate aim of healthy soils by 2050. Note that currently England is following a different approach. SLM supported actions which could impact on these impact indicators include soil testing to ensure only the fertiliser required for efficient crop production is applied, encouraging reduced tillage, changing management practices of animals to reduce compaction and other options. It should be noted the careful use of the indicator title to include the word 'alert' reflecting the need for investigation and review rather than immediate action. The approach seeks to highlight where the direction of travel is potentially undesirable and where early action could prevent soil health reaching levels where risks are costly to reverse.

Proposed indicators that track whether SLM actions are **Helping Rural Communities to Thrive and Strengthen links between Agriculture Businesses and their Communities (PoS 1.2**) consider issues that capture the strength of supply chains between farmers and their local communities. However, this is a complex area and no single suitable indicator was identified. One potential future component could be the **Strength of supply chains between farmers & their local communities (upstream & downstream) (1.2A)** but only partial data were identified although there is active research in this area. The **Number / proportion of rural households beneath median income (1.2B)** is an existing indicator for tracking economic security and equality in the rural community for the Well Being of Future Generations Act and could help track whether rural communities are falling behind the urban population. **The number / proportion of rural community reporting mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm in rural communities (1.2C)** is considered a meaningful indicator that could contribute to assessing the ability of rural communities to thrive and will act as a comparison for indicator 1.3E.

The proposed indicator to report on the **Area of Land Under Horticulture (1.2D)** could provide some indication of the increased potential, if not actual creation, of local food supply chains going forward as horticultural produce lends itself relatively easily to local supply chains especially at the small scale typical of Welsh horticultural enterprises, although this may not always be the intention or outcome. Further information would need to be gathered on the purpose and scale of production as large-scale horticulture may not be indicative of supporting local food supply chains. SLM supported actions could include investment support for an increase in local horticultural ventures based on maintaining and proposals on horticulture policy development announced in December 2024, the community food strategy and the barriers to small scale horticulture development identified in 2023 for Food & Drink Wales and ensuring fair and equitable distribution of support for local supply chains between the urban and rural community.

Going forward, **Improving the Resilience of Agricultural Business (PoS 1.3)** is clearly of benefit for the farming sector to navigate future climate change extremes and global market volatility. An indicator relating to **Levels of diversification in farm products and adoption of climate adaptation techniques (1.3A)** is proposed but no robust data are available. Separating the two issues of diversification and climate change adaptation is recommended if this indicator is taken forward for further development. Another proposed indicator which could indicate increased resilience is **Net farm income (showing levels of public funding) (1.3B).** The request from some stakeholders to have this indicator showing levels of public funding perhaps reflects the principle that a more sustainable agricultural sector over time may become less reliant on public support as a proportion of total income however this indicator requires further development due to variability and volatility in data.

Capturing **Agricultural Workforce numbers (1.3C)** and **age (1.3D)** could provide some indication of the ongoing resilience of the agricultural sector with respect to current and new entrants into the industry. SLM supported actions which could improve outcomes reported by these indicators could include support for new entrants and business advice relating to options for diversification and adoption of climate adaptation techniques ensuring a more sustainable future. The **Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm by farmers/farm workers (1.3E)** is an important indicator in an industry with known challenges on mental health and there are available data, although these are not currently held at the right level or aggregation and in different places.

Production being maintained or increased should not come at the expense of **Achieving High Standards of Animal Health and Welfare (PoS 1.4**). The Office of the Chief Veterinary Officer advised that nationally robust data are not currently available but various indicators are under development. SLM supporting actions to increase access to advice here could be beneficial for greater impact. If high animal welfare standards (above the regulatory minimum) were to be used as a metric, then new assessments on data collection would be required, as well as an agreed definition of what constitutes high animal welfare, since whilst animal health metrics are relatively objective, welfare is less so.

Maximising Resource Use Efficiency (PoS 1.5) is important both to save costs for farmers and also reduce unintended impacts on the environment with respect to both greenhouse gas emissions and nutrient release into the wider countryside (land and water). It is proposed that resource use efficiency for efficient production is tracked by comparing **Average Agricultural Output (1.1A)** per hectare of **Utilised Agricultural Area (UAA) (1.5A)** and **Agricultural Workforce numbers (1.3C)** and this being maintained or even increased relative to **Total Inorganic Fertiliser and Feed Use (all crops and grass) (kt) (1.5B), Organic Manure Use (% dressing cover all crops and grass) (1.5C)** and **Plant Protection Product Use in Agriculture (1.5D).** Ideally, this would adopt the approach used to report total factor productivity which is currently only available at the UK level. It should be noted that tracking any indicator in isolation will not reflect the level of food production that is grown sustainably. Currently, nationally robust data are only available for Average Agricultural Output and Total Inorganic Fertiliser Use. Improved data are required for use of feed, organic manures and plant protection products (PPPs). SLM supported actions that could impact on these indicators could include changing animal / crop type or management practices to ones more efficient under a changing climate. SLM could also support training and advice from accredited advisors for example, how to make a move towards Integrated Pest Management and/or make a move towards organic practices.

It should be noted there are clear links to other SLM objectives for all of these indicators. For example, production of inorganic fertiliser has a significant climate change footprint in terms of both its production and link to greenhouse emissions from the soil (**SLM Obj2**). Manure use can also be linked to greenhouse gas emissions if not well managed. Improved resource use efficiency is also important in reducing the unintended release of nutrients into the wider environment, thereby reducing impact on species and ecosystems through e.g. ammonia release and nitrogen and phosphorus leaching losses to adjacent land and into water courses. (**SLM Obj3**).

As described above (and supported by the TEG and stakeholders) resource use efficiency indicators should be presented as relative values i.e. yield per area per use of fertiliser / manures/feed/PPPs. As this kind of integrated indicator can be hard to interpret it is perhaps best understood by exploring trends over time for each individually (Figure 4-1). What becomes clear from this analysis is that income is highly volatile and has little relationship to other indicators. Average Farm Output (+21% since 20-21) and manure use have increased (+12% since 2014-15 although note these values are very uncertain for England and Wales) whilst Utilised Agricultural Area (-5%) and inorganic fertiliser use (-44%) have declined since 2014-15. The decline in area matches that reported in ERAMMP Report-105 (Emmett et al., 2025) which suggested a loss of 5% of our most productive land (i.e. arable and improved grassland) from 2010 to 2021 using earth observation data.

These trends perhaps suggest there have been increased output rates relative to land area use and inorganic fertiliser use but it should be emphasised these data hide significant variability both within and across farm types and more detailed data exist that provide greater clarity as to underlying trends. Average and total data can also hide localised issues. For example, a few farms using high quantities of fertiliser (as reported by ERAMMP Report-105) could lead to important local effects for water bodies even if overall fertiliser use has declined for Wales as a whole and the reported localised decline in soil health **(1.1B)**.

The data also suggest past fertiliser use may have been in excess of production requirements as a 17% decline in fertiliser use from 2021 to 2024 was accompanied by a 21% increase in output (Note: output data are only available for this more recent time period from the Wales Farm Business Survey, however the WG Aggregate Agricultural Output and Income data also indicate an overall increase in output (+34%) since 2014 despite the long term decline in fertiliser use). It is possible that output could decline going forward if legacy levels of fertiliser are used up from the soil. This emphasises the value of more soil testing being encouraged by the SFS to ensure better matching of fertiliser use and crop needs going forward.

Despite these concerns, the task is to provide simple national indicators and the proposed resource efficiency indicators provided here do provide some overview of the national picture with respect to resource use efficiency.

Finally, whilst not proposed as an indicator, it is perhaps interesting to note that farm numbers have declined (-7% since 2014-15) whilst Total Utilised Agricultural Area has declined and Average Utilised Agricultural Area has increased by 2% over the same time period (data not shown) suggesting a trend towards fewer, bigger farms. Number of farms, may be an indicator WG which to track going forward.

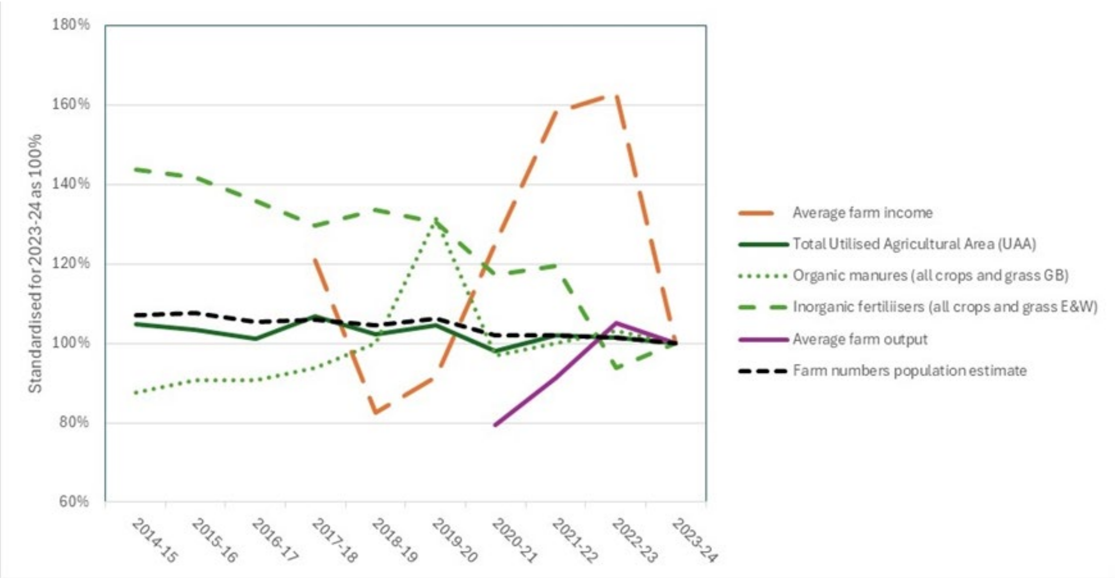

Figure 4-1 Trends in various measurements relating to average farm output, land area used, fertiliser and manure use, income and farm number all scaled to 2023-24 values. Figure created for this report using data sources as described for each section.

A more detailed description of each of the proposed indicators, grouped under PoS for SLM objective 1 are set out in the sections below.

4.2 Purpose of Support 1.1: Producing food in an environmentally sustainable manner

4.2.1 Indicator 1.1A: Average agricultural output by farm (£)

Several members of the TEG and stakeholder community requested an indicator relating to 'yield'. As yield is a highly complex mix of different animals and crops, the conversion into their total economic value (£) to the farm business is captured and reported by Welsh Government. This allows the aggregation of agricultural output across farming sectors and products. If yield itself is required, the approach taken for reporting total factor productivity for the UK scales and aggregates the volume of outputs across all sectors relative to a 1973 baseline.

The use of the **Average Farm Agricultural Output (1.1A)** was recommended for use by the WG Statistical Services Division (WSSD) to provide the focus on agricultural production most relevant to SLM Objective 1. In 2023-24, Farm Agricultural Output represented on average 83% of total Farm Business Income for all farms. The best source of data recommended by WSSD was the Wales Farm Business Survey (WFBS) rather than the Aggregate Agricultural Output and Income report as the data in the latter report have to follow UK protocols and relies on a mix of data from different sources and the methods are currently under review. Both sources of data are available online. The Average Farm Agricultural Output indicator includes miscellaneous income and animal disease compensation not directly linked to 'yield' including wayleaves (income from e.g. utility companies for pipes and cable), wood fuel and woodland sales. It excludes income from basic farm payment, agri-environment payments and income from diversification (e.g. B&B) potentially not linked to agricultural and biomass production. Livestock represented an average of 85% of Agricultural Output with crop production 11% (2023-24 data).

As background for the data source recommended, in brief the WFBS *"incorporates financial and physical data from a representative sample of 600 farms in Wales and the results are presented as a series of tables, with introductory commentary. Farms in the survey are classified by type and size and the results are expressed in terms of outputs, inputs and incomes; land utilisation; tenant's capital; performance indicators, such as average business size and standard man-day availability; various income measures, including net farm income; livestock numbers; and farm liabilities and assets by type of tenure. Inter-year comparisons for an identical sample of holdings participating in the WFBS are also included, as are gross margins for the main enterprise types. The value of the survey depends on it being representative of Welsh farming. It is therefore desirable to have a small turnover of farms taking part in the survey so that new farms can regularly be included. Any new farms recruited must be of a suitable type and size and so able to replace farms that are leaving the survey*." (extracted from: Farm Business Survey: Institute of Biological, Environmental and Rural Sciences , Aberystwyth University). The survey is updated annually.

Table 4-2: Data source for indicator 1.1A - Average Agricultural Output by farm (£/year)

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
Wales Farm Business Survey Average Farm Output Headings by Farm Type and Year	Average Farm Agricultural Output (all farms) (£)	Annual	The data come from a survey of 600 farms captured by an Investigational Officer who visits the farm once a year and enters the data directly onto a laptop. All data are confidential and no farm is identifiable in the resulting data and report.	Use of Crop Output and Livestock Output only could be used which excludes miscellaneous income and animal disease compensation payments.

4.2.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	8	9	4	5

The main concerns raised by stakeholders related to this single indicator not relating to sustainability. We suspect this was due to stakeholders having not had time to read the full accompanying document but rather just reviewed the indicator list in excel and/or were concerned it could be misused. To address this issue, the use of total factor productivity was proposed by one stakeholder which has been adopted in the narrative and recommendations here. This calculates output on the basis of total volume relative to a range of inputs. We recommend that the WG consider commissioning the development of this indicator for Wales. The use of the Defra Food Security report was also proposed but as this is not available for Wales this was not considered further. However, WG may wish to review and see if they wish to commission work to replicate this for Wales. Inclusion of GHG emissions as part of the sustainability assessment was also proposed which we recommend deserves consideration. The inclusion of non-food production was also raised as an issue. Finally, WG proposed the Welsh Food and Drink Economic Appraisal – 2024 report which could have some data of relevance. Unfortunately, this report was highlighted too late for us to include here and the underlying data is not in the public domain but we recommend WG explore if the underlying data to the report could provide additional indicators.

4.2.1.2 Baseline data

Table 4-3: Available baseline statistics for indicator 1.1A - average agricultural output by farm

Data source:	Baseline/key statistics:
Wales Farm Business Survey Average Farm Output Headings by Farm Type and Year	Average Farm Agricultural Output (£) 2023-24 £178,400 In addition to agricultural output, it includes miscellaneous income and animal disease compensation not directly linked to 'yield' including wayleaves (income from e.g. utility companies for pipes and cable), wood fuel and woodland sales. It excludes income from basic farm payment, agri-environment payments and income from diversification (e.g. B&B) 5% increase pa from 2021-24
Aggregate Agricultural Output and Income	Gross Output 2024 £2,214M

4.2.1.3 Trends

Trends over time indicate an increase of 21% from 2020-21 relative to 2023-24. This represents a 5% increase per year. Note this will include the influence of inflation as this is an economic indicator and not necessarily an increase in volume.

Aggregate Agricultural Output and Income data are available for a longer period since 2014 was used as a cross-check, although these were not recommended for use by the WGSD for the actual indicator). This also suggests an ongoing increase in Gross Output in the longer term of slightly less at 3% per year since 2014 in economic terms.

4.2.1.4 Options for targets

To our knowledge there are no WG targets for this indicator other than maintaining ongoing food security. Furthermore, without consideration of resource use efficiency a target could create unintended consequences that work against ongoing sustainable production. A move to develop total factor productivity for agriculture in Wales is our recommendation.

4.2.2 Indicator 1.1B: Soil Health Alert

Soil health as an indicator was quickly accepted as an important indicator to track SLM outcomes by the TEG and stakeholder community. This recognises the fundamental importance of soil for all food and fibre production and also the importance of soil in supporting nature more widely on land and in water.

Within the four nations of the UK there is no accepted approach to reporting soil health as a single indicator. Instead, single specific soil properties / measurements are reported as seen previously for Wales (ERAMMP Report-105, Emmett et al., 2025) and for the Well-being of Future Generations Act where maintenance of soil organic matter is reported as Indicator No. 13.

As Wales has access to a long-term record of changing properties of topsoil (0-15cm) from 1978 to 2021-23 (ERAMMP Report-105; Emmett et al., 2025), it is in a unique position to develop a more integrated soil health metric which we have called a **Soil Health Alert Indicator**. Work was commissioned to deliver this indicator for this SLM indicator project from the UKCEH team who are responsible for the soil monitoring work component embedded within the GMEP / ERAMMP National Field Survey. The approach taken was to follow the principles adopted by the EU Soil Observatory (see EUSO Dashboard) of using trigger values for a range of issues which would encourage further investigation and review with an adviser to explore if any remedial action was required. The approach seeks to highlight where the direction of travel is undesirable and where early action could prevent soil health reaching levels where risks are costly to reverse.

For Wales we have selected trigger which relate to under-performance of soil with respect to either (a) efficient production (for improved soils), or (b) habitat support (for unimproved soils). A 'one-out / all-out' approach is then taken across measurements (soil organic matter, acidity, phosphorus, nitrogen, bulk density / compaction) to produce a single Soil Health Alert Indicator. This approach is common to the EU Water Framework Directive. The methodology and results are presented in detail in ERAMMP Report-94 (Feeney et al. 2025; see Annex 2). Further measurements could be added in over time if this is of interest to WG e.g. presence of PPPs and PFAS ('forever chemicals'), soil biodiversity using eDNA, erosion and disturbance, and loss of agricultural soil to urban development. There are also options to remove some trigger points if it is decided this could create unintended consequence e.g. the application of lime and fertilisers to land where an increase in production is not the intention of the farmer. Over time, the percentage of under-performing soils would be expected to decrease if sustainable production is being achieved and species and ecosystems being protected. The current percentage of agricultural soils which have one or more alerts indicating potential under-performance is 80%. This should not be a surprise considering the results reporting in ERAMMP Report-105 (Emmett et al., 2025) and summarised for the recent Senedd Inquiry on Soil Health in Agriculture.

Actions to improve soil health are wide ranging but generally include reduced tillage, improved management of animal and machine traffic, more rotations, more diverse cropping and sward systems and reduced fertiliser and control chemical use. Data from new soil testing of land within the SFS scheme could be compared to, and potentially integrated with, the national data to explicitly report on the benefit of the SFS scheme for soil health and improve the number of data points on which this indicator is based (see ERAMMP Report-103; Lloyd et al. 2025).

Further consultation is likely to be required for this indicator.

Table 4-4: Data source for Indicator 1.1B - the Soil Health Alert Indicator

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
GMEP/ERAMMP National Field Survey topsoil data	Soil organic matter; acidity; C:N; Olsen-P and bulk density (i.e. compaction)	8 years currently but see notes	No rather aggregation of data into a new single Soil Health Alert Indicator	This is a newly developed indicator created for the SLM Indicator project but subject to ongoing consultation. It follows the principles of soil health reporting by the EU. A move to a 5-year rolling monitoring programme as for UKCEH's Countryside Survey soil monitoring programme would allow for more frequent reporting. Data from SFS testing could be integrated with national data as it becomes available (ERAMMP Report-103)

4.2.2.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	9	9	1	7

A soil health indicator was widely accepted by stakeholders. However, it was clear that most if not all had not read the reports outlining the proposed approach but only had time to the excel indicator list as many questions related to requests for clarification of which measurements had been included in the reports. Stakeholders also raised the concern that soil health was not the only indicator of sustainable food production, which is accepted but it is an important natural resource which supports species and ecosystems over and above the issue of the support of sustainable food production.

WG Soils Policy have expressed a wide range of concerns and time was taken to explore these both by email and in online meetings. Of particular concern was the risk of the use of lower trigger points for phosphorus and pH and potential remedial action not well matched to production levels. However, the indicator title and report clearly state that no immediate action should be taken and

rather the indicator should be considered as an 'alert' suggesting further investigation and discussion with an appropriate advisory service is undertaken before any remedial action. Clearly further consultation is required with more time to explore the methodology and issues raised.

4.2.2.2 Baseline data

Table 4-5: Available baseline statistics for Indicator 1.1B - Soil Health Alert Indicator

Data source:	Baseline/key statistics:
GMEP/ERAMMP National Field Survey topsoil data Wales National Trends and Glastir Evaluation | ERAMMP	2021-2023 % soils which cross trigger points identified for efficient production or habitat support 80%

4.2.2.3 Trends

Recent trends have been calculated between the GMEP National Field Survey (NFS) (2013-16) and ERAMMP NFS (2021-23). Over this period there has been a deterioration in the performance of agricultural soils from 75% which had potential performance issues in 2013-16 to 80% in 2021-23. This is a decline of 5% in 10 years or 0.5% per year.

4.2.2.4 Options for targets

This is a newly created indicator for this project and there are no current targets, with the exception of the Well Being of Future Generations No. 13 National Indicator to maintain and increase soil carbon and organic matter. This is just one of the five soil measurements included in this integrated new Soil Health Alert Indicator.

Possible targets: Possible targets for the next 5-year period could be:

- *Minimal Goal (Status Quo)*
    - Maintain the current level of 80% halting the ongoing decline
    - Policy Implication: No improvement in soil and associated production efficiency and habitat support. Ongoing issues relating to water quality and greenhouse gas emissions from soil are likely.

- *Moderate Goal (Sustainable Improvement)*
    - Aim to reduce the alert level by 0.5% per year to return to 2013-16 conditions i.e. 75% in 5 years
    - Policy Implication: Some improvement in soil health and associated production efficiency and habitat support.

- *Ambitious Goal (Transformative)*
    - Exploit the SFS focus on soil testing and aim for a more ambitious target of 4% per year reaching 60% in 5 years.
    - Policy Implication: This would require greater investment in access to advice on farm in responding to SFS and other soil testing results e.g. approaches to adapt to wetter winters and drier summers to protect soil structure and also

potentially the promotion of e.g. 'regenerative farming practices' to e.g. reduce reliance on inorganic fertilisers still further.

Table 4-6: Summary table – possible targets for Indicator 1.1B: Soil Health Alert Indicator

Aspect	Details
Data Sources	GMEP and ERAMMP National Field Survey nationally representative topsoil results. In time, the use of SFS soil testing results could be included
Frequency	Currently every 8 years but the repeat time and potential to move to a rolling programme over a 5-year period is an option
Disaggregation	Rather aggregation of data which cross trigger points for efficient production or habitat support
Notes	This is a newly created indicator for the SLM
Possible Targets	Over 5 years: Minimal (Status Quo); No change remaining at 80% halting the ongoing decline Moderate: Reduce the increase by 0.5% per year so 75% in 5 years Ambitious: Reduce the increase by 4% per year so 60% in 5 years

4.3 Purpose of Support 1.2: Helping rural communities to thrive and strengthening links between agricultural businesses and their communities

Despite being a single purpose of support, it was felt that the two parts, namely "thriving rural communities" and "links between farms and their communities" may need to be monitored separately.

4.3.1 Indicator 1.2A Strength of supply chains between farmers & their local communities (upstream & downstream)

This indicator was initially suggested by the TEG, on the basis that one of the key links between agricultural businesses and their communities is in agricultural supply chains. This can be divided between the supply chains "upstream" of the farm, such as the purchases farmers make from other businesses in the community and the local contractors they hire; and the "downstream" supply chains: where farmers sell their produce to consumers, processors and other businesses in their community.

Stakeholders considered strength of local supply chains as a good indicator of farm-rural community connection with both economic and social functions. Local agricultural supply depots provide employment but also can function as informal farmer support and advice centres, whilst the ability to buy direct from farmers or via short supply chains can increase the proportion of the final price going to farmers but also build a sense of connection between farms and consumers (see for example Jones et al., 2022).

In addition to building local community connections, stakeholders also highlighted the importance of maintaining and building local supply chains to improve the resilience of our food system. Research for the National Preparedness Commission (Lang et al., 2025), highlights the vulnerability of our current highly centralised food supply chains. It notes that *"With so few companies responsible for high percentages of UK food retail, manufacturing* *and distribution, policymakers should take the case for diversification and appropriate regionalisation more seriously for resilience reasons."*

The main concerns expressed with this indicator were the difficulty in defining a local supply chain and identifying a specific indicator on which it is possible to collect, track and measure data.

Definition: A significant challenge with this indicator is defining local. A coalition of organisations, led by the Sustainable Food Trust has been looking into how to define local food and build local supply chain resilience at a UK level (Kipling, 2025). The definition of local food that they settled on was *"food that is produced, processed, sold and eaten within the same region or local administrative area through transparent, SME-focused supply chains."* They noted that the definition has practical benefits for monitoring due to the existence of Local Authority and other boundaries.

In the context of Wales, administrative area could be local authority, public service board or the whole of Wales. A downstream local supply chain would be one in which the farm, processor, retailer and end consumer are all within this same administrative area. Although the definition was developed with downstream supply chains in mind, for practical purposes it could also be used for upstream: e.g. the farm supply depots, contractors etc are from the same administrative area. The downside of this definition is that geographically close but cross-boundary supply chains would be excluded.

Downstream Data & Metrics: As supply chains are not in and of themselves an indicator, sub-indicators need to be considered. Potential specific indicators for the strength of downstream supply chain include:

1. Market share of local food as defined above available in relevant administrative area (e.g. proportion of food sold in Wales of Welsh origin).
2. Number and/or turnover of key retail outlets and distributors that supply local farm produce e.g. farm shops, farmers' markets, box schemes, milk or egg delivery, farm vending machines.
3. Number and/or turnover of key local processors such as abattoirs, dairies/creameries and value-added processors, available to farmers in the area.
4. On farm processors such as micro-dairies.
5. Volume of Welsh produce procured by Welsh public sector.

We were unable to find comprehensive publicly available data that regularly track all of the above at a Wales wide level. Various reports provide information on some of these indicators, suggesting that it is possible to track this.

Feedback from Welsh Government Food Division noted that it should be feasible to source data for 1 & 2 if an all Wales definition of local food is used, but data would be challenging to source if a more local definition were used. They noted that data are already available for the point 3 and are likely to be possible to obtain for points 4 and 5.

As a result, **additional indicator development and new monitoring work would be needed for this indicator**.

Table 4-7: Data sources for Indicator 1.2A - strength of supply chains (downstream data)

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Welsh Public Sector Food Procurement Brookdale Consulting (2022)	Proportion of Welsh public sector spending on food of Welsh origin.	One off: data from 2019/2020	Shows different food and drink categories with pounds spent and % of expenditure on Welsh origin produce.	Ongoing tracking data not found.
FUW & Wales Local Abattoir Network	Number of small & medium abattoirs in Wales	One off in 2025	Small & medium abattoirs in Wales.	Letter highlighting concerns rather than ongoing data tracking. However, low number should make future tracking straightforward.
Welsh Government Community Food Strategy	Notes increase in Welsh public procurement spending on Welsh food via 2 wholesalers.	One off		Strategy document rather than data source. Also includes Welsh Government priorities in relation to local supply chains.
Economic Appraisal: Welsh Food & Drink Sector Business Wales	Shows turnover, business numbers, employment figures of Welsh food sector.	Annual	Separates out "Food Foundation" sector including meat, dairy, wholesale, bakeries and more. Shows number of meat, dairy and egg processing businesses. Does not disaggregate for food of Welsh farm origin.	Would be very useful if food of Welsh farm origin could be disaggregated across subsequent supply chains listed. However, WG Food Division noted this is likely to be challenging and expensive.

Upstream Data & Metrics: Potential indicators for upstream supply chain strength include:

- Total contribution of farms to local economy through input purchases.
- Number of/growth in input-supplying businesses in local areas.
- % of agricultural input spending by Welsh farms at Welsh/local businesses.

The development of an indicator representing upstream supply chain strength is hindered by limitations in existing datasets. The gold standard would be spending by Welsh farms on inputs from suppliers within their local area, but initial research suggests that these data are not available.

However, data are available that could potentially be used to produce a relevant indicator with additional work. The Inter-Departmental Business Register (IDBR) can provide data on the number and type of relevant upstream businesses (e.g. agricultural wholesalers or feed manufacturers) that are operating in Wales, based on Standard Industrial Classification (SIC) codes, while the Business Register and Employment Survey (BRES) can provide data on the number of employees in particular sectors, based on SIC codes, by local authority area. These could be used to measure growth in the number of input-supply businesses in Wales, which could be a proxy indicator for upstream supply chain strength. This would, however, of course be limited by the fact that many of these businesses will supply farms outside

Wales, and as such their growth is not only influenced by increased demand from Welsh farms. Further research would be needed to enable disaggregation.

The Wales Farm Business Survey (WFBS) provides valuable data on farm input expenditure but does not break down this spending by supplier location. This may be able to be combined with IDBR/BRES data to produce an estimate of the percentage of agricultural input spending by Welsh farms at Welsh or local businesses.

In summary, similar to data on downstream supply chain links above, comprehensive publicly available data that regularly track aspects of upstream supply chains at a Wales wide level were also lacking. Again, **additional indicator development and new monitoring work would be needed for this indicator**.

Table 4-8: Data sources for Indicator 1.2A - the strength of supply chains (upstream data)

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Farm Business Survey Wales https://statswales.gov.wales/Catalogue/Agriculture/Farm-Business-Survey	Average expenditure at farm level on inputs e.g. seeds, contractors, fertilisers, pesticides	Annual	Separates out Dairy Farms, SDA Sheep Farms, SDA Grazing Farms, DA Grazing Farms, Low Grazing Farms and Other Farms.	Does not disaggregate spend by location of supplier.
Aggregate Agricultural Output and Income	Intermediate consumption (expenditure)	Annual	Shows figures for vets, machinery dealers, maintenance, contractors, fertiliser, feed, contractors.	Does not disaggregate spend by location of supplier.
Business Register and Employment Survey (via Nomis)	Number of jobs held by employees broken down by full/part-time and detailed industry	Annual	By 5-digit SIC2007 code	Does not provide information on whether employees work for businesses supplying Welsh agricultural businesses.
Inter-Departmental Business Register	Detailed information on UK businesses, including industry classification, location, size, employment range, turnover and structure	Annual	Geography (local authority level), Industry Classification (5-digit SIC2007 code), Business Size	Not publicly available without request

4.3.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	7	13	1	5

This was a popular indicator in principle, but many noted the challenge of measuring it and need for more definition. Breaking it down into separate components that contribute to strong local supply chains, could help address this. Components that stakeholders supported included:

Downstream:

1. Welsh public sector procurement of Welsh food.
2. Percentage of Welsh schools which procure majority of food from Wales.
3. Number of local abattoirs & creameries.
4. Number of farmers' markets.
5. Food produced in Wales sold in Wales.

Upstream:

1. Economic multiplier.

One stakeholder raised the need for integration with other potential WG targets for retaining/increasing agri-industry capabilities (e.g. local abattoirs).

Other suggestions included expanding it to cover supply chains for other land-based sectors such as forestry, land management and conservation.

Environmental concerns: One stakeholder supported this but only in combination with other indicators (1.1B, 1.4A, 1.5B, 2,1A, 3.1A, 3.1B) as it says nothing about the sustainability on its own. Another raised concerns about the upstream noting high levels of spending could be due to environmentally damaging reliance on inputs. A potential solution to this could be to exclude specific inputs.

Practical challenges: included the need to disaggregate trader supplies to Welsh and English farms; and to protect commercially sensitive information. A "blackbox reporting" approach similar to that used for the consumer price index (CPI) was suggested as a solution to the latter.

UK level data recommendations included the UK Food Security Report 2024 and Index 2024 - GOV.UK. These would need to be disaggregated to show Wales only info.

4.3.1.2 Baseline data

For both upstream and downstream supply chains, further research is needed to develop and track an overall indicator. Therefore, we are not currently able to provide overall baseline data.

With respect to potential components of downstream indicators identified above, the following information was found:

- Local abattoirs: 15 abattoirs in Wales (of which 5 "small" and 4 "medium").
- 58 establishments approved for handling, preparing, or producing meat products (poultry and red meat) in 2024 down from 97 in 2015.
- Public procurement: 23% food purchased by Welsh public bodies of Welsh origin in 2019/20.

4.3.1.3 Trends

No trends were found for the overall indicator identified as the indicator is not yet developed or measured. For the specific components of the indicator, only trends in relation to abattoirs and processing units were identified:

- Abattoirs: 45 abattoirs have closed since 1990 (not clear how many of these would be classed as "small" or "medium").
- Food Standard Agency approved processing units:
  - Poultry: 37 units in 2016, 30 in 2020 and 37 in 2024.
  - Red Meat: 57 units in 2016, 44 in 2020 and 21 in 2024.
  - Eggs: 88 units in 2016, 101 in 2020 and 108 in 2024.
  - Dairy: 75 units in 2016, 90 in 2020 and 109 in 2024.

4.3.1.4 Options for targets

It is not possible to determine a target for this for overall indicator as it does not yet exist. However, Welsh Government support for strong local supply chains is evident in its Community Food Strategy, which includes the following goals:

- Increase Welsh public spending on Welsh food by at least 50% by 2030
- Increase listings for Welsh products in Wales.

Recommendation: it is recommended to commission further research into upstream and downstream local supply chains to develop robust indicators and targets for future use. Components considered should include:

Upstream:

- Welsh public sector procurement.
- Key local processing infrastructure necessary for local sales.
- Key local retail and distribution that supplies produce from local farms.
- Overall sales of food of Welsh origin in Wales.

Downstream:

- Total contribution of farms to local economy through input purchases (potentially excluding environmentally damaging inputs).
- Number of/growth in input-supplying businesses in local areas.
- % of agricultural input spending by Welsh farms at Welsh/local businesses.

Where components are already trackable (such as for local abattoirs, food processors and public procurement) consider tracking these before the overall indicator is ready. For downstream, this should build on work already done in developing the Community Food Strategy.

4.3.2 Indicator 1.2B: Number / proportion of rural households beneath median income

Sustainable food production is not only about environmental stewardship but also about ensuring that those who live and work on the land can do so with dignity and economic security. Many rural households in Wales are directly or indirectly involved in land-based industries such as farming, forestry, and food production. If a significant proportion of these households are living below the median income, it raises concerns about the long-term viability of these sectors and the fairness of the rural economy. Monitoring income levels in rural areas can help identify whether land management policies are supporting equitable livelihoods or exacerbating rural inequality.

This approach aligns closely with the goals of the Well-being of Future Generations (Wales) Act 2015, which commits public bodies to improving the social, economic, environmental, and cultural well-being of Wales. Specifically, it supports the goals of creating a prosperous Wales, a more equal Wales, and a resilient Wales. By embedding rural income indicators into SLM targets, the Welsh Government can ensure that sustainability is not pursued at the expense of rural communities, but rather in a way that uplifts them—ensuring that food and goods are produced in a manner that is not only environmentally sound but also socially just and economically inclusive

Stakeholder feedback highlights that while monitoring rural household income is valuable, it does not directly measure farming-specific income or land-based economic resilience. The indicator risks being influenced by patterns of in- and out-migration and working from home/commuting trends, which can mask underemployment and poverty in rural areas. These complexities underline the need to interpret this indicator carefully and to complement it with qualitative insights and sector-specific monitoring to fully understand its relationship to sustainable food and goods production.

There were some stakeholder concerns, such as data limitations, which may restrict precision at rural micro-geographies, and migration patterns (in/out-movers, working from home) may distort poverty signals with the focus on the median value. It was also noted that income alone does not capture higher rural living costs or material deprivation, which are key to understanding rural poverty. As a solution, it was suggested that income monitoring should be complemented with contextual data on cost-of-living pressures and qualitative insights from rural communities. It was noted that there was ongoing research relating to issues of second home ownership elsewhere in WG, which might be relevant. Others suggested that assessing the number / proportion on or below the Living Wage might prove to be a better indicator. However, the overall decision was to remain in line with the existing WFG indicator, which covers the whole of Wales, but to note that differentiating between rural and non-rural areas might require careful interpretation that avoids generalisations.

Relevant data sources: Table summarises key data sources for monitoring income levels among rural households in Wales, including what each measures, reporting frequency, disaggregation potential, and interpretive considerations.

In terms of a practical monitoring approach, we suggest using the StatsWales Households Below Average Income (HBAI) and Welsh Index of Multiple Deprivation (WIMD) to track trends, recognising their limitations due to migration and working patterns. It might be worth integrating National Survey for Wales (NSW) and Bevan Foundation data to provide context on financial stress and deprivation. Overall, we would propose enhanced rural disaggregation in datasets to enable robust monitoring aligned with SLM objectives.

Table 4-9: Data sources regarding Indicator 1.2B - the number of/proportion of rural households beneath median income (WFG)

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
StatsWales **Households Below Average Income (HBAI) dataset - Family Resources Survey (FRS)**	Household income, employment, housing benefits	Annual (reported as 3-year rolling averages)	Age, family type, local authority	Core source for income data; rurality inferred via geographic indicators.
Welsh Index of Multiple Deprivation	Income, access to services, housing	Every 3–5 years	LSOA with rural/urban classification	Relative measure; no fixed poverty thresholds
National Survey for Wales	Material deprivation, financial strain	Annual	National and LA level	Useful for contextual indicators
Bevan Foundation Surveys	Essentials affordability, financial hardship	Quarterly/biannual	National with rural insights	Provides qualitative and lived experience data

4.3.2.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	5	11	4	6

Relevance to farming and SLM: Across all groups, a recurring concern was whether the indicator reflects farming households and sustainable land management (SLM). While some green voters viewed it as workable, amber and red voters argued it captures rural households more broadly, with incomes influenced by factors beyond farming and forestry. This was seen as limiting its ability to assess farm resilience or agricultural business viability. However, others noted that the act has a wider remit concerning the link between rural communities, enterprises and agriculture.

Risk of misleading signals: Amber and red voters warned that shifts in the indicator may not reflect farming outcomes. The indicator could also improve for negative reasons, such as poorer households leaving rural areas or wealthier households buying second homes and inflating averages, masking pressures on farming livelihoods.

Value added and attribution: Several stakeholders questioned what the indicator adds, noting its weak link to farming performance and high sensitivity to wider socio-economic factors and policies. Red voters stressed that poverty trends are more likely to be shaped by structural issues beyond food and farming, meaning the measure risks tracking the "wrong thing."

Amber voters highlighted the need for indicators that better capture supply chain dynamics, farm margins, and financial viability in sustainable transitions—seen as more directly attributable to agricultural systems.

4.3.2.2 Baseline data

The baseline data suggest that understanding the extent of income poverty among rural households in Wales is complex, as no single dataset provides a complete picture. However, by drawing on a range of national and regional sources, we can build a reasonably clear understanding of the issue.

The most direct measure of income poverty comes from the Family Resources Survey (FRS) and the derived Households Below Average Income (HBAI) dataset. These show that around 22% of people in Wales live in relative income poverty, defined as having a household income below 60% of the UK median, after housing costs. While these figures are not routinely broken down by rural or urban status, analysis by local authority suggests that rural counties such as Powys, Ceredigion, and Gwynedd have some of the lowest median earnings in Wales, indicating a higher likelihood of rural households falling below the poverty threshold.

The Welsh Index of Multiple Deprivation (WIMD) includes a rural/urban classification, allowing for the identification of rural areas where a significant proportion of the population receives income-related benefits. WIMD highlights concentrations of deprivation in rural communities, particularly when combined with poor access to services.

The National Survey for Wales adds a qualitative dimension, capturing people's experiences of financial hardship, such as difficulty affording food, heating, or essential bills. It provides valuable indicators of material deprivation and financial stress, which are often more acute in rural areas due to higher living costs and limited access to services.

The Bevan Foundation contributes timely, Wales-specific data through its "Snapshot of Poverty" surveys. These surveys consistently show that many households across Wales—including in rural areas—struggle to afford essentials. The surveys reveal that rural residents often face additional pressures, such as lower wages, seasonal employment, and higher transport and housing costs.

Taken together, these sources suggest that a significant proportion of rural households in Wales are likely to be living below the median income, even if precise figures are not always available. The evidence points to a pattern of lower earnings, higher living costs, and reduced access to services in rural areas, all of which contribute to a heightened risk of poverty. While more granular, rural-specific income data would improve our understanding, the existing evidence base clearly indicates that rural poverty is a persistent and pressing issue in Wales. Table 4-10 below summarises baseline statistics to support tracking of rural income poverty within Wales.

Table 4-10: Available baseline statistics for indicator 1.2B - the number of/proportion of rural households beneath median income (WFG)

Data Source	Baseline/Key Statistics
StatsWales (HBAI)	~22% of people in Wales live below 60% of median income AHC (no systematic rural split)
WIMD	Identifies rural LSOAs with high income deprivation and poor access to services
NSW	Captures rural material deprivation and financial stress
Bevan Foundation	Highlights lived experience of rural financial hardship, lower wages, and high living costs

4.3.2.3 Trends

Currently, no trends are available specifically for rural households beneath median income, as disaggregated data are not routinely reported. Based on the Department for Work and Pensions' Households Below Average Income series and the Family Resources Survey, around 22% of people in Wales lived in relative income poverty in 2022–24, defined as having a household income below 60% of the UK median after housing costs. This figure has remained relatively stable in recent years (between 22 and 24 percent), down from approximately 25% toward the end of the last century. Whilst there has been a slight overall reduction in income poverty in Wales since the 1990s, the Well-being of Future Generations Future Trends Report (2021) highlights that poverty is experienced unequally across groups, with gaps evident between disabled people and those in Black, Asian, and minority ethnic communities. Though it does not provide any analysis of divergence between rural and urban households.

To support improved reporting and monitoring for rural poverty, the Department for Work and Pensions should consider including more granular rural/urban classifications in the HBAI dataset, with StatsWales providing regular reporting and analysis for rural populations in Wales.

4.3.2.4 Options for targets

A specific target for the indicator on the number or proportion of rural households beneath median income is not proposed at this stage. This is primarily due to the lack of disaggregated baseline and trend data, as well as the multiple external factors that influence rural income, many of which lie beyond the potential influence of the SLM framework.

Despite these limitations, the indicator remains valuable for assessing the ambition and direction of the SLM framework and tracking relative changes over time. We recommend that further evidence is collected and analysed to inform the development of a suitable target, based on the best available data. Where possible, alignment with broader policy frameworks should be recognised. In particular, this indicator relates to the Well-being of Future Generations Act National Indicator 18: People Living in Poverty and the national milestone to reduce the poverty gap between people with key and protected characteristics and those without by 2035.

Table 4-11: Summary Table: Possible targets for Indicator 1.2B - Number of/proportion of rural households beneath median income (WFG)

Aspect	Details
Data Sources	StatsWales (HBAI), WIMD, NSW, Bevan Foundation
Frequency	Annual (HBAI, NSW), 3–5 years (WIMD), quarterly (Bevan)
Disaggregation	LA/LSOA, rural inferred from geography
Notes	Data limitations, migration and remote work effects; complements with qualitative hardship indicators

4.3.3 Indicator 1.2C: Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm in rural communities.

Mental health is a critical, yet often under-acknowledged, component of sustainability. The psychological Well-being of rural residents, including farmers and land managers, is intrinsically linked to the long-term viability of rural economies and landscapes.

The Well-being of Future Generations (Wales) Act 2015 provides a legislative foundation for this approach, explicitly identifying "a healthier Wales" and "a Wales of cohesive communities" as national Well-being goals. These goals encompass mental health and social resilience, particularly in rural and agricultural settings where social isolation, economic stress, and limited access to services can negatively affect mental Well-being. Similarly, the Welsh Government's Mental Health and Well-being and Suicide Prevention and Self-harm Strategies 2025 to 2035 outline visions for improving mental health services, reducing suicides and supporting those who self-harm, and reducing inequalities.

This indicator will also link to other policy objectives and strategies, such as the guidance available on mental health and well-being support for farming families as well as the 'Mental Health and Well-being Strategy' and the 'Suicide Prevention and Self-harm Strategy' for Wales.

There was broad support from the stakeholders for this indicator, provided that it is able to provide the required focus on rural communities. It was recognised that this would provide a meaningful comparison to indicator 1.3E, which focuses on farmers and farm workers. The development of a practical monitoring approach will depend on being able to assemble the required disaggregated data. As a result, we suggest that this indicator is best categorised as 'modified existing'. We feel that a robust indicator is possible but will need to combine quantitative measures (e.g., WEMWBS scores and data on access to relevant services) with additional qualitative insights from other sources (e.g. MIND data).

Table 4-12: Data sources regarding Indicator 1.2C - Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm in rural communities

Data source	Measures	Frequency	Disaggregation	Notes
National Survey for Wales – Mental Well-being Module Results viewer dashboard	Warwick-Edinburgh Mental Well-being scale.	Annual	Age, health, material deprivation, religion, Welsh language use, urban/rural.	Large-scale, random sample
StatsWales Mental Health Statistics Dashboard	Aggregated data incl. prescriptions, diagnoses	Monthly updates	Some rural/urban classification, service type, time	Combines multiple sources; regional and service-level insights
Census for England and Wales (ONS)	Self-reported long-term mental health conditions	Every 10 years	Small-area geographies (e.g., Lower Super Output Areas)	Allows local authority-level analysis; trends over time

Data source	Measures	Frequency	Disaggregation	Notes
StatsWales Mental Health Statistics Dashboard	Referrals, diagnoses, prescriptions	Monthly (some variance)	Mostly Wales-wide totals, some rural/urban classification; demographics, service type, condition.	Aggregated clinical data; not occupation specific
ONS Mental Health and Suicide Data	Suicide rates by occupation. Breakdowns by Standard Occupational Classification (SOC) (incl. Farming)	Annual	Sex, age, method, residence.	FOI data available (2012 –2022) Recommended data source for suicide rates
Well-being of Wales Report	Collates data to track progress against WFG goals	Annual report	Rural/urban, population groups	
MIND – The Big Mental Health Report	Reports on published and qualitative evidence collected by YouGov on behalf of Mind.	Report produced annually		

4.3.3.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	6	12	2	6

Stakeholders agreed mental health is an important issue, but most saw this indicator as too broad, weakly attributed, and at risk of under-reporting.

Coverage and attribution: Across green, amber and red voters, there was broad concern about the indicator's ability to capture the range of mental health issues. Many felt it was too general, covering all rural residents rather than agricultural workers, and questioned its direct attribution to farming or sustainable land management. Amber and red voters emphasised the need for disaggregated or sector-specific data to ensure farming issues are proportionately reflected in 1.3E meaning this more general rural indicator will act as a comparison.

Reporting and data quality: All groups highlighted that mental health is often under-reported, particularly in farming, meaning the measure could underestimate the scale of the challenge. Red and amber voters also noted that the data are binary and lack nuance on severity, with risks of perverse incentives to "under-measure."

Relevance to SLM and policy: Green and amber voters questioned how well the indicator links to SLM, arguing changes in rural mental health are strongly shaped by wider social and economic factors outside the remit of the Agriculture Act.

Overlap: Amber and red voters pointed to overlap with other indicators (e.g., 1.3E number/proportion of farmers/farm workers reporting mental health issues, and the Wellbeing of Future Generations (Wales) Act national indicators #27 and #29). Stakeholders felt indicator 1.3E would offer more direct relevance to agriculture and avoid duplication, however the team felt that if the two indicators were read together this would provide a meaningful comparison.

4.3.3.2 Baseline data

Data on mental health among rural households in Wales are fragmented and often limited in rural specificity. However, several key data sources offer insights into baseline conditions.

The National Survey for Wales (NSW), which uses the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) to assess mental Well-being, found that in 2022–23, the average Well-being score in Wales was 48.2 out of 70, reflecting overall medium mental well-being for adults across Wales, with higher scores associated with older age, good general health, absence of material deprivation, and regular physical activity. Data for 2024-25 will be available in October 2025.

NSW results can be viewed via a dashgoard on the Gov.Wales website, hosting detailed breakdowns of results and other official statistics. It enables users to explore mental health indicators by geography, including rural and urban classifications. For example, users can examine how Well-being scores vary by local authority, deprivation quintile, or health status. This granularity is essential for identifying disparities within rural areas, which are often heterogeneous in terms of income, age, and service provision.

Data from the Census and Annual Population Survey (APS), made available by the Office for National Statistics (ONS), provide further context. Both sources include self-reported information on the number of individuals living with mental health conditions and how these conditions affect their ability to perform everyday tasks. Collected every 10 years and organised by Lower Super Output Areas, the census enables long-term tracking of trends in mental health across different geographic regions.

Quantitative findings are complemented by qualitative research and advocacy from organisations such as Mind Cymru and the Wales Alliance for Mental Health (WAMH), a coalition of mental health charities. Mind's Big Mental Health Report for England and Wales combines published statistics with insights from qualitative research. Their reports highlight the impact of isolation, digital exclusion, and stigma on rural mental health.

Despite these data sources, the lack of a coordinated, rural-specific mental health monitoring framework hinders comprehensive understanding. The baseline suggests a mixed picture: while rural areas may exhibit some protective factors, they also face unique and persistent challenges that are not fully captured by existing national datasets.

Table 4-13: Available baseline statistics for Indicator 1.2C - Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm in rural communities

Data source:	Baseline/key statistics:
National Survey for Wales – Mental Well-being Module	Annual since 2016 on large-scale, analysis by age, general health, material deprivation, religion, physical activity, Welsh language use, urban vs rural location.
StatsWales Mental Health Statistics Dashboard	Dashboard brings together data from multiple sources, which offers regional and service-level data that can be cross-referenced with rural areas.
Census for England and Wales (conducted by the ONS)	Improvements in self-reported health were seen across many age groups, despite an ageing population.
Well-being of Wales Report	Annual report to track progress against the seven national Well-being goals under the Well-being of Future Generations (Wales) Act 2015.
MIND – The Big Mental Health Report	Annual report on data collected by YouGov for MIND, allowing Wales to be benchmarked against the rest of the UK.

4.3.3.3 Trends

The NSW is the most suitable data source for monitoring the number or proportion of rural community reporting mental health issues in Wales, as it provides consistent, population-level information using validated measures such as the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). However, the NSW does not routinely break down WEMWBS mental wellbeing scores by rural versus urban location. While the classification exists within the survey, it is not used in the latest releases for reporting wellbeing trends. An exception is the 2012–13 survey, which initially suggested urban–rural differences in wellbeing, though these differences disappeared once other factors such as health, income, and employment were taken into account. As such, there are currently no trend data available specifically for rural communities. For Wales as a whole, the NSW shows that average adult mental wellbeing scores have declined since before the COVID-19 pandemic, from around 51 in 2018–19 to 48.2 in 2022–23, with roughly a third of adults now reporting low mental wellbeing. Although scores have stabilised since 2021–22, they remain below pre-pandemic levels, and inequalities are evident, with wellbeing lower among younger adults, people in poorer health, and those living in more deprived areas. As new data is released the trends can be updated and reviewed.

4.3.3.4 Options for targets

A specific target for the indicator on the number or proportion of the rural community reporting mental health issues is not proposed at this stage. This is primarily due to the lack of disaggregated baseline and trend data, as the National Survey for Wales (NSW) does not currently publish Warwick-Edinburgh Mental Well-being Scale (WEMWBS) results by rural versus urban location. While an urban–rural classification exists within the survey, it has not been applied in recent reporting, and the only previous breakdown (2012–13) showed that initial differences between rural and urban areas disappeared after accounting for other underlying factors. Also, there was some concern that setting a target given the breadth of rural communities would be challenging given the focus of the SLM framework. Essentially this indicator acts as a point of comparison with 1.3E, which focuses on farmers and farm workers specifically.

To make this indicator more meaningful in the future, improvements to the NSW and other national datasets are recommended, including clearer application of rural/urban classifications and ensuring that sample sizes are sufficient to allow robust analysis. This would create an evidence base to inform realistic and evidence-driven targets, while also supporting alignment with broader frameworks such as the Well-being of Future Generations Act National Indicator 29: Mental Wellbeing.

Table 4-14: Summary Table: Possible targets for Indicator 1.2C - Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm in rural communities

Aspect	Details
Data Sources	NSW (mental health module), StatsWales, Census ONS, WWP, MIND
Frequency	In year reporting (StatsWales) Annual (NSW WWP, MIND), Every 10 years (Census ONS)
Disaggregation	Age, various geographies and demographics, Welsh language
Notes	Needs some further analysis to disaggregate data by rural areas.

4.3.4 Indicator 1.2D: Land Used for Horticulture

A metric for horticulture was suggested by multiple stakeholders in the first workshop as an appropriate indicator for SLM Objective 1 under various PoS. It has been placed under POS 1.2: Helping rural communities to thrive and strengthening links between agricultural businesses and their communities, because it is particularly amenable to short supply chains and community engagement. In Wales, horticulture enterprises are typically small scale and use local supply chains. A 2020 report for Tyfu Cymru noted that the majority of enterprises are under 5 ha and use a mix of box schemes, community supported agriculture and other direct to customer sales. The limited additional processing ahead of sales makes it easier than other sectors.

As with short supply chains more broadly, resilience of food supply was raised as another reason to track horticultural production. Wales and the UK overall is particularly reliant on fruit and vegetable imports. The UK Government's Food Security Report 2024 notes that the UK produced just 53% of vegetables and 16% of fruit it consumed in 2023 and imports depend on a relatively small number of countries and are vulnerable to climate impacts.

Whilst indicators for horticulture could theoretically include volume of produce, area or number of enterprises, area is the only one regularly tracked at a Wales level. Although the relationship between production and area varies significantly between crops and farms.

Table 4-15: Data source for indicator 1.2D - Area used for horticulture

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Survey of Agriculture & Horticulture 2024	Hectares of land used for different types of crops in Wales.	Annual	Lists area for: Vegetables & Salad grown in the open. Commercial orchards. Other orchards & small fruit. Total hardy nursery stock. Glasshouses	Likely to exclude many small-scale enterprises. Ready to go data with annual ha of land dedicated to horticulture listed.

4.3.4.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	12	6	2	6

This was a popular indicator.

Some queried hectares as a metric, noting that not all land is suitable and suggesting only economically viable land be included; another noted that many horticulture enterprises are productive micro-businesses on very little land (implying volume would be better than area).

Another noted that horticulture is not always sustainable and does not always use local supply chains. Assessing productivity, sustainability and route to market makes would be desirable, this will require additional work, whereas hectares are ready to go.

Comments from those that selected green included suggesting this indicator for PoS 1.1 (producing food in an environmentally sustainable way) and adding an indicator focussed on protected horticulture (greenhouses and polytunnels) as this is particularly productive. Another noted the need to increase fruit & vegetable consumption and queried whether a separate dietary outcomes indicator was needed.

Those that marked red and some that marked amber queried why the measurement was limited to horticulture, noting that other sectors can support strong local supply chains. This is true, however, for most sectors the main barriers to consumers purchasing local food is processing infrastructure (e.g. local abattoirs, dairies etc) rather than limited local production. This is best addressed by tracking and increasing such infrastructure (see 1.2A). Conversely access to local fruit and vegetable does not usually depend on processing infrastructure but is significantly limited by the very low production in Wales (see baseline below); where fruit & veg farms do exist, they often generate strong engagement from local communities.

Welsh Government feedback queried how potential tensions between this indicator and 1.5D: PPP use in Agriculture could be managed as an increase in horticulture could lead to an increase in use in Wales. This could be mitigated through incentivising integrated pest management and organic production.

4.3.4.2 Baseline data

Land dedicated to various categories of horticulture in Wales is recorded in the June Agriculture & Horticulture survey. Proportion of land for horticulture hovered at or below 0.1% of total agricultural land in Wales for the last 10 years. Note that potatoes are excluded from the figures because from a farm operational perspective they are typically closer to arable and from a nutritional perspective they are not classed as a vegetable.

Table 4-16: Available baseline statistics for Indicator 1.2D – Land used for horticulture

Data source:	Baseline/key statistics:
Survey of Agriculture & Horticulture	2015: 1,599 ha dedicated to horticulture (excluding potatoes) 2024: 1,599 ha dedicated to horticulture (excluding potatoes) representing around 0.1% of Welsh land.
Farming Connect Horticulture	502 fruit & vegetable enterprises registered with Farming Connect Horticulture in 2024.
Welsh Fruit & Veg, Tyfu Cymru Baseline Study, 2020	204 fruit and veg enterprises identified for Tyfu Cymru (Farming Connect Horticulture's predecessor) in 2020.

4.3.4.3 Trends

Table 4-17: Changes in horticultural area (ha) 2015-2024

Crop/land use	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Vegetables & Salad grown in the open	449	458	464	499	325	N/A	298	288	319	344
Commercial orchards	356	356	373	357	336	N/A	336	327	322	319
Other orchards & small fruit	402	373	428	433	474	N/A	504	521	545	529
Total hardy nursery stock	363	413	410	366	319	N/A	281	264	322	379
Glasshouse	29	28	27	23	26	N/A	24	25	26	28
Total horticulture	1,599	1,628	1,702	1,678	1,480	N/A	1,443	1,425	1,534	1,599
Total agricultural land area	1662573	1677073	1686733	1722988	1763949	1697623	1,783,894	1,765,566	1,767,734	1,775,205
Horticulture as % of total Agricultural Land	0.096%	0.097%	0.101%	0.097%	0.084%	N/A	0.081%	0.081%	0.087%	0.090%

Source: *Survey of Agriculture & Horticulture*

No data were recorded for 2020, but since 2021 total land area for horticulture has increased by 11%. Looking over the last 10 years this recent increase simply reverses a reduction (overall levels are the same in 2015 and 2024), the recent increase is bucking a broader UK trend, which has seen a recent reduction in land for horticulture.

This increase has coincided with Welsh Government introducing new dedicated support for Welsh horticulture since 2022 including through and development grants helping with capital costs and the Welsh Veg into Schools Scheme providing a route to market and reliable price for Welsh organic vegetables. Welsh Government have also explored barriers to development to small scale horticulture, and made initial steps at addressing these in the planning system. Training and mentoring support has also increased through the establishment of Farming Connect Horticulture, while Local Food Partnerships and other community focussed initiatives have built engagement and connections between farmers, consumers, voluntary organisations and food businesses.

This support came in a context of low historic financial support for horticulture, which is poorly supported by area-based payments such as BPS. This is because the high cost and high output per hectare compared to livestock and arable means that horticulture enterprises are typically significantly smaller in area.

4.3.4.4 Options for targets

No existing numerical targets for area of land for horticulture in Wales were found. However, a December 2024 Cabinet Statement committed to support horticulture growth with a goal *"to foster a larger, vibrant horticulture sector"* and referenced Wales's strong history of fruit & vegetable production (prior to mid-20th century). The subsequent Community Food Strategy includes an Objective to maximise opportunities for community growing and small scale horticulture.

On the basis of these commitments, it is reasonable to assume a high ambition from Welsh Government.

Research into the potential for fruit & vegetable production in Wales (Wheeler, 2018) found that 2% of Welsh land could produce enough fruit & vegetables for 5 a day for everyone in Wales. This shows what is possible with enough time and support, but as the current baseline less than 0.1% it would require a 29 fold increase in land dedicated to fruit & veg production and therefore it therefore not achievable by 2030.

Following discussions with an academic and Lantra - Farming Connect Horticulture, a target of 100% increase in land dedicated to horticulture by 2030 is suggested as ambitious but definitely achievable target.

Whilst this is high percentage increase, it is building on a very low baseline in terms of land area and were all considered achievable based on the momentum that has built up around horticulture in recent years.

Possible targets for the next 5 years period could be:

- *Minimal Goal (Status Quo)*
  - Increase by 11% in line with recent trends.
  - Policy Implication: continue to expand support schemes identified above at current rate of growth. Identify and address barriers to accessing support. Continue to address barriers in planning system already identified.

- *Moderate Goal (Sustainable Improvement)*
  - For example, increase area of land dedicated to horticulture by around 60%.
  - Policy Implication: increase rate of growth in support for existing schemes for financial support, training, and market development. Ensure horticulture included in optional & collaborative layers of Sustainable Farming Scheme. Address administrative and planning barriers identified.

- *Ambitious Goal (Transformative)*
  - Increase land area dedicated to horticulture by e.g. 100% increase to at least 0.2% of Welsh agricultural land.
  - Policy Implication: This would require a substantial increase in rate of investment in all points of support identified above.

Table 4-18: Summary table: Possible targets for Indicator 1.2D – Land used for horticulture

Aspect	Details
Data Sources	Survey of Agriculture & Horticulture
Frequency	Annual
Disaggregation	Vegetables & Salad grown in the open (not including potatoes) Commercial orchards Other orchards & small fruit Total hardy nursery stock Glasshouse Total horticulture
Notes	Some market gardens and other small horticulture enterprises may not be picked up by this survey as they may not have been picked up by Welsh Government.
Possible Targets	Minimal: maintain 11% increase in land dedicated to horticulture. Moderate: e.g. 60% increase in land dedicated to horticulture. Ambitious: Increase overall land dedicated to horticulture significantly by e.g. 100%.

4.4 Purpose of Support 1.3: Improving the resilience of agricultural businesses

4.4.1 Indicator 1.3A: Levels of diversification in farm products and adoption of climate adaptation techniques

It is widely recognised that a diverse range of farm products and introducing new land management techniques helps in the transition towards a more resilient farming sector. This combined indicator is being considered as it is part of the ERAMMP evaluation process and has been subject to other analysis in recent years by other organisations. The main source of the data to underpin an indicator in this area would logically come from the ERAMMP M&E framework in the form of the data linked to the ADAS Farmer Practice Survey as there are three distinct data points in 2011, 2016 and 2023. However, while data on both diversification and climate adaption are reported in various ERAMMP reports, it has not been possible to determine how diversification is defined or what climate adaptation options were offered. If this indicator is adopted, then the link to the data which underpin it will need to be accessible so definitions and options for both diversification and climate adaption can be assessed. This will reduce concerns among in interested parties outside of WG.

The other data options to consider are the Wales Farm Business Survey (WFBS), which considers diversification in terms of the actions undertaken and the impact on revenues but it has less relevance to climate change mitigation. The last report looking at this in detail was in 2017. NFU reports in 2018 and 2023 have focused on diversification, but only the 2018 report is available. This does include a clear definition of diversification, but data are reported for the whole of the UK and not just for Wales.

Table 4-19: Data sources for Indicator 1.3A: Levels of diversification in farm products and adoption of climate adaptation techniques

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
ADAS Farmer Practices Survey	Looks at climate change adaptation action and business improvement through diversification. However, the data on diversification isn't clear on what is considered and what isn't.	The survey has been conducted three times. Initially in 2011, then in 2016 and most recently in 2023.	By changes in management and business improvement actions.	Dataset is not accessible. Tricky to understand how findings were reached from the survey. Does not define diversification.
NFU Diversification Report	Self-reported diversification aspects within farm businesses.	Infrequently. A report from 2018 is accessible. A further report from 2023 is known to exist but not accessible.	Broken down into headline statistics, by farm type, diversification type, funding type.	Data in report is for the entire UK, not just Wales. Defines diversification.
Farmer Business Survey	Examines diversification actions and revenues in England and Wales.	One-off 2017 report.	By farm size, by diversification action.	Looks at diversification, not as relevant to climate change adaptation.

4.4.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	4	15	1	6

The main concern among those stakeholders who gave an amber vote for this indictor was that it incorporated two separate issues around farm product diversification and climate change adaptation. Others mentioned that terms such as 'diversification', 'resilient' and 'adaption techniques' need to be clearly defined when included within an indicator. There was a request for the farm practices survey to be more granular and frequent in order to collect the data that is required to underpin this indicator. The one red vote was cast as the stakeholder felt the indictor connected two separate issues.

4.4.1.2 Baseline data

The stakeholder feedback noted that it was difficult to determine how the data from the ADAS Farmer Practice Survey (FPS) under ERAMMP were obtained. While the findings reported in the table below are interesting, without being able to access the definition of diversification and what aspects of climate change adaptation were offered. Nevertheless, the FPS reports, based on three separate surveys, do provide some details that reveal some of the changes that are taking place in Welsh farming. There have also been reports by the NFU on diversification and the Farm Business Survey (FBS) in 2017 looks at diversification from an economic perspective and covers both Wales and England.

Table 4-20: Available baseline statistics for Indicator 1.3A - Levels of diversification in farm products and adoption of climate adaptation techniques

Data source:	Baseline/key statistics:
Farmer Practice Survey	Business improvement: +9% of farms taking action on diversification. Sits within a wider context of between 16 and 83% having taken actions to improve aspects of the farm business in the past three years. 25-40% of land managers in GE and GA schemes had made land management improvements that would contribute to climate change adaptation.
NFU	(2018 data) 62% of UK farms have diversified.
Farmer Business Survey	Diversified revenues represent 3.4% of total income in Wales compared to 7.7% in England. Property rental makes up 52% of diversification revenue.

4.4.1.3 Trends

Trends in this area are difficult to determine as there are no consistent data or reporting. The farm practice survey suggests that farm businesses are increasingly looking to diversification in order to broaden their business base, but this is not the same as broadening their range of agricultural products. Likewise, there is some evidence that farm businesses are responding to the impact of climate change through adopting adaption approaches but there are no trends available.

To improve the reporting and monitoring of both diversification and climate change adaption there needs to be more transparency on the FPS so that the definition of diversification and the areas of questioning on climate change adaptation can be examined in more depth.

4.4.1.4 Options for targets

This is a new area without existing data to underpin the indicator, although there may be some useful starting points in the FPS and the FBS. Therefore, we suggest that, in parallel with the development of the indicator, evidence is collected that will help in the formation of a suitable target based on the best available evidence.

Table 4-21: Summary Table: Possible targets for Indicator 1.3A - Levels of diversification in farm products and adoption of climate adaptation techniques

Aspect	Details
Data Sources	ERAMMP FPS (ADAS), NFU, FBS
Frequency	Every 6 years or so (FPS), infrequent (NFU 2018 and FBS 2017)
Disaggregation	LA/LSOA, rural inferred from geography
Notes	Data limitations, lack of detail on phrasing of questions and options offered

4.4.2 Indicator 1.3B: Net farm income (showing levels of public funding)

There are a number of data sources covering farm income and it was agreed by the stakeholder group that the source used should show the level of income that derives from public funding, both agri-environment scheme (AES) payments and Basic Payment Scheme (BPS). Because there are a number of sources, consideration needs to be given to the most robust. This might not be the one which has the longest track record but the one which will be able to be standardised and accepted as being robust by stakeholders.

The AgriStats data show extreme variability in this area due to high levels of global volatility and farming remains reliant on government support to deliver environmental objectives and continue food production. The advice received is to avoid the Aggregated Agri income data, which has a longer data run, as it has to follow UK protocols and the methods are under review.

The most detailed data on farm incomes in Wales are collected by the WFBS. It was made very clear in the consultation that this indicator should relate to agricultural production income and exclude income from other sources, such as diversification (see discussion for Indicator 1.1A).

Table 4-22: Data sources for Indicator 1.3B: Net farm income (showing levels of public funding)

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Welsh Government: Farm incomes. Annual reports. 2023-24	Gross average farm income for all farms & by type. Also shows costs.	Annual	Divided by type: Dairy, cattle & sheep less favoured area (divided by severely disadvantaged and disadvantaged), cattle and sheep (lowland) and other.	Also shows Variation in Farm Business Income by Farm Standard Output Size in Wales, 2023-24.
Stats Wales income data	Farm Business income, Cash Farm Income & **Net Farm Income.**	Annual	Separates out Dairy Farms, SDA Sheep Farms, SDA Grazing Farms, DA Grazing Farms, Low Grazing Farms	

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Farm Business Survey https://www.gov.wales/farm-incomes-april-2023-march-2024-html	Farm income	Annually	By farm type, by costs	Does not examine the public funding role in income.

4.4.2.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	16	4	1`	5

While most were supportive of this indictor, some had reservations. The one red vote noted that net farm income 'doesn't reflect the true cost of farming' as it does not account for unpaid family labour or levels of dept and could therefore provide a misleading picture of financial reality. The text around the indictor does acknowledge that it is not perfect.

The four amber votes noted that the indicator focuses on the economics and this doesn't account for the issue of profitability (or lack of it). One suggested that gross margins might be a different way of viewing the issue. Another concern was that this indicator on its own does not account for the method of production and highlighted the need to the outputs from this indicator with other under this objective. Finally, one stakeholder suggested that the figures might need to be corrected for farm size.

Overall, there was support for this indicator noting that over time it will provide an insight into how local, national and global issues impact the sector and no one year should be taken as a snapshot.

4.4.2.2 Baseline data

There are large amounts of data from a number of sources showing farming incomes and the levels of support from AES and BPS. It is clear that a sustainable level of farm incomes is the ambition of the SLM framework. However, the data appear to show extreme variability in this area due to high global volatility and farming remains reliant on government support to deliver environmental objectives and continue food production. The advice received is to avoid the Aggregated Agri income data, which has a longer data run but do not comply with analysis standards and has to follow UK protocols and the methods are under review.

The most detailed data on farm incomes in Wales are collected by the FBS. For example, the figures for 2023-24 show that whilst most income for the average farm (£28,600) appears to be from the public purse (£27,500), this hides a huge amount of variability by farm type and individual farm. How to interpret this data is open to discussion, is a greater gap between income and public payments a suggestion of a more sustainable and resilient agricultural system?

It was made very clear throughout the consultation that this indicator should relate to agricultural production income and exclude income from diversification practices such as B&B. This is possible but what is included and excluded needs clarifying e.g. should income output from woodlands would be included or excluded? As a result, consideration to separating out as an agreed agricultural production output compared to other income (e.g. B&B) going forward needs to be agreed.

Table 4-23: Available baseline statistics for Indicator 1.3B - net farm income (showing level of public funding)

Data Source	Baseline/Key Statistics
Welsh Government: Farm incomes. Annual reports. 2023-24	Farm incomes show some volatility from year to year, influenced by prevailing agricultural (including weather related) and market conditions. There is also wide variation in farm incomes for individual farms, including for farms of the same type.
AgriStats Wales income data	Best to use 2023-24 standardised data, which show large variability (-27% to +63%) without a consistent trend. Large variability in AES without a consistent trend. Lowest level of income (£28,000) in 2023-24 and lowest level of income extracting AES and BPS (£2,000).
Farm Business Survey https://www.gov.wales/farm-incomes-april-2023-march-2024-html	Average Farm Business Income of £28,600 for 2023-24. BPS and AES so for 2023-24 the total value would be (£23,200 + 4,300 = £27,500

4.4.2.3 Trends

The average farm business income by farm type is captured in the Farm Business Survey. The last 10 years of data are displayed in Figure 4-2.

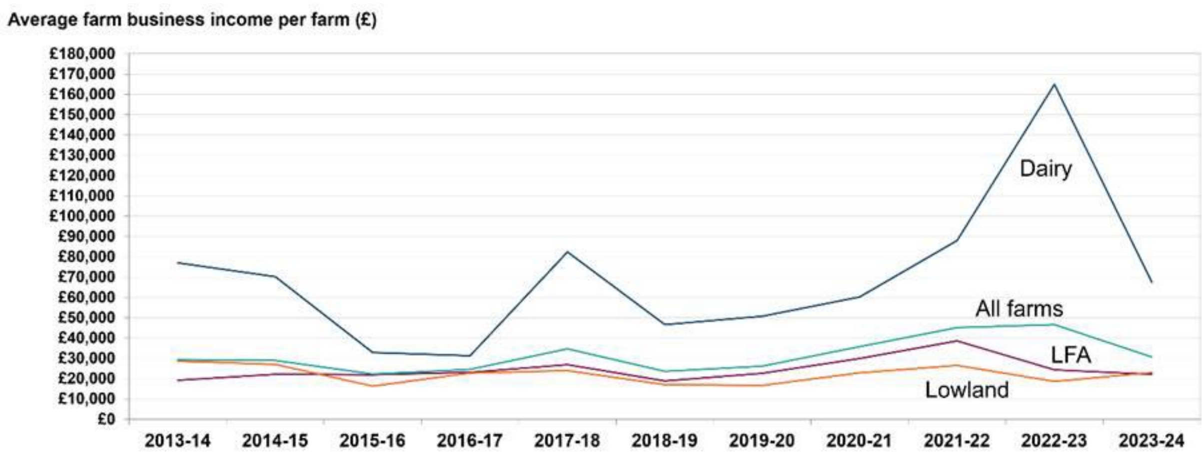

Figure 4-2: A line chart showing average farm business income by farm type between 2013-14 and 2023-24. (Welsh Government, 2025: Farm incomes: April 2023 to March 2024)

The table shows the volatility in farm income over the past decade with large fluctuations, especially in dairy. Other farm types generate lower levels of income and have a higher proportion of financial support from public sources. As shown in Table 4-23 this can represent the majority of the farm income.

Reporting and monitoring: To improve the reporting and monitoring of levels of agricultural income, several steps could be taken. First, the review of the AgriStats needs to be completed and the benefit of these data to understanding the situation in Wales determined. The data from the FBS need to be clarified in terms of definition of farm income and its representativeness of the situation in Wales. national surveys such as the Family Resources

Survey and the National Survey for Wales Collaboration between government and other interested parties could help develop a more meaningful and trusted indicator that makes best use of the wide range of data available. This would ensure that the unique challenges faced by the farming sector are consistently captured and addressed in policymaking.

4.4.2.4 Options for targets

Setting targets for this indicator is particularly difficult due to multiple external factors that could impact net farm incomes and the potential lack of influence that the SLM framework may have. However, it is important that the indicator is kept, to assess the ambition of the Welsh Government under the SLM framework that farm incomes in agriculture increase while at the same time meeting the challenges of climate change, restoring nature and protecting the countryside (Welsh Government 2023). Some public investment is required to fulfil the SLM objectives but its ability to influence overall levels of net farm income compared to national and global issues may be limited.

Table 4-24: Summary Table: Possible targets for Indicator 1.3B - Net farm income (showing level of public funding)

Aspect	Details
Data Sources	WG, AgriStats, FBS,
Frequency	Annual
Disaggregation	Sector, geography and demographics
Notes	Clarify definitions in FBS data and AgriStats to meet required standards.

4.4.3 Indicator 1.3C: Agricultural workforce numbers

A workforce-based indicator was initially proposed in the TEG, with a specific suggestion to track new entrants. The justification was that for agriculture to be resilient as an industry overall, it needs to be able to attract new workers and entrepreneurs, including both those from farming families and others.

During the first stakeholder workshop it was pointed out that retaining existing farmers and farm workers was also a crucial part of the sector's resilience. Therefore, tracking those leaving the sector is also important. Robust data for those joining and leaving the sector were not found. Whilst it may be possible to deduce this from employment statistics, the most straightforward metric to use is trends in total numbers.

Overall agricultural workforce numbers are reported on in the June Agriculture & Horticulture Survey. This includes farm employees and principal farmers and family members that work on the farm. Contractors are not included because they are self-employed and often farmers themselves and therefore included in a separate category. These data are ready to go but only to track overall workforce numbers.

Table 4-25: Data source for indicator 1.3C – agricultural workforce numbers

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Agriculture & Horticulture Survey	Number of people working in agriculture including principal farmers.	Annual – survey carried out on a single day in June each year.	Reports principal farmers, directors, business partners and their spouses together. Employees (part time and full time) are reported separately.	Contractors are not included because they are self-employed and often farmers themselves and therefore included in a separate category.

4.4.3.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	15	5	0	6

This was a popular indicator with no objections raised.

Some respondents suggested amendments including: a) adding workforce numbers in the broader agricultural supply chain to capture indirect employment impact; b) adding workforce numbers in other land-based occupations such as forestry, landscape management, conservation and nature-based tourism; c) adding agricultural contractors who are not currently included as farmers in their own right; d) adding non payroll family labour (note spouses are already included if they work on the farm and other family members are included if on payroll); and e) tracking hours as an alternative to the number of workers.

As this indicator is related to the resilience of agricultural businesses purpose of support, we maintain it is important to track the agricultural workforce on as a standalone metric. Furthermore, there is already annually published data available to track this straightaway.

Tracking other inherently rural land-based occupations makes sense: these occupations are likely to increase in demand due to the SFS and it is indicative of the broader resilience of rural communities. No ready to go data on this were found, although it may be possible to disaggregate annual ONS employment data.

There is also a logic for tracking supply chain employment data. Identifying which supply chain jobs are directly related Welsh farming will require significant investigation and we recommend examining it as part of the broader supply chain indicator research.

Suggested amendments c), d) and e) above are likely to be easier, but data are not currently available.

4.4.3.2 Baseline data

There was an estimated total of 49,538 agricultural workers in Wales in 2024. Employed regular and casual workers made up a quarter of the total numbers, with the majority being both full and part-time principal farmers (including directors, business partners and spouses that worked on the farm).

Table 4-26: Available baseline data for Indicator 1.3C – Agricultural workforce numbers

Data Source	Baseline/Key Statistics
Agriculture & Horticulture Survey	In 2024 the Agriculture & Horticulture Survey estimated 49,538 agricultural workers in Wales including full- and part-time principal farmers, directors, business partners and their spouses, as well as regular and casual workers.

4.4.3.3 Trends

The total number of agricultural workers in Wales dropped by an average of 1.6% per year between 2020 and 2024. Between 2023-2024 it dropped by 1.4%.

Table 4-27: Trends in agricultural workers in Wales (2015-2024)

Worker Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
All principal farmers, directors, business partners and their spouses - full-time	19,307	18,564	18,324	18,274	18,052	18,689	17,802	18,223	18,014	16,621
All principal farmers, directors, business partners and their spouses - part-time	22,312	21,339	21,657	21,028	21,621	18,593	20,151	20,195	20,228	20,697
Total regular and casual workers	16,700	13,621	11,962	12,942	13,183	15,527	12,448	11,458	12,002	12,220
Total Labour	58,319	53,524	51,943	52,244	52,856	52,809	50,401	49,876	50,244	49,538

Source: Agriculture & Horticulture Survey

4.4.3.4 Options for targets

A target for this specific indicator was not discussed with stakeholders or the TEG, but a new entrants target was. There was strong support for having a target for attracting new entrants on the basis that people coming into farming (whether from farming families or outside) was vital for ongoing sector resilience and a high target was considered important, though no specific target was suggested.

There are no known specific WG targets for total agricultural workforce numbers or new entrants; however, Welsh Government have been explicit about their support new entrants in both the design of SFS and with specific programmes such as Start to Farm.

Given feedback from the TEG on the desire for an increase in young entrants, together with the fact that the above data show total agricultural workforce numbers have fallen at an average annual rate of 1.6% between 2020 and 2024, a minimal goal should be to maintain current workforce numbers, whereas moderate and ambitious goals should involve growth. The quality of the jobs created also needs to be considered.

- *Minimal Goal (Status Quo):*

- Maintain current workforce numbers (0% growth) ensuring that agricultural jobs are of good quality, well paid, and not exploitative.
- Policy Implication: Continue support for new entrants.

- *Moderate Goal (Sustainable improvement):*
  - Restore workforce numbers back to 2020 baseline over next five years (1.6% average annual growth over this period)
  - Policy Implication: Increase number of new entrants, e.g. by improving access to finance and creating new opportunities for young farmers.

- *Ambitious Goal (transformative):*
  - Grow workforce numbers by an average of e.g. 2.5% per year over the next five years, in order to exceed the 2020 baseline.
  - Policy Implication: Even greater investment in new entrants, e.g. through access to finance and new opportunities.

Table 4-28: Summary table – possible indicators for Indicator 1.3C – Agricultural workforce numbers

Aspect	Details
Data Sources	Welsh Government "Agriculture and Horticulture Survey"
Frequency	Annual
Disaggregation	Shows total combined number of principal farmers, directors, business partners and their spouses, disaggregated by full- and part-time. Also shows total number of regular and casual workers, no further disaggregation.
Notes	None.
Possible Targets	Minimum (status quo): Maintain current levels i.e. 0% growth Moderate: e.g. 1.6% average growth over 5 years noting the ambition to increase high quality jobs Ambitious: e.g. 2.5% average growth over 5 years noting the ambition to create high quality jobs

4.4.4 Indicator 1.3D: Agricultural workforce age

As noted under indicator 1.3C, the original intention had been to track new entrants into farming, but robust data reporting numbers of new entrants were not found. However, farmer and farm worker age is recorded. Whilst individuals can of course start careers in farming at any age, a decreasing average age implies a greater number of young people starting careers in the sector, whilst an increasing average age implies fewer new entrants.

Welsh Government reported that the average age of the principal decision maker or head of holding was 61 years old in 2016, with the majority over 55 (68%), with just 3% are under 35 years old.

Combining data on overall numbers working in agriculture with age of farmers and farm workers would give more information on the long-term resilience of the workforce.

The Census data allow tracking of age against either industry or occupation, in different groupings. However, as it is only annual, more regular data would be preferable.

The most straightforward way to source both total number and average age of agricultural workforce would be to add a question on age of each worker to the June Agriculture & Horticulture Survey.

Table 4-29: Date source for indicator 1.3D Agricultural Workforce Age

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
Office for National Statistics Census Dataset Create (2021)	Data on age of farmers and farm workers in Wales can be found by selecting: country, age, and industry or occupation.	Every 10 years	Census records age, occupation and/or industry.	Age can be shown in groupings or individual years. Occupations and industries grouped in different options.
Agriculture in Wales (2019), Welsh Government	Various agricultural facts and figures including average age of principal farmer/decision maker.	One off	Includes stats for "principal farmer" age	No info on agricultural workers' age.

4.4.4.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	13	7	0	6

This was a popular indicator which was generally supported with no major concerns raised.

Some noted that age as an indicator did not sufficiently reflect new entrants or succession challenges.

A couple of stakeholders did not think age was necessarily relevant to resilience or outputs.

Several stakeholders argued that other demographic diversity factors should also be included with race and gender mentioned in particular.

We agree that other demographic indicators are valuable and we would welcome their introduction in future as a means of tracking equality of access and diversity. We nonetheless prioritise age at present, because of its particular relationship to the long-term resilience of the sector.

4.4.4.2 Baseline data

Table 4-30: Available baseline statistics for Indicator 1.3D – Agricultural workforce age

Data Source	Baseline/Key Statistics
Office for National Statistics Census Dataset Create (2021)	The mean average age of a Welsh person working in "crop and animal production, hunting and related service activities" in 2021 was 51 years old. As this is by industry rather than occupation it likely includes head of holding farmers, contractors and employees. Note that neither "farming" nor "agriculture" were found as standalone options for industry. Alternatives grouped them either forestry and fishing or energy and water.
Agriculture in Wales (2019), Welsh Government	The average age of the principal decision maker or head of holding was 61 years old in 2016, with the majority over 55 (68%), with just 3% are under 35 years old. As this comes from data that assign one person in each farm as the key decision maker, it does not necessarily reflect the age of all the partners in the business. No information on agricultural worker age.

4.4.4.3 Trends

No trends for this indicator were found. A matching industry description was not identified in the 2011 census data.

4.4.4.4 Options for targets

There are no known WG targets for the average age of the agricultural workforce in Wales. However, as with total workforce numbers, Welsh Government statements and programmes in support of new and young entrants suggests there would be support for such an indicator in principle. A current lack of historical trend data makes it difficult to estimate a reasonable percentage reduction in average age for both the moderate and ambitious goals, and we suggest that the minimal goal remains to maintain the current average age of agricultural workers.

Minimal Goal (Status Quo)

- Maintain the average age of agriculture workers in Wales
- Policy Implication: Continue training and other support for new entrants. Support old farmers with succession planning

Table 4-31: Summary table- possible targets for Indicator 1.3D – Agricultural workforce age

Aspect	Details
Data Sources	Office for National Statistics Census Data 2021
Frequency	10 years
Disaggregation	Number of people of each age by year working "crop and animal production, hunting and related service activities". Mean average calculated.
Notes	While currently only gathered once every 10 years through the census, this data could be gathered by adding a new question on worker age into WG's June Agriculture & Horticulture Survey.
Possible Targets	Minimal (Status Quo): maintain average age of Welsh agricultural workers

4.4.5 Indicator 1.3E: Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm by farmers/farm workers

The mental health and Well-being of farmers and farm workers is a critical, yet often overlooked, factor in achieving sustainable food and goods production. There are also links with other policy objectives/strategies, such as the 'Mental Health and Well-being Strategy' and the 'Suicide and Self-Harm Prevention Strategy'.

Farming is a physically demanding and emotionally taxing profession, shaped by unpredictable weather, financial uncertainty, regulatory pressures, and social isolation. These stressors can significantly impact decision-making, productivity, and long-term resilience. Poor mental health not only affects individual Well-being but also undermines the stability of farm businesses and the wider rural economy. As Wales strives to meet sustainability goals—balancing environmental stewardship, food security, and rural livelihoods—farmer Well-being must be recognised as a key performance indicator. Monitoring mental health trends and setting clear targets for improvement will help ensure that the people at the heart of sustainable land management are supported, resilient, and able to thrive. Without healthy farmers, sustainable production cannot be achieved. It is worth noting that connections with Farm Health and Safety would be sensible going forward.

There was broad support from the stakeholders for this indicator and it was recognised that the mental health and Well-being of farmers and farm workers in Wales is a growing concern. This is shaped by a complex mix of occupational, environmental, and social pressures. It was noted that a Farm Support Group exists with representation from different organisations across Wales.

The development of a practical monitoring approach will depend on national statistics being able to aggregate data across sectors in order to provide insight into the unique challenges faced by the Welsh farming community. Because of this need to be sure that existing data can be disaggregated in an appropriate manner, we suggest that this indicator is best categorised as 'modified existing'. We feel that a robust indicator is possible but will need to combine quantitative measures (e.g., WEMWBS scores and data on access to relevant services) with additional qualitative insights from other sources (e.g. MIND and RABI data).

Table 4-32: Data sources for Indicator 1.3E: Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm by farmers/farm workers

Data source	Measures	Frequency	Disaggregation	Notes:
Royal Agricultural Benevolent Institution (RABI) - Big Farm Survey	Warwick-Edinburgh Mental Well-being Scale, Generalised Anxiety Disorder 7 (GAD-7) Scale, self-reported depression, sources of stress, help-seeking behaviour:	One-off (2021)	Region, gender, age, farm type/size, employment role	Conducted in partnership with University of Exeter. 15,500 responses.
National Survey for Wales – Mental Well-being Module	Warwick-Edinburgh Mental Well-being scale.	Annual	Age, health, material deprivation, Welsh language use, urban/ rural.	Large sample; no breakdown by job role or sector
StatsWales Mental Health Statistics Dashboard	Referrals, diagnoses, prescriptions	Monthly (some variance)	Mostly Wales-wide totals, some rural/urban classification; demographics, service type, condition.	Aggregated clinical data; not occupation specific
ONS Mental Health and Suicide Data	Suicide rates by occupation. Breakdowns by Standard Occupational Classification (SOC) (incl. Farming)	Annual	Sex, age, method, residence.	FOI data available for farmers (2012 – 2022) Recommended data source for suicide rates
Opinions and Lifestyle Survey (ONS)	Self-reported mental health status, stressors, access to and use of mental health services	Monthly	Age, sex, region, occupation (using SOC), industry sector, employment status.	Sample size: around 1,000-2,000 adults per wave; covers farming via SOC codes
Census for England and Wales (ONS)	Self-reported measures of long-term mental health conditions.	Every 10 years	Local authority; occupation	No published farming specific analysis for Wales.

4.4.5.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	11	6	1	8

Stakeholders generally supported the indicator as more targeted than indicator 1.2C (a more general rural mental health measure) although a number expressed no view, while noting significant limitations around reporting, attribution, and understanding root causes.

Relevance and attribution: Green and amber voters agreed this indicator is more directly relevant to agriculture than broader rural mental health measures. It targets farming populations, aligning better with sustainable land management objectives. However, several stakeholders noted that the indicator does not explain the underlying causes of mental health issues or distinguish between work-related stress and other factors.

Reporting limitations and data completeness: Across all voter groups, concerns were raised about under-reporting. Farmers may not recognise stress, loneliness, or despair as mental health issues, and rural communities may be less inclined to seek help. Red and amber voters also highlighted that capturing only reported cases risks incomplete or misleading trends. A perverse incentive was noted: reporting less could make outcomes appear more positive. Green voters suggested supplementing official data with information from rural/farming mental health charities.

Scope and broader wellbeing: Amber voters highlighted that mental health is only one aspect of overall wellbeing. Other factors, including physical health, safety, and socio-economic pressures not linked to SLM, can influence farmer wellbeing.

Overlap: One red voter suggested considering existing Well-being of Future Generations (Wales) Act indicators (27 and 29) and disaggregating data for the farming community to improve relevance and completeness.

4.4.5.2 Baseline data

The mental health and Well-being of farmers and farm workers in Wales is a growing concern, shaped by a complex mix of occupational, environmental, and social pressures. While national statistics often aggregate data across sectors, several key sources provide insight into the unique challenges faced by the Welsh farming community.

The most comprehensive sector-specific data comes from the RABI Big Farming Survey (2021), which gathered responses from over 15,000 individuals across England and Wales. It found that 36% of respondents reported being "probably or possibly depressed," and 47% showed signs of anxiety. These figures were higher among women (58%) and livestock farmers, the latter being more prevalent in Wales. Farmers on smaller holdings, also common in Wales, were more likely to report poor mental health. The most frequently cited stressors included regulation and compliance, unpredictable weather, financial uncertainty, and succession planning. There was no specific Wales analysis.

The National Survey for Wales (2022–23), while not occupation-specific in its published outputs, provides valuable context. It uses the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) to assess population Well-being. The overall average WEMWBS score for adults in Wales was 48.2 in 2022-23. Importantly, the survey collects data on occupation, meaning that with access to the raw data, researchers could isolate and analyse the Well-being of agricultural workers specifically.

The StatsWales Mental Health Statistics Dashboard aggregates data from health services, education, and public health. While it does not disaggregate by occupation, it provides regional insights into mental health service use and outcomes, which can be cross-referenced with rural areas where farming is prevalent. The dashboard is updated periodically and includes indicators such as GP consultations, hospital admissions, and prescriptions for mental health conditions.

The Office for National Statistics (ONS) contributes further context through its suicide data by occupation, which includes agricultural workers. Between 2012 and 2022, suicide rates among farmers in England and Wales remained a serious concern, with 44 suicides registered in 2022. Although the numbers for Wales alone are small and often suppressed for confidentiality reasons. For example, in some years, fewer than 5 suicides were recorded among farmers in specific Welsh local authorities, making it difficult to publish detailed breakdowns without risking identification.

Finally, the 2021 Census collected self-reported data on long-term mental health conditions and occupation, offering a valuable but underutilised resource. While no published analysis has yet combined these variables to focus on farmers in Wales, the raw data set could support such research.

The 'Supporting farming communities at times of uncertainty' report led by Public Health Wales, and the Mental Health Foundation, outlines mental health challenges specific to farmers and farming families, including financial stress, isolation, and succession planning. The report includes qualitative insights and recommendations but not detailed quantitative statistics.

In summary, while Wales lacks a single, unified dataset on farmers' mental health, multiple sources—RABI, the National Survey for Wales, StatsWales, ONS, and the Census—collect relevant data. Together, they paint a picture of a profession under strain, with elevated risks of depression, anxiety, and suicide, particularly among women, livestock farmers, and those on smaller farms. There is a clear need for continued monitoring, targeted support, and more granular analysis to inform policy and intervention.

Table 4-33: Available baseline statistical data for Indicator 1.3E – Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm by farmers/farm workers

Data Source	Baseline/Key Statistics
RABI	From 15,000 responses in 2021 it reported 36% of respondents reported being "probably or possibly depressed," and 47% showed signs of anxiety.
National Survey for Wales – Mental Well-being Module	The overall average WEMWBS score for adults in Wales was 48.2 in 2022-23.
StatsWales Mental Health Statistics Dashboard	Dashboard brings together data from multiple sources, which offers regional and service-level data that can be cross-referenced with rural areas.
Census for England and Wales (conducted by the ONS)	Improvements in self-reported health were seen across many age groups, despite an ageing population.
Well-being of Wales Report	Annual report to track progress against the seven national Well-being goals under the Well-being of Future Generations (Wales) Act 2015.

Data Source	Baseline/Key Statistics
MIND – The Big Mental Health Report	Annual report on data collected by YouGov for MIND, allowing Wales to be benchmarked against the rest of the UK.

4.4.5.3 Trends

It is not currently possible to calculate reliable trends in the number or proportion of farmers and farm workers reporting mental health issues in Wales. The RABI Big Farming Survey, conducted in 2021, remains the most comprehensive sector-specific dataset, with over 15,000 responses across the UK. However, as this survey has not been repeated, it provides only a baseline snapshot rather than trend data, and results for Wales specifically are not published. Similarly, the National Survey for Wales collects information on occupation but does not produce occupation-specific wellbeing outputs, meaning no national dataset currently provides trend data for the mental wellbeing of the farming community in Wales.

4.4.5.4 Options for targets

There are currently no Welsh Government targets for the mental health and wellbeing of farmers and farm workers in Wales. The wellbeing of this population is a critical aspect of rural health and sustainable land management and improving it aligns with the objectives of the Well-being of Future Generations Act, particularly Indicator 27: Sense of Community and Indicator 29: Mental Wellbeing. In developing targets, our approach balances the available evidence with the limitations of current data, while aiming to encourage measurable improvements in mental health outcomes for farmers and farm workers.

Given the absence of robust, Wales-specific trend data for farmers and farm workers, the proposed targets focus on maintaining current levels and supporting sustainable improvements through evidence-based interventions. The approach recognises the value of existing national surveys, such as the National Survey for Wales (NSW) and the Opinions and Lifestyle Survey (OPN), which could be enhanced by routine disaggregation of mental health data by occupation, specifically identifying agricultural roles. This would provide actionable insights without requiring entirely new data collection infrastructure.

The success of the RABI Big Farming Survey demonstrates the value of sector-specific research. Building on this, a regularly repeated, Wales-focused farming wellbeing survey, co-developed with farming organisations and mental health experts, would provide timely, sector-specific data to guide policy and service delivery.

Therefore, we suggest that only the minimal target of 'no further decline' is considered until trend data can be determined.

- *Minimal goal (status quo):*
    - Prevent further decline in mental health indicators among farmers and farm workers by 2030.
    - Maintain current levels of self-reported Well-being (e.g. average WEMWBS score of ~48.2). Keep depression and anxiety prevalence stable (e.g. 36% reporting probable/possible depression). Ensure suicide rates among agricultural workers do not increase beyond current levels (e.g. 44 suicides in 2022 across England and Wales).

- Policy implications: Focus on stabilising mental health services available to farmers and farm workers through continued support for existing schemes and monitoring of uptake of relevant services.

Table 4-34: Summary Table: Possible targets for Indicator 1.3E - Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm by farmers/farm workers

Aspect	Details
Data Sources	RABI, NSW, StatsWales, ONS, OLS
Frequency	OLS (monthly), NSW & ONS (annual), Regularly (Stats Wales), baseline (RABI)
Disaggregation	LA/LSOA, +rural inferred from geography
Notes	Data limitations, lacking single, unified dataset on farmers' mental health, but multiple sources collect relevant data.
Possible Targets	Minimal: no further decline by 2030

4.5 Purpose of Support 1.4: Achieving and promoting high standards of animal health and welfare

4.5.1 Indicator 1.4A: Animal Health & Welfare Indicator

No suitable indicator was found to measure animal health and welfare and therefore more research is needed. We held discussions with staff from the Office of the Chief Veterinary Officer (OCVO) and discussed various options that could be used for an indicator. Whilst there is significant work between OCVO, Welsh Government, vets, farmers and other organisations aimed at tackling disease and other animal health and welfare, there is insufficient data to enable a specific metric to be used.

There are areas where additional research could lead to the development of valuable indicators and the ability to set targets. It is important to work with farmers and vets to develop approaches that are robust, fair, build trust, keep data anonymous and not incentivise under reporting.

Tackling Diseases: Indicator and target setting in relation to disease control needs to account for what is and what is not in farmers' control. There are measures that farmers can take to reduce the risk of disease outbreaks and these should be followed. However, there are many circumstances outside of farmers control including extreme weather events and endemic disease outbreaks compounded by common farming practices including high numbers of animal movements between farms and variable uptake of biosecurity advice.

The two diseases that OCVO recommended be explored for potential indicators and targets were Cattle Bovine Viral Diarrhoea (BVD) and sheep scab:

- **BVD** is highly infectious disease which opens the door to further diseases and has causes significant distress amongst infected cattle. It should be easy to track and Welsh Government already wishes to control and ultimately eradicate it and has started exploring monitoring approaches. Further investment is needed to get to a point where it can be properly monitored and there is enough information to set targets.

- **Sheep scab** was considered the most appropriate disease in sheep to monitor and set targets to reduce. It is further behind CBVD in terms of developing a monitoring approach or getting to the point of setting targets; however, starting this work would be valuable.

Animal Health & Welfare Pilot projects: There are various pilot projects looking at ways to monitor animal welfare and health more broadly. These should be followed and the results examined to see if the approaches piloted could be broadened across the farming sector. These include:

- Arwain DG's syndromic surveillance pilot is exploring the use of Artificial Intelligence (AI) technology as a complementary method of disease surveillance on livestock farms in Wales. It is currently in its infancy.
- Good Life AI: Enhancing positive welfare for Welsh livestock through computer vision AI technology.
- Beefed-Up Mobility: Enhancing Beef Cattle Performance and Welfare by developing a resource to mirror that available in the dairy sector.
- A positive future for farm animal welfare in Wales: Defining assessments and proposing funding strategies for positive welfare solutions, starting on beef and sheep farms.

Sustainable Farming Scheme Measures: The SFS will require farmers to undertake various animal health and welfare measures and develop plans with their vets. The SLM indicators and targets need to go beyond SFS, examining the impact of these measures could help inform indicators for the sector more broadly.

Considered but not recommended: Regulatory minimum: OCVO staff noted that some statistics on the number of farms that pass the current regulatory minimum on animal health and welfare standards are collected as part of cross compliance investigations, but the sample size is small. Furthermore, the SLM Framework aims to go beyond the regulatory minimum. Therefore, this was not considered to be a suitable indicator.

Considered but not recommended: Antibiotic Use Data: There is a lot of good work on monitoring antibiotic use and improving antimicrobial/antibiotic use stewardship in the Welsh lamb, beef and dairy sectors for this reason it was initially considered as an indicator and discussed with stakeholders. However, OCVO did not consider levels of antimicrobial use to be an appropriate indicator and specifically cautioned against setting targets for it. Reasons for this included:

- Tackling antimicrobial resistance is not a devolved policy area so Welsh Government does not have the power to make regulations on it. They can collaborate with farmers and vets to improve best practice in particular sectors, and have developed a strategy for tackling antimicrobial resistance in animals, but regulatory power is limited.
- There is a law of diminishing returns when it comes to reducing AMU. Welsh sheep and cattle may be close to the point where further reductions in antibiotic use don't have a material benefit for antimicrobial resistance.

- Reduction is not always the right approach for a given farm, and it is important not to pressure vets and farmers against using antimicrobials when they are needed. The best approach is to focus on good farm stewardship and making the best-informed decision on antibiotic use for that specific situation.

Considered but not recommended: Veterinary investigation data centres: Veterinary investigation data centres track samples sent in by vets to improve knowledge of animal health and disease status across the UK. However, whilst they are useful monitoring sources, they are not suitable for developing indicators for specific points at present as their work depends on what is proactively sent in by vets.

Recommendation: Welsh Government should commission additional research into monitoring and tackling VBD and sheep scab and consider whether it is appropriate to set targets. They should also track the pilot projects noted above and investigate whether the results could be used to set broader animal health and welfare targets.

4.5.1.1 Stakeholder feedback on proposed indicator

Stakeholders were consulted on the Antimicrobial Use indicator as that was the previous proposal (see Annex 3).

<table>
<tr><td rowspan="2">Total respondents = 26</td><td>Acceptable</td><td>Acceptable with caveats</td><td>Not acceptable</td><td>Don’t Know</td></tr>
<tr><td>10</td><td>8</td><td>1</td><td>7</td></tr>
<tr><td colspan="5">Whilst some support for tracking AMU in principle, there was significant concern that it is neither an accurate nor sufficient metric of animal welfare. In particular stakeholders cautioned against it being considered an indicator of negative animal welfare and potential to disincentivise antibiotic use when needed. Others noted the need to account for varying reasons why use might fluctuate and potential issues with data.

Additional substances to track included other medicines such as anthelmintics and ionophores which are antibiotics that are regulated as feed additives/anticoccidials rather than antibiotics and very prevalent in poultry production.

Alternative animal welfare metrics proposed included: aspects of animal husbandry such as overall health and resilience; membership of assurance schemes; livestock performance; and use of vaccines.</td></tr>
</table>

4.5.1.2 Baseline data

No baseline data are available as the indicator is not yet confirmed and further research is required on all potential options or components.

4.5.1.3 Trends

No trends have been identified as the indicator is not yet confirmed and further research is required on all potential options or components.

4.5.1.4 Options for targets

Existing targets: Welsh Government has already stated that it aims to eradicate BVD (Welsh Government statement, 24 June, 2024) suggesting an appetite for a target on this.

No targets are suggested in this report as further research is required before determining an appropriate animal health and welfare indicator.

4.6 Purpose of Support 1.5: Resource efficiency

4.6.1 Indicator 1.5A: Utilised Agricultural Area

Some members of the TEG and Stakeholders requested that **Agricultural Output (1.1A)** was standardised by the amount of land being used for agricultural production, workforce employed and the amounts of inputs as fertiliser, feed, organic manures and PPP use. This has been accepted with a recommendation that total factor productivity data be developed for Wales.

With respect to area, **Utilised Agricultural Area (UAA) (1.5A)** is proposed as the indicator following the advice of the WG Statistical Services Division (WGSSD). UAA refers to the total area of land used for farming activities, including arable land, permanent grassland, permanent crops, and kitchen gardens. UAA excludes areas like woodland, buildings, farmyards, and land not directly used for agriculture.

Note that depending on the data source and definition used, the area of agriculture land in Wales varies from 1,258,669 to 1,984,000ha i.e 30% of total land area of Wales (Table 4-36).

Table 4-35: Source of data for Indicator 1.5A - Utilised Agricultural Area (1.5A)

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
Welsh Government Statistics Division (Data not yet available online)	Utilised Agricultural Area (ha)	Annual	None	Welsh Government will be publishing this data shortly to support this report but provided the data ahead of this publication to the ERAMMP team

4.6.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	12	5	2	7

A variety of comments provided here suggested this should be part of a suite of indicators to indicate sustainable production. This was indeed the intention as indicated in the full report. We appreciate time limitations are significant for everyone in reading the full report. Others asked what the indicator covered again not recognising that what categories of land was included in the area was fully captured in the report. Others suggested this indicator did not capture the social and economic value of the land or that land could be better used for nature conservation purposes.

4.6.1.2 Baseline data

Some members of the TEG and stakeholder community asked that yield could be reported in efficiency terms i.e. with respect to the area of land used and inputs applied (see 1.5B and C). WG advised the use of the Utilised Agricultural Area (hectares) which they would publish soon to support this SLM indicator work which we have taken on board.

Table 4-36: Available baseline statistics for indicator 1.5A – Utilised Agricultural Area

Data Source	Baseline/Key Statistics
WG Statistical Division Utilised Agricultural Area (UAA) (Data to be published online soon)	2024 1,258,669 hectares Area of land (hectares) refers to the total area of land used for farming activities, including arable land, permanent grassland, permanent crops, and kitchen gardens. UAA excludes areas like woodland, buildings, farmyards, and land not directly used for agriculture.
UKCEH Land cover Map [Wales National Trends and Glastir Evaluation | ERAMMP]	2021 1,984,000ha if urban, freshwater and excluded and all other habitats included. Area of land by different land use types within which it is possible to identify the change in improved land area which is likely to produce the greatest agricultural output. Whilst not recommended as data source this data provides a useful cross-check as it use earth observation data to track change across Wales and is now reported annually.
WG Survey of Horticulture and Agriculture [survey-agriculture-and-horticulture-june-2024-651.ods]	2024 1,948,000ha A WGsurvey of a subsample of land holdings intended to provide key statistics relating to the agriculture sector.
Wales Agriculture Land Classification [Agricultural land classification: predictive map | GOV.WALES]	2019 1,258,669ha This is considered a potential value.
LPIS [Welsh Government: Land Parcel Identification System (LPIS) Farm and Field Boundaries (3rd Party Data)]	2021 1,367,843ha This only includes land holdings who claimed payments.

4.6.1.3 Trends

Current trends in UAA indicates an ongoing loss of area of 5% over 10 years or 0.5% per year. The best quality agricultural land should ideally be protected from urban sprawl and conversion to other land use types to ensure ongoing food security (note this does not however include all UAA which will include land of variable Agriculture Land Classification types (ALC 1-5) types. Generally, ALC 1-2 would be considered those most relevant to protect.

Loss of arable and Improved grassland (likely to be the more productive land) of 5% was also reported by ERAMMP Report-105 with no change in semi-natural habitat (Woodland and Urban land increased) over the last 10 years.

An analysis of actual Agricultural Land Classification types could be done (i.e. overlain with the UKCEH landcover map) to identify the quality of the land lost but this has not been done to date.

4.6.1.4 Options for targets

No WG policies or ambitions are available with respect to this indicator. Our recommendations are this indicator is considered part of the narrative of capturing sustainable food production rather than a standalone indicator.

4.6.2 Indicator 1.5B: Total Inorganic Fertiliser and Feed Use (all crops and grass) (kt)

With respect to fertiliser use, the British Survey of Fertiliser Practice (BSFP) is the primary source of data on **Total Inorganic Fertiliser Use (1.5B)** in Great Britain. The results from the Survey are used by the British fertiliser industry, by Government and by the wider agricultural and environmental community. Data are reported for England & Wales, Scotland and GB as a whole i.e. separate Wales data are not available.

Data for inorganic fertiliser use are also captured for Wales separately by the Wales Farm Practice Survey (WFPS). The WG Statistical Services Division advised the more robust data to use were the BSFP as it also included the use of organic manures and was available for a longer time period (1942 compared to 2017-18 to present day). However subsequent to this discussion the robustness of the organic manure data has been questioned by stakeholders.

To explore the potential bias of using combined England and Wales data for inorganic fertiliser date, a comparison of the trends between the two surveys for total inorganic fertiliser use was carried out. The results indicate a very similar picture with a 22% decline for total inorganic fertiliser use for England and Wales for the period 2017/18 to 2023/24 (BFPS 2023) compared to a 29% decline for Wales only (WFPS 2023-24). In both surveys, the decrease in fertiliser use is primarily presumed to be due to increased cost. The greatest reduction in use is seen for phosphate by 41-50%, potash by 32%-34% and nitrogen by 14-26%. Note that the total inorganic fertiliser use is total use rather than average use per hectare to report the cumulative effect of both the few farms with high use and many farms with relatively low use which all contribute to total agricultural output. In addition, it is only these data which are reported by both surveys thus enabling a direct comparison of trends.

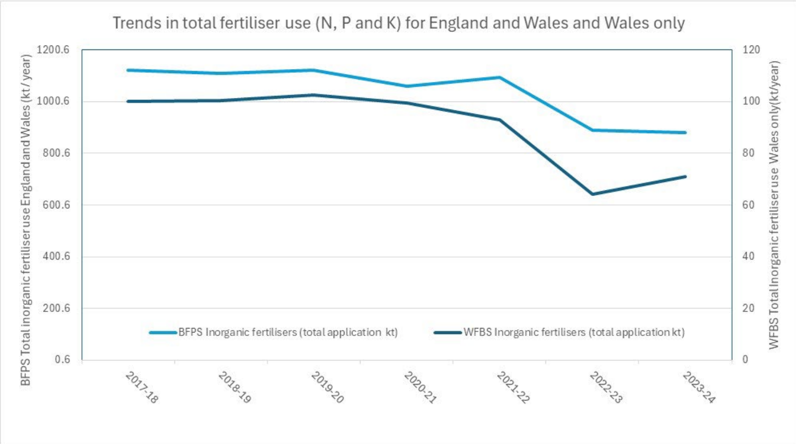

Figure 4-3: A comparison of trends over time for Total Inorganic Fertiliser Use 1.5B (aggregated weight of nitrogen, phosphate and potash) over time reported by the British Fertiliser Practice Survey and the Wales Farm Business Survey.

The conclusion is that the use of the data from the BFPS provides relatively robust data for Wales alone although ideally the WFPS could collect organic manure information going forward as the BFPS recognise that their survey design is not optimal to capture this information and anyway trends for Wales may increasingly diverge over time.

The use of feed is more uncertain. UK import figures for soya bean meal are available (e.g. EFECA – UK Roundtable on Sustainable Soya, Annual Progress Reports) and it is generally assumed 75% is used within animal feed. Some major assumptions would have to be made to convert to Wales use alone e.g., see ERAMMP Report-69 (Prosser, 2022) where the proportion of the UK animal population in Wales was calculated assuming the major uses are for dairy cattle and broiler chickens to estimate an import figure for Wales only. This indicator is identified as a potential future indicator as an agreed methodology for disaggregating Wales only data should be agreed between WG and the industry.

As for other indicators listed in this section, inorganic fertiliser use should form part of an overall assessment of resource use efficiency and total factor efficiency of agriculture assessment.

Table 4-37: Sources of data for Indicator 1.5B - total inorganic fertiliser use and feed

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
British Fertiliser Practice Survey (BFPS) [British survey of fertiliser practice dataset - GOV.UK]	Total inorganic fertiliser used (all farms; crops and grass) (kt / year)	Annual	Aggregation of total nitrogen, phosphorus and potash use Note disaggregation of England and Welsh data is not available.	England and Wales data are combined in this survey. However, a comparison with the Wales Farm Business Survey (WFBS) Wales inorganic fertiliser use data indicated similar trends for Wales although there was a greater decline in use over the last 5 years for Wales alone.

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
				The benefit of using the BFPS is they also report on use of organic manures which the WFBS does not report. However, this data is not considered very robust.
Wales Farm Business Survey NPK Application by Farm Type	Total application of Inorganic fertiliser use (kg)	Annual	None	Data from 600 farms using structured sampling approach but no data on organic manures are collected.
Animal feed UK-Soya-Annual-Progress-Report-2023-.pdf	Import of Soya to the UK	Annual	Disaggregation approach needed for Wales only reporting	No data is available for Wales. Going forward, disaggregation of UK data could be possible if a methodology was agreed.

4.6.2.1 Stakeholder feedback on proposed indicator

Total respondents = 21	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	14	6	1	5
There was strong support for this indicator including particularly with its combining with total food output. There was also strong support the urgent need to obtain robust data on feed and organic manure use for Wales which is currently not available. Concerns that the overall picture reflects a decline in use of inorganic fertiliser for grasslands whereas use in arable land has remained static. Other comments concern the interaction with the use of organic manures and CoAP regulations. Nitrogen use efficiency and timing of application is critical as well as conditions during application will influence its value for production. All are valid comments however for the overall national indicator, total use may remain valid.				

4.6.2.2 Baseline data

This indicator again relates to the request to relate change in output relative to inputs. Here it is the use of inorganic fertiliser namely, nitrogen, phosphorus and potash. Note that whilst feed was also requested there is no current nationally robust data source for Wales.

Table 4-38: Available baseline statistics for Indicator 1.5B – fertiliser use (and crops and grass and feed)

Data Source	Baseline/Key Statistics
British Fertiliser Practice Survey (BFPS) British survey of fertiliser practice dataset - GOV.UK	2024 Total inorganic fertiliser used (all farms; crops and grass) (kt / year) 881kt

4.6.2.3 Trends

Trends over time are available in total use since 2014 to the present day. Use has declined by 26% i.e. a 2.6% reduction per year.

4.6.2.4 Options for targets

Possible targets in the next 5 years could be:

- *Minimal Goal (Status Quo)*
  - Maintain current use levels at 2024 levels (i.e. no change): which if linked to continued ongoing increased in output would suggest an overall increase in efficiency with respect to use of inorganic fertilisers.
  - Policy Implication: Accepts that current use by some farms in excess of crop needs may continue leading to economic and environmental costs. Policy focus on soil testing in SFS could improve this situation but only if advice is sought from advisers, as could encouraging more uptake of regenerative agriculture practices e.g. use of legumes.

- *Moderate Goal (Sustainable Improvement)*
  - Maintain current ongoing declines in rates of use i.e. 2.6% less per year: Maintain current reduction rates of 2.6% per year to support ongoing reduction in costs and reduced environmental impacts however this should be focussed on farms where inputs are not well matched to crop needs or are over known trigger points (see Indicator 1.1B).
  - Policy Implication: More focus on promoting soil testing and access to advisory services to support action related to test results could ensure outputs and output efficiency were increased but only if advice is sought from advisers, as could encouraging more uptake of regenerative agriculture practices e.g. use of legumes.

- *Ambitious Goal (Transformative)*
  - Accelerate reduction in use e.g. by 3.5% per year. This should be focussed on farms where inputs are not well matched to crop needs or are over known trigger points (see Indicator 1.1B).
  - Policy implication: As for moderate goal.

Table 4-39: Summary table – possible targets for Indicator 1.5B – total inorganic fertiliser use (kt)

Aspect	Details
Data Sources	British Fertiliser Practice Survey
Frequency	Annual
Disaggregation	Not possible to separate out England and Wales
Notes	This is combined weight of inorganic-N, phosphate and potash use. Note there is no current nationally robust data for feed use for Wales , only UK level.
Possible Targets	Minimal (status quo): No change to 2024 use Moderate: Maintain ongoing reduction in use rate e.g. 2.6% reduced use per year Ambitious: Accelerate reduction rates e.g. 3.5% reduced use per year

4.6.3 Indicator 1.5C: Organic manure use

Organic manure use (in contrast to inorganic fertiliser use) is increasing over time in GB although the quantities suggested by the BFPS do not compensate for the major decline in inorganic fertiliser use. It is not possible to aggregate inorganic and organic use in terms of either weight or nutrient content currently and they are therefore listed as separate indicators. It should also be noted that the BFPS emphasise the survey is likely to be less accurate with respect to organic manures and the data are only available for Great Britain as a whole. The data are not considered robust enough to be used for Wales currently. Ideally the Wales Farm Business Survey would collect data on manures going forward to produce a Wales specific indicator. As for inorganic fertiliser use, this indicator should form part of an overall assessment of resource use efficiency and total factor efficiency of agriculture assessment when robust data become available.

Table 4-40: Sources of data for Indicator 1.5C - Organic Manure use

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
British Fertiliser Practice Survey (BFPS) [British survey of fertiliser practice dataset - GOV.UK]	Organic manure use (% dressing cover all crops and grass)	Annual	Disaggregation of data for Wales only is not possible.	Data are for Great Britain.

4.6.3.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	11	8	0	7
Many questions were raised relating to the source of manures, whether this includes sewage, levels of contaminants and how manures are used as part of circular farm system versus those imported to farm. There were also many questions relating to the current robustness of data and potential for perverse outcomes.				

4.6.3.2 Baseline data

The use of organic manures is an important component of the farming system as they supply both organic matter and nutrients to the soil. If used or stored inappropriately they can also lead to issues for water and air quality, air quality and greenhouse gas emissions. The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 sets out compliance guidance for its use. Currently, there is a concern with the high number of non-compliant farms relating to COAP regulations.

Table 4-41: Available baseline statistics for indicator 1.5C – organic manure use

Data Source	Baseline/Key Statistics
British Fertiliser Practice Survey (BFPS) British survey of fertiliser practice dataset - GOV.UK	2024 Organic manure use (% dressing cover all crops and grass) 32% Note these data are for GB as a whole and are not currently available for Wales separately.

4.6.3.3 Trends

Trends in the use of organic manures (all crops and grass; % dressing cover) are available from 2014 to the present day. Its use has increased by 4% over this period from 28% to 32% i.e. an increase of 0.4% per year. However, these data are not considered sufficiently robust currently for their use in developing an indicator for Wales.

4.6.3.4 Options for targets

No options for targets are provided due to the many uncertainties as to current baseline, trends and what exactly are the ambitions for organic manure (and type) use is in Wales.

4.6.4 Indicator 1.5D: Plant protection products (PPP) use in agriculture

Agriculture uses many different chemicals for a variety of purposes. The term plant protection products (PPP) are those used to specifically protect plants by repelling or limiting the growth of pests, limiting the growth of weeds or modifying the growth of plants to combat harmful organisms or weeds. Here we propose the focus should be on PPPs only (as opposed to a wider range of 'pesticides' which include biocides and veterinary medicines) as they are most related to food production. As the issue of pollution is of increasing concern for both people and nature, it would be beneficial to capture data on this issue going forward as they relate to both soil and water quality as well as human health. Increased production of food as for land, workforce and fertilisers ideally should not be a result of increased PPP use.

The WGSSD indicated that there are no nationally robust data available for the use of PPP and pesticides more broadly in Wales. Even if this data was available simply looking at the volume of PPP used does not provide a reliable measure of whether there is a change in behaviour. It would not demonstrate for example whether there had been specific issues in a particular year relating to weather or pest pressure that meant that use was higher or lower than an average year. It would also not demonstrate whether there was greater use of a lower-risk PPP or higher use of a higher-risk PPP. The UK Pesticides National Action

Plan provides a UK pesticides target which specifically does not look at volume or weight but rather to reduce each of the 20 UK Pesticide Load Indicator metrics by at least 10% by 2030, taking figures for 2018 as a baseline. Another possible approach could be to track farmers taking up Integrated Pest Management approaches through the Sustainable Farming Scheme alongside those moving into organic production, both of which are associated with reduced use of PPPs but may be more appropriate as activity indicators.

In addition to data on PPP use, the legacy impact in the soil with likely consequences for the soil biological community and thus soil health (and potentially also legacy effects into crops directly), could be tracked. For soil, there is the potential of tracking PPPs in soil sampled and archived for the ERAMMP National Field Survey soil samples. Ongoing assessment in water bodies by NRW provides another source of potential information as to the ongoing and legacy effect of PPP use and build-up over time in freshwater and marine systems. Although there are difficulties with these approaches as the same 'active ingredient' may appear in a biocide or veterinary medicine or PPP meaning it could be impossible to distinguish the root source of any contaminant identified. Whilst disaggregating the current load versus the legacy effect would be challenging, this would perhaps provide the most targeted approach to identifying actual impact on natural resources in Wales resulting from changes in PPP use as inputs potentially decline and some PPPs are degraded through natural processes.

As for other indicators listed in this section, change in PPP use should form part of an overall assessment of resource use efficiency and total factor efficiency of agriculture assessment.

Table 4-42: Data source for Indicator 1.5C: Plant Protection Product (PPP) Use in Agriculture

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
FERA Pesticide Usage Surveys for the UK. Pesticides Usage Statistics - Home	PPP load metrics as described in the UK National Pesticide Action Plan	N/A for Wales	This would be a requirement for Wales only reporting	Legacy effects on soil and water could provide a more targeted approach for actual impact relating to ecosystem health.

4.6.4.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	12	7	3	4
Whilst in general there was a support, there were comments concerned the vagueness of what the indicator included (this was when the indicator suggested was 'Control Chemical Use' more generally which has now been clarified), what levels could be considered as relevant etc. A suggestion whether FERA data on pesticide use could be disaggregated for Wales was proposed. Also, a comment was made that a diversification of farm products and could increase the use of chemicals e.g. if grassland move to arable (and horticulture) where use of chemicals is greater could set different indicators in conflict e.g. with 1.3A.				

4.6.4.2 Baseline data

The use of PPPs is an integral part of farming systems however a move towards Integrated Pest Management to reduce both economic costs and potential environment impacts are being encouraged.

No Wales level were identified but disaggregation of the FERA survey data, Pesticides Usage Statistics, could be explored.

Table 4-43: Available baseline statistics for Indicator 1.5D – ***Plant Protection Product Use in Agriculture***

Data Source	Baseline/Key Statistics
FERA Pesticide Usage Survey PESTICIDES USAGE STATISTICS	Not available for Wales

4.6.4.3 Trends

Not applicable as this indicator does not yet exist

4.6.4.4 Options for targets

The UK Pesticides National Action Plan has a UK pesticides target to reduce each of the UK Pesticide Load Indicator metrics by at least 10% by 2030, taking figures for 2018 as a baseline.

5 Proposed indicators for SLM Objective-2

SLM Objective 2: **Mitigate and adapt to climate change**

There are four PoS which are of direct relevance to this SLM Objective:

- Reducing emissions of greenhouse gases (GHG)
- Maximising carbon (C) sequestration and storage
- Mitigating flood and drought risk
- Encouraging agricultural businesses to manage energy effectively including renewables

The final set of proposed indicators are coded by SLM Objective number and PoS (A-C where more indicators are proposed) and highlighted in bold with the indicator title and units.

The proposed indicators for SLM Objective 2 are set out in the table below.

Table 5-1: Proposed indicators relating to SLM Objective 2, by Purpose of Support

Purposes of Support relevant for SLM Objective 2	Indicator	Indicator status
2.1 Reducing emissions of Greenhouse gases (GHG)	2.1A. Annual greenhouse gas emissions from agriculture (Agriculture GHG Inventory)	Existing
2.2 Maximising carbon sequestration and storage	2.2A. Annual rate of carbon sequestration and storage (Land Use and Land Use Change and Forestry (LULUCF) greenhouse inventory).	Existing
	2.2B. Farm level carbon and/or greenhouse gas reporting tool	Potential future
2.3 Mitigating flood and drought risk	2.3A. Area of farmland subject to prolonged flood / drought from earth observation (EO) (where not intentional)	Potential future
	2.3B. Quantity of water abstraction licenses for Agriculture	Existing
2.4 Encouraging agricultural businesses to manage energy effectively including renewables	2.4A. Installed capacity of renewable electricity locally owned by Welsh farms, estates and communities.	Existing

5.1 Narrative for suite of indicators for SLM Objective 2

The requirements of SLM Objective 2 for mitigation and adaptation to climate change are becoming ever more urgent as Wales experiences more climate extremes. The indicators proposed cover the impact of agricultural activities, and land use more generally, on the rate of Greenhouse Gas (GHG) emissions and carbon sequestration and storage, as well as actions which could indicate the success of greater adaptation by the farming sector to cope with the increased frequencies of climate extremes – notably extreme heat, droughts and floods.

The SLM impact indicator proposed for reducing emissions of GHG **(PoS 2.1)** is the **Annual Greenhouse Gas (GHG) Emissions from Agriculture (2.1A)** as reported in the Wales Agriculture GHG Inventory. In Wales, these emissions arise primarily from activities linked to ruminant animals, be they direct emissions from the animal linked to enteric fermentation in the animal gut, or emissions relating to manure management. Actions which would reduce these emissions could include an overall reduction of animal numbers, shift in animal type, feed additives and actions to manage manures more efficiently.

For maximising carbon sequestration and storage **(PoS 2.2)** the impact indicator proposed is represented by the Land Use, Land Use Change and Forestry GHG Inventory which reports on activities linked to annual rates of **Carbon Sequestration and Storage (2.2A)** in trees, hedges, soils and peatlands. SLM supported actions could be through increased use of some regenerative agricultural practices, increased planting of trees and hedges and restoration of peatlands.

At a local scale, WG are committed to providing a **Farm level Carbon and/or GHG Reporting Tool (2.2B)** for all farms in the SFS scheme which could provide a future potential indicator although, as this will not represent all farms, this may not be suitable as a national impact indicator unless its uptake was supported by e.g. Farming Connect.

Two impact indicators are proposed which would demonstrate reduced risk of flood and drought (**PoS 2.3**). The first of these is the **Area of Farmland subject to prolonged flood or drought (where this is no intentional) (2.3A)**. The only likely source of such and indicator is the use of remote sensing. No current dataset is produced but could be developed e.g. using Living Wales data streams. The second indicator is one related to the **Quantity of Water Abstraction Licenses for Agriculture (2.3B)** provided by Natural Resources Wales (NRW) which is required for abstracting more than 20 cubic meters (20,000 litres) of water per day from a surface or groundwater source. Actions which could contribute to achieving both of these outcomes could include improvement of soil infiltration rates, use of more drought resistance crop varieties, creation of sacrificial flood areas, and natural flood management.

The best indicator to track the contribution of agriculture to renewable energy generation **(PoS 2.4)** is proposed as the **Installed Capacity of Renewable Electricity Locally owned by Welsh Farms, Estates and communities (2.4A)**.

A more detailed description of each of the proposed indicators, grouped under PoS for SLM objective 2 are listed below.

5.2 Purpose of support 2.1: reducing emissions of greenhouse gases

5.2.1 Indicator 2.1A: Annual Greenhouse Gas Emissions from agriculture

Greenhouse gas emissions are reported by ten different activity sectors which are aggregated up to create the overall UK GHG emissions budget. These inventories are also disaggregated to allow for reporting by the Devolved Administrations (DAs). There is an internationally agreed approach for calculating and reporting GHG emissions relative to a baseline rate of emissions established at 1990 levels. All emission estimates include the basket of seven Kyoto greenhouse gases in kilotonnes of CO_2 equivalents (CO_2eq). That said three tiers of approaches are available to individual countries for reporting which increase in their complexity and data requirements recognising available expertise and data are highly variable across nations. Change in methods of reporting by a country requires significant justification by a country to the Intergovernmental Panel for Climate Change (IPCC) who are responsible for the governance of GHG inventory reporting and collation. For a change in methodology to be allowed, the new method must stay within agreed methodologies and be well justified. Most recently, management or wetlands was included in the UK Agricultural GHG inventory due to the availability of data and significant activity in peatland and other wetland restoration which previously were not captured and therefore could not contribute to emission reductions.

The GHG inventory most relevant for agriculture is the Agriculture GHG inventory however, it should be noted that additional GHG emissions will be present in other inventories linked to agricultural activities e.g. fertiliser and plastics production. GHG emissions linked to fertiliser production is particularly significant and plastic production could be particularly important e.g. in the horticulture sector if significant plastic protection is used e.g. polytunnels. Carbon capture and storage reported in the Land Use, Land Use Change and Forestry GHG inventory is also highly relevant **(see Indicator 2.2A)** and is discussed below**.** The reporting lines within the Agricultural GHG inventory include many different entries relating to livestock emissions (e.g. methane from ruminants) , direct and indirect emissions relating to manure management, emissions from soil (e.g. nitrous oxide emissions which can increase with excess nitrogen and compaction), burning, liming and urea application.

The UK Government created a statutory obligation for the UK in June 2019 to achieve what is called 'Net Zero' with respect to reducing GHG emissions by 100% relative to the 1990 baseline levels by 2050. This target is devolved to each nation and each sector. Currently the Agriculture sector is having problems reaching this target due to the challenge of having a sector dominated by grazing ruminant animals and having a highly distributed community. One option for the sector is not just to decrease emissions but also increase carbon sequestration in soils and biomass (i.e. trees and wood products as other biomass such as grass and crops are considered temporary). This is reported in the Land Use, Land Use Change and Forestry (LULUCF) GHG Inventory.

The TEG and stakeholders recommended that the PoS and indicator for Reducing GHG Emissions by Agriculture (Indicator 2.1) were kept separate from the Maximising Carbon Sequestration and Storage potential (Indicator 2.2) to ensure perverse outcomes were not encouraged i.e. action to reduce emissions were slowed to account for increase sequestration and storage.

Table 5-2: Data source for Indicator 2.1A - Annual Greenhouse Gas emissions from Agriculture

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Agriculture GHG Inventory for Wales [Devolved Administration Greenhouse Gas Emissions | National Atmospheric Emissions Inventory]	Annual rates of GHG emissions (CO_2eq year^{-1})	Annual	Data are devolved from the UK inventory	Due to the need to follow UK protocols some enhanced data available in Wales e.g. the amount of peatland restoration cannot be used in the inventory.

5.2.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	14	4	1	7
There were mixed responses as to whether a net value should be reported integrating GHG emissions (2.1) and C storage (2.2). The issue of reporting on gases separately to capture the issue of short-lived methane GWP* was also raised to avoid 'demonising livestock'.				

5.2.1.2 Baseline data

Reducing the emissions of GHG from agriculture is a devolved commitment by Welsh governments to help ensure the meet the UK commitment to reach Net Zero by 2050 relative to 1990 baseline levels. The GHG inventories are the official source for national reporting in Wales, and whilst there are various known issues and improvements that could be made to these inventories (greatest concern relating to how methane is currently included as a short-lived GHG), WG are obliged to report on emissions using this indicator.

Table 5-3: Available baseline statistics for Indicator 2.1A – Annual Greenhouse Gas emissions from Agriculture

Data Source	Baseline/Key Statistics
Agriculture GHG Inventory for Wales Devolved Administration Greenhouse Gas Emissions | National Atmospheric Emissions Inventory	2023 5158 Mt CO2 eq/yr

5.2.1.3 Trends

Trends in the emissions are a reduction of 1% over 10 years (2013 to 2023) and a reduction of 3% over the last 5 years (2018 to 20023) relative to 2018 levels. However annual rates vary significantly and fluctuated between -1% to +6% over the last 10 years relative to 2013 levels . These rates are unlikely to ensure agriculture emissions will meet Net Zero ambitions even with carbon storage and sequestration accounted for (see Indicator 2.2).

5.2.1.4 Options for targets

There are interim targets approved by the Senedd as laid out in the various carbon budgets and progress towards meeting these targets are laid out in the Net Zero Wales reports. No attempt has been made below to match these various commitments to the targets below which rather follow principles for other targets which span just the next 5 years.

Possible targets for the next 5 years could be:

- *Minimal Goal (Status Quo)*
  - Maintain current reduction at recent 5-year levels i.e. -3% per year
  - Policy Implication: Accept agriculture will not meet its target for GHG emission reductions.

- *Moderate Goal (Sustainable Improvement)*
  - Improve the rate of reduction to e.g. -5% per year

- Policy Implication: This would help better meet the ambition of an average 58% decrease for Wales by 2030. This would require support to the agriculture sector to re-structure away from a reliance on ruminant animals which with animal wastes contribute the majority of GHG emissions from agriculture in Wales.

- *Ambitious Goal (Transformative)*
  - Accelerate rate of reduction to e.g. -10% per year
  - Policy implication: This would meet the average target of 58% for Wales by 2030. This would require significant support to the agriculture sector to re-structure away from a reliance on ruminant animals which, with animal wastes, contribute the majority of GHG emissions in Wales.

Table 5-4: Summary table – possible targets for Indicator 2.1A –Annual greenhouse gas emissions from agriculture

Aspect	Details
Data Sources	Wales Agriculture GHG inventory Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2023 | National Atmospheric Emissions Inventory
Frequency	Annual
Disaggregation	N/A
Notes	All emission estimates include the basket of seven Kyoto greenhouse gases in kilotonnes of CO_2 equivalents (CO_2eq). Best available data in Wales are not always possible to use in the inventory due to the need for consistency in data sources across the UK
Possible Targets	Minimal: e.g.-3% per year Moderate: e.g. -5% per year Ambitious: e.g. -10% per year

5.3 Purpose of Support 2.2: Maximising carbon sequestration and storage

5.3.1 Indicator 2.2A: Annual rate of Carbon Sequestration and Storage

Carbon sequestration into soils and biomass is reported in one of the ten activity GHG inventories at both UK and DA levels namely the Land Use, Land Use Change and Forestry (LULUCF).

In brief, land converted from any other land use to forestry will usually capture and store carbon whilst land moving from forestry to grassland, cropland or settlements will often create GHG emissions. The LULUCF GHG inventory is the only inventory which has the current potential to report negative GHG emissions i.e. uptake of CO2 equivalents, thereby offsetting emissions from other sources in the agricultural system (or indeed other sectors). However, to date this so called 'carbon sink or sequestration' potential is not increasing at a sufficient rate to compensate for current agricultural emissions. There currently remains an annual 5Mt CO_2eq gap between agricultural GHG emissions and carbon uptake / sequestration rates when comparing the Welsh Agriculture and LULUCF GHG inventories (Figure).

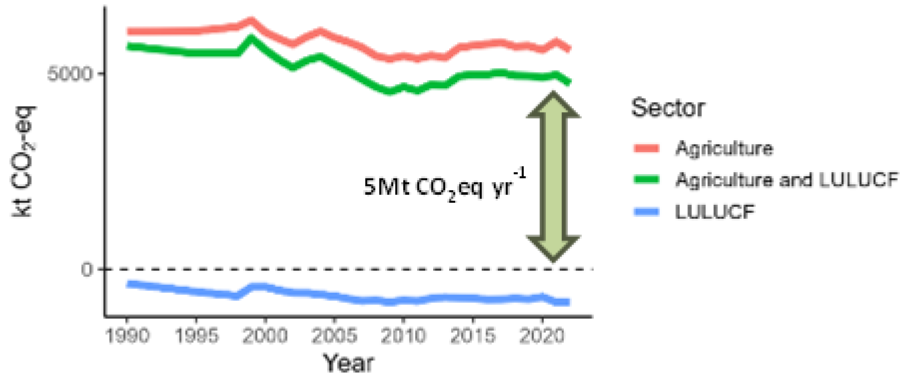

Figure 5-1: The current gap between GHG emissions from Agriculture and carbon sequestration and storage as reported by the Land Use, Land Use Change and Forestry GHG Inventory

Table 5-5: *Data source for Indicator 2.2A – annual rate of Carbon Sequestration and Storage*

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
Land Use, Land Use Change and Forestry GHG Inventory for Wales Devolved Administration Greenhouse Gas Emissions | National Atmospheric Emissions Inventory	Annual rates of GHG emissions (CO_2eq year^{-1})	Annual	These data are derived from the UK inventory	This inventory can report negative rates of GHG emissions which indicate uptake of CO_2eq into soils and biomass.

5.3.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	12	8	0	6

There was general acceptance of this indicator. The few comments received related to the need to include all farms including small. Whether carbon stored was permanent and whether saturation was a concern. Another comment suggested the need to include bioenergy with carbon capture and storage (BECCS).

Baseline data

Carbon captured or stored on soils, peatland and vegetation are reported in the Land Use, Land Use Change and Forestry GHG inventory.

Table 5-6: Available baseline statistics for Indicator 2.2A – annual rate of carbon capture and storage

Data Source	Baseline/Key Statistics
Agriculture GHG Inventory for Wales Devolved Administration Greenhouse Gas Emissions | National Atmospheric Emissions Inventory	2023 791.7 Mt CO_2eq/year

5.3.1.2 Trends

Since 2013, there has been a 0.8% increase in annual rates of capture and storage however annual rates fluctuate between -9% less capture and storage +11% more per year relative to 10 years ago in 2013. Capture and storage rates in 2023 are 15% of present-day agriculture emissions.

5.3.1.3 Options for targets

Possible targets for the next 5 years could be:

- *Minimal Goal (Status Quo)*
  - Maintain current rate of capture and storage
  - Policy Implication: Accept land use, land use change and forestry will not change its current contribution to helping agriculture meeting Net Zero.

- *Moderate Goal (Sustainable Improvement)*
  - Improve the rate of reduction to e.g. +5% per year
  - Policy Implication: This would increase the offsetting of present-day agriculture emissions to 20% per year. Policy support for actions to e.g. increase woodland and hedge planting and restore the most intensively emitting peatlands (i.e. not bogs) would be required.

- *Ambitious Goal (Transformative)*
  - Accelerate rate of reduction to e.g. +10% per year
  - Policy implication: This would increase the offsetting of present-day agriculture emissions to 25% per year. Even greater policy support for actions e.g. to increase woodland and hedge planting and restore the most intensively emitting peatlands (i.e. not bogs) would be required.

Table 5-7: Summary table – possible targets for Indicator 2.2A – annual rate of carbon capture and storage

Aspect	Details
Data Sources	Agriculture GHG Inventory for Wales Devolved Administration Greenhouse Gas Emissions | National Atmospheric Emissions Inventory
Frequency	Annual
Disaggregation	N/A
Notes	Best available data in Wales are not always possible to use in the inventory due to the need for consistency in data sources across the UK
Possible Targets	Minimal: No change to 2023 rates Moderate: e.g. +5% per year in rates of capture and storage Ambitious: e.g. +10% per year in rates of capture and storage

5.3.2 Indicator 2.2B: Farm level Carbon and/or GHG reporting tool

The Welsh Government has committed to provide each farm business in the SFS with a tool to baseline current carbon storage rates and GHG emissions. These data could use methodologies potentially not compliant with UK methodologies for GHG emission reporting, although that is to be decided. The benefits of this would be to include data which are available at farm-level and for Wales-only. Aggregation of this data across farms could provide another insight into the overall contribution of future actions undertaken through SLM with respect to climate mitigation.

This indicator is not available but is considered to have significant future potential if it is progressed by WG. The benefit of WG delivering this tool is the potential for consistency across all of Wales where an array of GHG tools currently is being used by some farmers. However, it should be noted unless a representative sample of farms outside of the SFS is also baselined, a national indicator will not be possible to produce.

Table 5-8: Data source for Indicator 2.2B - the Farm level Carbon and/or GHG reporting tool

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Farm level Carbon and GHG reports	The net effect of CO2eq emissions and sequestration and storage at a farm level	To be agreed	Rather aggregation of data to provide overall national trends could be an ambition together with better supporting action on the ground by farmers.	This is not available and no timeline or absolute commitment has been made by WG to provide this but it is being discussed

5.3.2.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	7	12	2	5
Comments on this indicator included that the value of the tool would depend on its useability for farmers and careful communication. The need to recognise short-lived nature of methane and use of GWP* to not 'demonise livestock' in the tool was also stated. The need to clearly demonstrate link to national GHG inventories was made. A concern that a net approach may be used for the tool combining emissions and sequestration could create perverse outcomes was also expressed. There was a request to include C emissions from inputs (e.g. fertiliser) and outputs (carbon miles from exports). There was a question about whether the indicator intended was the number of farmers using the tool or the actual trend data produced by the tool (the latter is intended and this is now clarified above). A need to ensure connectivity to other tools was stated by one stakeholder.				

5.3.2.2 Baseline data

WG have indicated a farm level carbon baseline will be a SFS requirement in year 2 of entry into the scheme. WG will use the data already held by, or available to WG to assist in the calculation. Farm level data may also be required to ensure a meaningful baseline calculation of the GHG emissions and carbon sequestration on farm.

Table 5-9: Available baseline statistics for indicator 2.2B – farm level carbon and/or greenhouse gas reporting tool

Data Source	Baseline/Key Statistics
WG farm level carbon and GHG baseline tool. See Sustainable Farming Scheme 2026: scheme description | GOV.WALES	See Chapter 9 of SFS Scheme 2026 publication.

5.3.2.3 Trends

No data are available

5.3.2.4 Options for targets

As no data are available no targets can be proposed.

Table 5-10: Summary table – possible targets for indicator 2.2B – farm level carbon and/or greenhouse gas reporting tool

Aspect	Details
Data Sources	WG Farm level carbon and GHG baseline tool
Frequency	Not known
Disaggregation	Aggregation to all Wales level is likely to be required
Notes	No further information is currently available however it should be noted that currently data will only be available for farms in the SFS so this will not capture all farms in Wales and therefore not be a national indicator unless a survey of other farms outside of the scheme is commissioned.
Possible Targets	Not possible at this time

5.4 Purpose of Support 2.3: Mitigating flood and drought risk

5.4.1 Indicator 2.3A: Area of farmland subject to prolonged flood / drought from Earth Observation (EO) (where not intentional)

The discussion in the TEG meetings and the meeting with wider stakeholders explored the possibility of developing a new indicator that uses earth observation (EO) data to show the amount of farmland that is subject to unintended prolonged flooding or drought (i.e. excluding land sacrificed for flood mitigation during peak events). The intention is to show the impacts of climate change and the ability of farmland and the wider landscape, including built up areas, to be resilient to the challenges of climate change. The main caveat is that those areas where the flooding is intentional, often to protect built up areas, are not included in the areas considered for the indicator.

Earth observation uses satellites and other remote sensing technologies to generate detailed images of farmland. As the quality of these increases and the analysis becomes more refined, through expert analysis and machine learning, EO could play a crucial role in monitoring and assessing the area of farmland impacted by prolonged floods and droughts. The analysis could include data on vegetation health, soil moisture, and water levels, thereby identifying areas at risk and quantify the extent of agricultural land affected by extreme weather events. This information would be beneficial for agricultural planning and developing strategies to mitigate the effects of climate change on food production.

Table 5-11: Data sources for Indicator 2.3A - Area of farmland subject to prolonged flood / drought from EO where not intentional

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
National LIDAR programme	Provides accurate elevation data at 1m spatial resolution for all of England	Regular since 2017, 2020-22 is publicly available	Over 100 survey blocks covering all of Wales, Products available in 5km tiles aligned to OS grid.	https://datamap.gov.wales/maps/lidar-viewer/
WG Earth Observation Program & Planet Labs	Offers licences to 20 university researchers	Covers 2,000 individual licenses	access high resolution, high frequency earth observation data.	https://epwales.org.uk/welsh-government-earth-observation-program-for-welsh-universities/
Living Wales	Capturing the state and dynamics of Wales's landscape through integrated earth observation data	Combines optical, radar, and lidar data with ground measurements	Products are being made openly available for multiple stakeholders	
Environment Platform Wales https://epwales.org.uk/	Seeks to bridge the gaps between researchers, evidence providers and policy makers.	Reflects the ethos of the Well-being of Future Generations (Wales) Act 2015	Multiple products involved	Collaboration with Welsh Government, Natural Resources Wales, universities and researchers

5.4.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	10	9	0	7

There were no stakeholders who replied that they did not support this indicator. Those voting 'amber' suggested several elements that needed to be considered in the development of the indicator. Issues such as the timing of the flood or drought and its length need to be factored in in terms of the impact on farming and other land uses. The terms flood, drought need clear definitions, as does the term 'prolonged'. It was pointed out that the indictor doesn't consider the cause but it does enable the positive steps that farms, and other land uses can take in terms of being part of the solution.

Analysis of the impact would be something long-term and cannot be a snapshot given the variability in climate conditions year on year as both flood and drought are outside SLM control. Linking this indicator with 1.3A – levels of diversification in farm products and adoption of climate adaption techniques and 1.1B - soil health alert indicator would be useful. Overall, there was a recognition that the development of this indicator could contribute to a better understanding how things are changing but in terms of climate and in land use change.

5.4.1.2 Baseline data

The discussion in the TEG meetings and the meeting with wider stakeholders explored to possibility of developing a new indicator that uses earth observation (EO) data to show the amount of farmland that is subject to prolonged flooding or drought where this is not intentional. The intention is to show the impacts of climate change and the ability of farmland and the wider landscape, including built up areas, to be resilient to the challenges of climate change. The main caveat is that those areas where the flooding is intentional, often to protect build up areas, are not included in the areas considered for the indicator.

The utilised agricultural area is known, and this would be the baseline. The indicator will require development and the links below suggest that there are a range of data streams where this could be possible.

Table 5-12: Available baseline statistics for Indicator 2.3A - Area of farmland subject to prolonged flood / drought from EO where not intentional

Data Source	Baseline/Key Statistics
National LIDAR programme https://datamap.gov.wales/maps/lidar-viewer/	The LandMap data includes both objective and subjective information and is designed to enable landscape quality to be taken into account in decision making.
WG Earth Observation Program & Plant Labs https://epwales.org.uk/welsh-government-earth-observation-program-for-welsh-universities/	Covers 2,000 individual licenses
Living Wales	Capturing the state and dynamics of Wales's landscape through integrated earth observation data.
Environment Platform Wales https://epwales.org.uk/	Aims: • Developing innovative approaches to identifying evidence gaps and understanding the needs of evidence users in Wales. • Facilitating interdisciplinary and cross sectoral collaboration to address identified evidence gaps. • Supporting exchange of expertise and skills between researchers, policy makers and practitioners within member organisations.

5.4.1.3 Trends

There are currently no data available as the indicator does not currently exist.

5.4.1.4 Options for targets

Given this is a new indicator it was felt that setting targets was premature. However, as the analysis suggests the focus on creating stability is important and linking this indicator with policy mechanisms encouraging improved soil health and adoption of adaption approaches is important. There is the potential for increased use of earth observation to assess progress and impacts of both flood and drought.

Table 5-13: Summary Table: possible targets for Indicator 2.3A - Area of farmland subject to prolonged flood / drought from EO, where not intentional

Aspect	Details
Data Sources	National LIDAR programme, WG Earth Observation Program & Plant Labs, Living Wales and Environment Platform Wales.
Frequency	Regular updates of EO data
Disaggregation	1m or finer, increasingly more granular.
Notes	Several policy and research networks available to develop this indicator
Possible targets	None proposed

5.4.2 Indicator 2.3B: Quantity of water abstraction licenses for agriculture

While Indicator 2.3A is under development, the TEG and stakeholders recognised that a more straightforward indicator would need to be offered which provided some information on the state of the water environment with respect to drought. The decision was to assess the quantity of water through abstraction licences. The downside of this is that licences are only required when abstracting more than 20 cubic meters (20,000 litres) of water per day from a surface or groundwater source. A full abstraction license is needed for abstractions lasting 28 days or more, while a temporary abstraction license is needed for periods less than 28 days. Also, certain activities, like firefighting or dredging operations authorised by a specific authority, may be exempt.

Nevertheless, the indicator would show the number and quantity of water abstraction for agricultural purposes. The assumption being that with the introduction of soil techniques and other land management techniques as well as different cop choices would reduce the need for water abstraction. However, this needs to be balanced by the need for more water abstraction as the impacts of climate change become more apparent.

Table 5-14: Data sources for Indicator 2.3B - Quantity of water abstraction licenses for Agriculture

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Welsh Government https://datamap.gov.wales/layers/geonode:nrw_water_resource_permits		Continuously updated	Information on each licence's issue date and purpose of abstraction.	Data are on a map rather than being available as a dataset.

Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	9	9	0	8
It is important to note that many stakeholders responded 'don't know' (8), which is higher than in most responses. Some of those who voted green questioned the usefulness of the indicator due to the volume required to obtain before a licence and doesn't link to outputs. Some caution as it was noted that the information hasn't been used in this way before meaning that it might not be as useful as it seems. Many pointed out that the volume of water abstracted is a more useful measure than the number of licences. Those who voted amber highlighted the need to consider the amount of water harvested and recycled, especially at farm level. Increasing the area of horticulture (1.2D) might increase the need for water abstraction. Allowance would need to be made for hydro and other schemes where the water was returned. Overall, the usefulness of the indicator will be determined by the ability to measure the volume of water abstractions and an assessment of whether its usage is within environmental limits.				

5.4.2.1 Baseline data

While Indicator 2.3A is under development the TEG and stakeholders recognised that a more straightforward indicator would need to be offered which offered some information on the state of the water environment. The decision was to assess the number quantity of water through abstraction licences. Data have been available since the passing of the Water Act 2003. The dataset holds details of all live water abstraction licences in Wales. Expired, lapsed and revoked licences are excluded. The table holds details of maximum abstraction quantities. The quantities are the maximum permitted under the licence; they give an indication of the size of the abstraction. Some licences may include aggregating conditions or other conditions which restrict the abstraction; only the annual aggregated quantities are included in this dataset. Wales currently has 6 regulated rivers for abstraction: Wye, Usk, Tywi, Severn, Dee, East Cleddau.

Examining this data is complex as while the purpose for the abstraction is recorded, allowing agriculture to be separated out from other water uses, there is no reporting on this. Therefore, in order for the indicator to the fulfilled the data need to be examined to calculate the quantity of water and number of licences assigned to agriculture.

Table 5-15: Available baseline statistics for Indicator 2.3B - Quantity of water abstraction licenses for Agriculture

Data Source	Baseline/Key Statistics
Welsh Government https://datamap.gov.wales/layers/geonode:nrw_water_resource_permits	Unclear – Data are on a map rather than being available as a dataset.

5.4.2.2 Trends

While this indicator uses well established and trusted data, the dataset is not examined in a way that enables the evidence and trends to be extracted. Some initial work will be required to determine if this is possible.

5.4.2.3 Options for targets

Given this is an indicator derived from an established data source but recognising that the data have not been utilised in this way before, setting targets is premature. However, it is important to recognise that the climate is changing and that maintaining the current level of water abstraction will be dependent on the weather in any particular year. Target might be able to encourage cross-policy action linking climate resilience, biodiversity and land management.

Table 5-16: Summary Table: Possible targets for Indicator 2.3B - Quantity of water abstraction licenses for Agriculture

Aspect	Details
Data Sources	WG – water resource permits
Frequency	Automatically updated
Disaggregation	provides data for the location and specific aspects of each licence
Notes	No overall picture or how many are in use for agriculture without delving into the data.

5.5 Purpose of Support 2.4: Encouraging agricultural businesses to manage energy effectively

5.5.1 Indicator 2.4A: installed capacity of renewable electricity locally owned by Welsh farms, estates and communities.

The principle of a renewable energy indicator was considered an appropriate indicator for Objective 2 and PoS 2.4 by the Technical Expert Group. In the first stakeholder workshop; however, some participants expressed concern around local environmental impacts of some generators; the importance of appropriate siting; potential conflict with local communities; and barriers such as grid connections.

A key consideration for the development of this indicator was the definition of 'on-farm'. As 90% of Welsh land is farmland including on generation physically on the farm would include the majority of onshore renewables.

As the purpose of support is specifically related to encouraging businesses to manage energy effectively, focussing on electricity generation for onsite use would be more appropriate. However, onsite use is often unmetered and no appropriate data source was found.

An alternative could be to track installed capacity of small-scale renewable microgenerators (under 50kW) on farms as these tend to have higher onsite use. The Microgeneration Certification Scheme database tracks installations of microgenerators, but it does not separate out farms from domestic or other business installations.

Welsh Government does, however, report on locally owned renewable energy by installed capacity and generation with farms and estates reported as a class of ownership. They define 'locally owned" installations as energy installations, located in. Wales, which are owned by one or more individuals or organisations wholly owned and based in Wales, or organisations whose principal headquarters are located in Wales.

Whilst not a perfect proxy for onsite use, locally owned renewables by farms and estates gives a good indication of the farming sectors' contribution to renewable generation in Wales. With this data already recorded, installed capacity of renewable energy locally owned by Welsh farms & estates, was the best indicator to use. Community owned renewables are also tracked by Welsh Government and were added following stakeholder consultation. Farms hosting community renewables builds community engagement with farms and therefore also contributes to Purpose of Support 1.2.

We have also changed this indicator from "renewable energy" to "renewable electricity" following stakeholder feedback. Renewable heat and electricity installations are tracked separately with the majority of the former biomass boilers. As these can create local air pollution, such as particulate matter, and greenhouse gas emissions whilst relying ongoing wood feedstock, including them could have perverse outcomes.

Table 5-17: Data sources for Indicator 2.4A - installed capacity of renewable electricity locally owned by Welsh farms and estates and communities

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Energy Generation in Wales Regen for Welsh Government	*Welsh Electricity generation and installed capacity plus renewable heat and storage.*	*Annual*	Shows capacity and generation of locally owned renewable energy generation including a specific category for farms & estates and community owned renewables.	*Best data source to use. Ready to go data available.*
Accredited official statistics: UK Energy Trends	*Renewable electricity capacity and generation.*	*Quarterly*	*Currently publishes at a Wales level but not disaggregated to see on farm generation.*	*Not clear if only includes generation on network only or also includes on site use "behind the meter".*
MCS Data Dashboard	*Updates on small scale renewable generator installations*	*Near real time updates*	*Shows data for Wales* *Broken down by technology* *Does not show on farm*	

5.5.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	9	10	0	7

This was a generally popular indicator with no major objections raised.

Specific questions were raised around siting of generators including in relation to tenant farmers, those on designated sites and sites with poor generation, with reference to capacity factor considered for the latter. The need to consider social impact of installations was also noted.

Others argued that on-farm consumption of renewable energy; efficiency measures installed; overall greenhouse gas emissions savings and increases in resilience were better metrics.

Some argued that the indicator should be expanded to include in hosting large scale renewables on farmland, noting benefits for in mitigating the climate emergency as well as providing farmers with secure long-term incomes.

Several stakeholders argued that community owned generators should be added and one that only renewable electricity should be recorded, not heat. These two recommendations have been followed.

Reasons for not selecting consumption are noted above, but if appropriate data are found, both onsite renewable consumption and energy efficiency, could be part of a future farm carbon calculator (Indicator 2.2B).

With respect to large privately owned renewables, we acknowledge their benefits to decarbonisation but consider them too far removed from farms themselves to be appropriate for this PoS. Given that 90% of Welsh land is farmland, this is more appropriate for indicators and targets for onshore renewables generally.

5.5.1.2 Baseline data

Table 5-18: Available baseline statistics for indicator 2.4A: installed capacity of renewable electricity locally owned by Welsh farms, estates and communities

Data source:	**Baseline/key statistics:**
Renewable Energy Generation in Wales 2021	2021: Installed capacity of renewable electricity generators owned locally by communities, farms and estates in Wales = 63MW
Renewable Energy Generation in Wales 2022	2022: Installed capacity of renewable electricity generators owned locally by communities, farms and estates in Wales = 63MW
Renewable Energy Generation in Wales 2023	2023: Installed capacity of renewable electricity generators owned locally by communities, farms and estates in Wales = 64MW.

5.5.1.3 Trends

1MW additional capacity between 2022 & 2023. However, more data are required to identify trends.

5.5.1.4 Options for targets

Existing targets: Wales has set a target to generate enough renewable electricity to meet 100% of its electricity demand by 2035 and 70% by 2030.

In 2017 Welsh Government set a target of 1 GW local ownership target by 2030, 90% of which was met in 2023. In 2022 it introduced another target of at least 1.5 GW of locally owned renewable energy capacity (excluding heat pumps) by 2035. At 0.9 GW, Wales was 60% of the way towards its new target in 2023.

There are no specific targets for renewable electricity locally owned by communities, farms and estates; however, at a minimum they should contribute to the overall locally owned target by increasing in proportion to current % share of locally owned capacity.

If the 2035 target of 1.5GW capacity were met with the same 7% from communities, farms and estates as they contributed in 2023 (the latest year for which data was found), this would mean **107MW total installed** capacity of renewable electricity owned locally by communities, farms and estates **by 2035.**

Building on the existing 64MW of capacity recorded in 2023, an **additional 43 MW** would be needed **by 2035**. This averages out at 3.6MW of additional capacity per year.

The possible targets for the next 5 years could be:

- *Minimal (status quo):*
    - Maintain current share of locally owned renewables met by communities, farms and estates and expand to keep on track for overall 2035 target. Additional 3.6MW installed per year over next 5 years.
    - Policy implications: continue existing programmes of support and advice to farmers and communities in relation to renewable energy installations. Ensure environmental standards still met.

- *Moderate (sustainable improvement):*
    - Expand renewable energy generation owned locally by communities, farms and estates by a moderate amount more than needed to maintain existing share of overall target e.g. an additional 7MW of new capacity per year.
    - Policy implications: continue existing programmes of support and advice to farmers in relation to renewable energy installations. Increase financial incentives. Work with local communities to reduce conflict potential. Ensure environmental standards still met.

- *Ambitious (Transformative):*
    - Significantly expand renewable energy generation owned locally by communities, farms and estates by than needed to meet existing overall target for locally owned with same target, e.g. by 14 MW per year.
    - Policy implications: Significantly expand existing programmes of support and advice to farmers and financial incentives to install renewables. Review planning barriers where amending these would not negatively affect environmental

standards. Work with local communities to reduce conflict potential. Ensure environmental standards still met.

Table 5-19: Summary table – possible targets for indicator 2.4A - installed capacity of renewable energy locally owned by Welsh farms, estates and communities

Aspect	Details
Data Sources	Welsh Government "Energy Generation in Wales"
Frequency	Annual
Disaggregation	Shows generation and installed capacity of all energy generation.in Wales. Broken down to show locally owned renewable energy and locally owned renewable energy on farms and estates and communities. No disaggregation between farms and estates.
Notes	Farms & estates are listed as a single business type. It may be possible to disaggregate between them but as estates typically include farms within them, it seems reasonable to keep them together for the purpose of indicators and targets.
Possible Targets	Minimal: e.g. around 3.6MW of new capacity per year. Moderate: e.g. around 7MW of new capacity per year. Ambitious: e.g. around 14MW of new capacity per year.

6 Proposed indicators for SLM Objective-3

SLM Objective 3: **Maintain and enhance the resilience of ecosystems and the benefits they provide**

SLM Objective 3 relates to the support of actions which promote the resilience of ecosystems. This will most often involve a reduction in the pressures on ecosystems relating to land use and management, air pollution and/or water pollution. Pollution is most often related to inefficient use of resources (e.g. of fertilisers) and indicators on this topic have been reported under SLM Objective 1 above and so information is not repeated here.

6.1 Narrative for suite of indicators for SLM Objective 3

There are four PoS which are of direct relevance to this SLM Objective:

- Maintaining and enhancing the resilience of ecosystems
- Improving air quality
- Improving water quality
- Maximising resource efficiency

The final set of proposed indicators are coded by SLM Objective number and PoS (A-C where more indicators are proposed) and highlighted in bold with the indicator title and units.

The proposed indicators for SLM Objective 3 are set out in the table below.

Table 6-1: Proposed indicators relating to SLM Objective 3, by Purpose of Support

Purposes of Support relevant for SLM Objective 3	Indicator	Indicator status
3.1 Maintaining and enhancing the resilience of ecosystems	3.1A. Ecosystem Health and Resilience Indicator	New
	3.1B. Change in abundance of all species (%)	Existing
3.2 Improving air quality	3.2A. Area of land where ammonia levels (defined as 1ug/m3) exceeds tolerance of sensitive species.	Existing
	3.2B. Woodland area which removes air pollution (hectares)	Existing
3.3 Improving water quality	3.3A. Percentage of freshwater bodies in good ecological condition in areas dominated by agriculture	Potential future
	3.3B. Number of pathogens from agriculture in fresh and coastal waters	Potential future
	3.3C. Percentage of soils in arable and improved grassland which exceed trigger points for phosphorus leaching	New
3.4 Maximising resource efficiency	3.4A. Utilised Agricultural Area (ha)	Repeat indicator (see 1.5A)

Purposes of Support relevant for SLM Objective 3	Indicator	Indicator status
	3.4B. Total Inorganic Fertiliser and Feed Use (all farms; all crops and grass) (kt) (Note: Feed to be added when robust data are available for Wales).	Repeat indicator (see 1.5B)
	3.4C Organic Manure use (% dressing cover all crops and grass)	Repeat indicator (see 1.5C)
	3.4D. Plant Protection Product (PPP) Use in Agriculture	Repeat indicator (see 1.5D)

Impact indicators for maintaining and enhancing ecosystem resilience **(PoS 3.1)** are required that provide a robust national picture of ongoing trends in the five characteristics that confer resilience to ecosystems – Diversity, Extent, Condition, Connectivity and Adaptability (DECCA). Two indicators are proposed which directly relate to these characteristics. The first is a new **Ecosystem Health and Resilience Indicator (3.1A)** which summarises trends for an extensive suite of 58 measurements across 19 Broad Habitats and Landscape Features which capture many elements of DECCA (ERAMMP Report-99; Emmett et al. 2025; see Annex 2). Note this is a new analysis of the extensive ERAMMP National Field Survey data and earth observation data from the UKCEH Land Cover Map integrating it into a single national indicator comparable with that proposed for species abundance.

This second indicator for the change in the **Abundance of all Species (%) (3.1B)** relates more directly to the Diversity element of DECCA for individual species. Both of these indicators have nationally robust data sources available although both could benefit from improvement. A summary of the recent change for the two indicators over the last ten years is shown in Table 6-2.

Table 6-2: Trends over the last 10 years in the status of the Ecosystem Health and Resilience Indicator (new analysis from ERAMMP Report-105) and All Species Abundance (State of Nature 2024). The Ecosystem indicator is weighted by resource, habitat and DECCA category.

Proposed Indicator	Status (% change over last 10 years)		
	Improvement	No change / Stable	Decline
Abundance of All Species	32	25	43
Ecosystem Health and Resilience Indicator (weighted)	23	55	22

The PoS for this objective also includes the ambition of improving air quality **(PoS 3.2).** This will have a co-benefit for the ecosystem and species indicators above (3.1. and 3.2) as nitrogen (and pollution more generally) is a major cause of species and ecosystem change and loss in Wales (UK and globally). Two indicators are proposed. The first is the **Area of Land where ammonia levels (1ug/m3) exceed the tolerance of sensitive species (3.2A)**. The value of this indicator is that it explicitly focuses on the contribution of ammonia on the degradation of our species and ecosystems. The latest estimate available is for 2017-19 when 68.8% of Wales exceeded the limit. An alternative is the current target of a reduction of ammonia emissions in Wales by 2030 to be 16% lower than 2005 levels. The former is recommended as it more directly relates to ecosystem impacts however for efficiency and practicality, we recognised the latter may be preferred.

A second indicator is the **Woodland Area which Removes Air Pollution (3.2B)** out of the atmosphere. All vegetation types, including crops will act as a deposition surface for particulates from the air, but trees have a high leaf surface area per unit ground area, and therefore remove more air pollution. The removal of particulate PM2.5 by trees accounts for ~75% of the health benefit resulting from all air pollution removal by vegetation in the UK. This effect is well recognised and included in most environmental economic assessments for woodland and tree planting (e.g. for SFS by ERAMMP Report-110 (Dickie et al., 2025)). For Wales it is estimated our current woodland is responsible for reducing air pollution valued at around £75 million pa (ONS Woodland Accounts ONS – Woodland Accounts).

There is also a PoS relating to improving water quality **(PoS 3.3).** To track impacts on water quality, high water quality data for Water Framework Directive reporting are available from NRW, although this often conflates data related to farming activities (e.g. fertiliser and manure losses to watercourses) with those unrelated to farming practices such as releases from septic tanks and sewage works and other sources. A study in 2018 by the Wales Land Management Forum sub-group on agricultural pollution identified a set of 47 catchments dominated by agricultural pollution. The suggestion is that these catchments form the basis of this indicator – **percentage of freshwater bodies in good ecological condition in areas dominated by agriculture (3.3A)** - meaning that it should be possible to show how changes in land management practices as prioritised by SLM are able to improve water quality.

No indicator is currently available for pathogens in coastal waters which can be attributed to agricultural sources. Therefore, the **number of Pathogens from Agriculture in Fresh and Coastal Waters (3.3B)** is considered an indicator with 'future potential' but is not currently operational.

A final potential indicator for water quality is the status and change of soil health, as it relates to risk to waters as most water passes through soil before it reached watercourses. This proposed indicator requires a different analysis of a subset of the data proposed for the **Soil Health Alert Indicator (1.1B)**. It uses data for only arable and improved grassland where leaching risk is greatest and utilises higher trigger points relative to those used for efficient production and habitat support (ERAMMP Report-94). The indicator proposed is **the percentage of Soils in Arable and Improved Grassland which exceeds Trigger Points for Phosphorus Leaching (3.3C).**

A more detailed description of each of the proposed indicators, grouped under PoS for SLM objective 3, are set out in the sections below.

6.2 Purpose of Support 3.1: Maintaining and enhancing the resilience of ecosystems

6.2.1 Indicator 3.1A: Ecosystem Health and Resilience Indicator (%)

The definition of an ecosystem was defined by Sir Arthur Tansley in 1935 as an integrated system composed of a biotic community (living organisms) and their abiotic environment (non-living components such as air, soil and water). Ecosystem condition and resilience is therefore much more than biodiversity or species (see Species Abundance indicator 3.1B below) as the inter-dependence between biodiversity and the environment they live is fundamental. Ecosystem resilience forms one of the seven well-being goals with the Well-being of Future Generations Act 2015 and sustainable management of natural resources was developed in the Environment Act (Wales) 2016 as a key approach for maintaining and enhancing ecosystem resilience. The SLM objective provides the policy framework for delivering action to enable maintenance and enhancement to be directly supported through policy actions.

The DECCA framework is followed in Wales to capture the complexity of characteristics which create a healthy and resilient ecosystem. DECCA stands for:

- D – diversity from genes to species, habitats and landscapes. Diversity supports the complexity of ecosystem functions and their interactions. Some diversity may not be desirable for example if this arises from the presence of non-native or invasive species.
- E – extent or put simply how large an ecosystem is. Larger units can increase the capacity of an ecosystem to adapt, recover or resist disturbance. Smaller units can be at greater risk from catastrophic events. However, some species specialise using small fragments of our highly modified landscape such as streamsides and field margins. Extent can then be considered as to the quantity of these smaller units in total across the landscape.
- C – condition can cover the status of both the biotic and abiotic components and agreed indicators are available for most of these components for terrestrial and freshwater systems.
- C – connectivity enables the movement of species across the landscape and is through to increase resilience as species can move to avoid stresses. There can be negative aspects of this for example in linking fast flows of water which generate floods across the landscape.
- A – adaptability describes how the elements above come together to create resilience. There is as yet no agreed approach for quantifying this in Wales or indeed for any nation of the UK.

The Well-being of Future Generations Act currently has as indicator No.43 to report on this issue i.e. 'Area of Healthy Ecosystems within Wales'. This value was recently reported as 43% of the land area of Wales which had not changed between 2013-16 to 2021-23 (ERAMMP Report-105; Emmett et al., 2025). However, this only reports on the extent of semi-natural vegetation, not its condition, diversity or connectivity. It was therefore not considered appropriate for SLM. Instead, we propose a new indicator for ecosystem health and resilience here in Wales exploiting WG investment in the ERAMMP National Field Survey (NFS) and change data from earth observation from UKCEH's Land Cover Map. Field observations are considered the highest quality data by the IUCN and the data used here arise from nationally representative data from 150 1km squares across Wales (ERAMMP Report-105; Emmett et al., 2025). Data are collected and reported which are relevant to:

- Diversity – this includes a wide range of indices which capture species richness and abundance for birds, pollinators, vegetation, woody features and streamsides and small freshwater bodies plus an estimate from earth observation of whole landscape habitat diversity across Wales (see Chapters 3, 4, 6 and 8)

- Extent – area of our dominant Broad Habitats was reported (see Chapter 2)
- Condition – a large number of condition metrics were collected and reported as for diversity (see Chapters 3, 4 and 6)
- Connectivity of our dominant assets i.e. Woodland, Grassland and Wetlands. (see Chapter 8)
- Adaptability - Overall resilience was also reported (see Chapter 8 but an improved approach proposed here)

For this new indicator, we have counted the 10-year trend data for 58 individual measurements across 19 broad habitats and landscape features following the approach used for reporting trends in the e.g. State of Nature species abundance report. Trends are identified as either being improved, stable or in decline following statistical analysis. A summary of the results for some of the measurements can be seen in Figure 6-1 but the data are reported for all 19 dominant Broad Habitat types and Landscape Features in ERAMMP Report-105.

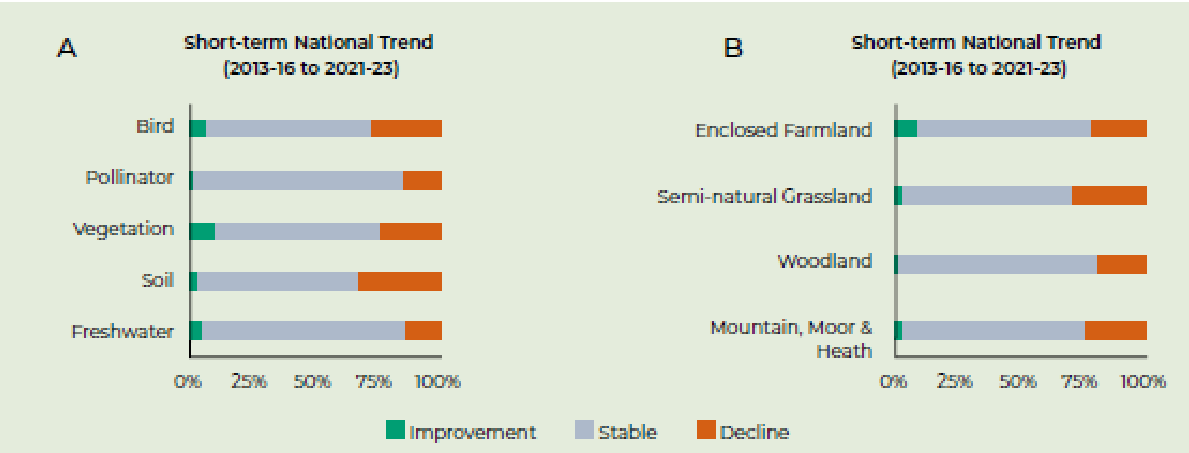

Figure 6-1: The percentage of total counts of indicators which had improved (green), were stable (grey) or had declined (red) at the national scale for a) Natural Resources and b) Asset Class 2013-16 to 2021-23.

The new national ecosystem health and resilience indicator aggregates these counts across the Broad Habitat and Landscape features to report on the total where a decline or stability and improvement was reported as a percentage of all observations. Two approaches are reported in ERAMMP Report-99 where the data and methods for this new indicator are reported in greater detail. These are a simple count of measurements which have improved, are stable or are in decline mirroring that for species abundance reporting, or where measurements for resource, broad habitat and landscape Feature and DECCA category are weighted is carried out to create a more equitable indicator for multiple outcomes. Note this type of weighting is not carried out for e.g. The State of Nature report 2024 where every species has equal weight. Some concern of this species approach however has been raised as the contribution of more numerous species e.g. moths can dominate the indicator compared to large mammals such as the badger. Our weighted approach tries to avoid this issue.

We propose SLM impact would then be reported as the change in the percentage of indicators where a decline for indicators was reported relative to the previous reporting period. Currently, the value of this as shown in Table 6-2 is 22% of all measurements. The ambition would be to reduce this value and in time perhaps also increase the number which are improving.

Alternative approaches are:

a) Re-use of the Well-being of Future Generations Act indicator No.43 to report on this issue i.e. 'Area of Healthy Ecosystems within Wales'. As explained above, this only captures and reports on one element of the DECCA framework i.e. 'Extent' and options to consider and include the other elements were considered important to explore.

b) The area of WG and NRW have developed an ecosystem resilience indicator called the Current Relative Value (CuRVe) map atlas (Naumann and Medcalf, 2019). This approach is not yet available for all the agricultural area in Wales relevant to the SLM but has rather been reported for test areas. In brief, a range of factors have been identified relating to 16 separate attributes relating to the first four attributes listed and which were available at the 1km square scale. These are then combined into a single relative resilience metric which is then mapped. As we understand it, the map is for all Wales but presumably could be disaggregated for reporting on the agricultural area only. This indicator is considered a future potential indicator as it is not yet available at the national scale.

c) Another possible indicator which follows the international standard for ecosystem reporting, is the IUCN Guidance for the Application of Red List of Ecosystems (IUCN, 2024) which has been adopted as one of the headline indicators of the Global Biodiversity Framework. The overall aim is to identify ecosystems most at risk of biodiversity loss. However, this includes five criteria which goes beyond biodiversity *per se* and includes the broader state of the abiotic environment and ecosystem function as well as overall risk status. These are: (a) declining distribution, (b) restricted distribution focussing on ecosystems with small distributions, (c) environmental degradation, (d) disruption of biotic processes, and (4) quantitative risk analysis of collapse and conversion into a novel ecosystem. These criteria are applied to evaluate spatial and functional symptoms of ecosystem decline. The process includes gathering data on ecosystem characteristics, threats, and changes over time, followed by a rigorous analysis to assign risk categories ranging from "Least Concern" to "Collapsed". The timeframe however is not appropriate for SLM impact indicators (+/- 50 years) but that could be adapted for the 5-year reporting cycle required for SLM. This indicator is again considered a future potential indicator but it would require significant investment by WG to follow the very robust requirements of the approach.

Table 6-3: Data sources for Indicator 3.1A - ecosystem health and resilience

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Integrated ecosystem indicator based on data aggregation from the ERAMMP National Field Survey Wales National Trends and Glastir Evaluation | ERAMMP	Percentage of counts of indicators that increased, were stable or decreased covering vegetation, soil, small water bodies, birds and pollinators across 19 Broad habitats and landscape features	Currently 8 years but see notes	Quantitative assessment of reported indicators for each Broad Habitat and Landscape Features aggregated into a single national indicator with data proposed below.	A shift to a 5-year rolling programme for more timely reporting could be considered going forward as already undertaken by UKCEH for the aligned Countryside Survey monitoring programme
Diversity of Habitats Wales National Trends and Glastir Evaluation | ERAMMP	Shannon-Wiener index where higher values indicate greater diversity	As required	All Wales data need to be disaggregated into agricultural area only	This is derived from the UKCEH Land Cover Map as this is the only data source with 10-year trends available. Future reporting could use Living Wales or another source. The current data were produced specifically for the ERAMMP Report-105. A 5-year cycle is probably most sensible to capture and report avoiding methodological variance which can occur in annual reporting cycles.
Extent of Semi-Natural Broad Habitats Wales National Trends and Glastir Evaluation | ERAMMP	Area (ha)	As required	All Wales data need to be disaggregated into agricultural area only. ERAMMP reported for each Broad Habitat and then for Semi-Natural land as a whole.	These data were derived from the UKCEH Land Cover Map specifically for ERAMMP Report-105. A 5-year cycle is probably most sensible to report.

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Condition of Broad Habitats Wales National Trends and Glastir Evaluation | ERAMMP	Expert assessment of current status into 5 categories from a large number of indicators covering soil, vegetation, small water bodies, birds and pollinators	8 years	A wide range of condition metrics relating to vegetation, soil, small water bodies, birds and pollinators.	These data can only be captured from field survey results. A move to a rolling survey over a 5-year window (rather than the current 8-year single report) would enable early warnings and more frequent updates. Note that small water bodies (headwaters and ponds) reported here are less influenced by non-agricultural pollution sources embedded in Water Framework Directive statistics and are therefore highly suited to SLM needs.
Connectivity of major asset types Wales National Trends and Glastir Evaluation | ERAMMP	Scale 0-1	As required	Disaggregation would not be appropriate here as connectivity across non-agricultural land will be important to include.	This was derived specifically from the UKCEH Land Cover map for ERAMMP Report-105. A 5-year cycle would be most sensible.
NRW / WG CuRVE ecosystem resilience	16 indicators are integrated and mapped	Not known	Rather aggregation of a wide range of data available at the 1km square level	Under development
IUCN Red List of Ecosystems 2024-021-En.pdf	Indicator covering extent, environmental degradation, ecological processes and risk	Many elements not currently available	Aggregation of a large number of different indicators	Not developed but note Scotland has commissioned work to develop the indicator from UKCEH, UKCEH and SAMS.

6.2.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	10	10	0	6
There was strong support from the stakeholders for the concept underpinning this indicator. Where there was some concern, it appears stakeholders had not had time to read the report as questions relating to sources of data, who would do the assessment and methods were all raised which were all described in the report. NRW, who were included in the expert panel, have asked for more time to explore the approach.				

6.2.1.2 Baseline data

Ecosystems describe the integrated system of both living and non-living systems. They are often reported in categories described as Broad Habitat classes e.g. arable and horticulture and broadleaved woodland. There are also landscape features (e.g. streamsides) which are important within these broad classes which provide important refugia for biodiversity and provide important functions e.g. buffering of water transport between land and water bodies.

There is no widely accepted approach to reporting on ecosystem condition and resilience across the 4 nations in the UK. An international approach was described in section 3.4.1 but this would require significant investment to produce for Wales. Instead, here we have exploited the major investment by WG in the GMEP and ERAMMP National Field Surveys which capture and report on data known to confer resilience on ecosystems namely; Diversity, Extent; Condition and Connectivity and the availability of long-term trend earth observation data from the UKCEH Land Cover Map.

It should be noted that the indicators for the new Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill are also considering indicators for ecosystem reporting.

Table 6-4: Available baseline statistics for indicator 3.1A – Ecosystem Health and Resilience

Data Source	Baseline/Key Statistics
GMEP and ERAMMP National Field Survey Wales National Trends and Glastir Evaluation | ERAMMP	Change between 2013-16 and 2021-23 % of all counts of indicators weighted by resource, 19 Broad Habitats and Landscape Features and DECCA category for soil, vegetation, woody features, pollinators, birds and small water bodies which have improved, were stable or had declined Improved: 23% No change: 55% Decline: 22%

6.2.1.3 Trends

Current trends are embedded in the indicator proposed i.e. from the period 2013-16 to 2021-23 a total of 22% measurements relating to ecosystem health and resilience declined.

6.2.1.4 Options for targets

This indicator by definition is reported relative to a previous reporting period. The target could be a reduction in the % of indicators showing decline. Although the reverse to present a more positive picture of the % of indicators which were stable and / or improved could also be used in the future as there is likely to be diminishing returns as the number of declines reduce. Here we suggest the use of those in decline.

Possible targets: Possible targets for the next 5 years could be:

- *Minimal Goal (Status Quo)*
    - Maintain current rate of decline i.e. 22% accepting holding the line in the face of climate extremes and ongoing pollution is in itself a challenge.
    - Policy Implication: Will not help meet the wider policy ambitions of current WFG and Environment (Wales) Act and the new Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill.

- *Moderate Goal (Sustainable Improvement)*
    - Reduce the % of indicators which indicate decline e.g. to 20% over 5 years
    - Policy Implication: This would contribute to multiple policy ambitions and targets however this would require investment in multiple areas from species and feature support to soil health and water quality. The relatively small change proposed recognises the known lag times often reported in reversing declines (compared to the rather rapid rate of loss).

- *Ambitious Goal (Transformative)*
    - Reduce the % of indicators which indicate decline e.g. to 15% over 5 years
    - Policy implication: This would contribute to multiple policy ambitions and targets however this would require significant investment in multiple areas from species and feature support to soil health and water quality.

Table 6-5: Summary table – possible targets for indicator 3.1A – Integrated Ecosystem Indicator

Aspect	Details
Data Sources	GMEP and ERAMMP National Field Survey Wales National Trends and Glastir Evaluation | ERAMMP
Frequency	8 years currently but could move to a 5-year rolling programme
Disaggregation	More aggregation of many different indicators across multiple ecosystem properties
Notes	A new indicator which would require some extra work to cross-check initial rapid estimates and potentially road-test with the community.
Possible targets	Minimal: maintain current rate of decline e.g. 22% indicators indicating decline Moderate: reduce % of indicators showing decline e.g.20% indicators indicating decline Ambitious: reduce % of indicators showing decline e.g. 15% indicators indicating decline

6.2.2 Indicator 3.1B: Change in Abundance of all species (%)

The Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill has a priority area which focuses on reducing the risk of the extinction of native species. The species of focus have not yet been agreed. For the SLM, it is proposed to focus on maintaining and enhancing as broad a spectrum of terrestrial and freshwater species as possible which are important for the delivery of many important ecosystem services. These two indicators together will provide a combined overall picture of the status and change of our biodiversity.

Future developments should include the impact of agriculture on marine species due to the known negative effects of agricultural derived nutrients and sediments. For example, nitrogen pollution was a major cause of failure of marine SACs recently (Hatten-Ellis et al, 2025). As for all biodiversity impacts, attribution of these to agriculture can be problematic relative to other sources of pollution (or indeed any specific activity). See also indicator 3.3B where there is a similar challenge. Indicator 3.2A is perhaps one exception as agriculture is the predominant source of ammonia and the indicator directly linked to this specific source. It is for WG to decide if a terrestrial and freshwater species indicator in isolation is acceptable without inclusion of marine biodiversity. We are not aware of any integrated data source currently.

Species data are presented in many different ways (e.g. abundance, richness, occupancy etc). They are all valuable and provide different information. Species abundance is now thought to be most sensitive to change and therefore ideal as a national indicator when demonstrating impact of policy supported actions such as that intended by the SLM. The proposed indicator is therefore **Change in Abundance of All Species (3.1B)** with change reported as percent change from the previous reporting period of those either in decline or improved and maintained. Data for this indicator are collected by a large number of organisations which focus on different components of our biodiversity. Many of these data, but not all, is often collated in the Local Record Centres in Wales and across the UK, and the Biological Record Centre supports over 100 recording organisations illustrating the sheer number of these organisations. Note that we are not proposing a focus on priority species but rather an all-species approach to capture the effects of agriculture in the wider countryside. This is intended to be complementary to the proposals in development for setting indicators and targets of the Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill.

For Wales, the most recent relevant data were reported by The State of Nature Report (Smith et al, 2023) where the change in average species abundance of 380 terrestrial and freshwater species (as well as many other sub-level indicators) were reported for the previous 10 years. The indicator most often cited is the percentage of species which show a moderate or strong decline in abundance over the last 10 year i.e. 43% of species, whilst 32% of species had a strong or moderate increase and 25% of species had little change. Whilst the creation of this indicator was a major achievement, they recognised that species were missed. As an example of the potential number of species which could be captured, is that in England Defra commissioned a major piece of work to develop their Species Abundance indicator. This now includes 1,176 species. Over the last five and ten years they reported little or no overall change suggesting a halt in the decline of species for England. Why there is the major difference in decline between England and Wales, the reason for this needs to be explored e.g. whether that is due to the different number of species number or a bias towards particular taxa here. Note also the concern that these species indicators may be overly influenced by particularly numerous taxa such as moths relative to say large native mammals as no weighting is applied.

It is recommended the State of Nature 2024 species abundance indicator be enhanced going forward but this could be used as a benchmark for setting targets for SLM now.

Table 6-6: Data source for Indicator 3.1B – Change in abundance of all species

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
State of Nature Wales report TP26053-SoN-Wales-summary-report-v10.pdf	Trends in species abundance for 380 species (% change)	Annual	No	Increasing the number of species captured by this indicator would improve this indicator. This is an ambition of the State of Nature consortium. It is always noted in all of these reports that average indices such as these hide many important patterns for individual species.

6.2.2.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	8	8	4	6
The main concerns raised by stakeholders related to the perceived lack of independence of the State of Nature Report despite its production by many independent research organisations as well as perceived 'campaigning' organisations (60+ organisations in total). Others highlight that all species are not desirable (e.g. wood pigeon) and questioned if Welsh native species should be focussed on or more rare species or species of conservation value. Other concerns were common to the creation of many national indicators as the aggregation of many species does not provide information useful for managing and understanding drivers of change of species trends or where spatially the losses (or indeed improvements) are being observed. The lack of soil species data was raised and data are available from ERAMMP NFS but there are no agreed metrics within the soil eDNA community. If all species of microbes and animals were included it would swamp the indicator if included as a whole. There was suggestion farmers should be encouraged to capture species data.				

6.2.2.2 Baseline data

A key component of ecosystem resilience is the diversity of species they support. The State of Nature Report 2024 reported on the change in status of 380 terrestrial and freshwater species. It is strongly encouraged that this indicator be enhanced over time with additional species data, particularly those from marine, with work commissioned to explicitly attempt to link impacts to agricultural activities. This indicator is intended to be complementary to those being developed for the new Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill. Here we focus on all species (terrestrial and freshwater only currently) due to their important contribution to many different ecosystem services and the importance to maintain diversity across the countryside irrespective of their conservation value. Many common species provide valuable ecosystem functions.

Table 6-7: Available baseline statistics for indicator 3.1B – Change in abundance of all species

Data Source	Baseline/Key Statistics
State of Nature Wales report TP26053-SoN-Wales-summary-report-v10.pdf	2024 Trends in species abundance for 380 terrestrial and freshwater species (% change) for last 10 years (2014) 32% Improved 25% no or little change 43% in decline

6.2.2.3 Trends

By definition, as for Indicator 3.1A, this indicator is a change indicator reflecting current trends over the last 10 years i.e. 43% of species are currently in decline.

6.2.2.4 Options for targets

The target could be a reduction in the number species in decline (matching the focus on decline in the Ecosystem Health and Resilience indicator.

Possible targets for the next 5 years could be:

- *Minimal Goal (Status Quo)*
  - Maintain current rate of decline i.e. 43% accepting holding the line in the face of climate extremes and ongoing pollution is in itself a challenge.
  - Policy Implication: Will not help meet the wider policy ambitions of current WFG and Environment (Wales) Act and the new Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill.

- *Moderate Goal (Sustainable Improvement)*
  - Reduce the % of species in decline e.g. to 38% over 5 years
  - Policy Implication: This would require investment to improve condition of our wider countryside. SFS Optional and Collaborative schemes will be important here but many other actions to support and provide advice land managers to support species would be required. Critically, focusing on just protected areas would be unlikely to deliver this outcome of more widespread species as there could be a risk of leakage and the creation of 'oases' of no decline and 'deserts' of accelerated decline.

- *Ambitious Goal (Transformative)*
  - Reduce the % of species in decline e.g. to 33% over 5 years
  - Policy implication: This would require substantial investment to improve condition of our wider countryside. SFS Optional and Collaborative schemes will be important here but many other actions to support and provide advice land managers to support species would be required. Critically, focusing on just protected areas would be unlikely to deliver this outcome of more widespread species as there could be a risk of leakage and the creation of 'oases' of no decline and 'deserts' of accelerated decline.

Table 6-8: Summary table – possible targets for indicator 3.1B – Change in abundance of all species

Aspect	Details
Data Sources	State of Nature Wales report TP26053-SoN-Wales-summary-report-v10.pdf
Frequency	Annually
Disaggregation	The report is aggregation of change data for 380 terrestrial and freshwater species
Notes	The report notes that the numbers of species captured in the indicator could be increased.
Possible targets	Minimal: e.g. maintain % of species in decline at 43% Moderate: e.g. Reduce % of species in decline to 38% of species over 5 years Ambitious: e.g. Reduce % of species in decline to 33% of species over 5 years

6.3 Purpose of Support 3.2: Improving air quality

6.3.1 Indicator 3.2A: Area of land where ammonia levels (defined as 1ug/m3) exceed tolerance of sensitive species

With respect to ecosystem condition and resilience, the primary impact issue relating to air quality concerns the ongoing emission and deposition of ammonia as it contributes to nitrogen enrichment of the wider countryside. The reason for this is that most of our species and ecosystems have evolved under nutrient / nitrogen limited conditions. Under nitrogen-enhanced conditions, a few nitrogen-loving and often taller species such as grasses and brambles outcompete shorter mosses and lichens and many flowering plants. The change in vegetation, causes knock-on effects for wildlife more generally.

Air pollution, such as ammonia, is particularly difficult to manage as it is emitted from every field and farm and transported across the landscape in rainfall, and as gases and particulates ignoring our fences, walls and other ways we try to limit pressures on our designated and protected sites and semi-natural land more widely. Ammonia is also directly toxic, especially to mosses and lichens. Whilst other air pollutants such as acidic pollutants, ozone and heavy metals also impact ecosystems and biodiversity, the evidence and magnitude of potential impacts is less strong than that known for ammonia (ERAMMP Report-77 – Row and Perring, 2023).

The primary source of ammonia emissions is agriculture are due to its release from animal wastes and its primary impact is in semi-natural habitats present in our rural environment. Agriculture contributes an estimated 85% of Welsh ammonia emissions. It is therefore highly relevant for SLM. It should be noted that ammonia also contributes to the formation of particulates (PM2.5s) which have important adverse impacts on human health. There are therefore important co-benefits if ammonia emissions can be reduced.

To agree on the specific indicator for ammonia, the WG Clean Air Advisory Panel (CAAP) subgroup on setting Air Quality Target for Welsh Ecosystems discussed the issue and reported their conclusions here: ERAMMP Report-77 An Air Quality Target for Welsh

Ecosystems v1.0.2.pdf (Rowe and Perring, 2023). After much discussion, the Panel came to a specific recommendation for the indicator and target to be: the **Area of land where the Ammonia Concentration (defined as 1 ug/m3) Exceeds the Tolerance of Sensitive Species (3.2A)**. This is different to (but associated with) the often-used indicator of land where the Nitrogen as a Nutrient Critical Load is Exceeded which combines the effect of both ammonia and oxides of nitrogen (which are generated from combustion processes). For the arguments about why exceedance of ammonia critical levels is the preferred indicator, see ERAMMP Report-77 (Rowe and Perring, 2023). This indicator is proposed as it is more clearly linked to the WG ministerial commitment to deliver 30 by 30 relative to the current indicator and target to reduce Welsh ammonia emissions by 16% by 2030 compared to 2005 level i.e. our proposed indicator captures the actual damage which occurs to sensitive species.

It should be noted that this indicator is also relevant to the new Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill since sites may fail to achieve Favourable Conservation Status because of exceedance of air and water pollution thresholds, so a focus on reducing air pollution impacts is essential to meet the “30 x 30” target (30% of Earth’s land and sea to be conserved by 2030) under the UN Post-2020 Global Biodiversity Framework. However we understand that, whilst ‘reducing pollution’ is one of the priority areas of the Bill, ammonia is currently not being considered as a potential target to avoid overlaps with the Environment (Air Quality and Soundscapes) (Wales) Act 2024. Under the Environment (Air Quality and Soundscapes) (Wales) Act 2024, WG are obliged to set at least two AQ targets – the first one selected relates to particulates i.e. PM2.5 which impact mainly on human health, and the other(s) to be from a short list that includes ammonia. Due to the importance for species and ecosystems, we are including an indicator for ammonia here.

One issue of importance which could influence the use of this indicator is whether Wales has any control over the emissions of ammonia as if not, we are setting an indicator and target for which SLM actions has no impact. To answer this question, ERAMMP commissioned the UKCEH team who model air pollutant emissions and deposition across the UK. The conclusions from this report are that Wales is estimated to be the biggest source of ammonia deposition present into Wales contributing 54.7% of total deposition of reduced nitrogen (which is derived from emissions of ammonia) and therefore action by SLM in Wales can have an important impact on this indicator (Table 6-9 and ERAMMP Report-97; Brown et al., 2025; see Annex 2). Note also that Wales exports 35% of the amount deposited in Wales to elsewhere so we contribute to problems beyond our boundaries.

Table 6-9: Import and export of ammonia sources in and from Wales (2018 data). See ERAMMP Report-97 or methods and total nitrogen values.

Country / Area of origin	Deposition of reduced nitrogen (NHx) (%)		Export of reduced nitrogen (NHx) to elsewhere	
	kt N yr^{-1}	% of total	kt N yr^{-1}	% of total
Wales	9.8	54.7	3.4	N/A*
England	4.5	25.1	0.1	N/A*
Northern Ireland	0.3	1.7	0.4	N/A*
Scotland	0.2	1.1	N/A*	N/A*
Republic of Ireland	1.6	8.9	N/A*	N/A*
Continental Europe	1.5	8.4	N/A*	N/A*
International Shipping & Offshore	N/A*	N/A*	N/A*	N/A*
Total	17.9	100	N/A*	N/A*

* Requires additional modelling

Table 6-10 :Data source for Indicator 3.2A - Area of land where ammonia levels (1ug/m3) exceed tolerance of sensitive species

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Area where 1ug/m3 annual mean concentration of ammonia is exceeded to protect sensitive species	Data for all of Wales	Annual	Modelling required for this (calibrated to measurements) has to be at UK level due to the transport of pollutants both into and from Wales. This is then disaggregated for Wales (see ERAMMP Report-77 and Report-97)	The recommendation of ERAMMP Report-.77 was to report on relative change from baseline and to not focus on just protected sites.

6.3.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	9	6	4	7

Comments from stakeholders included questions as to whether monitoring data for ammonia were sufficient in Wales. Also concern that individual farmers have no control on impacts on land as ammonia may be emitted elsewhere – but this is a misunderstanding of the purpose of a national indicator which does not report at individual farm level. All farms with livestock and that use fertilisers and manures will be contributing to the overall national picture. Questions also concerned the sources of ammonia in Wales (i.e. transport from England) which is covered in ERAMMP Report-97 and was outlined in the report. Some also suggest the simpler use of the ammonia inventory data however the use of thresholds in policy setting is well established recognising we cannot remove all pollution and an impact threshold provides an impact focus. Others indicated the importance of considering 3.2 A and B together although the number of animals and their management is the greater influence on the ammonia indicator 3.2A.

6.3.1.2 Baseline data

The SLM action indicator to improve air quality most relevant to agriculture and the impact on species and ecosystems and the delivery of 30 by 30 is proposed to be focussed on ammonia. Agriculture is the primary source of ammonia in the atmosphere and impacts on ecosystem and species is also most prevalent in the wider countryside. A new study commissioned by ERAMMP for this report has identified Wales itself is the dominant source of ammonia deposited into Wales (54.7%) and therefore actions we take in Wales will have a significant effect.

Table 6-11: Available baseline statistics for indicator 3.2A - Area of land where ammonia levels (1ug/m3) exceed tolerance of sensitive species

Data Source	Baseline/Key Statistics
Trends Report 2022: Trends in critical load and critical level exceedances in the UK [Report: Trends Report 2022: Trends in critical load and critical level exceedances in the UK - DEFRA UK Air - GOV.UK]	2017-19 Area of land where ammonia concentration (defined as 1ug/m3) exceeds the tolerance of sensitive species. 68.8%
ERAMMP Report-97 (Brown et al., 2025)	2021 Wales contribution to total deposition of reduced nitrogen (which is derived from emissions of ammonia) into Wales 54.7%

6.3.1.3 Trends

Trends over time indicated an increase in the exceedance area from 56% in 2009-11 to 68.8% in 2017-19, an increase of 12%. This was likely in part driven by a 1.3M increase in sheep numbers and 0.6M increase in poultry numbers. There were relatively small declines in cattle (4k) and pig numbers (4k). However, there is no simple relationship between animal numbers in Wales and exceedance levels – some sources are outside of Wales and complex process modelling of all sources from animals and wastes and transport pathways have to be included to produce the impact indicator.

6.3.1.4 Options for targets

A proposal for targets is not included below to avoid prejudice to a potential future consultation on long-term target options.

Table 6-12: Summary table – possible targets for indicator 3.2A - Area of land where ammonia levels (1ug/m3) exceed tolerance of sensitive species

Aspect	Details
Data Sources	Trends Report 2022: Trends in critical load and critical level exceedances in the UK [Report: Trends Report 2022: Trends in critical load and critical level exceedances in the UK - DEFRA UK Air - GOV.UK]
Frequency	Annual but there appears to be a lag time of 3-4 years in reporting
Disaggregation	Wales data are reported separately
Notes	There is a need to create the most recent data for 2024 which may impact on targets
Possible targets	None proposed

6.3.2 Indicator 3.2B: Woodland area which removes air pollution

A second indicator focussed on air pollution is the amount of woodland present across the landscape which contributes to removal of air pollution from the atmosphere. All vegetation types, including crops will act as a deposition surface for air pollution from the air, but trees have a high leaf surface area per unit ground area (Leaf Area Index), and therefore remove more air pollution (Jones et al. 2019). The removal of particulate PM2.5 by trees accounts for ~75% of the health benefit resulting from all air pollution removal by vegetation in the UK (Jones et al. 2017). For Wales it is estimated our current woodland is responsible for reducing air pollution valued at around £75 million pa (ONS Woodland Accounts ONS – Woodland Accounts.

This contribution by trees to air quality improvement is included in ERAMMP Report-105 which reported on' Natural Capital Social Benefits for 2025' and underpinned payment rates offered in the SFS (Emmett et al., 2025).

A co-benefit of woodland is **Capture and Storage of Carbon (Indicator 2.3)** and well as contributing to **Integrated Ecosystem Indicator (Indicator 3.A**) and **All Species Abundance (Indicator 3.1B).**

Table 6-13: Data source for indicator 3.2B – woodland area which removes air pollution

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Woodland and woody feature cover e.g. UKCEH Land Cover Map or Living Wales or WG RPW	Hectares	Annual	None	Data sources all differ in their current estimates due to different definitions of 'woodland' and 'woody features' and different spatial resolutions. One source needs to be selected and then tracked over time.

6.3.2.1 Stakeholder feedback on proposed indicator

Total respondents = 19	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	12	7	0	7
Stakeholders wanted woodland defined – for example to be clear whether it include hedges, woody features, individual trees etc. Some also questioned whether the location of woodland would be more important and this is true but all woodland provides some removal of air pollution as air moves across the landscape in multiple directions albeit most air movements are predominantly from the southwest. A more targeted indicator of woodland which provides most removals for the greatest number of people and ecosystems could be developed. Some comments surrounded the noted disbenefits of some woodland types e.g. acidification by coniferous species if planted on sensitive soils. Some highlighted removal would be for ammonia and particulates and other pollutants which was already recognised in the indicator title and text using the phrase 'air pollution' removal as a catch-all phrase.				

6.3.2.2 Baseline data

All vegetation types, including crops will act as a deposition surface for air pollution from the air, but trees have a high leaf surface area per unit ground area (Leaf Area Index), and therefore remove more air pollution as air moves across the landscape. This is not just relevant to vegetation upwind of urban centres due to the major movements of air across the landscape. The removal of particulate PM2.5 by trees accounts for ~75% of the health benefit resulting from all air pollution removal by vegetation in the UK. For Wales it is estimated our current woodland is responsible for reducing air pollution valued at around £75 million pa.

Table 6-14: Available baseline statistics for indicator 3.2B – woodland area that removes air pollution

Data Source	Baseline/Key Statistics
UKCEH landcover map as reported in Chapter 2 of: Wales National Trends and Glastir Evaluation | ERAMMP	2021 Area of Woodland (Broadleaved + Conifer) 23,600 hectares

6.3.2.3 Trends

Trends over time are a 7% increase between 2010 and 2021 which equates to 2,145ha / year. This exceeds the current WG ambition of 2,000 ha / year of new planting (estimate is 2,145ha). However, note this statistic captures and reports all 10m earth observation pixel where a woody feature dominates i.e. not just the 0.5 hectare parcels of woodland which is the basis for this WG ambition. The increase in cover is due to an increase in Broadleaf Woodland (+16%) and an overall loss of Conifer woodland (-4%). This trend will increase small woody features if 10m in size i.e. not hedges.

Options for targets

Possible targets: Possible targets for the next 5 years could be:

- *Minimal Goal (Status Quo)*
  - Maintain current rate of woodland planting at 2,145ha per year
  - Policy Implication: It appears that increase in woodland cover is happening in addition to that supported by public funds i.e. Glastir. Just 1% of the 7% new woodland could be attributed to Glastir. Going forward, access to advice and best practice for woodland management would ensure these woodlands are healthy and contribute to multiple SLM Objectives.

- *Moderate Goal (Sustainable Improvement)*
  - Increase the rate of new woodland planting to 2,300ha per year
  - Policy Implication: Following the experiences of SFS this is likely to extremely challenging through public support however private financing may lead to more planting. The challenge of this is whether it comes at a cost of food production and ecosystem and species targets

- *Ambitious Goal (Transformative)*
  - Increase the rate of new woodland planting to 2,450 ha per year
  - Policy implication: As for the moderate goal, following the experiences of SFS this is likely to extremely challenging through public support however private financing may lead to more planting. The challenge of this is whether it comes at a cost of food production and ecosystem and species targets

Table 6-15: Summary tables – possible targets for indicator 3.2B – woodland area that removes air pollution

Aspect	Details
Data Sources	UKCEH landcover map as reported in Chapter 2 of: Wales National Trends and Glastir Evaluation | ERAMMP
Frequency	Annual
Disaggregation	Aggregation of Broadleaf and Conifer Woodland extent
Notes	WG are likely to use their own product for estimated woodland cover going forward but UKCEH landcover map is the only current data source with trends going back 10 years
Possible targets	Minimal: Maintain current new planting rates of 2,145ha / year Moderate: Increase new planting rates to 2,300ha / year Ambitious: Further increase new planting rates to 2,450ha / rates

6.4 Purpose of Support 3.3: Improving water quality

Since the introduction of the Water Framework Directive (WFD) there has been a renewed interest and policy drive to improve water quality across Wales and Europe as a whole. There are a number of benefits of this. Good water quality is vital for human health and maintaining freshwater ecosystem health in surface waters, groundwater, and coastal waters makes sense for wide range of environmental, economic and social reasons. Improving water quality before it enters waterbodies, through the filtering actions of soil and geology is the most effective way of resolving this alongside reducing the causes of poor water quality. Drinking water has its own high standards set by OFWAT and related regulations, which is the responsibility of Government and the water companies. Overall water quality is the responsibility of Natural Resources Wales. By preserving and supporting good water quality, benefits are provided to public health, through recreation and amenity uses on water courses as well as the protection of water resources for future generations.

6.4.1 Indicator 3.3A: Percentage of freshwater bodies in good ecological condition in areas dominated by agriculture

The Water Framework Directive (WFD), a European Union directive that aimed to protect and enhance the quality of water resources across Europe, was implemented in Wales through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. WFD set out the objectives for managing water bodies, including rivers, lakes, transitional waters, and coastal waters, to ensure they achieve "Good Overall Status". WFD led to the development of River Basin Management Plans (RBMP) and sub-catchment partnerships. In order to determine if rivers were heading towards 'good overall status' a wide range of data were collected. As a result, it is widely thought that water quality in Wales has shown significant improvements, particularly in bathing waters, but challenges remain in certain areas, especially regarding nutrient levels and specific water bodies.

Currently this indicator is not ready to be introduced across all of Wales as it is not possible to determine the source or type of activity that impacts water quality. However, a study in 2017 by the Wales Land Management Forum sub-group on agricultural pollution identified a set of agriculturally dominated catchments. The suggestion is that these catchments form the basis of this indicator meaning that it should be possible to show how changes in land management practices as prioritised by SLM are able to improve water quality.

Table 6-16: Data sources for Indicator 3.3A - Percentage of freshwater bodies in good ecological condition in areas dominated by agriculture

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Natural Resources Wales Water quality in Wales	Continues the data developed for WFD	Regularly updated	By river body, catchment and river basin	Comprehensive well-established data set that is continually improving but does not currently report on catchments dominated by agriculture
Wales land Management Forum sub-group on agricultural pollution	Identifies those agricultural dominated catchments and assess their ecological status.	One-off report in 2017	Sub-catchment level across Wales	Uses WFD data with a wide membership on the sub-group.

6.4.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	8	8	5	5

One of the stakeholders who voted green considered this indicator to be essential, however other noted the challenges with it. The need to have a robust correlation with the source of pollution was the most often quoted but also the condition of river habitats.

Those who voted red all agreed that an indicator on water quality was needed, but that this one unfairly attributed to agriculture when the issue is complex and water quality can be influenced by a wide range of factors. Avoiding a reliance on modelling data was noted as this historically singles out agriculture as the main cause.

Those voting amber would accept the indictor if it was able to ensure that the data reflected the source of pollution accurately. Terms such as land dominated need to be tightly defined.

It is clear that further work needs to be undertaken on this indicator to ensure that the underpinning data and approach can be clearly explained to stakeholders so that there is transparency and trust in the approach before implementation.

6.4.1.2 Baseline data

The Water Framework Directive (WFD), a European Union directive that aims to protect and enhance the quality of water resources across Europe, was implemented in Wales through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. WFD set out the objectives for managing water bodies, including rivers, lakes, transitional waters, and coastal waters, to ensure they achieve "Good Overall Status". WFD led to the development of River Basin Management Plans (RBMP) and sub-catchment partnerships. In order to determine if rivers were heading towards 'good overall status' a wide range of data were collected.

In 2017, the Wales Land Management Forum sub-group analysis focused on identifying those catchments where agricultural activities have been shown to be the main cause of catchments not achieving good status. The analysis identified 47 catchments where this was the case. We suggest that this should form the baseline data for the indicator with the aim that these catchments are re-analysed to confirm their current status. Potentially they would be a focus for SLM related activity in order to show the impact that change agricultural activities can have on water quality.

Table 6-17: Available baseline statistics for Indicator 3.3A - Percentage of freshwater bodies in good ecological condition in areas dominated by agriculture

Data Source	Baseline/Key Statistics
Natural Resources Wales	2024 interim classification shows 44% of water bodies at good or better overall status. This is the same as the previous classification in 2021 but an improvement of 5% from 2015 and 3% since 2019. All 9 of the Welsh rivers designated as Special Areas of Conservation are in unfavourable condition.
Wales land Management Forum	Based on 2015 data the analysis in 2017 identified 47 catchments where agricultural activities had been confirmed as the main reasons that the catchment was not achieving 'good' status.

6.4.1.3 Trends

It is widely thought that water quality in Wales has shown significant improvements, particularly in bathing waters, but challenges remain in certain areas, especially regarding nutrient levels and specific water bodies. **We suggest that the basis for the indicator are the 47 catchments confirmed as not meeting WFD good status as a result of agricultural activities.**

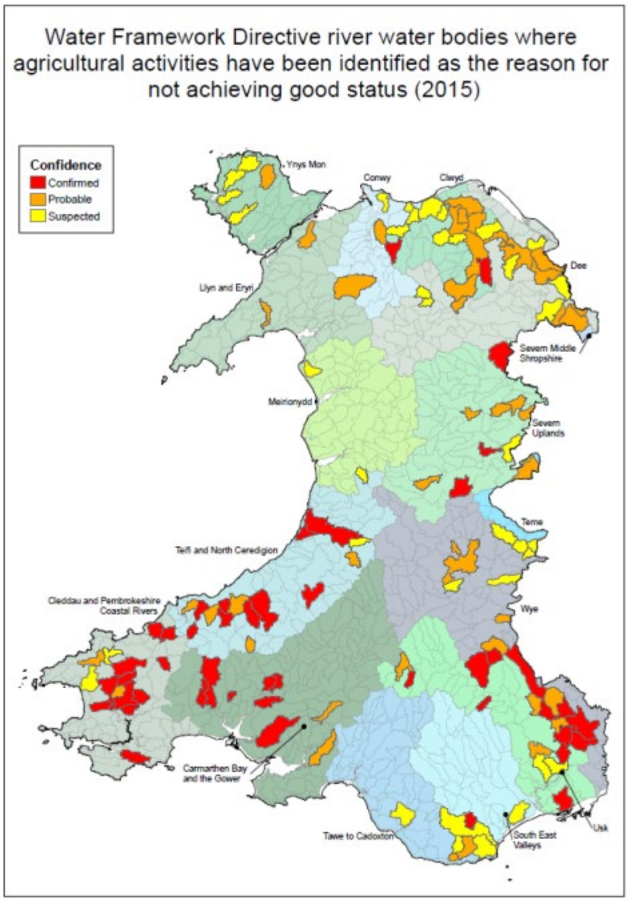

Figure 6-2: Water Framework Directive river water bodies where agricultural activities have been identified as the reasons for not achieving good status (2015) (Source: Wales Land Management Forum 2015)

Reporting and monitoring: While this indicator uses well established and trusted data as a result of the work under the WFD, the data suggested arise from a sub-group formed in 2016/7 and using WFD from 2015. Further work will be required to determine the current situation on these catchments. This at least meets the thoughts of those in the TEG meetings and stakeholder workshop who agreed that focusing on sub-catchments dominated by agriculture would be an acceptable stating point.

6.4.1.4 Options for targets

Due to the preliminary nature of the indicator and the need to confirm the baseline data linked to the start of SLM-related activity it is considered premature to set targets.

Table 6-18: Summary Table: Possible targets for indicator 3.3A - Percentage of freshwater bodies in good ecological condition in areas dominated by agriculture

Aspect	Details
Data Sources	NRW
Frequency	Regularly
Disaggregation	Waterbody, catchment and river basin
Notes	Still not possible to separate out agriculture from other factors impacting overall status.

6.4.2 Indicator 3.3B: Number of pathogens from agriculture in fresh and coastal waters

Water courses and coastal waters are important habitats, recreational areas and provide resources for food production. As well as an overall indicator relating to water quality, and in particular the need for good ecological condition, it is sensible to think about the increase in the range of pathogens occurring in freshwater and coastal areas. This is due to a range of sources, including agriculture. In order to monitor this effectively it requires improved monitoring platforms to reduce the economic and public health implications of high pathogen loads.

Currently this indicator is not ready to be introduced as it is not possible to determine the source of pathogens, however we understand that existing research at Cardiff University might make this possible in the future. In order for this indicator to be relevant to ecosystem resilience the source and range of pathogens needs to be identifiable. This will then enable actions under the SLM framework to be targeted at the right areas of agricultural activity.

Table 6-19: Data sources for Indicator 3.3B – Number of Pathogens from agriculture in fresh and coastal waters

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Natural Resources Wales	Continues the data developed for WFD	Regularly updated	By river body, catchment and river basin	Comprehensive well-established data set that is continually improving but does not currently report on sources which can be attributed to agriculture.

6.4.2.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	8	8	3	7

Thos voting on this indicator recognised water quality as an important issue but were not convinced that this indicator would be able to separate out agriculture from other sources of pollution.

Those stakeholders who voted amber agreed with this assessment that pollution needs to be identified correctly and questioned if this approach was possible. It was felt that it has potential but needs further development and testing. One stakeholder felt that pathogens alone do note capture the full impact of pollution as it excludes nitrates and pesticides.

It is clear that further work needs to be undertaken on this indicator to ensure that the underpinning data and approach can be clearly explained to stakeholders.

6.4.2.2 Baseline data

The analysis of pathogens, covering bacteria, virus and other microorganisms that can cause disease has improved in recent years. The focus has been on bathing water, notably at 110 designated bathing sites across Wales and this is cover in the NRW reporting, alongside other data on water quality, mainly in relation to drinking water. Increased sampling and citizen science data collection by organisations, such as Afonydd Cymru, will increase the data set further although this tends to be on more general measures of water quality rather than pathogens.

The most significant issue relating to this indicator is the inability to separate agriculture from other sources of water pollution, such as highways, water treatment plants, industry and urban development. However, we understand that research is currently underway to do this. Should it be possible then targeted sampling on catchments where agriculture is dominate in the first instance will fast-track the ability of the policy mechanisms under SLM to tackle the issues.

Table 6-20: Available baseline statistics for Indicator 3.3B – Number of pathogens from agriculture in fresh and coastal waters

Data Source	Baseline/Key Statistics
Natural Resources Wales	Levels of pathogens have been rising in recent years. There is a focus on bathing sites, in the 2024 report 108 out of the 110 designated bathing waters met the minimum water quality standards, with 75 rated excellent down from 80 in 2023.

6.4.2.3 Trends

NRW publish profiles on the physical and hydrological conditions of bathing areas and analyse the potential impacts on their water quality. The bathing season starts in May and lasts until the end of September, with samples taken throughout this time. Samples are analysed for the presence of E. Coli and intestinal enterococci and the results used to analyse compliance with the WFD standards. Over a 10 year-period, an additional eight sites have been designated as bathing waters, such that NRW now sample and classify 110 sites. The trend in the data reported from 2014-2024 is shown in Figure 6-3.

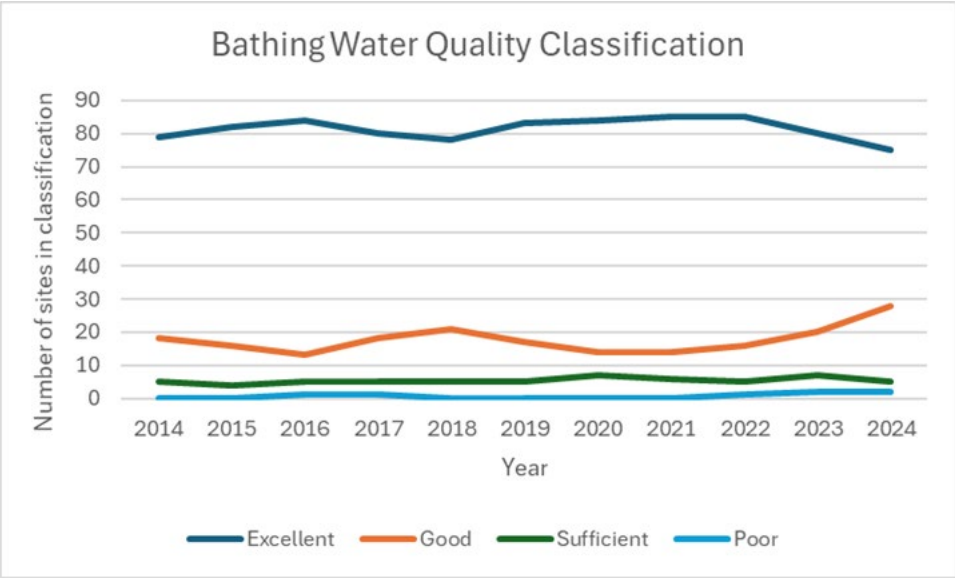

Figure 6-3: 10-year trend of bathing water quality classification (Author's visualisation of data from NRW bathing water quality reports, 2014-2024).

Reporting and monitoring: While this indicator uses well established data, it requires new techniques in order to undertake water testing that can separate out the origin of pathogens either by locations or by activity e.g. agriculture.

6.4.2.4 Options for targets

Given this is an indicator under development creating precise targets makes little sense as the approach needs to the fit with the overall policy mechanisms under the SLM framework. It is also worth noting that this is an indicator that would encourage cross-policy action linking climate resilience, biodiversity and land management.

Table 6-21: Summary Table: Possible targets for indicator 3.3B – Number of pathogens from agriculture in fresh and coastal waters

Aspect	Details
Data Sources	NRW
Frequency	Regularly
Disaggregation	Waterbody, catchment and river basin
Notes	Not possible to separate out pathogens generated by agriculture from other factors.

6.4.3 Indicator 3.3C: Percentage of soils in arable and improved grassland which exceed trigger points for phosphorus leaching

This indicator uses the same data source as for the overall Soil Health Alert Indicator (1.1B) but uses just a subset of the data which relate only to arable and improved grassland and higher trigger points for phosphorus associated with increased leaching risk. If the percentage of soils which exceed these limits decline, then the risk to waters from many agricultural sources is also likely to have decreased. Trigger points in soils for leaching of phosphorus are significantly greater than for efficient production and support of habitats (see Indicator 1.1B) i.e. 60mg/kg compared to 16-45mg/kg for arable and 16-25mg/kg for improved grassland. These trigger points are only relevant to arable and improved grassland habitats i.e. where inorganic fertilisers and manures are applied. Current numbers exceeding these limits for arable and improved grassland for 2021-23 from the ERAMMP National Field Survey is 14%. It should be noted that this indicator will not capture inputs of fertilisers and manures into water courses linked to poor agricultural practice and those not following cross-compliance requirements e.g. application of fertilisers or manures when the ground is frozen.

For nitrogen, leaching risk is not linked to soil levels but rather nitrogen inputs and whether these are consistent with or above crop needs. No nationally robust data are available on this. however, future potential data sources for nitrogen leaching risk are compliance records relating to the Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 Statutory review of the Control of Agricultural Pollution Regulations: 2025 review (or COAP) which report on levels of compliance but the most recent report focussed on farms with 'high risk; activities and therefore cannot be used as a national statistic. The review reported 59.2% of farms that were not compliant however this this is likely to be an over-estimate of all farms due to the focus on assessment on farms with high-risk activities.

'Substantiated pollution incidents which impact on water from agricultural sources' collated by NRW indicated there are currently 150 incidents / year with no change since 2001. However, this value is likely to depend on resources available for investigation so may not be a reliable national indicator.

Finally, it should be noted there are also leaching risks associated with ongoing atmospheric N deposition in woodland and unimproved habitats which are generally related to low C:N ratios of < 20. Generally enhanced leaching of nitrogen are more prevalent in woodland catchments due to their efficient capture of atmospheric N pollution but it has also been observed in acid grassland and heathland. The term nitrogen saturation describes these situations and there is extensive literature on the subject. Whilst leaching levels are considerably lower than for improved land, the nitrogen leaches into highly sensitive headwaters where losses and damage could occur. This issue could be included in the future if requested.

As an initial interim indicator which can be used to set an initial target, the % of arable and improved soils which exceed the leaching limit for phosphorus is proposed. This indicator can be enhanced in time and recognises nitrogen to some extent is already captured by the Water Resources (Control of Agricultural Pollution) Wales regulations 2021.

Table 6-22: Data sources for Indicator 3.3C - % of arable and improved grassland which exceed trigger points for phosphorous leaching

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
ERAMMP National Field Survey (NFS) Wales National Trends and Glastir Evaluation | ERAMMP	% of arable and improved grassland soils where phosphorus levels exceed trigger points for leaching	8 years	Survey data for phosphorus in arable and improved grassland is disaggregated to extract those which exceed trigger points.	Trigger points for leaching are above those for efficient production and habitat support used for Indicator 1.1B

6.4.3.1 Stakeholder feedback on proposed indicator

Total respondents = 19	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	11	4	4	7

Stakeholder comments included the need for reporting to at least every 5 years for both N and P. Trigger values for different crops was also requested but is not available as the issue more relates to the quantity of phosphorus in the soil which likely to exceed any crop. Improved trigger values for different soil types would however be beneficial. One stakeholder suggested farmers will not understand the issues leading to distrust. Soil erosion was considered by one stakeholder to be the more likely transport pathway of phosphorus to watercourses. Others asked how data would be collected not recognising the data are already available from the ERAMMP NFS as described in the report although new farmers self-assessment data will provide additional data for a subset of soils across Wales going forward. Finally, there was a question on slurry and manure contribution with respect to both on farm and export.

6.4.3.2 Baseline data

Trigger points in soils for leaching of phosphorus are significantly greater than for efficient production and support of habitats i.e. 60mg/kg compared to 16-45mg/kg for arable and 16-25mg/kg for improved grassland. They are only relevant to arable and improved grassland habitats i.e. where inorganic fertilisers and manures are applied. Current numbers exceeding these limits for arable and improved grassland for 2021-23 from the ERAMMP National Field Survey is 14.4%,

For nitrogen, leaching risk is not linked to soil levels but rather nitrogen inputs (as captured by COAP) and whether these are consistent with or above crop needs. No nationally robust data are available on this.

Other possible data sources for nitrogen leaching risk are compliance records relating to the Water Resources (Control of Agricultural Pollution; COAP) (Wales) Regulations 2021 Statutory review of the Control of Agricultural Pollution Regulations: 2025 review which report on levels of compliance. The most recent report focussed on farms with 'high risk; activities and therefore cannot be used as a national statistic. The review reported 59.2% of farms that were not compliant which is of concern, however this this is likely to be an over-estimate of all farms due to the focus on high-risk activities.

'Substantiated pollution incidents which impact on water from agricultural sources' collated by NRW. There are 150 incidents / year with no change since 2001. However, this value is likely to depend on resources available for investigation so may not be a reliable national indicator unless an indicator is constructed which focuses on these specific high-risk farms.

Finally, it should be noted there are also leaching risks associated with ongoing atmospheric N deposition in woodland and unimproved habitats which are generally related to low C:N ratios of < 20. Generally enhanced leaching of nitrogen are more prevalent in woodland catchments due to their efficient capture of atmospheric N pollution but it has also been observed in acid grassland and heathland. The term nitrogen saturation describes these situations and there is extensive literature on the subject.

As an initial interim indicator which can be used to set an initial target, the % of arable and improved soils which exceed the leaching limit for phosphorus is proposed. This indicator can be enhanced in time and recognises nitrogen to some extent is already captured by the Water Resources (Control of Agricultural Pollution) Wales regulations 2021.

Table 6-23: Available baseline statistics for Indicator 3.3C - % of arable and improved grassland which exceed trigger points for phosphorous leaching

Data Source	Baseline/Key Statistics
GMEP/ERAMMP National Field Survey topsoil data Wales National Trends and Glastir Evaluation | ERAMMP	2021-23 % of arable and improved soils combined which exceed current leaching limits for phosphorus 14.4%

6.4.3.3 Trends

The percentage of arable and improved grassland soils reported by ERAMMP in 2021-23 was 14.4%. This was an increase from the GMEP report 2013-16 where only 4% of these soils exceeded limits.

6.4.3.4 Options for targets

Possible targets for the next 5 years could be:

- *Minimal Goal (Status Quo)*
    - Maintain exceedance levels at 2021-23 levels i.e. 14.4%
    - Policy Implication: This recognises it will take time for soil testing to change behaviours and help save farmers costs and environmental impacts including water quality.

- *Moderate Goal (Sustainable Improvement)*
    - Reduce exceedance levels to 2013-16 levels i.e. to 4% (a rate of 2 % per year over 5 years)
    - Policy Implication: Targeted advice and support for where phosphorus applications are likely to be higher are likely (i.e. cereals and general cropping and mixed farming according to the Wales Farm Business Survey) to achieve more rapid results on this indicator which is focussed on the highest risk soils.

- *Ambitious Goal (Transformative)*

- Reduce exceedance levels below 2013-16 levels to 1% at a rate of 2.7% per year
- Policy implication: Targeted advice and support for where phosphorus applications are likely to be higher are likely (i.e. cereals and general cropping and mixed farming according to the Wales Farm Business Survey) and include next highest phosphorus user the dairy section, to achieve more rapid results on this indicator which is focussed on the highest risk soils.

Table 6-24: Summary table – possible targets for Indicator 3.3C - % of arable and improved grassland which exceed trigger points for phosphorous leaching

Aspect	Details
Data Sources	GMEP/ERAMMP National Field Survey topsoil data Wales National Trends and Glastir Evaluation | ERAMMP
Frequency	Every 8 years but there is potential to move to a 5-year rolling survey
Disaggregation	New analysis to extract out soils with exceed leaching trigger points
Notes	This interim indicator only captures issues associated with phosphorus but this is important as the Water Resources (Control of Agricultural Pollution) Wales Regulations 2021 only cover nitrogen. Further work is needed to capture risks associated with nitrogen use possibly through use of compliance data for Water Resources (Control of Agricultural Pollution) Wales regulations 2021 when this can provide a nationally robust statistic.
Possible targets	Minimal: Maintain levels at 14.4% exceedance Moderate: Reduce exceedance to 2013-16 levels to 4% (a rate of 2% per year over 5 years) Ambitious: Reduce exceedance below 2013-16 levels to 1% in 5 years (i.e. 2.7% a year over 5 years)

6.5 Purpose of Support 3.4: Maximising resource efficiency

Resource use efficiency has previously been described for SLM Objective 1; PoS 1.5. Resource use efficiency has important implications for ecosystems as well as costs to farmers. Where there is inappropriate management of land and/or inefficient use of Inorganic Fertilisers and Feed (1.5B), Organic Manures (1.5C) and PPP use (1.5D), nutrients, sediments and PPPs they can escape hydrologically into the adjacent land, or into the atmosphere and deposited across the landscape, causing environmental damage. All four indicators proposed for SLM Objective 1 are relevant here, including the area of land used for agriculture as this is likely to come at a cost for ecosystems i.e. Utilised Agriculture Area (1.5A).

7 Proposed indicators for SLM Objective-4

SLM Objective 4: **Conserve and enhance the countryside and cultural resources and promote public access to and engagement with them, and to sustain the Welsh language and promote and facilitate its use.**

There are three PoS which are of direct relevance to this SLM Objective:

- Sustaining Welsh language and promoting use
- Conserving and enhancing landscapes and historic environment
- Access and engagement to countryside and heritage

The final set of proposed indicators are coded by SLM Objective number and PoS (A-C where more indicators are proposed) and highlighted in bold with the indicator title and units.

The proposed indicators for SLM Objective 4 are set out in the table below.

Table 7-1: Proposed indicators relating to SLM Objective 4, by Purpose of Support

Purposes of Support relevant for SLM Objective 4	Indicator	Indicator status
4.1 Sustaining Welsh language and promoting use	4.1A. Number and proportion of Welsh speakers in rural areas and within the agricultural sector	Modified existing
4.2 Conserving and enhancing landscapes and historic environment	4.2A. Condition of designated landscapes (NPs and AONBs)	Potential future
	4.2B. Historic Environment Assets & Scheduled Ancient Monuments	Modified existing
4.3 Access and engagement to countryside and heritage	4.3A. Public Rights of Way open and signed	Existing
	4.3B. People and Nature Survey Wales engagement statistics	Potential future
	4.3C. Farm open days / farm visits / school groups	Potential future

7.1 Narrative for suite of indicators for SLM Objective 4

SLM Objective 4 presents a uniquely complex challenge within the monitoring and evaluation architecture, functioning as a broad umbrella for landscape conservation, cultural heritage, public access and engagement, as well as the sustainability of the Welsh language in rural areas. Impact indicators are required that provide a robust national picture of ongoing trends in the five characteristics that cover this mix of cultural, social and environmental objectives.

The impact indicators for SLM Objective 4 are essential for capturing the lived experiences, cultural richness, and community vitality inherent in Welsh rural landscapes and identities. They aim to ensure that progress is monitored not only in terms of landscape quality and cultural heritage protection but also in sustaining and promoting the Welsh language and facilitating meaningful public access and engagement with the countryside.

The first indicator covers the PoS 'Sustaining Welsh language and promoting use' **(PoS 4.1)**, namely **Number and proportion of Welsh speakers in rural areas and within the agricultural sector (4.1A).** This is derived from the Welsh language strategy 'Cymraeg 2050', which sets out the Welsh Government's long-term vision of achieving the target of a million Welsh speakers by 2050 and increasing the use made of the Welsh language. Discussions with stakeholders agreed that monitoring the number and proportion of Welsh speakers in rural areas and within the agricultural sector provides an indication of the sustainability of the Welsh language within communities closely tied to land management and stewardship. It also offers insight into cultural resilience and the contribution of the agricultural sector to sustaining linguistic heritage. The findings of the *Iaith y Pridd* project also highlight the close connection between agriculture and the future of the Welsh language, and the opportunities for policy and community action to strengthen its use in rural areas. In order to meet the needs of the SLM Framework the current data do not meet the requirements set out in the indicator proposed but modification is possible.

Conserving and enhancing Welsh landscapes and historic environments (**PoS 4.2**) is critical for protecting cultural heritage, landscape quality, biodiversity, and community identity across rural Wales. This PoS is covered by two indicators. Landscapes are living systems shaped by natural processes and human management, underpinning well-being, sense of place, and sustainable rural economies. The impact indicator **Condition of designated landscapes (4.2A)** covers the monitoring of National Parks and AONBs. While data are collected on the condition of protected landscapes they are not of sufficient detail to meet the needs of the SLM Framework. The indicator **Historic Environment Assets & Scheduled Ancient Monuments (4.2B)** draws on terminology already embedded within Welsh Government frameworks, most notably National Indicator 40 under the Well-being of Future Generations (Wales) Act 2015, which measures the "percentage of designated historic environment assets that are in stable or improved condition." It also appears within ERAMMP reporting, which underpins the SLM and SFS through its field survey and integrated modelling work. Retaining this established terminology ensures consistency with statutory indicators, facilitates integration with ERAMMP's evidence base, and supports continuity across policy areas. The explicit inclusion of Scheduled Ancient Monuments further reflects their statutory importance and aligns with monitoring approaches elsewhere in the UK, such as Defra's Outcome Indicator Framework for the 25 Year Environment Plan (2021 Update).

Cadw have, however, highlighted that the current indicator is not sufficiently refined, as it only refers to Scheduled Monuments and Historic Environment Assets - a term they do not use. They propose instead the more accurate and comprehensive term "Historic Assets", which would encompass Scheduled Monuments, Listed Buildings, Registered Historic Parks and Gardens, Historic Environment Features, Traditional Farm Buildings, and Landscape Features. Changing the indicator wording to "Historic Assets" may therefore be something Welsh Government wish to consider.

Indicators 4.2 A and 4.2 B may need modification to meet the needs of the SLM Framework. Neither of these indicators is ideal as they focus entirely on designated sites and, in order to fully align with the PoS, monitoring and policy frameworks should recognise the importance of landscape quality and heritage within the wider countryside beyond designated areas, ensuring that interventions contribute to resilient, thriving landscapes across all of Wales.

The third PoS under Objective 4 covers the monitoring of public engagement with nature, the countryside, and heritage (**PoS 4.3**). Access to and engagement with the countryside and heritage are fundamental to the well-being, cultural identity, and quality of life of communities across Wales. The Welsh countryside provides spaces for recreation, connection with nature, learning, and the celebration of cultural heritage, while supporting physical and mental health and fostering community cohesion. The indicator **Public Rights of Way open and signed (4.3A)** enables a deeper understanding of how people access and experience these environments, the benefits they gain, and the barriers they face. Monitoring public access, including the condition and availability of Public Rights of Way, and the extent and nature of public engagement with rural and heritage spaces, helps to understand how well people can connect with the landscape and heritage of Wales in meaningful and equitable ways. This ensures that sustainable land management policies not only protect and enhance the environment but also support opportunities for all people in Wales to experience, enjoy, and benefit from the countryside and heritage, aligning with the goals of the Well-being of Future Generations Act. This in turn supports the development of effective environmental, health, and well-being strategies, which align with the Well-being of Future Generations Act.

The indictor **People and Nature Survey Wales engagement statistics (4.3B)** concerns the People and Nature Survey for Wales (PaNS Wales) and promotes this as the primary tool for capturing insights into benefits gained from engaging with nature and the challenges faced. Once fully operational it will offer a robust, nationally representative dataset on patterns of visits, perceived benefits, and visitor demographics. Our understanding is that the survey will track not only the frequency and location of visits to the countryside and agricultural landscapes but also the quality of these experiences, supporting the development of indicators that reflect both access and meaningful engagement.

A further indictor is proposed, **Farm open days / farm visits / school groups (4.3C)** to allow an analysis of visits specifically to agricultural and countryside settings. Further analysis will be required to fully understand demographic patterns and the nature of engagement with these landscapes.

The indicators suggested may not be sufficient to capture the full scope of Objective 4. To fully meet the Purposes of Support, WG may need to consider adapting or enhancing current datasets to provide the more nuanced information required for effective monitoring and policy development. The suggested indicators are discussed more fully below.

7.2 Purpose of Support 4.1: Sustaining Welsh language and promoting use

7.2.1 Indicator 4.1A: Number and proportion of Welsh speakers in rural areas and within the agricultural sector

Derived from *Cymraeg 2050*, this indicator measures the number and proportion of Welsh speakers in rural areas and the agricultural sector. Stakeholders agreed this reflects the sustainability of the language in communities linked to land management, offering insight into cultural resilience.

In a briefing note, the Welsh Language Commissioner (March 2024) warned that the Sustainable Farming Scheme could undermine Cymraeg 2050 by weakening the rural economy and Welsh-speaking communities. They called for the SFS to be strengthened to support cultural and economic sustainability in line with the Agriculture (Wales) Act 2023. Once operational, this indicator will help monitor that risk.

Stakeholders suggested considering the number of learners achieving and going beyond Level 2 Welsh and the WFG indicator on 'daily Welsh usage'. However, this was set aside due to insufficient rural/sectoral breakdown.

Current available data require modification to meet SLM requirements for identifying the number and proportion of Welsh speakers in rural areas and within the agricultural sector. Data on Welsh speakers are available from the Annual Population Survey (APS), National Survey for Wales, Census 2021, and StatsWales, but each has limitations (See Table 7-2). The APS currently has greatest uncertainty, while the Census remains the key source despite showing different trends. Data specifically for rural areas and the agricultural sector are limited, so trends require cautious interpretation using all available sources together. Data on Welsh language use surveys are available at StatsWales.

The Welsh Language Commissioner's Office notes that Census data, collected only every ten years, are insufficient for monitoring Welsh language use (personal communication). Project Bro, led by Elin Haf Gruffydd Jones, is addressing this by analysing census data at Lower Layer Super Output Area (LSOA) level to gain a more detailed, contemporary understanding of Welsh use in specific communities (personal communication Welsh Language Commissioner's Office). Both the APS and the Welsh Language Use Survey cover Welsh language trends. The Welsh Government has a dedicated Welsh Language Data Unit which is also reviewing how ONS collects Welsh language data.

There were some stakeholder concerns. First that there was a risk of reducing the indictor to a "numbers game" without the more detailed context. Some stakeholders suggested a need to track daily use of Welsh and associated community vitality. It was noted that rural depopulation and urban migration undermine the resilience of the Welsh language. It was confirmed that farming communities are critical to Welsh language sustainability, but data specifically for "Welsh speakers within agriculture" may be sparse.

The development of a practical monitoring approach needs to focus on the use Census and National Survey for Wales (NSfW) for quantitative tracking, using Language Use Surveys for frequency/context. Consideration of qualitative case studies on Welsh-medium farm activities could be developed to complement numeric data.

Table 7-2: Data sources regarding Indicator 4.1A - Number and proportion of Welsh speakers in rural areas and within the agricultural sector

Data Source	Measures	Frequency	Disaggregation	Notes
Census (ONS, Welsh Government) Welsh language by population characteristics (Census 2021)	Self-reported Welsh-speaking ability, incl. geography & employment sector	Every 10 years (latest 2021)	Age, gender, LSOAs, urban/rural, occupation/industry	Widely used but infrequent
National Survey for Wales (NSfW) National Survey for Wales, 2018-19:	Welsh language in the workplace; employer provision of learning opportunities	Annual	Age, gender, employment, region	No rural/agricultural breakdown. 2018-19: 80% of Welsh speakers used Welsh with Welsh-speaking colleagues.
Annual Population Survey Welsh language data	Welsh language data including: Personal Work Education Health characteristics	Annual	Age, gender, region, frequency of use	Sample sizes declining. Estimates higher than Census (e.g. 2021 APS: 752k vs Census: 538k).
Welsh Language Use Survey Questionnaire for adults aged 16+	Frequency, fluency, learning history; includes national indicator of use	Last run 2019-20	Region (e.g. Gwynedd, SE Wales), sector (public, private, third)	Ended early due to COVID-19. Captures usage, not just ability.

Cadw support the development of an emerging indicator that would more effectively capture agriculture's direct contribution to sustaining the Welsh language. They highlight the potential of the CAPIT (Common Agricultural Policy IT) system, which already records written and spoken language preferences but is not publicly available. It is likely that these data can be adapted into a stronger measure of actual Welsh usage within farming households and landholdings. This could be expanded to include indicators of daily or informal Welsh use, offering more nuanced insights into the role of agricultural communities in sustaining linguistic heritage.

Cadw also suggested additional opportunities exist through the SAF forms, which currently record over 70,000 field names. With greater promotion, these records could be made public and resurveyed periodically to safeguard linguistic heritage. Similarly, farm names - many of which are missing, outdated, or anglicised on existing registers - could be updated using SAF data. Successful pilot projects in Eryri and Ynys Môn also demonstrate that community-led recording of topographic features is both feasible and impactful, with the potential to be scaled nationally through an online tool already in place. Taken together, Cadw believe these measures would significantly strengthen the evidence base for monitoring and enhancing the agricultural sector's contribution to the Welsh language.

7.2.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	14	5	0	7

Stakeholders stressed that the current indicator does not adequately reflect the agricultural sector's role in sustaining the Welsh language and rural cultural identity.

Several practical mechanisms were suggested to generate more meaningful, measurable indicators. These include using existing CAPIT data on farmers' language preferences - expanded to capture household usage, informal day-to-day practices, and levels of proficiency from learner to fluent speaker. SAF returns could also be harnessed to record and update Welsh place names (field names, farm names, and topographic features), complementing projects led by the Royal Commission on the Ancient and Historical Monuments of Wales and partners. Such measures would not only monitor Welsh usage in the farming community but also safeguard local names and heritage for future generations.

Stakeholders also called for more dynamic indicators to capture the resilience of Cymraeg, for example, the proportion of Welsh learners, the linguistic profile of young people moving in and out of rural areas, or the number of farmers engaging in Welsh learning. Some cautioned that demographic change, such as greater diversity in agricultural employment, could complicate measurement if Welsh-speaking prevalence alone were used.

Census data and previous research (e.g. the Mentera report on Welsh in agriculture) were also cited as resources. Overall, stakeholders advocated moving beyond binary or token indicators towards embedded, sector-specific measures that reflect both the vitality and lived use of Welsh in agricultural contexts.

7.2.1.2 Baseline data

Monitoring the number and proportion of Welsh speakers in rural areas and within the agricultural sector provides valuable insights into the sustainability of the Welsh language in communities closely tied to land management and stewardship. This indicator offers a lens on cultural resilience and the contribution of the agricultural sector to sustaining linguistic heritage in Wales.

Stakeholders have emphasised the need to look beyond numeric counts to capture the vitality, frequency, and context of Welsh language use within rural communities. Therefore, this indicator could pair quantitative tracking with qualitative insights to reflect community-level language use and sustainability. While this indicator is measurable using established data sources, changes over time will be influenced by wider policies and societal factors. Targets should therefore be used to inform contextual monitoring rather than attributing direct causality to SLM interventions alone.

The Census 2021 and the National Survey for Wales provide the primary baseline figures, with the potential for a StatsWales data request to refine rural and sector-specific detail. Data sources and available baseline statistics are provided in Table 7-3. There is currently no single published headline figure specifically reporting the proportion of Welsh speakers in "rural areas" of Wales. As a result, any understanding of Welsh language use in rural contexts must be inferred indirectly from available data. One approach is to use rural counties as a proxy, noting that areas typically considered rural have higher Welsh-speaking rates, but this remains an informed estimate rather than a precise baseline. To obtain an accurate figure, it would be necessary to extract small-area data classified as "rural" and analyse Welsh language use within those geographies. Similarly, there is no single direct statistic reporting the number of Welsh speakers working in agriculture in Wales.

Given these data limitations:

- Any current analysis of Welsh speakers in rural areas and within the agricultural sector in Wales relies on inference.
- Acceptable limits of change could be locally defined in collaboration with stakeholders, where monitoring is undertaken at sub-national levels.
- To improve future data precision, adding targeted questions to National Survey for Wales modules, agricultural surveys, or local monitoring efforts could address these evidence gaps and directly inform rural language policy and planning.
- Pairing these quantitative baselines with qualitative monitoring will enable meaningful tracking of Welsh language use in rural and agricultural contexts.

Table 7-3: Available baseline statistics for indicator 4.1A - Number and proportion of Welsh speakers in rural areas and within the agricultural sector

Data Source	Baseline/Key Statistics
Census (ONS, Welsh Government) **Welsh language by population characteristics (Census 2021)**	Census 2021: 538,300 people aged 3+ (17.8%) reported being able to speak Welsh. Down from 19.0% in 2011 There is no single published headline figure for "rural areas," but an estimation can be made using rural local authorities with higher Welsh-speaking rates: Gwynedd: 64.4% Anglesey: 55.8% Ceredigion: 45.3% Carmarthenshire: 39.9% Powys: 16.5%
National Survey for Wales (NSfW) **National Survey for Wales, 2018-19:** **Welsh language in the workplace**	In 2022-23 11% of the population aged 16 years or older speak Welsh daily and can speak more than just a few words.

Data Source	Baseline/Key Statistics
Annual Population Survey Welsh language data from the Annual Population Survey: April 2024 to March 2025	828,600 people aged 3 and over were able to speak Welsh in the year ending 31 March 2025 E.g. Age 45-54: 23.5% Females and 19.5% Males speak Welsh Perceived rural areas: Gwynedd: 72.7% Anglesey: 62.5% Ceredigion: 56.0% Carmarthenshire: 47.5% Powys: 31.6%
Welsh Language Use Survey July 2019 to March 2020 Questionnaire for adults aged 16+	10% spoke Welsh daily and could speak more than a few words, the same percentage as in 2013-15 (National Indicator) 10%(r) could speak Welsh fluently, a decrease of one percentage point since 2013-15

7.2.1.3 Trends

Census 2021 data show a continuing decline in Welsh speakers, with only 17.8% of the population (538,300 people aged three or older) reporting Welsh-speaking ability - the lowest proportion ever recorded. This represents a fall of 23,700 speakers since 2011 and reflects long-term downward trends, with numbers now only slightly above the low points of the 1981 and 1991 censuses (see *Figure 7-1*).

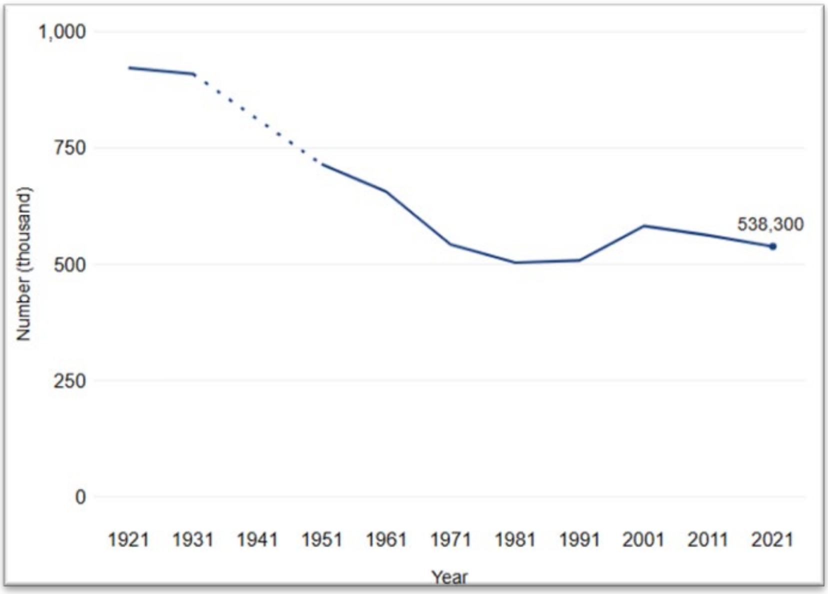

Figure 7-1: Number of people aged three years or older able to speak Welsh, 1921 to 2021 Source: Census of population, 1921 to 2021) Note: The census did not take place in 1941 due to the Second World War.

7.2.1.4 Options for targets

Accepting that there needs to be some further work on the data and to develop a clear baseline, which means that setting targets is more difficult. Nevertheless, given the presence of wider ambitions and targets it was felt to be important. Possible targets in the next 5 years for the number and proportion of Welsh speakers in rural areas and within the agricultural sector could be:

- *Minimal Goal (Status Quo)*
  - Maintain the current proportion of Welsh speakers in rural areas and within the agricultural sector, with no decline over the next monitoring period.
  - Policy Implication: Positions stability as a success in the current environment of a reduction in Welsh speakers. Effort and investment potentially required to halt this trend.

- *Moderate Goal (Sustainable Improvement)*
  - Achieve an e.g. 3–5% increase in the proportion of daily Welsh language users in rural areas and within the agricultural workforce.
  - Policy Implication: A 5% increase every 5 years using the Census data of 538,300 people able to speak Welsh would not achieve the million Welsh speaker goal by 2050 (672,875 by 2050) and therefore does not align with the Well-being of Future Generations Act aspirations for daily Welsh use. However, this target is focussed on rural areas and agri workforce. Would require investment.

- *Ambitious Goal (Transformative)*
  - Achieve an e.g. 10% increase in daily Welsh language use among rural residents and agricultural workers within 5 years, supported by community initiatives and adult Welsh language learning opportunities.
  - Policy Implication: A 10% increase every 5 years using the Census data of 538,300 people able to speak Welsh would not achieve the million Welsh speaker goal by 2050 (807,450 by 2050). Again, missing the Well-being of Future Generations Act aspirations for daily Welsh use. However, this target is focussed on rural areas and agri workforce. It requires programme alignment (e.g., Welsh-medium community events, language learning in farming communities), potentially positions SLM as a contributor to national Cymraeg 2050 goals and could encourage cross-policy action linking language sustainability with rural development and farming community well-being.

Table 7-4: Summary Table – possible targets for indicator 4.1A - Number and proportion of Welsh speakers in rural areas and within the agricultural sector

Aspect	Details
Data Sources	Census (10 years), National Survey for Wales (annual), Annual Population Survey, Pupil Level Annual School Census (annual)
Frequency	1–10 years depending on data source
Disaggregation	Age, gender, rural/urban, some employment sector data
Notes	Combine numeric tracking with frequency/context of use; stakeholder concern over vitality vs numbers
Possible targets	Minimal: Maintain current proportion of Welsh speakers in rural areas and within the agricultural sector Moderate: e.g. 3–5% increase in daily use of Welsh in rural areas and within the agricultural sector Ambitious: e.g. 10% increase in daily use of Welsh in rural areas and within the agricultural sector

7.3 Purpose of Support 4.2: Conserving and enhancing landscapes and historic environment

7.3.1 Indicator 4.2A: Condition of designated landscapes (NPs and AONBs)

Designated Landscapes in Wales - three National Parks and five Areas of Outstanding Natural Beauty - cover 25% of the country. They protect areas of exceptional environmental, cultural, and scenic value while supporting local economies and well-being. Attracting around 12 million visitors annually and generating over £1 billion, they are internationally recognised as IUCN Category V Protected Areas and exemplify the balance of people and nature. Registered Historic Landscapes add further cultural significance but, as non-statutory designations, receive less public engagement and systematic monitoring.

The indicator *Condition of designated landscapes (NPs and AONBs)* provides valuable insight into these protected areas but does not capture change across the wider Welsh countryside. In the absence of consistent national-scale data, it should be interpreted with caution and, where possible, supplemented with additional evidence. Natural Resources Wales's LANDMAP offers Wales-wide information on landscape character, quality, and sensitivity, which could inform broader monitoring, although it does not assess "condition" in the same way as biodiversity or habitat surveys. For National Parks, State of the Park Reports provide useful assessments of condition and trends, but reporting is less consistent across AONBs and not available for non-designated areas.

Comparative approaches can provide learning. Scotland, for example, designates National Scenic Areas and established National Parks under the 2000 Act with four statutory aims: conserving natural and cultural heritage, promoting sustainable resource use, encouraging public enjoyment, and supporting sustainable economic and social development. These broader aims may offer insights for strengthening Welsh indicators.

Wales has also committed to the Global Biodiversity Framework's "30 by 30" target to protect and manage 30% of land and seas for nature by 2030. Designated landscapes are recognised as key delivery mechanisms, yet the SoNaRR Interim Report (2024) highlights persistent gaps in habitat condition and trend data, reinforcing the need for improved monitoring to track biodiversity and climate targets.

Stakeholders stressed the need for indicators that reflect all landscapes, including social and cultural dimensions such as stewardship and sense of belonging. Concerns were also raised about the variable quality and coverage of existing data sources, which may not be sufficient for robust monitoring. Stakeholders also questioned the use of "condition" in the wording of the indicator which was seen as problematic due to its ambiguity and difficulty to assess consistently. A respected stakeholder suggested reframing this indicator as "quality and diversity of landscapes," which may better capture landscape character without implying a static or uniform baseline of "good condition".

Suggested next steps:

- Retain the designated landscapes indicator but acknowledge its limited coverage and need for more clearly defined definition.
- Pilot LANDMAP as a supplementary baseline for the wider landscape to support future target setting.
- Strengthen links between landscape indicators and agri-food policy to reflect farming's role in shaping landscape condition and heritage.
- Consider Scotland's four National Park aims as a model for integrating sustainable resource use and community development.
- Highlight the contribution of landscapes to SLM Objective 3 through ecosystem resilience and associated benefits.

Adopting this approach would enable transparent, robust reporting while ensuring ambitions for landscapes and the historic environment apply across all of Wales, not only within designated areas.

Relevant data sources: Several existing datasets provide partial insight into the condition of Wales's designated landscapes, but coverage and consistency vary. State of the Park Reports offer structured assessments within National Parks, AONB, and the National Landscapes Anglesey, Gower, the Wye Valley, the Llŷn Peninsula, and Clwydian Range & Dee Valley. LANDMAP provides a comprehensive national baseline on landscape character and quality. Other sources, such as the Register of Historic Landscapes and the State of Natural Resources Report (SoNaRR), highlight the importance of designated landscapes for biodiversity but in respect of cultural heritage they lack systematic or up-to-date condition monitoring. Together, these sources form a fragmented evidence base that can inform indicator development, though significant gaps remain.

Table 7-5: Data sources regarding Indicator 4.2A - condition of designated landscapes (NPs and AONBs)

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
State of the Park Reports (Snowdonia, Bannau Brycheiniog, Pembrokeshire Coast)	NP condition and trends across biodiversity, heritage, access, and well-being (linked to Management Plans).	5-year cycle	By Park, theme, some location-based insights (varies by Park).	**Pros:** Place-based, statutory alignment, integrates multiple data, public. **Cons:** Only NPs (~25%), methods vary, infrequent, gaps in systematic condition monitoring.

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
LANDMAP LANDMAP Managed by NRW	GIS dataset of landscape characteristics and qualities across Wales to provide a landscape baseline.	10-12 year reporting cycle	By location, layer (historic, cultural, habitats), and quality attributes. LANDMAP Visual & Sensory landscape evidence and monitoring identifying change in character, diversity and quality (White, 2018) and 2026.	**Pros:** National coverage, NRW produce baseline statistics (less need for specialist GIS analysis) **Cons:** inconsistent updating, units of assessment relatively large
Report on Registered Historical Landscapes of Wales (link not available)	Focus on 58 outstanding and special historic landscapes	In development	To be confirmed	**Pros:** Targeted/detailed focus, integration with LANDMAP Historic Landscape in progress **Cons:** Partial coverage
The State of Natural Resources Report (SoNaRR) Interim Report December 2024	Ecosystem health, well-being contributions, national biodiversity. Interim 2024 notes lack of designated landscape condition data.	5-year cycle	National scale New baseline landscape data on tranquillity and dark skies is to be published in SoNaRR 2025.	**Pros:** Mandated, broad ecosystem focus, links to 30x30 targets. **Cons:** Focuses on biodiversity, no specific baseline condition/trend data for cultural or heritage aspects of designated landscapes.

7.3.1.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	6	13	2	5

Stakeholders raised concern that the proposed indicator offers an overly simplistic measure of "condition" and fails to reflect the dynamic role of farming and land management in shaping Welsh landscapes. It was noted that current indicator wording does not adequately capture the social, cultural, and economic value of landscapes, nor the positive improvements already being made by farmers.

One stakeholder highlighted the new *Ffermio Bro* agri-environment scheme, which focuses on improving ecosystem condition within NPs and AONBs. Measuring progress will be essential, particularly given the strong political and policy drive to enhance biodiversity in these designated landscapes.

Several contributors questioned the clarity of the causal link with farming, given the influence of other pressures such as tourism, invasive species, and forestry in designated areas. A key concern was that designated landscapes are not representative of Wales as a whole. Many stakeholders preferred shifting the language from "condition" to "quality," with an emphasis on landscape character and diversity, underpinned by LANDMAP (particularly its Visual and Sensory layer) and data from Registered Historic Landscapes.

More robust survey data, including indices for SPAs, SACs and SSSIs, were proposed to provide quantitative measures, counterfactuals, and a clearer understanding of cultural landscapes, which links with other SLM objectives. Stakeholders also suggested revisiting designation criteria to ensure they reflect contemporary socio-ecological and cultural values, including heritage, skills, and traditional farming practices.

While existing condition assessments were acknowledged, stakeholders observed that many currently show sites as failing, which risks undermining constructive engagement. A more nuanced, Wales-wide approach, integrating ecological, cultural, and economic dimensions, was considered essential to create indicators that not only reflect challenges but also incentivise and evidence positive land management contributions.

7.3.1.2 Baseline data

An example of the available data is provided in the table below. There was no obvious mention of using drones to measure landscape condition in any of the data sources however, this could potentially be implemented in the future.

Table 7-6: Available baseline statistics for Indicator 4.2A - condition of designated landscapes (NPs and AONBs)

Data Source	Baseline/Key Statistics
LANDMAP Managed by Natural Resources Wales	Baseline data available via LANDMAP which is a national, spatial landscape information system developed by Natural Resources Wales. It classifies and evaluates the landscape across five key aspects – Geological Landscape, Landscape Habitats, Visual and Sensory, Historic Landscape, and Cultural Landscape – to support consistent, evidence-based decision-making in planning, conservation, and sustainable land management. All datasets available from DataMap Wales

Data Source	Baseline/Key Statistics
State of the Park Reports (Snowdonia, Bannau Brycheiniog, Pembrokeshire Coast)	e.g. Pembrokeshire Coast National Park LANDMAP Visual and Sensory (Evaluation) in 2025: Outstanding (dark green): Concentrated in the north and along key inland river valleys, highlighting visually striking or unique landscapes. Low (orange): Localised patches, notably in the south and some central inland zones, suggesting landscape degradation or detracting elements. Pembrokeshire Coast National Park LANDMAP Detracting Views Map in 2025: Tendency to follow pattern of Visual and Sensory maps e.g., south Pembrokeshire has areas that likely experience visual intrusion from infrastructure, degraded environments, or land use conflict, diminishing scenic value and offer potential for targeted landscape enhancement.
Report on Registered Historical Landscapes of Wales (link not available)	The baseline data are under development and will focus on 40 areas outstanding landscapes which are important. Potentially more targeted/detailed than LANDMAP
The State of Natural Resources Report (SoNaRR) Interim Report December 2024	No new quantitative condition data specifically for designated landscapes (NPs and AONBs) concerning biodiversity but acknowledges the lack of sufficient condition and trends data for these areas.

7.3.1.3 Trends

LANDMAP provides a nationally consistent GIS baseline covering five landscape dimensions: Geological Landscape, Landscape Habitats, Visual & Sensory, Historic Landscape, and Cultural Landscape Services. Each aspect area is evaluated for its value, condition, and trend, enabling longitudinal comparisons (e.g., datasets from 2001–03 versus 2013–14) to detect significant landscape change.

Repeated LANDMAP surveys, particularly within Landscape Habitats, have identified areas undergoing notable change, including habitat fragmentation, shifts in biodiversity values, or evolving visual characteristics. In this sense 'change' is recorded but no trend data are available. It is thought that LANDMAP could calculate the extent to which landscape character, diversity, and quality have changed from the 2017 baseline by 2025–26.

This would involve reporting the percentage/hectares of each character and diversity classification, and the percentage/hectares of each quality evaluation (outstanding, high, moderate, low), both at an all-Wales scale and within designated landscapes. The approach could first be completed for LANDMAP Visual & Sensory (2026), and then for the integrated Register of Historic Landscapes and LANDMAP Historic Landscape datasets (circa 2026–27). This refinement would ensure that progress is systematically monitored in terms of landscape quality and cultural heritage, integrated into indicator frameworks, and aligned with the SLM Framework. It would also enhance reporting consistency, extend coverage to the wider countryside beyond designated areas, and capitalise on LANDMAP's national quality assurance and comparability.

The State of Natural Resources Reports (SoNaRR) highlight ongoing concerns about the condition of designated landscapes and protected sites in Wales. According to SoNaRR 2016 and 2020, most protected sites, including SACs and SPAs, remain in unfavourable condition, with little improvement since 2016. Ecosystem resilience in designated landscapes, such as National Parks and AONBs, is declining, as these areas face the same pressures as the wider countryside, including habitat loss, intensive agriculture, visitor impacts, and climate change. SoNaRR 2016 reports that for species features on Natura 2000 sites, "the overall condition of SAC and SPA species features on these sites in Wales, as reported in 2013, was mostly unfavourable (55 %) with the exception of birds and mammals of which 86 % and 68 % were in favourable condition respectively," and that "92 % of grassland SAC features in Wales are considered to be in unfavourable condition." SoNaRR 2020 placed greater emphasis on the societal and cultural value of designated landscapes, noting that "many designated landscapes in Wales (Areas of Outstanding Natural Beauty, National Nature Reserves, Sites of Special Scientific Interest and National Parks) contain areas of enclosed farmland and associated patterns of crops, buildings, field enclosures and management regimes which provide a sense of place and appreciation of nature valued by residents and visitors." SoNaRR 2025 will be published in December 2025.

Limitations: Despite these strengths, LANDMAP has some constraints. Updates are cyclic, so the data may be a decade or more out of date in places, limiting its ability to capture rapid or short-term landscape change. Aspect areas are mapped at a broad scale, which can mask fine-grained variation within landscapes. Evaluations of value, condition, and trend rely on expert judgement, introducing subjectivity. Finally, LANDMAP does not directly integrate socio-economic drivers of change, so it is most effective when used alongside other datasets (e.g. remote sensing, ecological surveys, or local socio-economic data).

7.3.1.4 Options for targets

In order to develop a practical monitoring approach, it needs to be recognised that landscapes are dynamic, not static and therefore targets must be flexible over time. The targets presented here are tentative, given the concerns over the data.

Possible targets for the next 5 years if the indicator is worded the condition of designated landscapes (NPs and AONBs) could be:

- *Minimal Goal (Status Quo):*
    - Maintain current distribution of landscape value; avoid further decline in LANDMAP Moderate and Low areas for the next 5 years.
    - Policy Implication: Continued adherence to LANDMAP in planning policy. If including undesignated landscapes this may have a funding implication. Could integrate landscape quality scoring into agri-environment scheme assessment criteria.

- *Moderate Goal (Sustainable Improvement):*
    - Improve e.g. 10% LANDMAP Moderate areas to High through landscape restoration (e.g., hedgerow replanting, infrastructure screening creating visual mitigation zones in areas with high detracting views) in the next 5 years.
    - Policy Implication: Could include integrating landscape enhancement objectives into existing agri-environment schemes such as the Sustainable Farming Scheme. Strengthened development management policies may be encouraged

to require restoration measures in LANDMAP Moderate areas. Support for localised visual impact assessments and small-scale restoration grants could help incentivise landowners. Cross-sector collaboration between NRW, local planning authorities, and designated landscape bodies may be useful to identify and prioritise areas for improvement.

- *Ambitious Goal (Transformative):*
    - Improve e.g. 15% LANDMAP Moderate and High areas to expand Outstanding-rated areas through rewilding, biodiversity corridors, and sensitive land management in the next 5 years.
    - Policy Implications: May require strategic investment in large-scale land-use change, such as rewilding or the development of nature recovery networks, with landscape quality recognised as a co-benefit. A dedicated landscape enhancement fund could support such initiatives. Policy alignment across planning, agriculture, and biodiversity strategies would help ensure visual and sensory quality is embedded in broader environmental goals. Promoting multi-benefit land management that supports climate, biodiversity, and public access objectives alongside landscape value could be key. Enhancing LANDMAP indicators may also be necessary to monitor and evidence improvements effectively.

Table 7-7: Summary Table: Possible targets for Indicator 4.2A - condition of designated landscapes (NPs and AONBs)

Aspect	Details
Data Sources	State of the Parks Reports, LANDMAP (NRW)
Frequency	1-5 years
Disaggregation	LANDMAP according to Geological Landscape, Landscape Habitats, Visual and Sensory, Historic Landscape, and Cultural Landscape
Notes	The use of drones could potentially be implemented in the future
Possible targets	Minimal: Maintain current distribution of landscape value; avoid decline in LANDMAP Moderate and Low areas over next 5 years. Moderate: Improve e.g. 10% LANDMAP Moderate areas to High through landscape restoration over 5 years. Ambitious: Improve e.g. 15% LANDMAP Moderate and High areas to expand Outstanding-rated areas over 5 years.

7.3.2 Indicator 4.2B: Historic Environment Assets & Scheduled Ancient Monuments

Historic Environment Assets (HEAs) and Scheduled Ancient Monuments (SAMs) are integral to conserving and enhancing Wales's landscapes and cultural identity, providing a tangible link to the past while supporting tourism, education, and community connection to place.

There are about 4,200 SAMs in Wales, which are monitored on a 10-year cycle using Cadw's Monument at Risk Survey, assessing condition (favourable/unfavourable) and trends (improving, stable, worsening) alongside risk categories (low, medium, high, high immediate). As of the last assessments:

- 67% were in favourable condition, 32% unfavourable.
- 51% at low risk, 34% medium, 12% high, and 3% high immediate risk.

These data can be disaggregated, for example, in Snowdonia National Park, there are 374 Scheduled Monuments, with over 97% considered in stable condition (data provided in State of the parks Report).

HEAs is a collective term that covers SAMS, Listed buildings, Historic Parks and Gardens and other known historic environment features. Listed Buildings (~30,000 in Wales) are assessed in a five-year cycle using the Buildings at Risk Survey, with GIS data available to inform place-based management. This programme is overseen by Cadw.

Registered Historic Parks and Gardens are captured in a 2022 register and includes 385 such sites. There is currently no monitoring of these sites but 14 are picked up under the ERAMMP monitoring.

Undesignated Historic Environment Assets are captured in the Historic Environment Record (HER) and monitored by HENEB, with advice available on how agricultural operations may impact these sites. The Environment and Rural Affairs Monitoring & Modelling Programme (ERAMMP) has surveyed HEAs across Wales, showing:

- HEA condition has remained stable: 59% in excellent/sound condition in 2013-16 vs. 54% in 2021-23.
- The number of threats to re-surveyed HEAs decreased by 32% between 2013-16 and 2021-23.
- Vegetation and agricultural operations remain key threats, requiring ongoing management.

There were some stakeholder concerns, namely the need for clarification on the definition of "condition" (typically refers to physical state, stability, integrity, and immediate risks). It was also felt that monitoring alone is insufficient as this does not include active protection, management, and mitigation, which is clearly the intention of the SLM framework as these are needed to address degradation from vegetation, agriculture, and climate impacts. It was noted that agricultural operations (e.g., deep ploughing) can significantly impact HEAs. Finally, monitoring needs to align with spatial targeting of agri-environment schemes to avoid unintentional damage and support restoration where possible.

Relevant data sources: The following table summarises the data sources, key measures, and reporting approaches currently used to monitor the condition and status of these historic assets, providing a clear overview of the existing evidence base for this indicator.

In terms of a practical monitoring approach, it is proposed to use Cadw and HER data to identify HEAs within agricultural areas and then to integrate monitoring of features with agri-environment scheme inspections. Consideration should be given to leveraging GIS mapping to assess spatial distribution and potential risks with a focus on periodic reassessment aligned with Cadw and ERAMMP cycles to track trends.

Table 7-8: Data sources regarding Indicator 4.2B - Historic Environment Assets & Scheduled Ancient Monuments

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Cadw Monument at Risk Survey 2025 (link not available as internal document)	Condition (favourable, unfavourable, trends), risk categories (low, medium, high) for Scheduled Monuments (~4200 in Wales)	10-year cycle	National, regional, site-specific	Includes threat monitoring (vegetation, erosion, climate, human impacts)
Cadw Buildings at Risk Survey 2025 (link not available – as internal document)	Condition and risk status for Listed Buildings (~30,000 in Wales)	5-year cycle	National, regional, site-specific	GIS mapping available
Historic Environment Record (HER, HENEB)	Location and status of undesignated historic environment assets	Ongoing updates	Regional, site-specific	Includes archaeological sites and landscapes not meeting designation criteria
ERAMMP Technical Annex-105TA1S11	HEA condition, threat categories, trend data (2013-16, 2021-23)	Multi-year survey (GMEP 2013-16, ERAMMP 2021-23)	Nationally Representative Squares, re-survey data available	Includes % in excellent/sound condition, threat category trends
State of the Park Report – Snowdonia	Number and condition of Scheduled Monuments in Snowdonia National Park	Periodic	National Park-specific	97% of monuments in stable condition, identifies pressures from natural decay, agriculture, and visitors

7.3.2.1 Stakeholder feedback on proposed indicator

Total respondents = 26	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	15	2	2	7

Stakeholders highlighted significant limitations with the current approach to monitoring historic environment features. Inaccurate mapping was identified as a key problem, and there was little support for using RPW inspections as an indicator, since these are compliance-focused rather than condition-based and judged against fixed standards. Concerns were also raised that current measures unfairly place responsibility on farmers for damage that may be historic or caused by factors outside their control, such as extreme weather or public access.

A stronger emphasis was placed on recognising positive stewardship and the active role land managers play in conserving heritage assets, rather than only assessing risks or damage. Stakeholders acknowledged that whilst data exist for around 51,000 polygonised non-designated assets in Wales, only small samples have been surveyed through ERAMMP to date (91 in round one and 71 in round two), and stakeholders called for significantly larger, representative samples. By contrast, Scheduled Monuments have a complete baseline dataset, offering a more robust starting point.

Stakeholders suggested reframing the indicator to focus on "condition of historic assets," with an expansion to include qualitative measures of registered historic landscapes. LANDMAP was noted as a valuable evidence source that could feed into a broader landscape-quality approach (linked to 4.2A).

Overall, stakeholders argued that knowing the location of assets is insufficient without systematic condition assessments and improvement plans. A shift toward measuring stewardship, condition, and proactive management was seen as essential to ensure meaningful monitoring and protection of historic environment assets.

7.3.2.2 Baseline data

There was some concern in the TEG and stakeholder meetings that recording the condition of these designated sites says little about sites in the wider countryside or how the public engage with them. Public engagement with historic environment assets, including SAMs, Listed Buildings, and historic parks and gardens, is integral to the objectives of the Well-being of Future Generations (Wales) Act, supporting cultural heritage, education, and community connection to place.

Public accessibility to monuments is partially recorded by Cadw and this could be expanded by using GIS mapping for proximity of sites to public footpaths. As noted elsewhere measuring "public engagement" is inherently complex, often requiring proxies such as visitor numbers, educational event participation, or survey-based sentiment indicators. It would be worth exploring if frame engagement data collection could be connected to cultural well-being indicators under the WFG Act, linking heritage access with health, well-being, and education.

Table 7-9: Available baseline statistics for Indicator 4.2B - Historic Environment Assets & Scheduled Ancient Monuments

Data Source	Baseline/Key Statistics
Cadw Monument at Risk Survey 2025 (link not available)	67% of Scheduled Monuments in favourable condition, 32% unfavourable; 51% at low risk, 34% medium, 12% high, 3% high immediate risk. For Listed buildings, those recorded as agricultural are more likely to be 'at risk' (32%) than the national figure for all Listed Buildings (9%).
ERAMMP (2021-23) Technical Annex-105TA1S11 (see page 9 of technical annex above)	National trend: n=39 of surveyed HEAs in excellent/sound condition; n=33 deteriorated or damaged
Glastir Monitoring and Evaluation Programme (2013-16) Technical Annex-105TA1S11 (see page 9 of technical annex above)	National trend: n=54 of surveyed HEAs in excellent/sound condition; n=37 deteriorated or damaged
Snowdonia State of the Park Report	374 Scheduled Monuments in Snowdonia; >97% in stable condition

7.3.2.3 Trends

Cadw does not appear to publish a regular national assessment showing proportions of SAMs in "good/stable / deteriorating / improving" condition over time but is prepared to share this information to benefit the opportunities under the SLM framework.

The condition of Historic Environment Assets (HEAs) was first assessed through the Glastir Monitoring and Evaluation Programme (GMEP, 2013–16) and re-surveyed under the Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP, 2021–23). Comparison of these two survey periods shows no statistically significant overall change in HEA condition, although threats from vegetation, agricultural operations, and other pressures remain key drivers of deterioration.

The State of the Park 2007 Report for Eryri (Snowdonia) National Park include a snapshot of Scheduled Monument (SAMs) condition from 1996–2003, when 97.2% were assessed as stable, 1.55% improved, and 1.25% worsened. However, the 2022 revised report does not provide updated condition statistics, and no assessments of SAMs condition for the period after 2003 are included. As a result, there are currently no trend data available on how the condition of SAMs in Snowdonia has changed over time.

Nevertheless, the hi proportion of Listed traditional farm buildings at risk compared to the national figure suggests that attention does need to be paid to gaining a greater understanding of the current baseline

The proposed aim is to maintain and improve the condition and reduce risks to HEAs and SAMs while supporting sustainable agricultural practices that are sensitive to historic assets. Baselines from Cadw and ERAMMP indicate stability in condition over time, but threats persist (see details above), particularly from vegetation and agricultural activities.

7.3.2.4 Options for targets

Setting targets for the historic environment provides a strategic focus for safeguarding Wales's cultural heritage, ensuring that conservation efforts are proactive, measurable, and integrated with wider environmental and community priorities. As the data from CADW and ERAMMP have not been combined the setting of targets seems premature. However, in the interim a status quo target of no further decline would seem to be sensible, noting the proportion of high-risk listed agricultural buildings.

- *Minimal Goal (Status Quo):*
  - Maintain current condition levels of HEAs and SAMs with no net increase in high-risk sites/buildings/features in next 5 years.

Table 7-10: Summary Table – possible targets for indicator 4.2B - Historic Environment Assets & Scheduled Ancient Monuments

Aspect	Details
Data Sources	Cadw Monument at Risk Survey, Cadw Buildings at Risk Survey, Historic Environment Record (HER, HENEB), ERAMMP Technical Annex-105TA1S11, State of the Park Report – Snowdonia
Frequency	5–10 years depending on data source, with some ongoing GIS updates
Disaggregation	National, regional, site-specific; asset type (Scheduled Monuments, Listed Buildings, undesignated HEAs); risk and condition categories
Notes	Combines numeric tracking with condition, risk, and threat monitoring; stakeholder concern that "condition" requires clarity and that action may be needed beyond monitoring
Possible targets	Minimal: Maintain current condition levels of HEAs and SAMs with no net increase in high-risk sites/buildings/features in next 5 years.

7.4 Purpose of Support 4.3: Access and engagement to countryside and heritage

7.4.1 Indicator 4.3A: Public Rights of Way open and signed

Public Rights of Way (PROWs) are a vital part of Wales's countryside and cultural heritage, supporting physical activity, well-being, and community engagement with nature and landscapes. Local authorities hold statutory responsibility for the overall management, maintenance, and recording of PROW. However, landowners also carry important legal duties, including keeping routes unobstructed and safe, and share in the wider responsibility for ensuring that PROW remain accessible and usable. This indicator tracks the proportion of PROWs that are open and signed, providing a tangible measure of physical accessibility and maintenance of these assets.

Wales has an extensive PROW network (~32,500 km), but consistent monitoring is limited. Data from the ERAMMP National Field Survey (2021–23) indicate that around 50% of surveyed PROWs are open and signed, with the remainder blocked and/or unsigned, reflecting no significant change from 2013–16. This provides a working baseline, although the dataset covers only ~0.45% of the network. The use of stratified sampling means it is considered nationally representative despite its small size, and it avoids the bias towards heavily used or popular PROWs that often characterises citizen science data.

There is currently no systematic collection of data on public engagement or use of PROWs (e.g., footfall), making it challenging to assess cultural and well-being benefits beyond physical accessibility. Stakeholders, including Ramblers Cymru, emphasise that quality, condition, and usability are as important as legal access, and highlight the need for systematic, rolling monitoring linked to clear improvement targets.

Efforts to improve monitoring and engagement could include:

- Expanding citizen science monitoring (e.g., Ramblers Cymru volunteer path surveys).
- Using GIS mapping to track obstructions and signage.
- Exploring low-cost footfall counting or survey-based engagement indicators on selected routes.
- Integrating local authority maintenance and obstruction reports with national monitoring efforts.

The discussion with stakeholders raised several concerns. First there was a sense that the indicator focuses on accessibility, not actual use or engagement. A focus on engagement would increase the value of the indicator. It was acknowledged that there was a maintenance backlog (estimated at 10,000+ PROWs requiring attention) and this limits the effective access. In addition, landowner responsibilities and livestock management issues can limit permissive access, creating inconsistencies across the network.

Relevant data sources: Table below summarises the key data sources currently available for monitoring the condition and accessibility of Public Rights of Way in Wales. It outlines what each source measures, how frequently data are reported, and the potential for disaggregation, providing a clear overview of the evidence base informing this indicator.

The main data challenges are that there is no comprehensive, systematic monitoring across Wales and a lack of consistent methodology between datasets. Data on engagement and usage, such as footfall, are absent, and this would require new methods if it was to be pursued.

In terms of developing a practical monitoring approach, we propose establishing a rolling, citizen-science monitoring programme in partnership with Ramblers Cymru and local authorities. This could be integrated with ERAMMP periodic surveys for national snapshots, including the use of GIS to track signage and obstructions systematically. It might be worth considering piloting low-cost footfall or QR-based engagement data collection on selected routes as well as developing a centralised PROW monitoring database for use by Welsh Government and local authorities.

Table 7-11: Data sources for Indicator 4.3A - Public Rights of Way open and signed

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
ERAMMP (National Field Survey)	PROW condition (open/blocked, signed/unsigned)	Infrequent (2013–16, 2021–23)	Categorised by condition and PROW type	Best available baseline
Local Authorities Rights of Way Improvement Plans (RoWIP)	Maintenance issues, obstructions	Irregular (~10-year reviews)	By local authority	RoWIP funding ended 2018; inconsistent data collection
Ramblers Cymru Citizen Science Carmarthenshire County Council	Path condition surveys	Project-based; scalable to rolling monitoring	Path-specific; can align with local authority needs	Piloted in Carmarthenshire; potential for national scaling

7.4.1.1 Stakeholder feedback on proposed indicator

Total respondents = 21	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	12	5	4	5

Stakeholders expressed mixed views, with some strong criticism of the proposed indicator. Those who marked it as a *red showstopper*, argued that it is simplistic, potentially perverse, and risks unfairly placing the burden of responsibility on farmers to maintain routes that are legally a shared responsibility with local authorities. They also opposed the idea of using a citizen science programme for monitoring, questioning its reliability. Concerns were raised that the indicator ignores wider issues such as rural crime, fly-tipping, livestock attacks, and the need for stronger public education on the Countryside Code. Others highlighted the lack of robust, coordinated data to accurately measure whether PRoWs are "open" and "signed," making the indicator currently unworkable without significant investment and strategic co-ordination of data collection.

It was also thought that emphasis should shift from simple counts to the condition and usability of paths, especially in tourist "hot spot" areas under heavy recreational pressure where over-use was a threat. They also recommended clarifying whether "open" includes passable, and broadening scope to include permissive routes, CROW land, and indicators of overuse. ERAMMP's stratified random sampling approach was noted as useful, though still not thought to be not fully representative of areas most valued by the public.

Comments regarding refining terminology (e.g., "open and accessible" or "useable") were made. One stakeholder asked how open access land or accessibility benefits from solar farms, such as creating or maintaining local walking routes, would be incorporated. Overall, stakeholders called for a more nuanced, usable, and better-resourced approach.

7.4.1.2 Baseline data

The indicator is intended to help track progress, prioritise investment, and demonstrate delivery against cultural, well-being, and environmental objectives. The table below presents available baseline statistics for Public Rights of Way in Wales, providing context for target setting and identifying gaps in current monitoring efforts. This baseline will support prioritisation of improvements in accessibility and signage across the network.

The best available baseline is:

- 50% of surveyed PROWs open and signed (ERAMMP 2021–23).

Table 7-12: Available baseline statistics for Indicator 4.3A - Public Rights of Way open and signed

Data Source	Baseline/Key Statistics
ERAMMP (2025) Technical Annex-105TA1S12 (National Field Survey)	~50% of surveyed PROWs are open and signed; 50% blocked and/or unsigned
National Context	~32,500 km of PROWs across Wales, providing scale context
Local Authorities Rights of Way Improvement Plans (RoWIP)	Maintenance and obstruction data available at local authority level (variable consistency)
Ramblers Cymru Citizen Science	In progress; potential for consistent monitoring

7.4.1.3 Trends

Data from the ERAMMP National Field Survey (2021–23) indicate that around 50% of surveyed PROWs are open and signed, with the remainder blocked and/or unsigned, reflecting no significant change from 2013–16.

7.4.1.4 Options for targets

At present, there are no established national targets for the condition or accessibility of Public Rights of Way in Wales, noting that keeping PROWs open is a legal requirement. Looking ahead, possible targets over the next five years could include:

- *Minimal Goal (Status Quo):*
  - Maintain the current 50% of PROWs open and signed, ensuring no further deterioration.
  - Policy Implications: Maintaining current access levels requires continued baseline funding for local authorities to prevent deterioration. There is minimal additional cost but ongoing strain on stretched highways and countryside budgets may affect long-term sustainability. Missed opportunities to improve public health and connectivity could result if access remains static.

- *Moderate Goal (Sustainable Improvement):*
  - Increase the proportion of PROWs open and signed to e.g. 60% within 5 years, prioritising areas with high public health, well-being, and cultural value.
  - Policy Implications: Improving PROW accessibility by 10% would require modest increases in funding and staffing for inspection, maintenance, and signage, particularly in high-use or high-need areas. Prioritisation may create geographic or social disparities if not managed equitably. Coordination with health and well-being initiatives may unlock co-benefits and cross-sector support.

- *Ambitious Goal (Transformative):*

- Increase to e.g. 70% within 5 years, supported by a funded, systematic national maintenance and monitoring programme, with citizen science and local authority collaboration.
- Policy Implications: Achieving 70% accessibility would require a significant, sustained investment in a national maintenance programme. Costs may be high but could be offset by public health gains and rural economic benefits. Involving community volunteers and citizen science could enhance capacity but would require training and coordination. There may be tensions with landowners if increased access is not carefully managed or incentivised.

In addition to headline measures, further operational targets could be developed to track progress in a more practical way. These might include the number of kilometres of PROWs cleared of obstructions each year, the annual extent of new or improved signage installed, and the level of local authority participation in rolling monitoring programmes. Together, such indicators would provide a clearer picture of how ongoing management activities contribute to maintaining and improving the network.

Table 7-13: Summary Table – possible targets for indicator 4.3A - Public Rights of Way open and signed

Aspect	Details
Data Sources	ERAMMP (NFS), Local Authorities (RoWIP), Ramblers Cymru Citizen Science
Frequency	Infrequent national surveys; potential for rolling annual monitoring
Disaggregation	By local authority, path type, and condition; potential for GIS analysis
Notes	Current data are limited and unrepresentative; stakeholders stress quality and access equity; engagement data absent
Possible targets	Minimal: Maintain the current 50% of PROWs open and signed, ensuring no further deterioration. Moderate: Increase the proportion of PROWs open and signed to e.g. 60% within 5 years Ambitious: Increase to e.g. 70% within 5 years

7.4.2 Indicator 4.3B: People and Nature Survey Wales engagement statistics

The People and Nature Survey for Wales provides nationally representative statistics on how people engage with, use, and value the natural environment. It offers insights into participation in outdoor recreation, barriers to access, and the social and well-being benefits associated with nature, making it a valuable evidence base for tracking trends in public engagement.

Table 7-14 below summarises the key data sources available to monitor public access to and engagement with the countryside using PaNS Wales. It outlines what is measured, how frequently, the potential for disaggregation, and important notes on interpretation and use.

A key consideration for this indicator is that measuring visit numbers alone provides only a partial picture, as it does not capture the depth, purpose, or quality of people's engagement with the countryside. There is also a need to understand demographic differences in access (e.g., age, disability, car access, deprivation) as this is critical to enable inclusive policymaking. Although rich, the PaNS Wales dataset requires further analysis to isolate visits to “fields / farmland / countryside” and link them accurately with reported benefits and quality perceptions. This includes further definitional clarity, because “fields / farmland / countryside” is a broad category open to interpretation, which may affect data precision.

As a result, the main concern raised by stakeholders was the limited availability of suitable data, with some remaining uncertain about how well the indicator directly reflects engagement with the countryside or heritage.

If PaNS Wales were to be adopted as a monitoring tool, it could provide a practical basis for tracking engagement, with a focus on:

- Visits to fields/farmland/countryside settings.
- Reported physical/mental health and social benefits.
- Perceived environmental quality and safety.

We suggest that further analysis is commissioned to disaggregate visits and benefits by: demographics (age, gender, ethnicity, health status); geographic variables (urban/rural, deprivation status); and frequency and purpose of visits. Consideration should be given to periodic thematic deep dives (e.g., youth engagement, barriers for people with disabilities, engagement in areas of deprivation) to complement headline metrics. Finally, the PaNS Wales data could be used alongside complementary qualitative insights from community-led or school-based projects to capture the experiential and cultural dimensions of engagement.

Table 7-14: Data sources regarding Indicator 4.3B – People and Nature Survey Wales engagement statistics

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
People and Nature Survey for Wales (PaNS Wales)	Number of visits to green/natural spaces, including "fields/farmland/countryside". Perceived benefits from visits (physical/mental health, social connection, learning, connection to nature). Perceptions of quality (variety of wildlife, facilities, accessibility, litter, safety, tranquillity) Visits by children under 16 to countryside settings, incl. school trip context	Biennial	Age, gender, rural/urban, working status, health status, ethnicity, car ownership, educational attainment, children in household. Linked to specific visit type (e.g., "fields/farmland/countryside"). Associated with visit type Child visits reported by parents/guardians	Data since 2021; geocoded data allow urban/rural and deprivation analysis. Potential for detailed benefit analysis but risk of misattribution between primary/secondary destinations. Asked of a subset (30% of respondents), enabling qualitative insights. Useful for monitoring engagement of young people with the countryside

7.4.2.1 Stakeholder feedback on proposed indicator

Total respondents = 18	Acceptable	Acceptable with caveats	Not acceptable	Don't Know
	8	8	2	8

Stakeholders questioned this indicator's validity and relevance. Concerns focused on the reliance on public perceptions, which may not reflect farming realities or management practices. Stakeholders suggested alternative measures, such as tracking the number and proportion of farms actively participating in co-designed biodiversity monitoring schemes or incorporating volunteer data from organisations like Wildlife Trusts and RSPB.

Others described the statistics as potentially useful but limited in accuracy and questionable in relation to SLM outcomes. Questions were raised about whether such engagement data fall within the control of the SLM framework, and whether the focus should be on numbers of participants, levels of engagement, or direct contributions to biodiversity.

Some stakeholders expressed uncertainty about scope, e.g., whether visitors from both urban and rural areas are captured, and referred to literature on measuring potential approaches of using social media data for environmental sustainability (https://www.cell.com/one-earth/pdfExtended/S2590-3322(23)00088-X).

Finally, a contributor with a vested interest reiterated that solar farms could generate additional access and engagement benefits, which should also be recognised under SLM Objective 4.3.

Overall, stakeholders emphasised the need to refine what "engagement statistics" means and to ensure that the indicator is robust, representative, and directly linked to potential land management outcomes under the SLM framework. However, meaningful data regarding people's engagement with the countryside was recognised as important

7.4.2.2 Baseline data

The following table summarises available baseline statistics for countryside and agricultural landscape engagement using PaNS Wales data, providing a reference point for target development and monitoring.

Table 7-15: Available baseline statistics for indicator 4.3B – People and Nature Survey Wales engagement statistics

Data Source	Baseline/Key Statistics
People and Nature Survey for Wales (2021/22)	~46.5 million visits to "fields/farmland/countryside" by people in Wales (Steven King, NRW, July 2025)
PaNS Wales thematic data	Data on benefits, quality perceptions, and demographic patterns available but not yet analysed specifically for "fields/farmland/countryside"

7.4.2.3 Trends

There are currently no trend data available. The first People and Nature for Wales survey was conducted in 2021-22, with the dataset published in September 2024. While the 2023-24 survey is due to be released on 30 September 2025, this means that at present it is not possible to analyse changes over time in people's access to, and engagement in, the countryside in Wales using the PaNS dataset.

7.4.2.4 Options for targets

Establishing targets for this indicator would be premature as it will require analysis of the data from the 2023-24 survey and subsequent comparison with the 2021-22 survey. The benefit of this indicator is the focus on engagement with Wales's countryside and agricultural landscapes and the resulting alignment with well-being and cultural goals.

Table 7-16: Summary Table – possible targets for Indicator 4.3B - People and Nature Survey Wales engagement statistics

Aspect	Details
Data Sources	PaNS Wales (biennial), potential thematic deep dives
Frequency	Biennial survey with monthly data collection
Disaggregation	Age, gender, ethnicity, deprivation, urban/rural, disability, car access, education
Notes	Rich, nuanced dataset requiring further analysis for field/farmland/countryside settings; stakeholder priority for equitable, enriching engagement

7.4.3 Indicator 4.3C: Farm open days / farm visits / school groups

Farm open days, structured farm visits, and school group activities on farms provide immersive, educational opportunities that connect the public, particularly young people, with Wales's landscapes, food systems, and agricultural heritage. These activities foster environmental awareness, cultural connection, health, and well-being while supporting SLM Objectives, such as community engagement, education, and farm diversification.

Some stakeholders considered farm visits to offer a more meaningful form of engagement than passive countryside access alone, providing opportunities for cultural exchange (including the use of the Welsh language) and hands-on learning experiences. However, others felt such visits are not a substitute for the broader public rights of access and would require careful monitoring to assess their reach, inclusivity, and educational value.

Current data collection is fragmented, locally organised, and inconsistent, making systematic monitoring challenging. While UK-wide initiatives like Open Farm Sunday (OFS) capture high-level participation, Wales-specific data remain sparse. Existing mechanisms such as PaNS Wales provide partial insights into children's visits to farmland/countryside settings, including those as part of school trips, but do not specifically capture farm visit details or qualitative learning outcomes.

To fully leverage the potential of farm-based public engagement as an indicator of access and meaningful countryside connection, dedicated data collection in Wales is needed, alongside investment in farmer capacity-building, infrastructure, and collaborative delivery with schools and land-based learning organisations.

The sense from stakeholders was that farm visits offer meaningful, experiential learning beyond numerical access counts and that this indicator should complement, not replace, wider rights of access, largely because engagement quality (learning outcomes, cultural connection) matters. Ideally the indictor would include the farmer's perspective, covering issues such as managing visitor behaviour, respecting working farms etc. It was acknowledged that there are resource implications and barriers (e.g. transport costs, staff capacity, weather risks) that can limit participation. Stakeholders noted that Wales-specific participation data remain limited and expressed concerns about the absence of consistent information on learning outcomes and visit quality. There was also a sense that activity is often concentrated on a relatively small number of farms, potentially limiting broader reach and representativeness.

Relevant data sources: Table below summarises data sources relevant for monitoring public engagement through farm open days, farm visits, and school groups, outlining what is measured, reporting frequency, disaggregation potential, and key interpretive notes.

In terms of the practical monitoring approach, it was felt that the establishment a dedicated Wales-specific monitoring mechanism for farm visits, working with LEAF Education, Farming Connect, and education bodies was the best way forward. This would track the: number of participating farms; number and characteristics of visits (school groups, public events); Learning outcomes and visitor feedback; and participation in farmer training and accreditation schemes. It should also measure investment in farm-based public engagement infrastructure and encourage the use of consistent feedback tools (aligned with OFS and LEAF Education frameworks) to capture qualitative engagement metrics.

Table 7-17: Data sources regarding Indicator 4.3C - farm open days, farm visits, and school groups

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
PaNS Wales	Number of children visiting “fields/farmland/countryside” settings, incl. if part of school trip	Biennial	Child age/gender, household socio-economic status, urban/rural	Captures general countryside visits, not specifically farm visits; requires further disaggregation
Open Farm Sunday (LEAF)	Visitor numbers, motivations, learning outcomes, visitor feedback	Annual	Visitor location (county), urban/rural, age, first-time visitor status	Wales-specific data limited; measures learning and motivation
Farming Connect, LEAF Education, AHDB	Participation in farm visit training (e.g. CEVAS)	Ad hoc/project-based	Potential for geographic and farm type analysis	Useful for monitoring farmer capacity-building for visits
Farms for City Children, The Country Trust	Participation data for school visits	Annual (internal reporting)	School origin, pupil demographics (where available)	No systematic Wales-level data; key delivery partners for equity and reach

7.4.3.1 Stakeholder feedback on proposed indicator

Total respondents = 21	Acceptable	Acceptable with caveats	Not acceptable	Don’t Know
	10	9	2	5

Stakeholder opinions were mixed, with some arguing that this indicator is relatively insignificant compared to other measures and potentially dependent on ongoing public funding. Concerns were also raised about health, safety, and farm security risks if visits were expanded without safeguards.

While broadly supportive of educational opportunities, stakeholders highlighted limitations: not all farms can host visits due to size, geographical location, resources, or family circumstances, raising fairness concerns. School access may also be constrained by lack of transport or funding, pointing to the need for a more joined-up approach. Questions were raised about scope, whether a farm visit included petting farms, broader engagement such as due to social prescribing or in-depth discussions on sustainable food production. Stakeholders stressed the need for both qualitative and quantitative data, to capture not only the number of visits but also their depth and educational impact.

Stakeholders also emphasised the importance of access, knowledge exchange, and community engagement, so long as reliable data can be captured. Some also suggested including events more broadly, not only formal school visits.

Finally, the stakeholder with a vested interest reiterated that other forms of access, such as, those facilitated by solar farms, can provide additional community benefits and should also be recognised within Objective 4.3. Overall, while seen as valuable for education and engagement, this indicator was considered uneven, resource-dependent, and requiring clearer definition.

7.4.3.2 Baseline data

The table below presents available baseline data for farm open days, farm visits, and school group engagement, illustrating current activity levels while highlighting the need for systematic Wales-specific tracking. The available data largely capture tourism-related statistics rather than providing a comprehensive record of all public farm visits. While individual farm visitor figures highlight the potential popularity of farm-based attractions, they do not reflect the overall volume of visits to farms across Wales.

Table 7-18: Available baseline statistics for indicator 4.3C - farm open days / farm visits / school groups

Data Source	Baseline/Key Statistics
Open Farm Sunday (LEAF)	In 2025, 270 events took place across England, Scotland and Wales with >200,000 visitors; 4 known participating farms in North Wales (~1,300 visitors at Berth Bach Farm in 2022)
PaNS Wales	Visits by children to fields/farmland/countryside recorded, incl. school trip flag (no farm-specific detail)
Farms for City Children, The Country Trust (Pembrokeshire)	34 school groups, 1,060 children (2023–24), ~1/3 from Welsh schools
Farming Connect, LEAF Education, AHDB	Interest in farm education training recorded in baseline surveys; no systematic Wales-wide dataset yet available
Visit Wales	Folly Farm in Pembrokeshire - originally a working dairy farm - recorded approximately 349,000 visits in 2021

7.4.3.3 Trends

In 2025, a total of 270 events were held across England, Scotland, and Wales - representing a 20% increase compared with the previous year. Disaggregated data for Wales were not found.

There are currently no trend data available for this indicator from the People and Nature Survey for Wales (PaNS). The first PaNS survey was conducted in 2021–22, with the dataset published in September 2024 and the 2023–24 survey is due to be released on 30 September 2025.

While the PaNS collects information on the number of children visiting fields, farmland, or the countryside, these results are not officially reported, meaning that no baseline or trend data are currently available. Nonetheless, there is capacity for the PaNS to provide valuable information for this indicator if the data are reported and published routinely, offering a potential basis for future monitoring of engagement.

7.4.3.4 Options for targets

Suggesting targets for this indicator is challenging as the data are shared across a number of areas and have not been analysed in a consistent way to underpin the development of trends and patterns. Clearly consistency and robustness is required to underpin any target developed but at the moment any suggestions would be premature.

Table 7-19: Summary Table – possible targets for indicator 4.3C - Farm open days / farm visits / school groups

Aspect	Details
Data Sources	PaNS Wales, Open Farm Sunday, LEAF Education, Farming Connect, Farms for City Children
Frequency	Annual (OFS, project reports), biennial (PaNS), ad hoc (training schemes)
Disaggregation	Urban/rural, visitor demographics, school participation, farm location
Notes	Current data fragmented; measures quality and learning alongside participation numbers; stakeholder support contingent on visits complementing, not replacing, wider access

8 Final list of proposed SLM Indicators and options for targets

The four tables below, one for each SLM objective, set out how the indicators proposed and any related suggestions regarding potential targets.

8.1 SLM Objective-1

Purposes of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comments
1.1 Encouraging the production of food in an environmentally sustainable manner	1.1A. Average agricultural output by farm (£)	Existing	No	**Baseline:** Average Farm Agricultural Output (£) 2023-24 - £178,400 **Trend:** increase of 21% from 2020-21 relative to 2023-24 - 5% increase per year. **Targets:** No targets are proposed	Should be assessed alongside resource use efficiency. For the future explore developing Total Factor Productivity which is only currently available for the UK and also potential indicators from the Welsh Food and Drink Economic Appraisal – 2024 report
	1.1B. Soil Health Alert Indicator	New	Well-being of Future Generations No. 13 National Indicator to maintain and increase soil carbon and organic matter but only one element of new proposed indicator	**Baseline:** % soils which cross trigger points identified for efficient production or habitat support - 80% (2021-23) **Trend**: decline of 5% in 10 years or 0.5% per year **Targets:** *Minimal (Status Quo):* No change remaining at 80% halting the ongoing decline *Moderate:* Reduce the increase by 0.5% per year so 75% in 5 years *Ambitious:* Reduce the increase by 4% per year so 60% in 5 years	Consider removing low optimum nutrient trigger point for production for phosphorus and lime (pH) as there is a perceived potential risk of excess resource use not matched to production levels.

Purposes of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comments
1.2 Helping rural communities to thrive and strengthening links between agricultural businesses & their communities	1.2A. Strength of supply chains between farmers & their local communities (upstream & downstream)	Potential future	Community Food Strategy aims to: Increase Welsh public spending on Welsh food ≥ 50% by 2030 & increase listings for Welsh products in Wales.	**Baseline:** None found for overall local supply chain strength. However, there are statistics for specific elements: - Local abattoirs: 15 abattoirs in Wales (of which 5 “small” and 4 "medium") - 58 establishments approved for handling, preparing, or producing meat products (poultry and red meat) in 2024 down from 97 in 2015. - Public procurement: 23% food purchased by Welsh public bodies of Welsh origin in 2019/20. **Trend:** no overall trends found, but some data for specific elements: - Local abattoirs: 45 abattoirs have closed since 1990; - FSA approved processing units: data since 2016 varies according to sector (poultry-stable; red meat – decline; eggs and dairy – increase) **Targets:** No targets proposed	A wide number of sub indicators could contribute to this indicator to create a comprehensive new indicator.

Purposes of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comments
	1.2B. Number of / proportion of rural households beneath median income (WFG)	Existing	Not for rural – but it relates to the Well-being of Future Generations Act National Indicator 18: People Living in Poverty and the aspiration to reduce the poverty gap.	**Baseline:** ~22% of people in Wales live below 60% of median income, but no single dataset provides a complete picture of the situation in rural areas **Trend**: No information found for rural households **Targets:** No targets proposed	Note there were concerns about the data limitations and also regarding the use of a median value when differentiating between rural and non-rural areas might require careful interpretation that avoids generalisations.
	1.2C. Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm in rural communities	Modified existing	No	**Baseline:** average well-being score in Wales = 48.2 out of 70 (2022-23), but lack of disaggregated information for rural. **Trend**: No information found for rural **Targets:** No targets proposed	Tracking trend information for the rural community going forward will be needed and once in place, this indicator will act as a comparison with 1.3E.

Purposes of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comments
	1.2D. Land used for horticulture (hectares)	Existing	No but Community Food Strategy has an Objective to increase local edible horticulture.	**Baseline:** 2024: 1,599 ha dedicated to horticulture **Trend**: Since 2021 overall area has increased by 11% **Targets:** *Minimal (Status Quo):* increase by 11% over next 5 years in line with recent trends *Moderate*: e.g. increase area of overall land dedicated to horticulture by 60% *Ambitious*: Increase overall land dedicated to horticulture by e.g. 100%.	Tracking information on location and aim of new horticulture would be beneficial i.e. local supply
1.3 Improving the resilience of agricultural businesses	1.3A. Levels of diversification in farm products and adoption of climate adaptation techniques	Potential future	No – as indicator does not currently exist	**Baseline:** Not available – no consistent data to cover full scope of indicator, although some partial one-off survey data are available. **Trend**: Not available **Targets:** No targets proposed	Some high-level trend data are available from the ERAMMP ADAS Farmer Practice Survey but it is not sufficiently robust for use and change is currently very slow. Diversification and climate adaptation techniques should be split into separate indicators.
	1.3B. Net farm income (showing levels of public funding)	Existing	No	**Baseline:** 2023-24 average farm income = £28,600 (of which £27,500 is from public purse) – but hides significant variability by farm type/individual farm **Trend**: no consistent trends - volatile **Targets:** No targets proposed	Whilst this is considered a useful indicator, a straight target could be hard to interpret.

Purposes of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comments
	1.3C. Agricultural workforce numbers	Existing	No	**Baseline:** 2024 - 49,538 agricultural workers in Wales **Trend**: Average annual decline of 1.6% between 2020 and 2024 **Targets:** *Minimum (Status Quo):* 0% growth *Moderate:* e.g. 1.6% average growth over 5 years noting the ambition to increase high quality jobs *Ambitious*: e.g. 2.5% average growth over 5 years noting the ambition to create high quality jobs	If Total Factor Productivity is developed for Wales note that workforce numbers are part of this indicator.
	1.3D Agricultural workforce age	Modified existing	No – but there are a number of initiatives to support young farmers and new entrants	**Baseline:** The mean average age of a Welsh person working in “crop and animal production, hunting and related service activities” in 2021 was 51 years old. **Trend**: No information **Targets:** *Minimal (Status Quo):* maintain average age of agricultural workers in Wales No moderate or ambitious goals identified due to lack of trend information.	Improved data are needed on current trends to set a target. For now, a status quo target is suggested.

Purposes of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comments
	1.3E Number / proportion of reported mental health and wellbeing issues, number of deaths by suicide and reported incidences of self-harm by farmers/farm workers	Modified existing	No	**Baseline:** Various options (RABI / WEMWBS). 2021 RABI survey (England and Wales) found 36% of respondents reported being "probably or possibly depressed," and 47% showed signs of anxiety. **Trend**: Not possible to calculate currently **Targets:** *Minimal (Status Quo):* prevent further decline in mental health indicators among farmers and farm workers by 2030 No moderate or ambitious goals identified due to lack of trend information	Whilst there are no trend data available, a status quo target is proposed as a minimum.
1.4 Achieving high standards of animal health & welfare	1.4A. Animal Health and Welfare indicator	Potential future	No – as indicator does not currently exist	**Baseline:** No information **Trend**: No information **Targets:** No targets proposed	Various indicators are in development covering both animal health and welfare.
1.5 Maximising resource efficiency	1.5A. Utilised Agricultural Area (ha) (to be assessed alongside total output)	Existing	No	**Baseline:** 2024 - 1,258,669 hectares **Trend**: ongoing loss of area of 5% over 10 years or 0.5% per year **Targets:** No targets proposed	To be assessed as part of total factor productivity of agriculture Note additional option of capturing loss of ALC class 1 & 2 and how it is managed with respect to resource use efficiency

Purposes of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comments
	1.5B. Total Inorganic Fertiliser and Feed Use (all farms; all crops and grass) (kt)	Existing	No	**Baseline:** 2024 – Total inorganic fertiliser used (all farms; crops and grass) (kt / year) – 881kt **Trend**: decline of 26% since 2014, i.e. a 2.6% reduction per year **Targets:** *Minimal (Status Quo):* No change from 2024 level *Moderate:* Maintain ongoing reduction in use rate e.g. 2.6% reduced use per year *Ambitious*: Accelerate reduction rates e.g. 3.5% reduced use per year	To also be assessed as part Total Factor Productivity. In future include feed when robust data for Wales are available.
	1.5C. Organic Manure Use (% dressing cover all crops and grass) (to be assessed alongside total output)	Potential Future	No – as indicator does not currently exist	**Baseline:** 2024 – organic manure use (% dressing cover all crops and grass) = 32%, but figures are for Great Britain as a whole **Trend**: increase of 4% since 2014 / 0.4% per year (Great Britain figures) **Targets:** No targets proposed	No robust data are available for Wales. This is an urgent need. Also to be assessed as part of Total Factor Productivity.
	1.5D. Plant Protection Product (PPP) Use in Agriculture	Potential future	UK targets for pesticides more broadly are available.	**Baseline:** no robust data sources found for Wales **Trend**: not available **Targets:** UK target for pesticides could be used i.e. at least 10% by 2030, taking figures for 2018 as a baseline.	Disaggregation of FERA data could be possible for PPPs and for Wales only but WG highlighted the problems of overly simplistic interpretation of volume and weight data, Impact indicator benefits relating to reduced legacy effects for soil health and water quality are suggested.

8.2 SLM Objective-2

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comment
2.1 Reducing emissions of Greenhouse gases (GHG)	2.1A. Annual greenhouse gas emissions from agriculture (Agriculture GHG Inventory)	Existing	Interim targets in various carbon budgets – but not used to inform SLM targets	**Baseline:** 2023: 5,158 Mt CO2 eq/yr **Trend**: Annual fluctuations, but reduction of 1% over 10 years (2013 to 2023) and a reduction of 3% over the last 5 years (2018 to 20023) relative to 2018 levels **Targets:** *Minimal (Status Quo):* maintain current reduction at recent 5-year levels e.g.-3% per year *Moderate:* increase rate of reduction to e.g. -5% /year *Ambitious*: increase rate of reduction to e.g. -10%/ year	Some consideration could be given to take account of short-lived nature of methane using GWP* methods.
2.2 Maximising carbon sequestration and storage	2.2A. Annual rate of carbon sequestration and storage (Land Use and Land Use Change and Forestry (LULUCF) greenhouse inventory).	Existing	No	**Baseline:** 2023: 791.7 Mt CO_2eq/year **Trend**: 0.8% increase in annual rates of capture and storage since 2013 - however annual rates fluctuate between -9% less capture and storage +11% more per year relative to 2013 **Targets:** *Minimal (Status Quo):* No change to 2023 rates *Moderate*: e.g. +5% per year in rates of capture and storage *Ambitious*: e.g. +10% per year in rates of capture and storage	
	2.2B. Farm level carbon and/or greenhouse gas reporting tool	Potential future	No – as indicator does not currently exist	N/A	Useful comments and suggestions from stakeholders to be considered as this indicator is developed.

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comment
2.3 Mitigating flood and drought risk	2.3A. Area of farmland subject to prolonged flood / drought from earth observation (EO) (where not intentional)	Potential future	No – as indicator does not currently exist	**Baseline:** No data available **Trend**: No data available **Targets:** No targets proposed	Future work bringing data sources together and ground-truthing required.
	2.3B. Quantity of water abstraction licenses for agriculture	Existing	No	**Baseline:** Dataset does not enable data to be extracted **Trend**: Dataset does not enable data to be extracted **Targets:** No targets proposed	Check data once it is gathered in format required for the indicator. Focus on volume of water.
2.4 Encouraging agricultural businesses to manage energy effectively including renewables	2.4A. Installed capacity of renewable electricity locally owned by Welsh farms, estates and communities.	Existing	More general target re generating renewable electricity exists	**Baseline:** 2023: 64MW installed capacity of renewable electricity generators owned locally by communities, farms and estates in Wales **Trend**: 1MW additional capacity between 2021 & 2023. **Targets:** Minimal / status quo: maintain current share, e.g. around 3.6MW of new capacity per year. Moderate: expand to e.g. around 7MW of new capacity per year. Ambitious: significantly expand to e.g. around 14MW of new capacity per year.	

8.3 SLM Objective-3

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Action to be taken
3.1 Maintaining and enhancing the resilience of ecosystems	3.1A. Ecosystem Health and Resilience Indicator	New	No – as indicator does not currently exist	**Baseline:** 2021-23 indicator values **Trend**: Change between 2013-16 & 2021-23 for indicators across 17 Broad Habitats and Landscape Features: Improved: 23%; No change: 55%; decline: 22% **Targets:** *Minimal (Status Quo):* maintain current rate of decline e.g. 22% indicators indicating decline *Moderate*: reduce % of indicators showing decline e.g. 20% indicators indicating decline *Ambitious*: reduce % of indicators showing decline e.g. 15% indicators indicating decline	Continue development of the indicator with interested stakeholders including NRW and ensure added value (not duplication) with the Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill biodiversity indicator and target developments.

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Action to be taken
	3.1B. Change in abundance of all species (%)	Existing	Yes	**Baseline:** 2024 data **Trend**: % change for 380 terrestrial & freshwater species: 32% Improved; 25% no or little change; 43% in decline over the last 10 years since ca. 2014 **Targets:** *Minimal (Status Quo):* e.g. maintain % of species in decline at 43% *Moderate*: e.g. Reduce % of species in decline to 38% of species over 5 years *Ambitious*: e.g. Reduce % of species in decline to 33% of species over 5 years	Note: This does not currently include marine species and therefore all species is not valid but we would urge WG to ensure work is commissioned to enable this to be the ambition for this indicator. Various concerns raised by some stakeholders that the State of Nature report is not considered independent although 60+ organisations are involved. Also, the lack of weighting of species does give a lot of influence to very numerous species e.g. moths relative to say large native mammals and all species are considered recognising even common species have their value and contribute to ecosystem functions. It is intended that this will be complementary to indicators developed for the Environment (Principles, Governance and Biodiversity Targets) (Wales) Bill.
3.2 Improving air quality	3.2A. Area of land where ammonia levels (defined as 1ug/m3) exceed tolerance of sensitive species	Existing	No but there is a target to reduce Welsh ammonia emissions	***Baseline:*** *2017-2019 = 68.8%* ***Trend****: increase of 12% in the exceedance area from 56% in 2009-11 to 68.8% in 2017-19.* ***Targets:*** *No targets proposed*	This indicator is preferred to the current target for reducing ammonia emissions in Wales by 16% between 2005 and 2030. as it is more directly reflecting the damage to our ecosystems which is of interest to SLM and the WG commitment achieving 30 by 30.

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Action to be taken
	3.2B. Woodland area which removes air pollution (hectares)	Existing	Yes	**Baseline:** Area of Woodland (Broadleaved + Conifer) = 23,600 ha (2021) **Trend**: 7% increase between 2010 and 2021 - equates to 2,145 ha / year **Targets:** *Minimal (Status Quo):* Maintain current new planting rates of 2,145ha / year *Moderate:* Increase new planting rates to 2,300ha / year *Ambitious*: Further increase new planting rates to 2,450ha / rates	Note comments that the location of woodland is important when assessing impacts for specific local ecosystems or urban centres. However, all woodland does provide this service.
3.3 Improving water quality	3.3A. Percentage of freshwater bodies in good ecological condition in areas dominated by agriculture	Potential future	No – as indicator does not currently exist	**Baseline:** 2024 interim classification shows 44% of water bodies at good or better overall status. A total of 47 catchments where agricultural activities confirmed as the main reasons for catchment not achieving 'good' status. **Trend**: widely noted improvements across Wales but no specific trends available that link to agriculturally dominant catchments **Targets:** No targets proposed	New baseline needs to be determined before targets can be set.

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Action to be taken
	3.3B. Number of pathogens from agriculture in fresh and coastal waters	Potential future	No – as indicator does not currently exist	**Baseline:** 2024: 108 out of 110 designated bathing waters met the minimum water quality standards, with 75 rated excellent. Cannot separate pathogens from agriculture. **Trend**: Largely stable over past 10 years, slight decrease in number of bathing waters meeting excellent status 2022-24. **Targets:** No targets proposed	New techniques are required to undertake water testing that can separate out the origin of pathogens either by locations or by activity e.g. agriculture.
	3.3C. Percentage of soils in arable and improved grassland which exceed trigger points for phosphorus leaching	New	No – as indicator does not currently exist	**Baseline:** 2021-23: % of arable and improved soils combined which exceed current leaching limits for phosphorus = 14.4% **Trend**: increase from the GMEP report 2013-16 where only 4% of these soils exceeded limits. **Targets:** *Minimal (Status Quo):* Maintain levels at 14.4% exceedance *Moderate*: Reduce exceedance to 2013-16 levels to 4% (a rate of 2% per year over 5 years) *Ambitious*: Reduce exceedance below 2013-16 levels to 1% in 5 years (i.e. 2.7% a year over 5 years)	Overall support for this indicator.

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Action to be taken
3.4 Maximising resource efficiency	3.4A. Utilised Agricultural Area (ha) (to be assessed alongside total output)	Repeat indicator- see Indicator 1.5A			
	3.4B. Total Inorganic Fertiliser and Feed Use (all farms; all crops and grass) (kt)	Repeat indicator- see Indicator 1.5B			
	3.4C Organic Manure Use (% dressing cover all crops and grass) (to be assessed alongside total output)	Repeat indicator- see Indicator 1.5C			
	3.4D. Plant Protection Product (PPP) use in agriculture.	Repeat indicator- see Indicator 1.5D			

8.4 SLM Objective-4

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comment
4.1 Sustaining Welsh language and promoting use	4.1A. Number and proportion of Welsh speakers in rural areas and within the agricultural sector	Modified existing	Yes, links ambition to 1 million speakers by 2050 and WFG goals 36 & 37	**Baseline:** Various sources – difficult to differentiate rural **Trend**: Long-term downward trend overall (not distinguishing rural) **Targets:** *Minimal (Status Quo):* Maintain current proportion of Welsh speakers in rural areas and within the agricultural sector *Moderate*: e.g. 3–5% increase in daily use *Ambitious*: e.g. 10% increase in daily use	Some work required to arrange data in such a way to fit this indicator
4.2 Conserving and enhancing landscapes and historic environment	4.2A. Condition of designated landscapes (NPs and AONBs)	Potential future	Yes, although not considered ideal	**Baseline:** Various possible sources, with LANDMAP being the most nationally consistent source **Trend**: No clear trends available **Targets:** *Minimal (Status Quo)*: Maintain current distribution of landscape value; avoid decline in LANDMAP Moderate and Low areas over next 5 years. *Moderate*: Improve e.g. 10% LANDMAP Moderate areas to High through landscape restoration over 5 years. *Ambitious*: Improve e.g. 15% LANDMAP Moderate and High areas to expand Outstanding-rated areas over 5 years.	Work required to determine what is meant by condition and to collect data in consistent way to determine trends and baseline. Potential to link with ecosystem health and resilience indicator for Objective 3 (3.1A).

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comment
	4.2B. Historic Environment Assets & Scheduled Ancient Monuments	Modified existing	No, but regular reporting. Each site visited every 10 years.	**Baseline:** CADW Monument at Risk Survey (2025): 67% of SAMs in favourable condition, 32% unfavourable; 51% at low risk, 34% medium, 12% high, 3% high immediate risk. Listed farm buildings at higher risk (32%) than all listed buildings (9%). **Trend**: No information reported in this way for SAMS; ERAMMP data on HEAs show no statistically significant change in the overall trend between 2013-16 and 2021-23. **Targets**: *Minimal (Status Quo):* Maintain current levels No moderate or ambitious goals identified due to need for ongoing data compilation.	Merging CADW data on SAMs and listed buildings with ERAMMP data on HEAs required. These data need to be merged in order to develop a combined indicator and related target.
4.3 Access and engagement to countryside and heritage	4.3A. Public Rights of Way open and signed	Existing	No, but it is a legal requirement.	**Baseline:** ERAMMP 2025 data: ~50% of surveyed PROWs are open and signed; 50% blocked and/or unsigned **Trend**: No change in proportion open and signed since 2013-16 **Targets:** *Minimal (Status Quo):* Maintain the current 50% of PROWs open and signed, no further deterioration. *Moderate*: Increase the proportion of PROWs open and signed to e.g. 60% within 5 years *Ambitious*: Increase to e.g. 70% within 5 years	Existing national data are from ERAMMP, this would be strengthened by linking it to data from local authorities and other sources e.g. the Ramblers
	4.3B. People and Nature Survey Wales engagement statistics	Potential future	No – indicator doesn't exist	**Baseline:** ~46.5 million visits to "fields/farmland/countryside" by people in Wales (NRW people and nature survey for Wales, 2021/22) **Trend**: No information available for Wales **Targets:** No targets proposed	Once the People and Nature Survey Wales survey is finalised it will be possible to develop the indicator and associated targets

Purpose of Support	Indicator	Indicator status	Existing targets or ambition identified?	Proposed possible targets (over 5 years)	Comment
	4.3C. Farm open days / farm visits / school groups	Potential future	No – indicator doesn't exist	**Baseline**: LEAF Open Farm Sunday 2025 figures – but data not available for whole of Wales **Trend**: No information available for Wales **Targets:** No targets proposed	Disparate data sources need to be aligned to feed into to indicator.

9 Conclusions and Recommendations

9.1 Conclusions

This report represents an extremely rapid piece of work relating to a very complex piece of legislation. The study team is grateful to the TEG and Stakeholders for their patience and time as we navigated a very large number of potential indicators (> 700) and potential data sources.

Overall, it is clear that Wales is a data-rich nation due to the investment and commitment of WG to ensure that policy is grounded in evidence. The team have therefore been able to identify at least 1 indicator with robust national data sources which can be used as an impact indicator for all 15 PoS of the Agriculture (Wales) Act with one exception (animal health and welfare). A possible list of 35 indicators is proposed of which 22 have a baseline, 16 have recent trends and 16 have proposed targets. Some proposed newly developed indicators would benefit from further consultation and development due to the rapid pace of this work however in many cases this should not stop their immediate deployment as this will ensure the ambition of the Agriculture (Wales) Act is recognised and promoted.

The team however recognise there are some surprising gaps in our data covering important areas for SLM going forward. A series of 19 recommendations are provided which prioritises some of the most urgent needs if the impacts of SLM are to be effectively reported. Furthermore, it is recognised that nearly all indicators and targets will need to be developed and reviewed on at regular intervals.

Finally, it should be noted that stakeholders were extremely concerned about the potential for a very small set of impact indicators being adopted which did not reflect the full complexity and potential co-benefits and trade-offs of different indicators.

9.2 Recommendations

Priorities for additional data collection include:

SLM Objective 1:

1. **1.2C and 1.3E. Mental health and wellbeing.** A greater focus on mental health data with a focus on granularity of rural and agricultural issues would be required to underpin the development of indicators 1.2C and 1.3E. This would involve national data sources such as Census and StatsWales and more qualitative surveys such as RABI and MIND Cymru.
2. **1.3C & 1.3D Agricultural & rural workforce.** Improvements in data required would be to add the age of agricultural workers and both the number and age of contractors who are not farmers in their own right and ensure small farms and market gardens are captured. Consideration should be given to monitoring additional demographic metrics for farmers and farm workers aside from age. Explore how contractors can be included in overall agricultural workforce figures and how workforce numbers in other inherently rural land-based occupations (such as conservation and forestry) can be tracked alongside the agricultural workforce.
3. **1.4A. Animal health and welfare.** The continued development of indicators already underway for reporting animal health and welfare by the Office of the Chief

Veterinary Officer is recommended. There are currently no national indicators available. This is the only PoS which has no current operational indicators.

4. **1.5C. Organic manures.** Robust data on the use and movement of organic manures should be prioritised as an urgent need due to their key role in both production and environmental impacts. One option is to integrate data capture into the Wales Farm Practice Survey as the only current source of data is UK based and only provides data for England and Wales combined. Furthermore, it is recognised that this UK survey is not optimal for data capture for organic manures as the original purpose was for reporting inorganic fertilisers.

SLM Objective 2:

5. **2.1A GHG emissions.** Consideration should be given to the adoption of recognising the short-lived nature of methane (GWP*) methodologies to be reported alongside standard GHG inventory approaches. This is necessary if the livestock sector is to become more supportive of current reporting approaches.
6. **2.3A Flood and Drought.** Further research from a range of disciplines is required to underpin the development of an indicator to assess how land management changes might help adaption for flood and drought. Bringing these areas together as part of the development of the proposed indicator 2.3A Area of farmland subject to prolonged flood / drought from EO where not intentional would be required so a baseline can be identified.

SLM Objective 3:

7. **3.3A Agriculture impact on freshwater and coastal waters.** Improve data on the contribution of agriculture (relative to other sources) to nutrient and pathogen water pollution in both freshwaters and coastal waters. This is a contentious issue which can only be resolved with improved high quality attribution data to different sources.

SLM Objective 4:

8. **4.1A. Welsh speakers.** Currently data on Welsh speakers are not clearly identified. It is widely understood that Welsh speaking is more frequent in some largely agricultural areas. To improve future data precision, adding targeted questions to National Survey for Wales modules, agricultural surveys, or local monitoring efforts could address these evidence gaps and directly inform rural language policy and planning. Combining qualitative data on Welsh speaking will increase understanding of the numbers speaking Welsh with the lived experience aspects.
9. **4.2A. Condition of Designated Landscapes.** While there are reasonable data regarding condition for biodiversity within protected landscapes there are fewer for cultural aspects. Further work is required to determine what ‘good condition’ looks like for cultural landscapes. Once this is determined the condition of these areas can be assessed with targeted investment to fill the gaps identified in this report.
10. **4.2B. Historic environment.** While there is long-term monitoring of Scheduled Ancient Monuments, the data for Historical Environment Assets is less well known. Both represent the best cultural and historical assets in Wales so it is important that comparable data sets are developed. The proportion of listed farm buildings deemed at risk is much higher than for other listed buildings and this is a matter of concern, which this indicator should be in a position to highlight.

Priority development of new indicators for SLM impact to be effectively reported in the future includes:

SLM Objective 1:

11. **PoS 1.1. Sustainable food production.** The development of an integrated indicator such as Total Factor Productivity for Agriculture which can better indicate progress towards more sustainable food production combining overall output with resource use efficiency is recommended. A suite of six individual indicators is currently proposed to report on this until a new indicator can be developed.
12. **1.2A Strength and supply chains.** Some key, popular indicators such as upstream and downstream supply chains should be explored including:
    Upstream:
    - Welsh public sector procurement.
    - Key local processing infrastructure necessary for local sales.
    - Key local retail and distribution that supplies produce from local farms.
    - Overall sales of food of Welsh origin in Wales.

    Downstream:
    - Total contribution of farms to local economy through input purchases (potentially excluding environmentally damaging inputs).
    - Number of/growth in input-supplying businesses in local areas.
    - % of agricultural input spending by Welsh farms at Welsh/local businesses.

    Where components are already trackable (such as for local abattoirs and public procurement) consider tracking these before the overall indicator is ready. For downstream, this should build on work already done in developing the Community Food Strategy.
13. **1.3A. Diversification and climate change adaptation.** Stakeholders felt that the issues of diversifying farm products and introducing climate adaptation techniques were both important areas to include in indicators, however they are not necessarily connected and should be explored separately. Currently there are no regularly collected data on either issue. Existing surveys such as FBS or the ADAS Farm Practice Survey could be explored to assess if these two areas can be added or if new surveys are required.

SLM Objective 2:

14. **2.2B Farm level carbon / GHG tool.** Stakeholders were supportive of the need for a standardised farm level carbon and GHG tool as promised for all who enter SFS, however their comments illustrate the challenge of delivering a tool which will satisfy all.
15. **2.3A Flood and Drought.** Exploit new technologies such as remote sensing to better capture emerging issues and create novel indicators such as increased flood and drought on agricultural land.

SLM Objective 4:

16. **4.3A Public rights of Way**. Piloting of national PROW monitoring and publicising the outcomes and the benefits of a rights of way network will help underpin other targets under Objective 4 relating to engagement.

17. **4.3B People and Nature Survey Wales engagement.** A thorough comparison of the trends and findings of the two PaNS is required before the targets for this indicator can be developed and they could then form a baseline for future engagement targets.

Two final recommendations are:

18. **Context and narrative.** Reporting progress of indicators and targets should always include both the context and a narrative for each SLM Objective and PoS. Stakeholders were very concerned that trends in data alone may not illustrate the complexity of co-benefits and trade-offs within and between PoSs and Objectives. It should be noted that stakeholders were also extremely concerned about the potential for a very small set of impact indicators being adopted which again did not reflect the full complexity and potential co-benefits and trade-offs of different impact indicators.
19. **Ongoing review of indicators and targets**. All indicators and targets should be regularly reviewed alongside the ToC and M&E frameworks to ensure they remain fit for purpose. It should also be noted that the absence of targets for some indicators does not mean trends in baseline data should not be reported until targets can be agreed.

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Annex 1 Stakeholder Contributions to the Development of Indicators

Table 10-1 List of organisations and their involvement in the indicator development process

Organisation	Attended Workshop 1 [1]	Attended Workshop 2 [2]	Completed a response spreadsheet [3]
Afonydd Cymru			X
AHDB (Agriculture and Horticulture Development Board)	X	X	X
AIC Cymru Agricultural Industries Confederation		X	X
Bangor University	X	X	X
British Geological Survey		X	
British Trust for Ornithology	X	X	X
Buglife	X		
Chartered Institute of Ecology and Environmental Management (CIEEM)		X	X
Confor	X		
Farmers' Union of Wales (FUW)	X	X	X
Freshwater Habitats Trust			X
GWCT Cymru (Game & Wildlife Conservation Trust)		X	X
Gweithwyr yr Tir, Landworkers Alliance Cymru	X		X
Heneb: The Trust for Welsh Archaeology		X	X
Hybu Cig Cymru / Meat Promotion Wales	X	X	X
IBERS, Aberystwyth University	X	X	X
Lantra	X	X	X
LERC Wales		X	
Mentera	X		
National Landscapes Association	X		
National Sheep Association		X	X
National Trust Cymru	X		
Nature Friendly Farming Network	X		
NFU Cymru		X	X
Our Food Trust	X		X
Ramblers Cymru	X		
RenewableUK Cymru		X	X
RSPB Cymru	X	X	X
Social Farms & Gardens	X		X
Soil Association Cymru	X	X	X
Solar Energy UK		X	X
Sustainable Farming Consultancy		X	X
Sustainable Food Trust		X	X
Tenant Farmers Association Cymru	X		
The Farming Community Network (FCN Cymru)	X	X	X
Welsh Lamb and Beef Producers ltd		X	
Wildlife Trusts Wales	X	X	X
Welsh Lamb & Beef Producers (WLBP)		X	
WWF Cymru	X	X	X

Table notes:
[1] *Represented at an in-person workshop held in Builth Wells on 5th June 2025*
[2] *Represented at an online workshop held on 4th August 2025*
[3] *A sample of the response spreadsheet is given below*

In addition to the table above

- Ten other organisations attended workshops/returned the spreadsheet but did not give consent to be named in this report in time to be included here.
- 24 other organisations were invited to contribute to the process but were not able to engage.
- There were also contributions from various Governmental departments and public bodies including Natural Resources Wales, Cadw, Statistical Services, Office of the Future Generations Commissioner and the Office of the Chief Veterinary Officer.

Input was also sought from a **Technical Expert Group** (see section 3.1.1)

ADAS	-	Anne Bhogal
Afonydd Cymru	-	Gail Davies-Walsh
Bangor University	-	Dave Chadwick
Bangor University	-	Prysor Williams
FUW	-	Teleri Fielden
Local Environmental Research Centres	-	Roy Tapping
NFU Cymru	-	Rachel Lewis-Davies
NRW	-	Richard Cardwell
NRW	-	Russel De'ath
Soil Association & Wales Environment Link	-	Andrew Tuddenham
Welsh Government Statistics	-	Stuart Neil
WG Air Quality Panel	-	Paul Lewis
WWF Cymru & Wales Environment Link	-	Alex Phillips

A sample section of the **response spreadsheet** circulated after the second workshop for stakeholder responses:

Objective	**Purpose of Support**	**Indicator code**	**Indicator**	**Indicator status**	**Your assessment** Green (acceptable); Amber (acceptable with caveats); Red (showstopper). Don't know.	**Comments** (please explain here particularly the caveats for Amber and why a showstopper concerns you)[max 200 chars]
1. Produce food and other goods in a sustainable manner	1.1 Encouraging the production of food in an environmentally sustainable manner	1.1A	1.1A. Average agricultural output by all farms from the Wales Farm Business Survey (£)	Existing		
		1.1B	1.1B. Soil Health Alert Indicator	New		
	1.2 Helping rural communities to thrive and strengthening links between agricultural businesses & their communities	1.2A	1.2A. Strength of supply chains between farmers & their local communities (upstream & downstream)	Potential future		
		1.2B	1.2B. Number of / proportion of rural households beneath median income (WFG)	Existing		
		1.2C	1.2C. Number / proportion of rural community reporting mental health issue	Modified		
		1.2D	1.2D. Land used for horticulture (hectares)	Existing		
	1.3 Improving the resilience of agricultural businesses	1.3A	1.3A. Levels of diversification in farm products and adoption of climate adaptation techniques	Potential Future		
		1.3B	1.3B. Net farm income (showing levels of public funding)	Existing		
		1.3C	1.3C. Agricultural workforce - total numbers	Existing		
		1.3D	1.3D. Agricultural workforce: average age	Modified existing		
		1.3E	1.3E. Number / proportion of Farmers/farm workers reporting mental health issues	Modified		
	1.4 Achieving high standards animal welfare	1.4A	1.4A. Antibiotic / antimicrobial use (mg/kg)	Existing		
	1.5 Maximising resource efficiency	1.5A	1.5A. Utilised Agricultural Area area (ha)	Existing		
		1.5B	1.5B. Total Inorganic Fertiliser Use (all farms; all crops and grass) (kt) (Note there is no robust data is available for feed use).	Existing		
		1.5C	1.5C. Organic Manure use (% dressing cover all crops and grass)	Existing		
		1.5D	1.5D. Control Chemical use	Potential		
2. Mitigate & adapt to climate change	2.1 Reducing emissions of Greenhouse gases (GHG)	2.1A	2.1A. Annual emissions of greenhouse gases by agriculture (Agriculture GHG Inventory)	Existing		
	2.2 Maximising C sequestration & storage	2.2A	2.2A. Million of tonnes of CO2 equivalents per year captured into long term biomass and soil. (Land Use and Land Use Change and Forestry (LULUCF) greenhouse inventory).	Existing		

Annex 2 List of supporting ERAMMP reports produced to detail Indicators

ERAMMP Report-94: *Developing a New Soil Health Alert Indicator for Agricultural Landscapes Across Wales*

Feeney, C.J., Bentley, L., Lucas, J.R., Reinsch, S., Robinson, D.A. & Emmett, B.A. (2025). *Environment and Rural Affairs Monitoring & Modelling Programme (ERAMMP)*. ERAMMP Report-94: Developing a New Soil Health Alert Indicator for Agricultural Landscapes Across Wales. Report to Welsh Government (Contract C210/2016/2017)(UK Centre for Ecology & Hydrology Project 06297); https://erammp.wales/94

ERAMMP Report-97: *Estimates of Atmospheric Nitrogen Deposition in Wales: Made in Wales vs Imported/Exported (2018 data)*

Brown, R., Carnell, E. & Dragosits, U. (2025). *Environment and Rural Affairs Monitoring & Modelling Programme (ERAMMP)*. ERAMMP Report-97: Estimates of Atmospheric Nitrogen Deposition in Wales: Made in Wales vs Imported/Exported (2018 data). Report to Welsh Government (Contract C210/2016/2017)(UK Centre for Ecology & Hydrology Project 06297); https://erammp.wales/97

ERAMMP Report-99: *Developing a New National Ecosystem Health and Resilience Indicator for Sustainable Land Management*

Emmett, B.A., Bentley, L.F., Doeser, A., Norton, L., Maskell, L., Reinsch, S., Siriwardena, G.M. & Williams, G. (2025). *Environment and Rural Affairs Monitoring & Modelling Programme (ERAMMP)*. ERAMMP Report-99 Developing a New National Ecosystem Health and Resilience Indicator for Sustainable Land Management. Report to Welsh Government (Contract C210/2016/2017)(UK Centre for Ecology & Hydrology Project 06297); https://erammp.wales/99

Annex 3 Indicators included in earlier iterations and stakeholder consultation but now removed

These indicators were considered and discussed with stakeholders but subsequently removed following feedback.

Indicator 1.4A: Antibiotic/Antimicrobial Use on Welsh Farms

At a Wales level good data are available for beef sheep and dairy, but not for other animals.

At a UK level data on antibiotic use are published by the Veterinary Medicines Directorate (VMD). Antibiotic sales are recorded at a UK level for all food producing animals based on data collected by pharmaceutical companies. On farm use is recorded for some, but not ruminants. This is based on data collected by different sector bodies (AHDB for pigs, British Poultry Council for meat poultry). The VMD themselves confirmed that they cannot disaggregate the data.

The British Poultry Council collect and publish data on meat poultry antibiotic use at a UK level and around 80% of the sector contributes to this. However, due to the highly integrated nature of the British poultry sector (poultry meat is produced for just four companies), data are collected and published at a UK level and cannot be disaggregated.

It is currently possible to monitor some antimicrobial use in Wales but not all. Welsh, beef and sheep farms have been part of dedicated projects which have captured data; however, sourcing data on other animals at a Welsh level will require either disaggregation of UK level data, or in the case of poultry, additional monitoring.

Table 10-2: Data sources for indicator 1.4A – antibiotic/antimicrobial use

Data Source (and link)	Measures	Frequency of reporting	Disaggregation of data	Notes
WLBP Antimicrobial Use Report 2023	Antimicrobial use (AMU) in lamb, beef and dairy in Wales. Measured in mg/kg. (mg of antimicrobials per kg in kg) AM sales data captured and collated via the WLBP AMU Calculator, a novel reporting tool that produces accurate, standardised reports of AMU based on industry-agreed standards.	Annual	Sample covers 48% (~62,000) of the total beef stock, 54% (~1.9 million) of the total sheep stock and 57%(~99,000) of the total dairy stock which were assured under the Farm Assured Welsh Livestock (FAWL) Scheme in 2023.	Best source found for beef, sheep & dairy. 2023 is latest available. First report 2021. Does not report on other livestock.
The Arwain DGC Project	Research covers: AMR on Welsh dairy, beef & sheep farms; studying data set of antimicrobial use on 4500 farms; syndromic surveillance data; and piloting a system for vets and farmers to use active surveillance programme.	Annual	4500 farms in sample.	
UK Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS)	Sales of antibiotics average for mg/kg across multiple species. Breakdown of use by some species. Antibiotic tonnes for all animals.	Annual	Data shown at a UK level. Average mg/kg across all farm animals: separated out to give use figures for: pigs, broilers, gamebirds, gamebirds, salmon, turkeys, laying hens, trout, ducks. Ruminant use not reported on.	Last report 2023. First report 2014.
British Poultry Council Antibiotic Stewardship Report	Antibiotic use in meat poultry	Annual	UK Level, not possible to disaggregate into Wales.	

Baseline data

Wales specific data

WLBP has been analysing data and publishing annual reports on antimicrobial use (AMU) Welsh sheep, beef and dairy farms since 2021. This publication is part of a broader Arwain DGC (Defnydd Gwrthficrobaidd Cyfrifol / Responsible Antimicrobial Use) programme with Mentera, University of Bristol, Aberystwyth University, Iechyd Da and Vet Impress.

The reports show declining rates of mean and median AMU in all livestock categories over three reports from 2021 to 2023. However, the reports caution that the reports are not directly comparable as the farms included in the sample has changed and each year the number of enterprises participating has increased. The 2023 study represented AMU in 48% (~62,000) of the total beef stock, 54% (~1.9 million) of the total sheep stock and 57% (~99,000) of the total dairy stock which were assured under the Farm Assured Welsh Livestock (FAWL) Scheme in 2023.

In all three years the mean was significantly higher than the median, demonstrating a high amount of AMU is a relatively small part of the sample. In 2023 the highest 25% of AM users in beef, sheep and dairy enterprises contributed 77%, 72% and 76% of the total AMU in each sector, respectively.

No Welsh specific data was found for other livestock categories.

UK Level Data

The UK Veterinary Medicines Directorate has published annual data on sales and use of antibiotics on all food producing animals, adjusted for animal population, at a UK level. Data goes back to 2014 over which time sales have declined by 59%. This decline has been accompanied by a decline in multi-drug resistant E-Coli, showing that reducing antibiotic use in farm animals is helping to tackle Antimicrobial resistance.

Average mg/kg use across all farm animals: separated out to give individual figures for: pigs, broilers, gamebirds, gamebirds, salmon, turkeys, laying hens, trout, ducks. Use in all species has declined since first being reported on except salmon, which has increased 24% since it was first reported in 2017.

Ruminant use is not reported on because coverage of use data is low and may not be representative of the national sectors.

Table 10-3: Data sources and baseline statistics for Indicator 1.4A – Antibiotic/antimicrobial use (mg/kg)

Data source:	Baseline/key statistics:
WLBP Antimicrobial Use Report 2023 (Wales only)	**Anti-microbial use** Mean: beef = 4.9 mg/kg, sheep = 7.5 mg/kg, dairy = 11.9 mg/kg Median: beef = 2.3 mg/kg, sheep = 4.6 mg/kg, dairy = 9.3 mg/kg Sample size: 2701 beef, 2777 sheep and 582 dairy enterprises
WLBP Antimicrobial Use Report 2022 (Wales only)	**Anti-microbial use** Mean: beef = 5.2 mg/kg, sheep = 9.5 mg/kg, dairy = 12.8 mg/kg Median: beef = 2.3 mg/kg, sheep = 6.1 mg/kg, dairy = 10.4 mg/kg Sample size: 2422 beef, 2576 sheep and 430 dairy enterprises
WLBP Antimicrobial Use Report 2021 (Wales only)	**Anti-microbial use** Mean: beef = 7.0 mg/kg, sheep = 10.8 mg/kg, dairy = 14.3 mg/kg Median: beef = 3.4 mg/kg, sheep = 7.5 mg/kg, dairy = 11.6 mg/kg Sample size: 1037 beef, 1182 sheep and 291 dairy enterprises
UK Veterinary Antimicrobial Resistance and Sales Surveillance (UK VARSS)	**Antibiotic Sales (UK Wide)** Sales of veterinary antibiotics for use in food-producing animals, adjusted for animal population, averaged at 25.7 mg/kg in both 2023 and 2022 down from 36.6 mg/kg in 2014. **Antibiotic Use in Poultry & Pigs (UK Wide)** Broiler chickens: 13.5 mg/kg in 2023, a 72% decrease since 2014. Laying hen use: 0.22 % bird days in 2023, down 26% since 2016, when reporting started. Bird days are defined as 'actual daily bird-doses/100 bird-days at risk'. AMU in pigs was the highest recorded by dosage by weight at 84.8 mg/kg. However, this is down 69% since reporting started in 2015.

Indicator 2.4B Capacity of anaerobic digestion using primarily waste (not crop)

Amongst the members of the TEG, this was considered an appropriate indicator by most. Participants at the first stakeholder workshop, however, raised a number of potential perverse outcomes of increased numbers including anaerobic digester overcapacity leading more people to grow biomass crops rather than food, and the promotion of an energy generation method seen by some to be problematic. Sticking to majority waste feed in theory should help alleviate this, but only if "waste" is not deliberately created.

NRW note[8] that in addition to providing gas, anaerobic digestion can be used to reduce on-farm waste.

Accessible regularly reported and publicly available data were not found, but the Anaerobic Digestion and Bioenergy Association does track installations by location for its members.

[8] https://naturalresources.wales/media/1775/welsh-government-call-for-evidence-on-agricultural-waste.pdf

Table 10-4: Data sources for indicator 2.4B – capacity of anaerobic digestion using primarily waste

Data Source	Measures	Frequency of reporting	Disaggregation of data	Notes
Cardiff University report	All anaerobic sites, including on farms in Wales.	One off - 2020	Shows at Wales level.	
Anaerobic Digestion and Bioresources Association - Map of Active AD Plants	Data on AD across the UK	Updated when notified of change	Shown by location and feedstock	Only accessible with ADBA membership.
Welsh Government Energy Generation in Wales Report	Shows generation and installed capacity by technology including AD	Annual	Does not separate on farm or distinguish which use primarily waste feedstock	

Stakeholder feedback on proposed indicator

There was little enthusiasm for this indicator and many concerns raised. The respondent who selected red raised concerns about monitoring, feedstock classification and targets. Those that selected amber noted that AD carries significant environmental links elsewhere would need to be developed with caution; raised concerns about the use of the digestate including potential social impacts; % waste used and need for oversight of feedstock used. Others questioned its usefulness and relevance for Wales.

Given the many problems identified and the other indicators available, we do not recommend this indicator.

Baseline data

Table 10-5: Data sources and baseline statistics for indicator 2.4B – capacity of anaerobic digestion using primarily waste (not crop)

Data source:	Baseline/key statistics:
Anaerobic Digestion and Bioresources Association (ADBA) - Map of Active AD Plants	Data unavailable without ADBA membership. However, given that it offers up-to-date information on plant type, capacity and feedstock type.
Welsh Government Energy Generation in Wales Report 2023, 2022, 2021, 2020, 2019 (Uses ADBA data)	2023: 50 anaerobic digestion sites in Wales, total capacity of 26.9 MW. 2022: 50 anaerobic digestion sites in Wales, total capacity 27 MW. 2021: 47 anaerobic digestion sites in Wales, total capacity 27 MW 2020: 46 anaerobic digestion sites in Wales, total capacity 27 MW. 2019: 46 anaerobic digestion sites in Wales, total capacity 27 MW.

Trends

Not found.

Options for targets

None recommended.

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