

## Public goods and farming

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The delivery of public goods from agriculture is currently a major topic in relation to future farm payments in Wales and the UK in general. It is therefore important for farmers and others in the rural sector to have a clear idea of what public goods are and how they might be provided by agricultural practices. The term 'public goods' can be understood and used in different ways, often together with other phrases such as, 'ecosystems services' or 'natural capital'. This article aims to:

- Define what public goods are
- Consider the approaches to valuing public goods
- Describe the public goods which agriculture in Wales provides/could provide

### What is a public good?

A public good is defined in strict economic terms by two elements which differentiate them from private goods:

- A public good is 'non-rival' – if one person uses it, it doesn't stop others using it. In contrast, a good is 'rival' if one person's use affects another person's use (e.g., if two individuals want to eat an apple, they are rivals for it – they can't both eat it. But, two people can both look at a nice view – use by one does not prevent use by the other).
- A public good is 'non-excludable' – once it exists, it is (practically) impossible to stop other people using it. In contrast, a good is 'excludable' if it is possible to stop people using it (e.g., an apple producer could stop people eating her apples but if someone cleans the river water flowing through their property, they can't exclude people downstream from enjoying the benefits of the cleaner water).



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In recent times, even the meaning of the words in the term ‘public goods’ has become confused (Box 1). The definition has also come to be used to refer to different sets of things by different people. The divide between public goods (non-rival, non-excludable) and private goods (rival, excludable) is therefore blurred.

There is much debate about whether food or

renewable energy are public goods (and should therefore attract government support for their production). Broadening the economic definition of public goods above, [Kaul and Mendoza](#) defined public goods as those that are non-exclusive and available for all to consume in current circumstances. Further goods are *potentially* public if they have some non-rival or non-exclusive properties. Few goods are completely non-rival and non-excludable – instead there are varying levels. In many cases, goods which might seem non-rival become rival as more and more people access them – for example, congestion brings competition even to [enjoying a view or a walk](#) in the countryside. Kaul and Mendoza point out that in many (if not most) cases, society decides what it is acceptable (or not) to exclude people from, for instance by giving them human rights and enforcing legal boundaries. For example, we *could* exclude people from drinking clean water by force but, this would not be morally acceptable. Clean water becomes in reality non-excludable. When society decides whether or not we can exclude people from the use of a good, new things can come to be (or cease to be) treated as public goods, explaining the debates on this topic.

In the 2018 ‘Brexit and our land’ consultation, Welsh Government used a broad definition of public goods, which could include private goods for which no current market exists, or for

#### **BOX 1: What do we mean by ‘good’?**

The original economic use of the word ‘goods’ in the term ‘public goods’ referred not to ‘things that are good’ but, to things that are products (as in ‘goods and services’). So, something that is a public good in the economic sense may be associated with positive or negative effects: air pollution can be described as a public good because it is hard to exclude people from suffering its effects, and its experience by one person does not affect its experience by another. However, this strict economic use of the term is often altered in common use. For example, some people have described ‘public bads’ in contrast to public goods as positive things. Today most policymakers and lay people have come to think of public goods in this way, with good meaning ‘positive’, so that meaning will be used here.



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which current markets are not sufficient. An example is the value of productive land to future generations. The value for those generations is unlikely to be truly represented by today's prices. This broad definition of public goods also takes in Kaul and Mendoza's definition, which includes goods that society decides to treat as non-excludable and common resource goods like common grazing land or fresh water. A subset of the things described by Kaul and Mendoza as public goods, are the narrower set of goods that economists would consider to be public goods – things which are both non-rival and non-excludable such as the atmosphere and its state (clean or polluted). The different ways that public goods are defined, and how they fit with other terms you may have heard used by academics and policymakers, are summed up in Fig. 1.

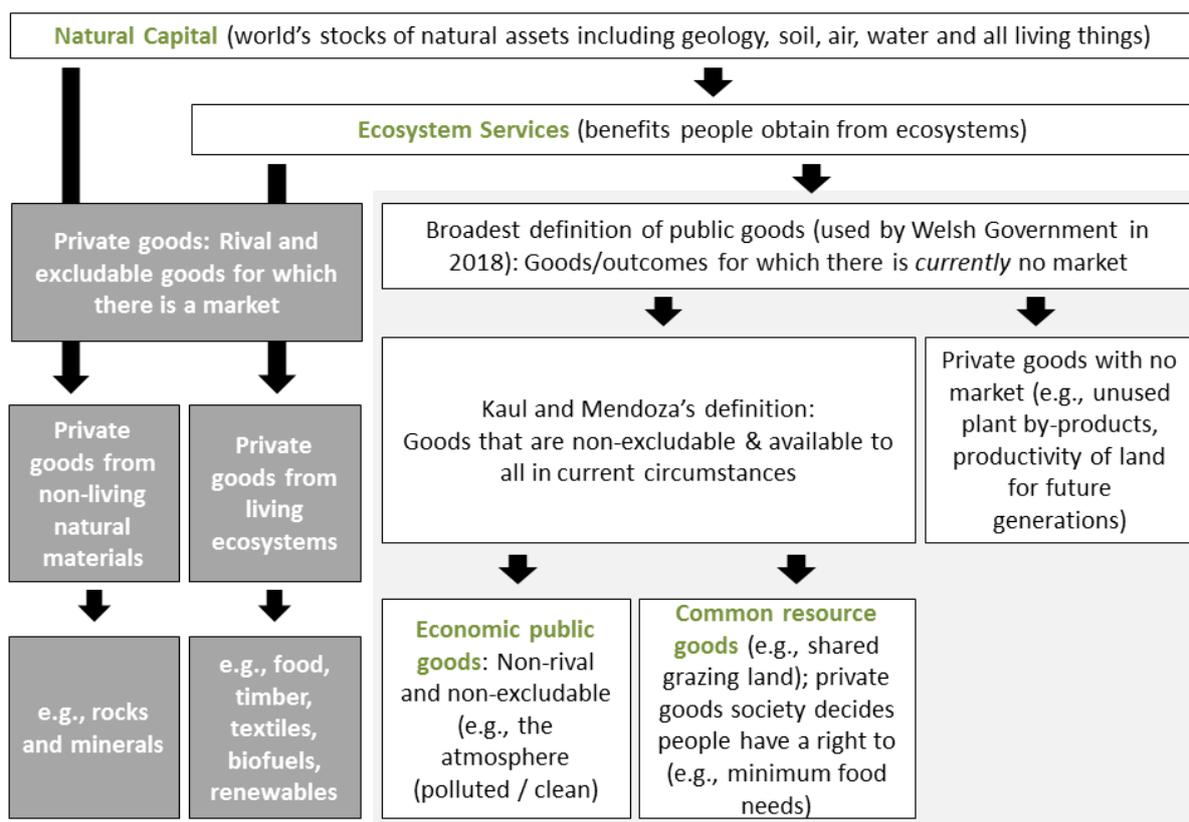


Figure 1



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## How do we value public goods?

Public goods may have intrinsic value – i.e., as themselves rather than in terms of the benefits they provide for us – and such value is subjective. For example, we might feel that human beings have a responsibility to safeguard other species (biodiversity), regardless of whether they have any direct value for us. This type of value cannot be calculated in monetary terms and is related to our belief systems. The extent to which intrinsic value is considered when deciding how much of a public good should be delivered is a matter to be agreed on by society rather than something that is objectively determined from physical evidence.

In addition to intrinsic value, public goods have value in terms of their benefits for people (those alive today and future generations). However, given the diverse range of public goods and the different ways people value them, only defining that value in economic terms is controversial. For example, if people need fresh, clean water to live, should its value be calculated according to the economic value of the people kept alive by it? If it is not valued in that way, how should it be valued? Much work has been undertaken to assess the value of public goods, for example in terms of [what people are willing to pay for them](#). Others have developed ways to make [assessments taking into account diverse types of benefit and value](#).

An alternative approach to deciding on the levels of public good we want to achieve, is to i) develop an understanding of the condition systems need to be in to deliver given types/amounts of public goods, and ii) undertake monitoring to assess the actual condition of public goods and the value they are delivering. Policymakers can then make choices about the amount of resources that should be put into delivering public goods, taking into account these types of evidence. An example of such assessments is the [SoNaRR report](#) on the condition of natural resources in Wales.

In summary, governments, public agencies such as NRW and international bodies such as the UN are involved in building an understanding about public goods, their value and their provision, in order to drive actions on the ground – these efforts are supported by scientific research and based on both i) improved understanding of the value people place on public goods, and ii) better understanding of public goods, their interactions and status. Such data facilitate the development of decision support systems that help policymakers, farmers and others choose directions that [maximise benefits and minimise negative impacts in the most efficient way](#).

At the same time, communities or groups of stakeholders may decide for themselves, bottom-up, that they want to enjoy particular public goods such as flood resilience or biodiversity, and collect and analyse data to help them achieve their goals – see for example, the work undertaken by a group of farmers in the [Pont Bren project](#).

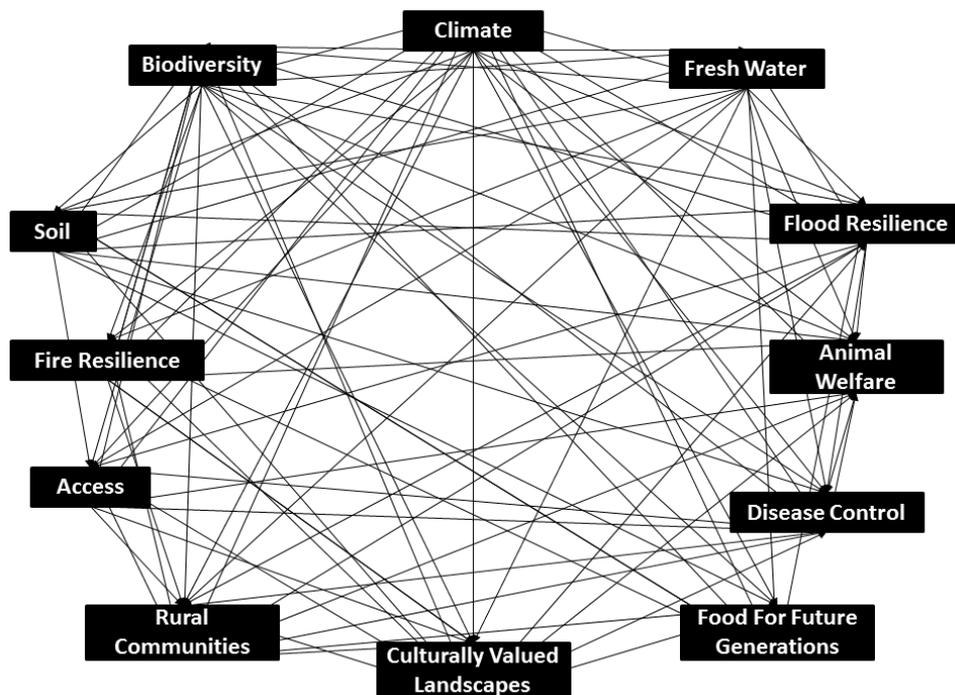
Another driver for bottom-up delivery of public goods is that farmers may be able to gain additional *private* benefits from delivering public goods. In other words, some of the benefits of the public good can be ‘privatised’: their value can be included in a market as a private good. For example, there may be potential for a farmer to gain price premiums for sustainably produced products or, to make money from a beautiful landscape through tourism (e.g., camping, bed and breakfast, direct sales etc.). Policies that help farmers identify and access these sources of value from public goods, can support a higher level of their provision.

Being aware of the public goods on the farm, those that the farm could potentially provide or those that might be at risk from current or planned activities is important for 1) understanding if a farmer can gain value from the public goods they are responsible for, 2) having the public goods that farmers deliver recognised in government support and 3) avoiding damaging or reducing the supply of public goods – which might harm people in the local community and/or society in general (and may put the farmer at risk of falling foul of regulations and laws). In agriculture both, top-down and bottom-up demand for public goods can therefore be the driving force for farmers (and others) to take action.

### **What public goods are relevant to agriculture, and what can be done to protect or provide them?**

There are many interactions between public goods and the benefits they provide, meaning that there are many different ways to categorise them. For example, in broad terms, good human health could be considered a public good. However, good human health could also be considered as part of the value delivered by the public good of access to the countryside. A selection of public goods relating to agriculture is shown in Figure 2. How each one is (or could be) delivered by agriculture and the issues, challenges and opportunities associated with this, are topics too large to go into in depth here. Visualising the interactions between public goods (Fig. 2) helps to demonstrate why it is possible for public goods to be categorised in different ways, and also why it is not possible to focus on the delivery of one public good in isolation from others. Pursuing different subsets of public goods in different areas may mean that improvements in one public good in one area might be off-set by a worsening of its provision

in another. Instead, decisions need to consider which actions make the most positive impacts *across* different public goods in a particular area, rather than choosing individual public goods to focus on and then choosing which actions to take.



**Figure 2:** Interactions between public goods. Direct impacts of each public good on others shown by arrows emerging from the bottom of boxes; direct impacts of other public goods shown by arrows arriving at the top of boxes.

Researchers are developing a better understanding of how ecosystem services (including those delivered by public goods) interact, in order to show how particular actions can drive improvements in [whole bundles of related services](#), and also where there may be trade-offs between actions taken for different aims.

Public goods and the production of private goods often interact, presenting opportunities and challenges for intervention. For example, even when something (like food production) is not in itself considered a public good, it might be supported because it has a positive impact on



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things that are defined as public goods – e.g., economically viable farming is considered to have an important [social role in supporting rural communities](#) (in economic terms thriving rural communities, which have been defined as a public good, are an *externality* relating to the production of food). Taking a wide definition of public goods, safeguarding the ability of land to provide food for future generations (sustainable production) might also be included as a public good, as the market price of agricultural land reflects today's supply and demand, and does not fully reflect its value for future generations.

Finally, it is clear that public goods are delivered at landscape scale and beyond, meaning that securing and improving them requires coordinated actions – efforts by individual farmers may be highly beneficial but are unlikely to deliver the full value of any public good if others do not get involved. This means that collaborative approaches bringing together groups of farmers and other stakeholders across landscapes are important in both, giving communities ownership of public goods delivery and, ensuring that maintaining and improving public goods is undertaken efficiently and effectively.

### **Why do governments intervene to provide public goods?**

There is a case for governments to intervene to provide or protect public goods because of what economists call the 'free rider' problem – because people cannot be excluded from using a public good they can use it without paying, making it not worth supplying. Some authors argue that these arguments alone are [not enough to justify intervention](#), especially when public finances are limited. It may be that a public good is still well supplied without intervention, if i) it is produced incidentally by individuals performing other actions or driven by other motives (e.g., a farmer may use less nitrogen fertiliser to reduce costs and, as a result, nitrogen run-off to the local river may decrease, improving water quality without the farmer having planned it) or, ii) its existence has no or little cost – and so it is maintained without incentives (e.g., a patch of low value unproductive land that has high biodiversity). However, there are risks associated with relying on these conditions to deliver the public goods society needs. Relying on practices driven by other motivations risks public goods being damaged or lost if such motives change (e.g., farmers may switch to organic farming to gain a price premium on their product, reducing fertilizer run-off into watercourses – but if the premium for organics falls, they may switch back). Similarly, if public goods are delivered just because there is no (or little) cost to the farmer today, they are at risk if circumstances change (e.g.,



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an old sandpit on a farm providing habitat for sand martins and reptiles may be at risk if sand prices for building increase, making it profitable to bring the pit back into use).

Under-provision of a public good might also arise despite policy intervention if it is undervalued. For example, the biodiversity of an area might be protected to a level that reflects its value in delivering pollination services but, if the aesthetic value it provides is not taken into account less biodiversity may be protected and created than desired. In addition, if we only consider the benefits people receive from public goods and ignore their intrinsic value, we may find that such benefits can be delivered without protecting that value. For example, we might be able to sequester as much carbon from a plantation of a single tree species as from a patch of semi-natural woodland but the plantation would lack much of the character of the original habitat. In all these cases, there is a role for governments, farmers or local communities, to take actions outside the economic market to maintain and enhance public goods.

In some cases, more of a public good might be provided by suppliers than expected if economic incentives alone are considered. Farmers (like everyone else) hold a [range of beliefs and values](#) that they try to abide by. They often provide public goods (like biodiversity or odour-free air) because they want to play their part in their community and avoid causing harm to others. When farmers suffer from increasing isolation or economic hardship their ability and motivation to provide public goods on the basis of these personal values may decrease – for example if their actions are not recognised or their efforts respected, if they are penalised in other areas despite such actions, or if they simply no longer have the [time or resources](#) to commit to maintaining and improving public goods. Further, provision of public goods, even where they could enhance the long term sustainability of land as a production resource, may be reduced if a farmer has no inheritance plan for his/her farm or if he/she is a tenant farmer who will not benefit from longer term improvement of the land or surrounding environment. Under these circumstances, provision of public goods becomes ever more reliant on top-down regulation or monetary incentives. Without recognition and respect for farmers' value-driven supply of public goods, these top down approaches may not be practically effective and may create conflict between farmers and policymakers, leading to failure to meet targets – see for example, research on the [implementation of nitrogen regulations in Italy](#).

## Summary



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The concept of public goods has been, and continues to be, used in different ways by different people. In agriculture, it is often used to encompass 'common resource' goods like water and biodiversity. This means it is used to include goods and services that it is hard to exclude people from and which are therefore often undervalued (or not valued) in the economic market. Because laws and rights determine what we allow ourselves to exclude people from, what counts as a public good can change over time, leading to much debate about what should be classed as a public good – even when people agree on what the term means.

Deciding which public goods to protect and what amount should be supplied is challenging because it depends on how we value them – as something with intrinsic value that should always be protected or, in terms of the impacts they have on us (or future generations). If we consider the value of public goods to us, how should we decide how much of them we want, or how much to spend supporting them? Who should make those decisions? These are ongoing debates.

The importance of public goods for farmers can be summed up quite simply: the public goods agenda is about farmers thinking about the effects their actions have on others, securing recognition and support for delivering positive impacts, exploring new business opportunities that they might exploit (like communicating to customers about biodiversity on the farm when marketing their products), and ensuring a positive local and national image for farmers based on the public goods they deliver.



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