



Thematic Working Group 3 - Public goods and public intervention
Conceptual framework on public goods provided through
agriculture in the EU

(Final version)

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Connecting Rural Europe

The Thematic Working Group 3

The EN RD has established Thematic Working Groups (TWGs) which carry out specific analysis on the basis of the current rural development programmes focusing on specific thematic priorities. Working on the basis of a specific mandate they provide in-depth analysis of the EU Rural Development policy implementation and contribute to the understanding and diffusion of 'know-how' and experiences and improvement of its effectiveness. As of November 2010, TWGs have been established on the following topics:

- TWG1: Targeting territorial specificities and needs in Rural Development Programmes
- TWG2: Agriculture and the wider rural economy
- TWG3: Public goods and public intervention
- TWG4: Delivery mechanisms of EU Rural Development Policy

The TWG3 aims at establishing a common understanding of the significance of the role of agriculture in the provision of public goods. Particular attention was to be given to understanding the delivery mechanisms needed for encouraging the provision of respective public goods and assessing the implications for future policy developments.

The analytical work of the group was carried out on the basis of a defined work plan articulated as follows.

Under Step 1 of the work plan (concluded in October 2009) a 'Conceptual framework on Public Goods' and the Step 1 report providing an overview of the main results of the Rural Development Programmes (RDP) screening exercise were produced.

The purpose of the Step 1 report was to investigate how Member States and Regions intend to deliver a range of environmental and social public goods associated with agriculture through their 2007-2013 RDP.

Step 2 of the work plan included an analytical report that builds on the evidence documented in Step 1, and provides a more detailed analysis of:

- the potential contribution of individual rural development measures to the provision of specific public goods in different regions of the EU;
- the relationship between public goods and agriculture, and aspects of undersupply of public goods;
- the role of rural development measures in delivering environmental and social public goods;
- the most used measures under the RDPs for the delivery of public goods.

Step 3 (carried out from March to mid-June 2010) involved a more comprehensive analysis of the socio-economic benefits linked to the provision of environmental public goods as well as economic and social public goods such as "rural vitality". It was undertaken by means of the collection of relevant example/case studies. The results of this activity have been incorporated into this final report.

A detailed communication plan has been outlined to be implemented starting from autumn 2010. A series of products (including a [brochure](#) on "Public goods and public intervention in agriculture") have been envisaged for a wider dissemination and discussion among EN RD stakeholders. Finally, a conclusive seminar is taking place the 10th of December 2010. The scope of the seminar is to present the outcomes of the work of the TWG3 to a larger group of stakeholders, and to clarify the notion of Public Goods to a wider audience. It will also demonstrate that the conceptual framework of public goods provides for common grounds in discussions about the CAP and Rural Development.

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1 Introduction

In Europe, agriculture has received a sustained level of public support over the last 50 years. It is widely argued that the provision of public goods provides a valid reason for public intervention in a market economy. This chapter presents the theoretical arguments underpinning the case for support for the provision of public goods in the agricultural sector and discusses the related policy implications.

Agricultural land management is spatially diffuse and occupies a large share of the European land area, leading to an appreciation on the part of the wider public of the close association between farming and the European countryside. There is a high level of interaction with the environment and as such, certain types of agricultural land management shape cultural landscapes, improve the quality of water and soils, and underpin the maintenance of semi-natural habitats and the survival of wild species. Furthermore, agriculture has an important role in providing economic, social, and cultural contributions to rural vitality and it is essential for food security.

All the afore-mentioned outcomes are not readily available on markets, while being of paramount public interests. They are referred to as 'public goods'. A shortfall in the provision of public goods, compared to the scale of public demand, underpins the case for public intervention, because without a functioning political allocation mechanism, the provision of public goods will remain below the level desired by society. This is the rationale for public intervention which underpins a number of sectors or realms of public policy, including the CAP.

2 The public goods concept

The public goods concept is well established in economic theory although there is a wide range of interpretations as regards their characteristics and the corresponding implications for policy. As first conceptualised by Samuelson, public goods exhibit two defining characteristics, and are:

- Non-excludable – if the good is available to one person, others cannot be excluded from the benefits it confers.
- Non-rival – if the good is consumed by one person it does not reduce the amount available to others.

Although public goods are often discussed in terms of desired outcomes, a good in a strict economic sense refers to a physical entity or service that is subject to an economic transaction. This specification is useful, as it distinguishes public goods from those by-products of certain agricultural activities which are beneficial, and which may well have public goods characteristics, but which do not require any deliberate action to ensure their delivery.

However, for those cases where a re-allocation of resources is required to support the provision of the public good, the providers need an incentive to do so. For example, the preservation of certain habitats depends on appropriate land management practices that may not be the most profitable in a given area. Without remuneration for the continuation of those practices that remunerate the maintenance of these grassland and arable habitats, farmers may revert to a more profitable form of land use, resulting in the loss of habitat, and a decline in species numbers.

The non-excludable and non-rival characteristics of public goods are influenced by their biophysical character. These characteristics are not either 'present' or 'not present'. In reality, both characteristics may be exhibited to almost any degree, from zero to 100 per cent. In many cases,

non-excludability can be influenced through the establishment of technical exclusion mechanisms, the potential for which is often limited due to the costs associated with the act of exclusion. As regards non-rivalry, this characteristic of public goods can fall victim to congestion effects, implying that at a certain intensity of use, the enjoyment or benefit perceived by the single user is depleted. This means that all public goods will be situated along a continuum of 'publicness' as represented in Table 1 below.

Table 1. Classification of goods according to their degree of publicness

Degree of Publicness			
Low	Medium		High
Private Good	Club Goods	Impure Public Good	Pure Public Good
Rival	Non-rival for a small user group	Non-rival	Non-rival
Excludable	Excludable	Excludable only at high costs	Non-excludable
Excludable and rival.	Excludable, but subject to congestion as the number of users increase.	Exclusion - even if technically feasible - is costly, therefore there is a high risk of congestion.	Exclusion technically impossible. Very high degree of non-rivalry in consumption, with a certain degree of congestion possible.
Examples: <ul style="list-style-type: none"> • Wheat • Timber 	Examples: <ul style="list-style-type: none"> • Private parks • Golf course 	Examples: <ul style="list-style-type: none"> • Public access to farmland • Landscapes and landscape features 	Examples: <ul style="list-style-type: none"> • Stable climate • Air of high quality • Biodiversity • Non-use values of landscape

The degree of publicness determines the maximum number of people who are able to consume the public good. This stipulates at the same time the minimum number of actors that have to engage in joint action to ensure the provision of the public good. A public good which displays a high degree of publicness, such as clean air, is largely non-rival and no-one can be excluded from consuming it. This

means that the number of people who can enjoy it is extremely large. However, in practice, even a public good with a global degree of publicness such as clean air may be subject to overuse, as demonstrated by the accumulation of greenhouse gases in the atmosphere, for example.

Certain public goods exhibiting a medium degree of publicness are non-rival up to a certain level of use beyond which, due to congestion, the condition of the good, and people's enjoyment of it may be depleted. Certain goods with a lower degree of publicness, such as club goods – including golf courses or private parks – are non-rival for a limited number of users, but entrance to the club may be restricted to paying members with non-payers excluded from entry. On account of these barriers, the number of people deriving enjoyment from them is limited. If too many people are allowed to enter, the facility becomes congested, and thus rival in consumption.

A phenomenon that is often associated with public goods is the over exploitation of commonly owned land, known as the "tragedy of the commons". Indeed, over exploitation results from non-exclusion from use – one of the main characteristics of public goods. However, common land displays characteristics completely different from those of public goods. Principally, non-exclusion in the case of the "commons" does not result from the technical or biophysical characteristics of the land, it is the absence of sufficiently well-defined and enforced property rights concerning the land. Therefore, the solution to the tragedy of the commons lies in defining precise property rights for the land in question to determine where responsibility for their appropriate management lies, and in enforcing them.

3 Coordinating Supply and Demand through Appropriate Allocation Mechanisms

Under the conditions of a free market, private goods are supplied through market interactions, with supply and demand coordinated via a decentralised pricing mechanism. If there is a decline in supply or an increase in demand, the price tends to rise, and if demand declines or supply increases, prices tend to drop. The efficient functioning of this allocation mechanism is predicated on the ability of consumers to articulate demand for a given private good through their purchasing power, to verify their satisfaction after its consumption, and for suppliers to organise their factors of production in a way that allows them to respond to demand and to levy a charge for their product. This means that markets are efficient where there are defined property rights, low transaction costs, and complete information.

Market mechanisms, however, do not function for the provision of goods with a high degree of publicness. A market cannot function as an allocation mechanism between suppliers and consumers in cases where consumers cannot be excluded from consuming the good and therefore have no incentive to pay for it. These circumstances are likely to lead to 'free-rider' behaviour and to the over-exploitation of the respective public good. The absence of an articulated demand means that the public good cannot be steered by a price mechanism. As a result of the defining characteristics of public goods, and the fact that they cannot be secured through ordinary markets, farmers as potential suppliers have no incentive to provide them because they are not being paid to do so - leading to a situation of undersupply. In order to ensure the supply of public goods in line with societal needs, other allocation mechanisms are needed to steer resource use towards the provision of a given public good.

For so-called club goods, common action by a limited number of potentially interested people is sufficient to ensure the provision of those goods which demonstrate degrees of non-rivalry, but where consumption can be limited to club members. In these cases, the good can be offered to a potential group of users, the club members, subject to their agreement to rules for cost-sharing and user

rights. In this sense, common action leads to a functioning allocation of the resources needed to provide the club good for the benefit of club members.

For public goods characterised by a higher degree of publicness, such as climate stability, air quality and biodiversity, the coordination of supply and demand can only be achieved through more complex mechanisms of social action. A core element in this is the need for a collective articulation of demand, with respect to the scale of public good provision desired by society as a whole.

When the number of potential consumers is large, this occurs through the institutionalised political process. Society's collective demands (including those of present and future generations) are often expressed in political targets which stipulate the level of provision required. The intervention of the state in securing the provision of public goods is supported by administrative mechanisms, including monitoring and evaluation and verification procedures, to ensure that suppliers act in line with agreed terms in relation to the public goods provided.

Following a political decision about the desirable level of provision, mechanisms can be introduced translating societal needs into demand addressed to those economic actors who are in a position to provide public good(s). The mechanisms stimulating supply may take a variety of forms often, but not exclusively, modelled after market mechanisms. They include, for example, incentive payments or those with competitive elements such as auctions or tradable emission certificates.

It is often argued that the more competitive approaches afford a possibility to create markets for the provision of public goods. However, while policy instruments can be developed to operate as substitutes for a market the result is, strictly speaking, not a fully functioning market because two essential elements are missing. First, a direct interaction of demand and supply is absent. Second, there is no means for society as consumers of public goods to verify their satisfaction of the goods provided - a quality check that is done by the individual consumer in an open market. In the case of public goods, the use of market mechanisms therefore is often limited to stimulating competition among suppliers to improve the cost effectiveness of delivery.

The discussion above demonstrates that the allocation mechanism which best ensures a reallocation of resources towards the delivery of public goods is influenced by the good's 'degree of publicness'. It also points to the number of people who have to interact to stimulate the supply of both private and public goods, ranging from individual actors (individuals, households or firms) operating in a market, to the common action of club members, to governments negotiating with multiple economic actors on behalf of society at large.

4 The Geographical Scale of Intervention

The 'degree of publicness' developed in section 2 is associated with the site-specificity or transboundary nature of a public good in question. These characteristics stipulate at the same time the most appropriate geographic or administrative scale of public intervention. When the public good is only available within a given local area and shows site specific characteristics, such as a buffer zone around a lake or a recreation area for local benefit, it may be regarded as a 'local' public good. Decisions about the scale of its provision and the most appropriate form of management should ideally be taken at the local level in line with the 'principles of subsidiarity and fiscal equivalence', whereby the responsibility for intervention and expenditure lies with the administration closest to the beneficiaries of the public good in question.

'Global' public goods fall at the other end of the spectrum, and include global biodiversity and a stable climate, both of which exhibit transboundary characteristics. In these cases, mitigating climate change or delivering biodiversity objectives cannot be achieved through action at the local level alone.

Measures for mitigating climate change can be applied at the regional or even local level, but these will have no noticeable impact if the efforts are not supported by activities at the global scale resulting from international political intervention.

In practice, however, what constitutes the most appropriate scale of intervention does not reflect these neat divisions between 'local' and 'global' public goods, because they do not take broader 'non-use values' into account. These values often mean that citizens care about the on-going existence of certain public goods - such as the protection of endangered species or the preservation of certain habitats - and are willing to bear the costs, even though they are not immediate users and may be far removed from the public goods concerned. 'Non-use values' also demonstrate the characteristics of non-rivalry and non-excludability, and therefore add a high degree of publicness to certain public goods which, on the basis of their physical characteristics alone, would otherwise be classified as 'local' public goods.

In reality, 'non-use values' are important drivers of policy decisions and as such, political intervention at a higher administrative level is necessary to ensure that the demands made by non-users are represented. Political and financial intervention at an international level is also needed where certain countries or regions have insufficient funds to address local needs, or in contributing to the achievement of common supranational objectives, countries or regions face a disproportionate burden in meeting the costs of providing the public goods in question. This is in line with the objectives of economic and social cohesion.

5 Identifying the Case for Public Intervention

The line of argument developed above establishes the relationship between a good's degree of publicness, along with its physical characteristics, and the allocation mechanism necessary to coordinate supply and demand. There is, however, no *prima facie* case for public intervention to secure the provision of all of the public goods associated with agriculture for the reasons discussed below. Public intervention is only needed in those cases where the current level of provision falls short of that demanded by society.

Certain types of agricultural activity in the EU provide a range of benefits which are highly valued by society. Given the limited availability of public finances and competing priorities, it is not necessary to intervene to secure the provision of public goods as long as these are provided incidentally, for instance as a side-effect of economically viable activities, and to the full satisfaction of the public. In these cases, the provision of the public good does not require any additional incentives via specific policy measures.

However, even where public goods associated with agriculture have been provided either incidentally, or as a result of philanthropic behaviour their continuing provision is not always guaranteed. For example, market forces and technological innovation have propelled traditional extensive agricultural systems down a route of restructuring towards more intensive forms of land use, or sometimes towards complete abandonment. In these cases, the opportunity costs associated with the continuation of forms of land management which provide public goods increase. This leads - in the absence of incentives established through targeted policy measures - to a shift to more intensive land management practices or to land abandonment and, thus, to a contraction in the flow of public goods.

The undersupply of a public good triggers the requirement for action and underlies the need for an allocation mechanism that allows economic transactions to take place to ensure adequate supply.

Typically this will involve economic incentives for land managers to ensure the allocation of their factors of production towards the desired provision of a respective public good.

The unintended and indirect side-effects of certain operations in agriculture and elsewhere are also referred to in economic theory as 'externalities'. Indeed, inappropriate agricultural management practices can have detrimental effects on environmental media, such as pollution of groundwater, surface waters, erosion of soil or degradation of habitats, as an unintended consequence of 'normal' agricultural production, although this is common to most productive activities competing for the use of scarce resources. The idea behind the theoretical conception of externalities is to signal the need for these effects to be internalised, which means that they are accounted for by individual actors and become the subject of a deliberate allocation decision. Internalisation is typically achieved through defining clear user rights.

The internalisation of external effects becomes necessary if the unregulated situation is considered unsatisfactory and the 'internalisation' of the external effect carries the potential for welfare gains. On this basis, policy measures can be established that encourage the reallocation of resources towards providing certain quantities of public goods, in response to society's demands. Once the coordination of the supply and demand of a public good has become a matter of a well-established allocation mechanism, a former externality ceases to be regarded as "external" in nature – it has become "internal" to the economic process. However, even then, the need for deliberate action towards the supply of public goods prevails, because the 'public goods characteristics' of the issue in question remain unchanged.

In summary, certain public goods may be provided incidentally as a side-effect of economically viable activities, or as a result of farmer self-interest or altruism. As soon as their provision is under threat, it is the role of an appropriate form of government to steer the allocation of the factors of production to stimulate supply in line with societal demand. These arguments establish the broad case for public intervention and in the following section we discuss the question of who bears the costs associated with the provision of public goods.

6 Providing Public Goods versus Avoiding Environmental Harm

In the preceding sections, it has been argued that where there is an undersupply in public goods relative to societal demand, some form of public intervention is needed and political decisions are required to ensure an appropriate scale of provision. This means first, agreeing on acceptable targets and second, encouraging providers to deliver public goods in line with these targets and, third, clarifying who bears the costs of providing public goods. Engaging in the provision of public goods means that farmers re-allocate resources to deliver an outcome that is different from what is likely to happen if only market signals are followed – for example, the retention and management of landscape features rather than removing them to increase field sizes in order to reduce private unit costs. As there will be costs associated with changing the allocation of resources towards the provision of public goods stipulations need to be made on who bears the costs – the farmer or the tax-payer? Economic theory provides an orthodox answer to this question by referring to the setting of property rights.

In present day discussions about the distribution of costs for achieving environmental objectives, reference is made to the 'Polluter Pays Principle' (PPP), a basic principle of cost allocation. Established in the early 1970s, and adopted by the OECD in 1974, the PPP states that 'the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level of pollution'.

In an agricultural context, the Polluter Pays Principle stipulates that farmers bear the costs of avoiding or repairing any environmental harm resulting as a side-effect of their agricultural activities. This principle can be translated into concrete policy terms by setting mandatory standards and enforcing them. The Polluter Pays Principle conveys one strict message - payments should not be made for any action arising from the need to comply with mandatory requirements and other environmental standards – and that the costs of achieving certain environmental outcomes fall onto farmers.

In its initial formulation, the Polluter Pays Principle focused on shifting the costs associated with achieving a certain environmental outcome generally to operators, as environmental achievements were only considered in terms of avoiding environmental harm. However, this does not take account of the fact that environmental outcomes - such as the maintenance of semi-natural habitats - require engaging privately owned land and capital, as well as labour. Evidently, those environmental results are achievable only if the providers are offered a financial incentive to do so.

To make a distinction between those cases where the costs of reaching certain environmental outcomes fall onto the operators, and those where private actors are remunerated for providing environmental public goods, the OECD developed the concept of the 'reference level'. In effect, the reference level defines the dividing line between the level of environmental responsibility farmers are expected to assume at their own expense, and those actions that lead to enhanced environmental delivery which farmers may be willing to undertake for adequate remuneration.

The concept of the reference level also introduces an institutional dimension into the equation, by taking into account existing property rights or - where these do not yet exist or are not clearly specified - by defining and allocating the property rights concerning the resources needed for responding to the public interest. Property rights stipulate what someone may or may not do with respect to a certain physical entity, thereby determining who receives an income from employing the factors of production (land and capital) for the provision of certain goods and services.

As explained above, establishing property rights is the very precondition for integrating resources or assets into allocation mechanisms that function to steer resource use towards the provision of public goods. However, there are no guiding rules for where property rights are set, nor is there a *prima facie* reason for granting or denying property rights to one particular group of operators/farmers or to another, notwithstanding the fact that the allocation of property rights does have economic implications for the individual farmer.

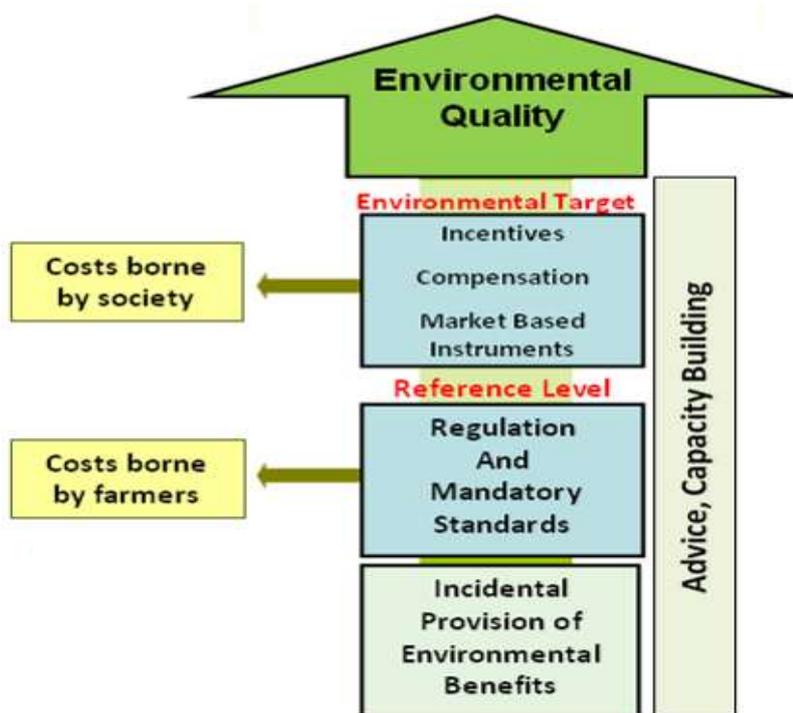
To illustrate this, a farmer – as the owner of a plot of land that provides a habitat for rare species – may have the right to plough it for conversion to a more profitable land use, and therefore to destroy the habitat, or he may have a duty to maintain the habitat in line with society's biodiversity interests. In the first case, he may have the right to plough, however, he may be willing to allocate his factors of production towards the preservation of the habitat if he is offered a payment to do so which is sufficient to cover his income forgone. In the second case, the destruction of a habitat is not part of the property right of the land manager and therefore, the farmer would bear the opportunity costs of denied conversion.

These considerations are reflected in the 'Coase Theorem' which underlines that the optimal allocation of resources follows from the highest achievable benefit, independently of the initial allocation of property rights. The question of to *whom* to grant the property rights, or *where* to set the reference level, depends neither on the desired overall outcome nor can it be derived from any biophysical characteristic of the issue at stake. The setting of the reference level is solely a question of legal tradition, political history and considerations of equity and fairness. What matters economically is that establishing those rights is the crucial step required to allow environmental outcomes to be internalised within an economic transaction. On this basis, functioning allocation

mechanisms can steer resource use towards achieving enhanced levels of environmental delivery in a cost effective way.

Figure 1. illustrates this discussion by showing, diagrammatically, the relationship between the reference level, environmental targets and different policy instruments, in relation to delivering increasing levels of environmental quality.

Figure 1. Environmental targets and the reference level



7 Conclusions

The theoretical framework developed here affords insights into the characteristics of public goods, along with the most appropriate allocation mechanism needed to secure their supply in line with society’s demand. It concludes with an examination of the case for supporting the provision of public goods through some form of public expenditure programme. However, any policy conclusions drawn from these theoretical considerations must reflect the wide variety of natural, economic, structural and institutional conditions encountered in the countries and regions of Europe.