

**The provision of agri-environmental public goods through collective action:
evidence from case studies in Italy**

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Abstract

The EU debate on the future orientation of the Common Agricultural Policy (CAP) is increasingly shaped by the role of agriculture in providing agri-environmental public goods, and there is a broad consensus that this approach will be particularly relevant in legitimating the EU policy intervention in the future. Nevertheless, in the EU institutional and academic debate, it is not clear to what extent collective action could be taken into consideration as a valuable alternative to market or state regulation in order to increase the environmental performance of agriculture. Similarly, it is not evident to what extent it is possible to design and implement agricultural policies that incorporate a collective approach for the provision of agri-environmental public goods.

This paper aims at addressing these issues by analysing two initiatives recently developed in Central Italy, which shed the light on the benefits and limitations of collective action for the provision of agri-environmental public goods and, above all, illustrate to what extent a collective approach to agri-environmental action could be better embedded and institutionalised in the current EU political settings.

The paper shows that public goods provision through agriculture is a very complex task which encompasses several dimensions, such as the bio-physical, socio-economical and socio-political dimensions. The case studies show that an effective provision of agri-environmental public goods relies heavily on the local knowledge of stakeholders and on the capacity of local institutions of influencing farmers' behaviours and attitudes.

From a policy development perspective, this implies the need of exploring innovative forms of intervention, such as stimulating the co-production of knowledge (amongst farmers, institutions, technicians, and citizens) and the co-management of agri-environmental measures. These arrangements allow taking more into consideration the collective dimension of public good provision and result in more viable and effective solutions, better tailored to the local situations.

Key words: *Agri-environmental public goods, collective action, Common Agricultural Policy (CAP), co-production, co-management*

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Introduction

The public support to agriculture is increasingly under scrutiny from governments, academic, policy analysts, NGOs and producers organizations. In particular, at the EU level, the debate on the future orientation of the Common Agricultural Policy (CAP) is shaped by the role of agriculture in providing public goods, and there is a broad consensus that this approach will be particularly relevant in legitimating the EU policy intervention in agriculture in the future.

At the European level, the literature shows that in many cases the policy tools implemented to date have been largely inadequate to provide agri-environmental public goods at the required scale, by acknowledging the need of carrying out additional theoretical and empirical researches on the relations between agricultural and rural development policies and the provision of agri-environmental public goods.

One of the main reasons of the ineffectiveness of the policy tools currently implemented is due to the fact that the agri-environmental measures have mainly focused on individual farms rather than on collective action, whilst in many cases it is evident that, in order to provide effectively agri-environmental public goods, a collective approach is necessary, with a joint involvement of farmers and of other rural stakeholders in the same area.

At the same time, it is not clear to what extent collective action could be taken into consideration as a valuable alternative to market or state regulation in contributing to the provision of environmental public goods associated to agriculture, and to what extent it is possible to design and implement agricultural policies that incorporate a collective and collaborative approach amongst different rural stakeholders.

The aim of this paper is analysing the role of collective action in the provision of agri-environmental public goods and in reducing environmental externalities through agriculture. More in details, the paper focuses on two initiatives recently developed in Central Italy, which shed the light on the benefits and limitations of collective action for the provision of agri-environmental public goods and, above all, illustrate to what extent a collective approach to agri-environmental action could be better embedded and institutionalised in the current political settings.

The first collective action is related to a local project in a mountain area of the Tuscany region, named 'Custody of the Territory'. The project was created and implemented by a local government authority, which set an agreement with the local farmers for the co-production of the environmental services, in order to increase the resilience to flooding and to improve the landscape and hydro-geological management of the territory.

The second case study focuses on Aso Valley area (Valdaso) in the Marche Region, where a group of farmers started a grass root initiative to adopt integrated management techniques at territorial scale, with the objective to protect water and soils from pesticides and nitrates

pollution. This action, co-managed by the local farmers and by the local institutions, was supported through an “agri-environmental agreement” (AEA) which ensured the delivery of public goods at landscape level.

The analysis of these case studies is based on the data collected through thirty semi-structured interviews with key informants, including farmers, representatives of farmers’ organisations, local authorities, technicians and independent experts.

Agriculture and public goods: the role of collective action

During the last decades an increasing amount of literature on collective action and natural resources has emerged, with a great emphasis on the conceptualization of collective action and on the analytical framework necessary to study it (Olson, 1965; Wade, 1987; Ostrom, 1990).

Marshall (1988) defined collective action as “*the action taken by a group (either directly or on its behalf through an organization) in pursuit members’ perceived shared interests*”. As observed by Meinzen-Dick *et al.* (2004), the more specific and varied definitions which have been added later have in common the following features: the involvement of a group of people, shared interests, common and voluntary actions to pursue those shared interests.

The role of collective action is increasingly analysed also in the context of the agriculture and rural development. In the context of developed countries, the majority of studies and analysis are related to collective marketing initiatives, since a collective and coordinated approach of farmers in the food supply chain may have positive economic effects, by increasing the economies of scale and by reducing transaction costs. At the same time, as it will be further discussed in the paper, it is also increasingly recognised that collective action of farmers and of other rural stakeholders may also play an important role in delivering public goods, non-commodity outputs and environmental services (Polman *et al.*, 2010).

In the framework of the CAP, agri-environmental measures are the main policy tools implemented to ensure the provision of agri-environmental public goods. These measures provide payments to single farmers to adopt specific farming practices on producing land, and are implemented specifically to achieve positive environmental effects and/or providing public goods (such as landscape, biodiversity, etc.).

Agri-environmental measures are based on formal contracts between individual farmers and government agencies, under which the farmers agree to follow a particular set of practices and not to undertake others. However, as observed by many authors, in many cases these measures are largely inefficient and they seem inadequate to improve the provision of such goods at the required scale. Their lack of efficiency is mainly related to their lack of targeting and tailoring, but also to the fact that usually their targets are defined in the form of a specific farming practice rather than a specific (and measurable) environmental outcome (Vojtech,

2010). In addition, these measures usually are targeted to individual farms, while environmental public goods could be more effectively delivered if farmers in a given area take joint action, since the provision of environmental goods such as biodiversity and landscape may be ensured only where groups of local stakeholders in rural areas agree to adopt a coordinated approach to resource management (Hodge, 2001). On the opposite, the current agri-environmental measures usually do not encourage landscape level co-ordination, by favouring a farm scale approach leading to individual, disconnected actions (Prager *et al.*, 2012).

The lack of coordination in implementing agri-environmental strategies is strictly related to two main limitations. Firstly, by preventing coordinated efforts and knowledge exchanges between farmers involved into the agri-environmental measures, in the majority of the cases these policies have failed in changing farmers' attitudes towards natural resource management (Burton *et al.*, 2008; Burton and Paragahawewa, 2011). Secondly, the strategies targeted to individual farms bring out the problem of the "scale mismatch" between the scale of administrative management of the measures (the farm scale) and the scale of the ecological processes which the schemes should manage (Cumming *et al.*, 2006).

For these reasons, in order to improve the efficiency of agri-environmental measures, there is an increasing emphasis on the need of promoting collaborative and coordinated strategies at landscape level. All the collective initiatives described in the literature show that there are different ways to deliver agri-environmental public goods collectively, with different degree of integration with the conventional policies and with different degrees of collaboration amongst farmers (see Hodge and Reader, 2007; Cooper *et al.*, 2009, Poláková *et al.*, 2011). At the same time, all these approaches usually interrelate and overlap, so that it is not easy to create divisions and to classify them. This variation reflects the complexity of the different agricultural and forestry practices as well as the broad range of local and regional institutions in charge of implementing agricultural and rural development policies.

Institutional arrangements

In many cases the outcomes of the collective action are highly dependent on the type of organisations involved, but also to the institutional arrangements which are in place at the local level. In the agricultural sector, for example, Uetake (2012) distinguishes two types of collective action: (i) *cooperation*: bottom-up, farmer-to-farmer collective action and (ii) *co-ordination*: top-down, agency-led collective action.

In the European context, the public intervention in agriculture is quite centralised, and central governments still play a very crucial role. Even though during the last decades important efforts to increase the decentralisation and to promote locally defined rural and agricultural policies were observed, it is evident how agriculture is an highly subsidised sector and how

its economic performance is highly dependent on public support, that usually is implemented through rather top-down policy tools.

At the same time the modalities through which is possible to stimulate collective action (for example cooperation or coordination collective action) do not depend only by the European support, but also to the local institutional settings and on the possibilities to implement participatory strategies and innovative and institutional arrangements at the local level. Indeed, the concept of collective action itself suggests the need of looking beyond the simple top-down management - that in the agricultural sector is usually based on state intervention - but also looking at the public/private partnerships and at innovative institutional arrangements which involve different levels. Those multi-stakeholders arrangements are usually characterised by strong horizontal linkages among user groups at the same level of organisation, but also by vertical linkages between different levels, for example between local stakeholders and central governmental agencies (Berkes, 2009).

This multi-stakeholders approach is also very relevant to stimulate collective action related to provision and protection of public goods, since the effectiveness of the public intervention is usually related to the involvement of a broader range of rural stakeholders that act together by sharing different knowledge, expertise and commitment for common goals.

As highlighted by Gatzweiler (2006), farmers cannot be expected to be the sole carrier of the costs for providing public goods and services and the government cannot be the sole authority in the allocation public funding, but in many cases is necessary to seek ways towards mixed solutions. From this point of view, as discussed by many authors, the solution is not as easy as leaving the allocation problem of private goods to the market and that of public goods to the government, but it is usually necessary to explore innovative solutions, based on mixed public-private arrangements which could ensure an effective provision of public goods through collective and inclusive strategies (Hagedorn *et al.*, 2002; Van Huylenbroeck *et al.*, 2009).

Some innovative institutional arrangements that may represent the basis for collective action for the provision of agri-environmental public goods have been conceptualised through the definitions of *co-management* and *co-production*.

Co-management, defined as the sharing of power and responsibility between the government and the local resource users, is a hybrid regime combining centralised and decentralised, state and community institutions (Berkes, 2009). More in details, co-management was defined by Singleton (1998) as a “*governance systems that combine state control with local, decentralized decision-making and accountability which, ideally, combine the strengths and mitigate the weak-ness of each*”. This institutional arrangement is usually combined with learning-based approaches, since it may be considered a knowledge partnership where different levels of organisations have comparative advantages in generating and mobilising of

the knowledge acquired at different scales.

While co-management refers to an arrangement in which private organisations or associations produce services in collaboration with the state, co-production refers to an arrangement where, at least in part, citizens produce their own services. Co-production has been defined by Ostrom (1996) as “*the process through which inputs used to produce a good or services are contributed by individuals who are not “in” the same organization [...]. Co-production implies that citizens can play an active role in producing public goods and services of consequence to them*”. Ostrom (1996) also argues that reciprocity is an important requisite to make co-production advantageous, since co-production process implies the building of credible commitment of the participants to one another and clear and enforceable contracts between government agencies and citizens enhance that credibility.

Institutional arrangements based on co-management and on co-production imply a shift from a linear approach to policy design towards a policy cycle, where rural development strategies are designed and implemented according the local needs, and where the knowledge of local farmers play a pivotal role.

Indeed, farmer decision making process is generally strongly influenced by the judgments of their peers, and this emphasises the need to explore the individual interests which allow farmers to interact each other, in order to understand the social networks, trust and norms of reciprocity which are in place in the farming communities.

At the same time, the study of collective action also implies a territorial and integrated approach, where it is important to analyse the interactions of farmers with wider networks, which may involve other farmers communities, technical services, local authorities, public bodies, NGOs, environmental organizations, political groups.

From this starting point, the following paragraphs provide a detailed analysis of two initiatives recently developed in Central Italy, which shed the light on the benefits and limitations of collective action for the provision of agri-environmental public goods and, above all, illustrate to what extent a collective approach to agri-environmental action could be better embedded and institutionalised in the current EU political settings.

The project “Custody of the territory” in Tuscany region

Co-production of environmental services

This case study refers to a local project in the Reclamation District No. 4 “Serchio Valley”, a mountain area of the Tuscany region of over 115.000 hectares in the drainage basin of the Serchio River. It is comprised of 35 municipalities in the Lucca and Pistoia provinces.

In this district, the local authority *Unione dei Comuni “Media Valle del Serchio”* is in charge of ensuring the hydro-geological management of the territory (i.e. cleaning up and restoring

the riverbeds, maintaining the 2.500 hydraulic structures of the areas). Due to the increasingly difficulties in managing over 115.000 ha of mountain areas and about 1.500 km of streams and torrents, this local authority has decided to set an agreement with local farmers, with the main objective of increasing the resilience to flooding by improving the landscape and hydro-geological management of the territory. This Payment for Environmental Services (PES) is articulated into two types of activities:

- Monitoring activities: periodical on site controls of torrents and streams, with report and pictures;
- First maintenance intervention: execution of simple maintenance works such as removal of trees, woods and debris from riverbeds and dikes to avoid overflowing, together with the management of riparian vegetation.

The agreement includes a fixed payment (€ 6.000 per year during the initial phase and € 4.000 per year during the following years) for the monitoring activities, and a variable payment for the first maintenance intervention, based on the extent of the work to be done².

This strategy was mainly financed through local funding coming from the local reclamation tax and, for larger intervention works, through the regional Rural Development Plan (RDP).

The project started in 2007 and during the most recent phase (2010/2011) the agreement was settled with 25 farmers and 4 cooperatives. In 2011 the local agency was then able to monitor 500 km of torrents and streams, corresponding to the 40% of the territory.

This project was created in order to provide and protect a large set of environmental goods and services closely linked to agricultural activities, such as landscape, soil protection, resilience to flooding, but also non-environmental public goods, such as social capital, institutional capital and new knowledge. The broad objectives may be summarised as follow (Rovai *et al.*, 2013):

- To improve the environmental management of the areas through the involvement and empowerment of local communities;
- To favour a pro-active role for farmers in managing the territory in order to maximise their role in delivering environmental services;
- To increase the resilience to flooding by favouring the involvement of farmers in preventive activities (monitoring, surveillance, early intervention works).

These objectives were pursued by “re-building” the technical knowledge of farmers related to the environmental management of the territory through the interactions and the exchanges

² The maintenance activities, according to the Italian law on multifunctional agriculture and diversification activities (national Legislative Decree n. 228/2001), cannot exceed € 50.000 per year for professional farmers and € 300.000 for specialized cooperatives.

between different actors (institutions, technicians and farmers). Indeed, instead of implementing the traditional hierarchical approach of learning transmission, the involvement of local farmers into this project led to a project of joint learning amongst the representatives of local institutions, technicians and local farmers. Through this project, the local authority aimed at creating not an instrumental relationship with based on compensation, but a more complex system of incentives, rules and knowledge, which is based on reciprocal relationships, trust and engagement. This integrated strategy based on the development of a local network of farmers, citizens, advisory system and local institutions resulted in process of learning and co-production of knowledge. This approach ensured, on one side, an efficient early warning system for the risk of flooding and, on the other side, the provision of cost-effective environmental services.

The collective action in “Custody of the Territory”

According to the farmers interviewed, the main strengths of this collective action are related to the creation of the new identity of local farmers as “custodians of the territory”, which implies not only the possibility for them to receive the payments for the environmental services, but also the opportunity of being involved in the environmental management of the territory. The most pro-active farmers involved into the project became a point of reference for the local community and, above all, they represented a reliable information network and an efficient early warning system for the public administrations in charge of the environmental management of the district. The involvement in the project also increased the visibility and reputation of farmers within the local community.

Table 1. Benefits and barriers of this collective action according to local farmers

Benefits	Barriers
- PES and income integration	- Lack of skills and equipment
- Joint learning and co-production of knowledge	- Lack of technical knowledge (especially for small farmers)
- Increased reputation of farmers	- Lack of specific training
- Building up of a network of local farmers	

Moreover, the interactions ensured by joint inspections carried out by the technicians working for the local authority and the farmers before the assignment of the environmental services resulted in a process of joint learning and co-production of knowledge. Through these joint inspections the local knowledge of farmers was introduced into the policy strategies and, above all, allowed to transfer the new knowledge generated into the public administration, with the integration of new data and new information that was considered strategic to plan the activities related to flooding prevention. The first-hand knowledge that the farmers acquired through the monitoring was also particularly important in updating - and in some case

correcting - the geographical data base of the local authority. At the same time farmers highlighted also some barriers related to the lack of skills, equipment that in some case prevent the participation of the small farmers into the project.

The representatives of the local authorities interviewed (*Unione dei Comuni Media Valle del Serchio*, provincial governments, municipalities) argued that an important strength of the project is its simplicity: both in terms of design and in terms of implementation. Indeed, the management of this collective action is based on a daily relationship between the coordinator of the project, the technicians and the farmers. This strong collaboration has favoured the development of trust and willingness to cooperate, by facilitating the implementation of a very simple agreement without excessive regulation or bureaucratic tape. This simplicity was stressed especially in contrast to the RDP measures, whose lack of simplicity and flexibility (especially regarding the administrative procedures) in many cases discourages their adoption by farmers. On the opposite, the agreement experienced in the project shows how a direct relationship between a local authority and the farmers may facilitate the adhesion to the collective action, also by increasing its effectiveness.

Thus, the representatives of the local authority have stressed their satisfaction with the effectiveness of this project, considered strategic for their activities, even from an economic standpoint, with an undoubted saving in terms of labour, equipment and monitoring activities. With regard to the specific innovation of this strategy, the project coordinator was also highly satisfied with the work carried out by the farmers, since they have demonstrated suitable actors to carry out the required hydro-geological management works.

Table 2. Benefits and barriers of the collective action according to the other stakeholders

Benefits	Barriers
- Cost effectiveness (saving in terms of labor, equipment and monitoring activities)	- Lack of coordination amongst local institutions
- Increased environmental stewardships	- Environmental services to be provided do not match with the administrative boundaries
- Knowledge generation and learning	- Difficulties in scaling up and expanding the collective action
- Institutional capital and capacity-building	

With regard to the main barriers of this collective action, the local representatives interviewed have emphasized how the landscape management activities would need a more coherent and homogenous approach at river basin level, since the territorial needs often do not coincide with the administrative boundaries (regional and provincial administrations, municipalities). While the hydro-geological management of the territory and the resilience to flooding are highly dependent to the correct management of rivers, canals and streams, the environmental priorities are usually addressed on the basis of the different administrative levels

(municipalities, provinces and regions). In some cases inflexible policy tools and institutional arrangements based on the administrative borders hindered a more effective approach to the broad range of environmental services to be provided at landscape level. A more effective coordination amongst these authorities would have favoured a more efficient support to this collective action, by providing a wider spectrum of services carried out by local farmers, such as maintenance of mountain path, fire services prevention, and other environmental services.

The Valdaso agri-environmental agreement in Marche region

Co-management of agri-environmental measures

Valdaso (Aso Valley) is a territory of Central Italy highly specialised in fruit production (peaches, plums, apples and pears), which concentrates almost 60 per cent of the regional production and processing industries in the fruit sector. The orchards in this valley have been traditionally cultivated with high use of chemical inputs (fertilisers and pesticides), with negative consequences on public goods as biodiversity, soil fertility, water and air quality.

In order to increase the environmental sustainability of local agriculture, in 2007 a small group of farmers (allied in the local farmers association *Nuova Agricoltura* – ‘New Agriculture’) started a grass root initiative to adopt integrated management techniques at territorial scale. This initiative has been supported by the regional and provincial governments, which settled a specific agri-environmental agreement AEA, financed by the regional RDP³.

The agreement established specific targets, to be achieved in a period from five to seven years, such as the reduction of 30 per cent in macronutrients (nitrogen, phosphorus and potassium) used in the territory and the substitution of agri-chemical inputs, characterized by acute or chronic toxicity, respectively by 90 and 85 per cent.

To achieve these results, the AEA is structured as an integrated package of measures of the regional RDP, with the aim of financing a set of initiatives that could support the adoption of more sustainable agricultural practices at territorial level. The package of measures comprises training activities and information actions and the following sub-measures of the agro-environmental measure: integrated pest management (IPM) techniques (mating disruption) and protection and improvement of soil through green cover.

Together with the actions specifically implemented to reach environmental objectives, the

³ An agri-environmental agreement (AEA) is defined by the regional government as “a set of commitments for farmers in a limited area, supported through a mix of RDP measures, that can be activated to reach specific environmental goals. Based on a territorial approach and by involving public and private actors in the context of a shared project, AEAs are aimed at implementing collective and coordinated actions for the management and improvement of the environment” (Marche Region, 2007).

training activities also were included into the agreement with the objective of rising farmers' awareness on the impacts of their farming practices on the environment, as well as on the role of farming in protecting the environment and enhancing the rural landscape. Through this RDP measure, a capacity building programme for farmers was established, with specific training regarding the technical guidelines on integrated and agriculture, articulated in farms visit and specific workshops, which were organized to increase information sharing among local farmers regarding the environmental, economic and health effects of the new techniques introduced with the AEA.

During the first year of the agreement (year 2009) 82 farms were involved, corresponding to 257 ha cultivated with Integrated Pest Management (IPM) techniques. In 2012 about 100 farmers were involved, corresponding to over 560 ha cultivated with advanced IPM techniques and to 270 hectares of orchards with green cover.

The most interesting innovation of the AEA is related to the fact that the regional and provincial authorities, aware of the inefficacy of an approach focused on individual farms, were able to institutionalise and support to specific needs of local farmers related to agricultural practices and public goods protection. In other words, the bottom-up approach experienced through the activities of *Nuova Agricoltura* was supported and coordinated by the regional and provincial authorities, in order to design and implement a mix of measures targeted to the local needs.

The collective action in Valdaso AEA

The participation of farmers in this collective action is highly motivated by economic reasons, since farmers believed that they would gain from participation, both by obtaining the CAP payments of the AEA and by saving in production costs, due to the reduced use of chemical products and machineries.

At the same time, the bulk of farmers involved in the agreement declared that they were motivated also by reasons which go well beyond the economic incentives, such as the willingness to reduce their health risks and to reduce the environmental impacts of their farming practices. Moreover, one of the characteristics of this agreement was facilitating the exchange within the farming community and this was emphasised by local farmers as an important opportunity to meet and to share point of views and experiences on the new techniques adopted. Information exchanges and learning processes were central to the success of this collective action to many extents: from the adoption of the IPM techniques, to the dissemination of such techniques to other farmers. At this regard the role of *Nuova Agricoltura* was crucial in creating the conditions to aggregate the farmers and to convince the most hesitant ones to participate into this collective action. It must be noticed that some farmers took part of this collective action also because their aggregation could potentially

have a higher ‘lobbying power’ than individuals, by increasing the credibility and the legitimacy of the joined action to be undertaken.

Recently the AEA became also part the regional strategy for food labelling: the “*QM-Qualità garantita dalle Marche*” (Guaranteed quality of Marche Region) and though the label local farmers had the opportunity to obtain higher prices on the markets. This label was also important for farmers to communicate the collective commitment to sustainability to local consumers and to increase the reputation and trust of local communities towards their production practices.

One of the main barriers of this collective action regards the fact that there are different levels of involvement amongst farmers, with some example of opportunistic and free riding behaviors: some farmers adhered to the agreement only to receive the payments but in reality continued to use chemical products for crop protection. At the same time, as observed by one of the AEA coordinators, free riding behaviors was limited as result of social control. The farmers themselves, who know each other, indicated the possible free riders (who joined the AEA only to receive the payment) also because they were damaged by this opportunistic behaviors, since the effectiveness of the mating disruption is highly dependent on the possibility of using this techniques on an unbroken piece of land. This social control is the result of to the relationships of trust and reciprocity which were created within the local farmers’ community: many farmers highlighted that one of the most the positive effects of the AEA was the fact that they learnt to collaborate and cooperate to achieve common goals. Indeed, IPM requires stronger analytical skills and deeper understanding of agro-ecological principles as well as a higher cooperation between farmers, and these aspects may result in the creation of social and human capital (Pretty and Ward, 2001).

Table 3. Benefits and barriers of collective action in Valdaso AEA according to local farmers

Benefits	Barriers
- CAP payments	- Free riding
- Knowledge generation and learning opportunity	- Unsatisfactory support from intermediary institutions (provincial authorities)
- Collective marketing strategy (QM label)	- Lack of flexibility of Rural Development Policy
- Increased lobbying power	

According to the majority of the stakeholders interviewed (farmers advisors, independent experts, representative of local institutions), compared to the traditional agri-environmental measures, the Valdaso AEA resulted in several environmental and socio-economic benefits. All these benefits are in some ways related the local governance and on the institutional arrangements experienced. Indeed, the joint role of private and public stakeholders, together

with the integration of different RDP measures in a territorial agreement, favoured the implementation of a coherent strategy more finely-tuned to the local needs.

With regard to the main barriers of the Valdoso AEA, the institutional stakeholders involved have also highlighted the problem of the high administrative costs in supporting and managing this territorial initiative. Indeed, whilst the devolution of powers to local institutions is deemed to implement more targeted strategies, the complexity of the different and interconnected levels of governance involved into the agreement⁴ resulted in an increase of costs related to the management and coordination of the measures implemented.

While some of these costs are not currently financed through the RDP, it would be necessary a more effective support to collectives to ensure territorial agri-environmental strategies, for example by providing additional funding for the initial capacity building process as well as funding for the coordination, management and group activities. This is especially true for farmers associations, but also for local institutions that are currently excluded from this type of funding, such as provincial authorities in the case of Valdoso AEA.

Table 4. Benefits and barriers of collective action in Valdoso AEA according to the other stakeholders

Benefits	- Barriers
- Right scale of public goods protection	- Control and monitoring
- Strategy coherent with the local environmental priorities	- Unsatisfactory support from institutions (lack of communication and delays on payments)
- Institutional capital and capacity-building	- Higher transaction costs

Discussion

The case studies described above differ to several extents. As synthesized in the table 5, in the “Custody of the Territory” project the local action was mainly developed and coordinated by a local public agency (*coordination*), whilst in the second Valdoso AEA the collective action was directly led by farmers and later institutionalised and supported by the local institutions (*cooperation*). Moreover, there are also several differences between the two territorial contexts and, above all, between the agri-environmental issues addressed, the institutional arrangements involved and the strategies implemented.

More in details, Custody of the Territory is a project led by a local authority that set incentives and supported a collective approach to the hydro-geological management of the district. This approach has resulted highly dependent on the institutional role of the local

⁴ The agreement is co-managed, even though with different levels of involvement, by the following actors: Regional government, Ascoli Provincial Administration, Fermo Provincial Administration, ASSAM, Crop protection products companies, farmers’ organisations, *Nuova Agricoltura*.

authority and in its capacity of setting and managing efficacy the PES with farmers. On the opposite, in the case of Valdaso, public institutions have been indirectly involved in a farmer-led collective action, by supporting a bottom-up approach in order to facilitate the adoption of integrated agriculture at territorial scale.

Table 5. Overview of the case studies

Case Study	Custody of the Territory	Valdaso Agri-environmental agreement
Type of collective action	Collective action led by the local agency in charge of the project (<i>coordination</i>)	Farmers-led action, later institutionalized and supported by local institutions (<i>cooperation</i>)
Objectives	Increasing farmers' stewardship, landscape management, hydro-geological management, reducing farm abandonment	Reducing the environmental externalities of agriculture through the adoption of more sustainable practices (Integrated Pest Management)
Location	Mountain and marginal area	Intensive agriculture (fruit production)
Public goods	Hydro-geological management and flooding prevention	Soil quality, water quality and food safety
Policy measures	Payments for Environmental Services	Package of Rural Development measures (111 and 214)
Institutional arrangements	Co-production of environmental services and joint learning	Co-management of the agreement

Nevertheless, it is possible also to recognise several similar features between the two case studies, such as the strong focus on the knowledge and learning dimensions and the efforts of the local institutions in involving farmers in the decision making process.

The case studies analysed show that a collective approach may foster trust and reciprocity amongst the local stakeholders and how this, in some cases, may result in reducing transaction costs and increasingly the effectiveness of the agri-environmental strategies. Indeed, as demonstrated by several authors, social capital is a crucial factor since it can help to overcome several problems associated to the implementation of collective action, especially in initiatives where a large and heterogeneous number of stakeholders is involved (Paavola and Adger, 2005; Pretty, 2003).

Another important key factor that determines the success of collective action is the issue of right scale: the effectiveness of the environmental action usually depends on the achievement of sufficient scale, such as the size of the areas interested and the continuity of the action across the territory. Since single landholders cannot satisfy these two conditions, in many cases a collective and a territorial approach is needed, where the coordinated action is tailored to the natural resources to be managed and to the agri-environmental public goods to be

provided, and not to the administrative boundaries and to the administrative roles of the different public bodies. It should be observed that in the two case studies this condition was not fully achieved. The main reasons are related to the lack of efficient coordination mechanisms amongst local institutions, to the high transaction costs that would have incurred in an increasing monitoring and enforcing at different scales, as well as to the lack of flexibility of the policy tools used to support the collective actions.

In spite of these limitations, the case studies show that successful collective actions for public goods may be supported by innovative institutional arrangements. From this perspective, the Custody of the Territory project shows that innovative PES schemes, based on co-production, may represent an example of mixed public-private arrangements which may deliver environmental services more efficiently. This approach is aimed at developing a pro-active role amongst farmers, by changing the logic of the PES and by developing a more effective system to deal to the flooding risks.

In the case of Valdaso AEA, on the opposite, the participation of a broad set of rural stakeholders determined a territorial strategy for public goods protection, based on shared responsibility and co-management amongst private and public actors. The coordination and the cooperation between the actors involved in collective action are particularly important also with regard generation, validation and exchange of information.

Thus, agricultural and rural development policies should give more attention to dimensions of knowledge and learning, in order to activate a virtuous circle where farmers may play a pro-active role in delivering agri-environmental goods. Indeed, as observed in the case studies, in many cases appropriate land management strategies depend not just on the economic incentives to land managers, but also on other factors, more related to farmers' motivations, attitudes and skills.

At the same time, a collective approach to agri-environmental strategies has not been so far widely applied also because the current legal basis for rural development in many cases is not setting the necessary pre-requisite for a successful implementation of collaborative schemes.

In the case of Custody of the Territory the main barriers are related to the financial support to flood prevention though monitoring, since this "immaterial service" is difficult to quantify in terms of economic return for the institutions (and for the society) and in terms of costs for farmers. The *Unione dei Comuni Media Valle del Serchio* experienced several difficulties in regulating and supporting this service through rural development measures, even though this service is unanimously considered the most innovative aspect of the project.

On the opposite, in the case of Valdaso AEA the main policy and institutional constraints are related the higher transaction costs associated to this collective strategy, mainly related to the financing of the initial capacity building process as well as funding for the coordination,

management and group activities.

In the two case studies it was also observed a lack of flexibility and autonomy in managing the RDP funds at the local level, and this was identified as one of the main barriers to their development. From this perspective the case studies highlight the role of local public bodies and institutions as key promoters and coordinators of specific projects related to agri-environmental public goods provision and the need, for implementing successful collective initiatives, of a stronger devolution of power and responsibilities. The devolution of powers to local bodies is discussed as crucial aspect not only in relation to the collective strategies, but also more generally for increasing the effectiveness of rural development policies on the ground. It may be argued that this devolution, with the corresponding increasing financial resources and responsibilities, is particularly important when complex and integrated policies are implemented, such as the territorial and collective actions described here.

At this regard, it is worth notice that according to the proposal on rural development policies of European Commission (2011) for the programming period 2014-2020, it is likely that the CAP will be more oriented at supporting territorial priorities, also through collective projects and strategies for agri-environmental public goods. Indeed, this proposal emphasises the crucial role of networks and of territorial strategies, also to deliver environmental public goods. This proposal, for example, highlights that *“support for collective approaches to environmental projects and practices should help to provide greater and more consistent environmental and climate benefits than can be delivered by individual operators acting without reference to others (for example, through practices applied on larger unbroken areas of land)”*. In this new formal position for collective action, the European Commission also mentions “group of farmers” as potential applicants and beneficiaries for the agri-environmental measures, by providing additional payments to cover the higher transaction of collaborative and collective strategies. Even though this may be considered a good starting point to re-orient the agri-environmental policies, the shift towards a greater emphasis on collective action of the policies should not just be aimed at addressing the higher transaction costs that are usually associated to territorial strategies, but it should involve a deeper shift on the way policies are thought, designed and implemented. The mainstream policies for agri-environmental public goods are still based on excessively ‘schematised’ practices with high standardization of schemes, which usually result in a tight focus on the management agreement and on the cost-effectiveness of the measures.

Final remarks

At the European level, national and international authorities are increasingly recognising that agri-environmental public goods such as biodiversity and landscape may be provided efficiently only by multiple persons and through collective and collaborative actions.

Thus, in order to achieve sustainable solutions in rural areas innovative policies and institutional arrangements should be adopted, with the objective of widening the agri-environmental action beyond the individual farm.

The paper shows that innovative institutional arrangements amongst rural stakeholders, focused on co-management and on co-production, may have the potential of enhancing the multifunctional capacities of agriculture and of delivering environmental good services in a cost-effective way.

The collective actions described also show that it is possible to improve the capacity of the rural stakeholders in proving and protecting high valued public goods by creating greater synergy between the action of local farmers and the action of governments, where the development of new social and institutional processes are efficiently stimulated. Indeed, as observed in the Italian case studies, collective action for public goods through agriculture does not involve just larger areas owned by many farmers, but also innovative institutional arrangements and coordinating mechanisms implemented at the landscape scale.

The approach of agri-environmental measures adopted at the European level in the framework of the CAP in many cases does not take into consideration in adequate way the collective dimension of the environmental problems concerned and the decision making processes related to the strategies to be implemented. In many cases a narrow focus on policy tools aiming at modifying the land management practices at farm level leaves behind the territorial dynamics, which are highly dependent on (local) social and institutional capital. On the opposite, policies for agri-environmental public goods that support collective action have the potential of developing innovative solutions where common interest and common goals play a central role.

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