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A POSSIBLE THIRD WAY TO THE PUBLIC-PRIVATE DICHOTOMY?

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pubblicazione internet realizzata con contributo della



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XVIII Riunione Scientifica SIEP
Pavia, 14-15 settembre 2006

Preliminary draft – Citation on authors' permission

JEL: H41; P13; L31 ; L33

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1. Introduction

The question of environmental and energy service provision in the last decades has produced a large amount of work, both theoretical and empirical. From a theoretical point of view the presence of several market failures (feature of public goods, impure public goods, externalities, natural monopoly) justified the provision of these services by the public sector, especially at the first development stage (Stiglitz, 1986). However, in the following decades several government failures emerged, namely the inefficiency in public service provision, the lack of innovation and the underinvestment. As a consequence, liberalisation and private sector involvement policies were advocated with the aim to improve the efficiency of public service provision and to raise alternative source of funding (Armstrong et al., 1994). In this view, the public sector retains a fundamental regulation role whilst the private operator is called to provide the services.

The aim of our paper is to suggest a third way as solution to this debate: the cooperative or community management model. In our view, under certain circumstances, the introduction of some forms of cooperative institutions for the provision or the governance of environmental and energy services could be superior to both public or private alternatives. A special form of cooperative institution is the non-profit organization (NPO). Until now the literature of NPOs has focused its attention on social services, like health and education (Bonzaga, 1996). A robust body of literature has analyzed the advantages of this form of social services provision with respect to alternative organizational forms of ownership, both public and private (Zamagni, 1998; Ortman and Schlesinger, 1997; Hansmann, 1980). In fact, all the elements that justify the introduction of NPO in social services could be found in environmental and energy services. NPOs have demonstrated to be effective in providing public goods characterised by non rivalry and exclusiveness. In environmental realm, Elinor Ostrom (1990) claimed the possibility to overcome the “tragedy of the commons” problem that characterise the common pool resource through self-organised cooperatives. Analogously, we aim at showing that free riding problem of environment and energy service provision could be overcome through users' cooperatives.

Our objective is to underline under which circumstances the self-provision of environmental and energy services, organised in a cooperative form (and thus non-profit), could be a valid alternative to both private and public provision of such services. Through an in-depth analysis of selected case studies, we will underline the advantages and the pitfalls of this organisation model. Experiences of self-supplied environmental services are not new: in the water sector, for example, community management is still present

in small rural or mountain areas. However, some forms of self-organizing forms of water and sewerage services management have developed in the last decades in addition to supply-driven water service policies in some areas and activities¹:

- a) rural and disperse population, through direct involvement of users;
- b) groups of firms settled in the same area;
- c) new urbanisations in the surrounding of cities or tourist urbanisation specially along the coasts;
- d) Direct ownership of customers of water and sewerage services companies or customer involvement in company governance.

The community management model is also experienced a great success in less developed countries, as an alternative to policies typical of the '90s, which favored the private sector involvement through delegation in water services provision. The basic assumption in this management model is that when central government fails to provide water services for all citizens, the provision of services could be based on direct initiative of people and users. Apart from its "traditional" form, the community management model shows high potential in relation to new users. Our point is that this management model makes possible to overcome the debate on public or private provision of water services, even in more developed environmental services. A new way to intend this form of water service management is shown in some example of recent evolution in the British water companies. The private regional monopolists, equity financed, have experience a great reform in corporate governance, allowing stakeholders to be involved in ownership and strategic decision making. An extension of this model could also been imagined for the special purpose companies built in the last years in Italy. Once a clear separation between ownership and operation is defined, we can imagine that different ways of customers involvement are introduced. Users' cooperative are then suitable for energy services as well, as the examples of northern countries show.

The paper is organized as follows. In the next paragraph , we will underline the pitfalls associated with private or public environmental service provision, showing how policy responses evolved following first market and then government failures. In the following paragraph we will argue that the debate on the public vs. private provision is framed on a public good definition (based on two dimensions, like exclusiveness and non rivalry) who has been discussed and enriched in the last years. The consideration of a particular kind of impure public good, the club one, will allow us to show how the community management model helps to go beyond this opposition. A special kind of club goods, i.e. the non profit organisation, will be described in the following paragraph, showing that the theoretical arguments advocated for NPO hold for environmental and energy services as well.

We argue that a users' cooperative, under certain circumstances, can help in going beyond the pitfalls associated with both forms of environmental and energy services provision, by emphasising the advantages and pitfalls of this organisational patterns. We will give some examples that will help to clarify this point, taken from different type of environmental services: all of them emerge as reply to a problem unresolved by private or public provision (financing, quality of the service ...). These example will made possible to clarify the institutional and economic conditions that have eased the birth and persistence of these kind of organisations.

In the last section we will conclude by arguing that the cooperative model should not be intended as a substitute for private or public provision, but as a supplementary one, by showing how cooperative could interact with different models of private and public service provision.

2. Market failures and government failures in environmental services

The provision of environmental services has for long time been characterised by their public provision, due to the need of guaranteeing important public good features linked to their supply. In water

¹ In certain cases it developed in pre-industrial era, on the basis of codes precedent to the French Revolution.

services public intervention has been justifying on the basis of “market failures” that characterised water services provision, namely (Massarutto, 2006; Noll *et al.*, 2000):

- the presence of cost sub-additivity exhibited by almost all the segments of the water industry (such as water transportation and distribution, water storage, pumping and treatment), which makes these services a natural monopoly;
- the externalities that characterised the use of the resource, especially that caused by pollution of water source that affect production or represent a threat to human health;
- the merit good nature of water services provision. At the beginning of the last century, it was important to guarantee the provision of that services to all the population. In other words, public water supply was justified by the pursue of the collective interest.

Concerning waste services, the public control of waste disposal practices was crucial on the basis of public health consideration and to avoid illegal or improper behaviour. Moreover, even the waste disposal activity exhibits monopolistic features: the high sunk costs associated with waste disposal make economic efficient the presence in the market of a sole operator. Finally the potential for exploitation of Ricardian rent, associated with landfill ownership, makes preferable that the monopolist was a public body. During the ‘70s, the waste emergency caused by the rapid increase of waste production calls for a great public intervention in order to assure the availability of landfills, thus subtracting them to monopolistic power that a private operator would benefit from.

In the last decade the public intervention on environmental services has been questioned. Theoretically, beside the “market failure” features, even the “public failure” receive a greater attention. The public sector is deemed more inefficient of private operators and unable to cope with technological development. Moreover, the financial crisis that concerns the public finance since the beginning of the ‘90s has de facto blocked investments in these sectors. Private sector involvement has been seemed as a way to find the source of investments needed to maintain the assets and comply with legislation requirements. Last but not least, during the ‘90s, and following the British experience, liberalisation policies found political favour in several European countries, leading to liberalisation directives in energy sectors. As a result, more private involvement was called for even in environmental services.

The choice of the appropriate regulatory regime should find a balance between market and non-market failures. There is a broad consensus in the economic literature that liberalized markets should be preferred, as far as possible. This preference derives from the assumed maximization of wealth in the longer run, associated with the free market. In the short run, however, issues like the social acceptance of institutional arrangements and the particular allocation of costs and benefits may ask for a more interventionist adaptive approach. Moreover, many components of the overall costs and benefits to society are not - and will never be - included in the calculative framework of private actors. The so-called externalities can only be internalized in the private trade-off of costs and benefits by the visible hand of specific public policy arrangements.

Concerning water services, competition in the market can be introduced only for some activities, such as input supply. The “core business” of the services, i.e. water supply and sanitation, is characterised by natural monopoly features that makes inefficient the provision by more than one operator. As a consequence, competition for the market or traditional regulation can be two alternatives. In first case, however, it is extremely difficult to write a complete contract, due to asymmetric information between incumbent and the regulation authority and the high transaction costs involved in contracting out. In case the services are not contracted out, an effective benchmarking regulatory system should be put in place to assure that the service is provided at least costs.

Regarding waste services, liberalisation could be experienced in a particular segment. Competition in the market of waste disposal, even if feasible at certain transport costs (i.e. municipalities would be free to decide where to dispose their waste), has so far been limited for several reasons. The most important one is the problem of “environmental dumping” that will arise if wastes converge towards countries in which landfill are cheaply built. Public intervention is thus needed, at least to harmonise the environmental regulation. The self sufficiency principle is a result of such consideration, together with the fact that landfill is accepted socially if citizens perceive that it will be served the community needs. In fact, for certain waste fraction, recovery potential will be maximised if trade of materials will be allowed (Massarutto, 2001).

Competition for the market is feasible in the waste collection segment, as it is quite simple to specify the contract obligation. It is not a case that in this field private operators cover the largest share of the market in UK, France, Italy and Spain. For what concerns waste disposal, competition for the market is suitable for the construction of the facilities, thus allowing the public authority to maintain the Ricardian rent that derives from the ownership of the disposal facility. Incentive regulation is difficult even in the case of waste services, as the total cost function is difficult to specify.

Despite the theoretical possibilities cited above, it seems that environmental services industries are less suitable for liberalisation and privatisation policies with respect to energy and telecommunication sectors. Competition in the market is applicable in small segment of the industry, in both water and waste services. Competition for the market is an efficient solution in the market for input provision, such that of facilities building in both services. In particular, delegation of the whole service is more difficult to implement, due to the difficulties to set up contracts that are fully specified. The reason of this difficulty is twofold. On one side the asymmetric information between the incumbent operators and the regulator makes the supply conditions difficultly knowledgeable. The problem of moral hazard is important and it is impossible to solve it only through an ex ante regulation. The uncertainty relative to investments needed to maintain the network in a good status makes difficult to precisely specify the contract conditions. Ex post regulation is not easy to implement as well, due to the difficulty of defining what should be deemed an adequate level of service, most of all in qualitative terms.

From all these reasons, it is clear that the theoretical condition for the efficient private sector involvement difficultly hold in the case of environmental services. The “government failure” cannot be solved simply by more private sector involvement, as the necessary government regulative function is difficult to implement.

A solution to this thorny question can be searched in the public good theory. In fact, the transition from public to private provision of environmental services can be explained also by the changing perception of the nature of environmental services. If at the beginning of their development they were seen as public goods, the liberalisation policies were experienced because they were considered more and more as private good. In fact, they can be labelled as private goods showing important externalities associated with their provision and consumption. Moreover, the fact that the benefit they give are until a certain point non rival but excludable makes them impure public goods. In other words, we suggest to solve the “market-government failure” starting from the theory of club goods, that gives some normative prescriptions. From an empirical point of view, a starting point is given by the study of a particular form of NPO, the cooperative one. It gives us some insights into the organisational, production and financing patterns of non private/non public bodies that show effectiveness in the production of social services. In the last part of this article we will consider some examples of non private/non public organisations that produce environmental services. In the next paragraph we recall briefly the theory of impure public goods.

3. The theory of impure public goods

The debate about public/private provision of environmental services has been implicitly framed by two dichotomous definitions of the good to be supplied. In the first stage of their development, the public good component was prominent, given the public health and merit good characteristics explained above. In the last decade, the private dimension emerged, given the financing problem and technological requirements. We suggest to frame the debate around the impure public good nature of environmental services.

Economics textbooks define private goods as those that are rival in consumption (i.e. consumption of a private good diminishes its availability for others) and have excludable cost or benefits (i.e. only who pays is allowed to consume the good). At the contrary, in the case of public goods no one can economically or technically be excluded from consumption and the consumption from one person does not decrease the overall availability of the good. This implies that the offer of an additional unit to an individual has a zero cost. Since no one can be excluded from consumption, individuals has no incentive to reveal their preferences, to avoid contributing to the provision of the good. As a consequence, private agents are not able to provide public goods.

In the past decades the public economics theory has definitively overcome the dichotomy between public and private goods. Seminar papers of Buchanan (1965) and Olson (1965) emphasise that the rigid dichotomy between public and private goods, traced considering the features of non rivalry and non exclusiveness, let unexplained a set of goods characterised by different degrees of non rivalry and exclusiveness. Thus private and public goods constituted the two extreme of a continuous summarised in Table 1.

Recently, several authors stressed the definition of public good should not be based merely on the two dimensions (i.e. rivalry and exclusion). In particular, Kaul and Mendoza (2003) argue that what is public or private cannot be stated on a priori ground, but is a social construct, i.e. they are largely determined by policies and other collective human action. For instance, several commons such as river, lakes and parks have a status which depends on property right definition. Moreover, technology development could entail this shift in definition of what is public and what is private. Consider the case of television: the scrambling of television waves made possible to restrict transmission through cables and transform what was previously intended as a public good into a toll good. Kaul and Mendoza (2003) propose to expand the definition of public good, to be intended as a good which is characterised by: (a) publicness in consumption, i.e. the well known non exclusiveness; (b) publicness in decision making, i.e. the participatory nature of the decision processes concerning how much of these good to produce and how to distribute the benefits; (c) the publicness of the distribution of benefits, i.e. the extent to which various groups derive benefits.

Table 1: Types of goods

		Rivalry	
		Perfect	Absent
Exclusion	Feasible	<i>Private good</i> (bread, shoes, books...)	<i>Club good</i> (theatre, discos, telephone services, toll road, cable TV, electric power)
	Infeasible	<i>Common Pool Resources</i> (water pumped from a groundwater basin, fish taken from an ocean, crude oil extracted from an oil field)	<i>Public good</i> (peace and security, national defense, mosquito abatement, fire protection, weather forecasts, "public" TV)

Source: Cornes and Sandler (1996).

It is important to consider the political dimension of public good provision because in the last decades the state ceases to be not the only actor responsible for public good provision, but several private and collective actors are involved for this task. Following Kaul and Mendoza (2003) "it is important to examine more in detail the various building blocks of public goods, exploring especially the types of incentives that different groups, notably private actors, might require to be motivated and able to deliver their expected contributions to a particular public good". Treating the publicness of a good as a social constraint has important research implications. It entails that incentives and mechanisms to provide public good should be investigated, to understand under which circumstances actors are able to overcome the free riding problem. In particular, we are interested in analysing the mechanisms which could ease the provision of a particular set of impure public goods, the club ones.

In case of club goods, indeed exclusiveness might solve the problem of underprovision of public goods by the private agents. Following the definition given by Cornes and Sandler (1996) "a club is a voluntary club of individuals who derive mutual benefit from sharing one or more of the following: production costs, the members' characteristics, or a good characterised by excludable benefits". In the cases where the production costs of a private goods are shared, we can define a private club good (Wiseman, 1957).

Buchanan (1965) hypothesises a cooperative or coordinated action by some members to maximise the welfare of a group. The resulting output is Pareto optimum². In fact sharing could lead to a partial rivalry of benefits as larger membership causes congestion. Analogously for the Samuelson condition, the club break even if the sum of members' marginal costs (or payments) must equal the club's marginal cost of provision. Generally speaking, if private benefits compensate costs incurred in production of club goods, they are produced. Cornes and Sandler (1996) stress the main characteristics of the club goods, namely:

- privately owned clubs must be voluntary: people has the incentive to participate because of the net benefits given by membership. In particular, the net gain from membership must exceed membership costs (e.g. fees or toll payments);
- congestion problems can decrease the benefits associated with the consumption of the club goods. Because of congestion problem, club goods have always a finite membership;
- a distinction can be made between members and nonmembers;
- exclusion mechanisms must not be too costly. In particular, institutional form of a club may be influenced to cost considerations.

For the other kind of impure public good, i.e. common pool resources, Ostrom (1990) shows that empirical evidence seems to contradict the theoretical findings that common pool resources are overexploited: this is due to the well known tragedy of the commons (Hardin, 1968). She shows that, under several conditions, this overexploitation does not occur and that resource users are able to self-organise, by putting in place new institutional setting or by changing the existing ones. As a result, they are able to engage in sustainable use patterns and self-regulate. In particular, she stresses that, in order to avoid the tragedy of the commons, a set of individuals can make commitments inspired by these design principle, i.e. rules that: (a) define a set of appropriators who are authorised to use CPR; (b) are congruent with local conditions; (c) can be modified by the appropriators; (d) can be monitored at no excessive costs; (e) envisage gradual sanctions for those who violates the rules. Moreover, the possibility to have arenas to solve conflicts and the recognition of these CPR management institution by governmental institutions are the other two factors that ease the setting and persistence of rules among appropriators of a common pool resource.

We are interested in understanding if the same ability to self-organise could be found in the other kind of impure public good, the toll good, and to state under which conditions this kind of good can be supplied directly by users. In economic terms, these organisations act as collective-consumption unit and producer unit (Ostrom and Ostrom, 1985). Firstly, they are able to explicit the demand of a certain good. Secondly, they are able to produce and supply this good. In other words, this goods are provided by demand side stakeholders. This phenomenon is not new to public economics literature. Helsley and Strange (1998) refer to private governments when consider "voluntary and exclusive organisations that supplement services normally provided by the public sector", whose main features that characterise this economic entities are:

1. they are constituted by firms or household not satisfied with services provided by the public sector, i.e. they are voluntary.
2. they are exclusive, since they provide additional services only to their members;
3. they are self-financed organisation, through taxes or fees imposed to members.

Empirically, these authors refer to residential community associations, formed in the U.S. by homeowners to provide security, recreation, transportation and parks. Our questions is thus: is this possible to refer to private governments in case of environmental services as well? Since this kind of organisation does exist in practice, what are the conditions that makes possible for them to emerge and persist? Finally, are they a viable alternative to both private and private provision of environmental services? We start by answering the last question: in the next paragraph we argue that NPOs, organised as cooperatives, is a successful example of non public/non private provision of environmental services. In the last paragraph we will recall briefly the theoretical explanations of this success, and state the similarities with environmental services. We then provide some example of cooperative environmental and energy services, emphasising the

² At the optimum each member equates the marginal rate of substitution (MRS) between the club good and the private good and the marginal rate of transformation (MRT) between the two goods.

factors of success. We finally claim how this cooperative management model could be complementary to both public or private service provision.

4. NPO as club goods: beyond the public-private dichotomy?

The NPO have been studied with great interest since the end of the '70s. NPOs usually are also referred with "third sector", i.e. they are treated as organisations that cannot be included neither in the public sector nor in the private sphere. This definition is not free of problems: as noted by Zamagni (1998), we can define something by negation only when we know the whole universe. Others authors (Salamon and Anheiner, 1996) focus on some particular features that NPO should possess to be defined as such. They are: (a) the formal constitution; (b) the private status; (c) the profit distribution constraint; (d) self-governance; (e) importance of the voluntary work with respect with the total labour employed. Generally speaking, NPO are characterized by the fact that their organisation and governance does not reflect fully market functioning: the bringing in of capital takes often the form of a donation. Labour, as already stated, is given voluntarily, without a remuneration.

Apart from definitional issues, economic literature focused on the reasons behind the spread of NPO, focussing on their superiority with respect to public provision (in cases of heterogeneous preferences) or private one (in cases of asymmetric information and conflict of interests). Weinsbrod (1977) argues that NPO are a suitable organisational alternative to public provision, in presence of **heterogeneous preferences**³. When the public provision is deemed as inadequate, NPO are able to supply collective goods and services. This theory refers to both pure public goods and to private goods with positive externalities and sees the emergence of NPO as a way to solve a government failure that occurs when preferences are heterogeneous. The public provision of public goods, i.e. the definition of organisation in charge of the provision of that good, is based on collective decision mechanisms. If preferences are similar, the public organisation will determine a level of provision of public good which is consistent with the community preferences. Otherwise, whatever the collective decision mechanism, this will let a large proportion of the population unsatisfied. As a consequence, we come out with an inadequate provision of public good, as some people prefer more or a different quality of that good. In the case of goods characterized by non rivalry and exclusiveness (i.e. club goods), it could be convenient for citizens to self organise the provision of the public good. Here it is important to emphasise that the crucial element to be consider is not the juridical status, but the economy of scale. In other words, the NPO organisations are a viable alternative to public supply only if technology allows to exploit the advantages of collective provision, considering the non rivalry.

Consider the example of education. In this field the spread of NPO is a reply to the inadequacy of the public education supplied by the State. As several citizens deem as unsatisfactory the public education system, they can create a NPO with the objective to give their children the desired level of education. In this example, however, it is not clear why a NPO should be preferable to a private one. This is a major critique to Weisbrod argument. Another important critique regards the lack of explanation about individual motivation for the donation of labour of capital.

A second feature that has been used to explain the emergence of NPO is the presence of **asymmetric information** between producers and customers. Hansmann (1980) refers to both cases of hidden information (adverse selection) and hidden action (moral hazard) to argue that NPO are more suitable of private organisation to the provision of collective goods, where the public sector is not able to do that. The asymmetric information arises because consumers can hardly control the quality of the good supplied or because they are not able to do that due to the technological complexity. As a consequence, they will believe that the firm will use the informative advantage to make profit instead of increasing the quality of good supplied. The result will be that they will avoid to increase contribution to private firms, as they fear that economic organisation will use their contribution to augment profits instead of improve quality of services

³ Weinsbrod considers collective goods, thus referring to both pure public goods and club goods. In the case of pure public goods, he does not solve the free riding problem. We thus refer only to impure public goods.

provided. Thus under these conditions, the consumer contribution to private firm does not happen. He argues that a constraint on the profit distribution will reduce the incentives to use inadequately the resource raised through contribution. Since directors will not benefit from a reduction of costs (obtained through a decrease in quality) they have no incentive to sacrifice quality for minor costs. Ortman and Sclesinger (1997) critique this conclusion, stating that this condition is not sufficient to solve the asymmetric information problem, as directors and managers can find other (hidden) ways to increase their benefits. In fact, the constraint of profit distribution will decrease the consumer control on the directors and thus entail an easy attainment of hidden objectives. Krashinsky (1997) argues that NPO are able to solve conflict of interest between different stakeholders more effectively with respect to other organisational forms. In particular, NPO should make possible to minimise the transaction costs associated with the solution of conflicts which arise because it is impossible to set contracts which are clear. As the individuals that join a NPO normally share the same values, the costs associated with this incomplete clearness should be eliminated.

Ben-Ner (1996) suggests that the only way to overcome this conflict between consumers and managers/owners of the firm is through direct provision of the services by the consumers. Following Ben-Ner (1996) when the costs associated with quality control are greater than the costs of direct production, consumers will choose to acquire the firm control of which they are customers. This will take the form of cooperative body. In this model, the asymmetric information disappears as consumers and producers become a unique subject. The organisational solution proposed by Ben-Ner is suitable for small cooperatives, controlled by homogeneous consumers group (Bacchiega, 1997). The organisational structure will be horizontal.

As noted by Musella and D'Accento (2004), each of these contributions refer to a single aspect that should explain the diffusion of NPO. What is missing is a theoretical framework able to summarise all of them. Moreover, Zamagni (1998) emphasises that each feature used to explain their spread could be used to explain at the same time their non persistence. He suggests, instead on the advantages of such organisation with respect to private or public organisations, to focus on their relational feature. In other words, what distinguishes these organisations from others is the way they produce goods. In his view, individuals have several motivations: egocentric, altruistic and relational ones. Under his assumptions, consumers do not care only to the quality-price ratio, but is interested in other aspects⁴. In fact, even the Zamagni's critique is not satisfactory, because it stresses the importance of NPO with reference to the production of relational goods, leaving unexplained a realm of different type of goods, such as the environmental services, in which the relational feature, even if important, is not the fundamental characteristic that needs to be emphasised.

The theoretical framework that would help to give a unique picture to the different type of NPO is that of club goods, described in paragraph three. From this characterisation it is straightforward that NPOs do produce club goods and this theoretical framework allow us to depict a consistent framework, that in many points recall the features underlined by different contribution of NPO literature. NPO members can be considered members of homogeneous club goods. Voluntary contribution and any form of payment represent the costs of membership. They normally compensate the benefits given by participation to the club. We can distinguish easily between members and non members, and usually non members can be excluded from benefits deriving from the product (good or service) of the NPO. Club goods experience congestion. The size of the NPO is designed to benefit from economies of scale that characterise the production of such goods. Over the minimum efficient scale, the increasing of the size of the club could entail an increase of the costs of provision.

Weinsbrod's argument on heterogeneity of preferences as a determinant of NPOs emergence is similar to that of homogeneity of club members in explaining the birth of a club. In club goods model, heterogeneity of preferences leads to the constitution of several club goods, different one another but similar in terms of membership. Club goods allow members to overcome the asymmetric information (and the consequent conflict of interest) that characterise production of several private goods, by direct supply of that good. In the model, members will decide to self-produce the club goods if the gain deriving from the self production overcome the costs of asymmetric information. This because the producers of the goods enjoy the benefits given by the club goods.

⁴ Zamagni refers to relational goods, i.e. goods whose utility depends on the characteristics of the goods and on the way it is consumed.

The aim of our paper is to bridge the gap between the theory of club goods and environmental services. Several scholars had focused mainly on market failure and government failure associated with environmental services (the main findings are summarised in the next paragraph). Their impure public goods feature make desirable to use the club good theory to go beyond the public-private dichotomy. The case studies described in the last section of the paper will consider individually each of the features referred by economic literature as fundamental in explaining the spread of NPO. We will show that the same arguments should be extended to environmental services, and we will use them to explain the diffusion of self governance mechanisms in environmental services. At the same time, we will underline what additional elements will favour this spread.

5. Cooperatives for the provision of environmental services: advantages and pitfalls

In this paragraph we are going to analyse the factors that ease users' cooperative set up, together with the related advantages (with respect to publicly or privately provided service) and pitfalls.

Let first define what we intend for cooperative. We define a cooperative as an enterprise owned by its customers. There are two broad families of activities they carry out: on the one side, they are involved in good production and supply of services; on the other, they can buy services or goods from other firms, thus exploiting the advantages associated with the purchase of bigger quantities. Examples include mutual insurance companies, mutual banks, business-owned wholesale and supply cooperatives (Morse, XX). With this definition, we consider the cooperative as both profit and non-for-profit organisations.

In this paper we focus in cooperatives supplying a particular kind of impure public goods, environmental and energy services. Differing from private goods cooperatives, these kinds of cooperative will be set up and continue to exist once their members are able to cope with the free riding problem, thus overcoming the tragedy of the commons problem. This concept has been brought to the fore by the Hardin's article (1968), which stated that, in situations where the resource is held in common among a group of users, every user have the incentive to exploit the resource without taking into account the effects of this action on other users, thus leading to an inefficient outcome.

The theoretical framework used to analyse the common pool resource case is useful for dealing with the club good provision as well. In the case of CPR, the problem is to avoid overexploitation of the resource (like in the fishery case) or to assure the investments necessary for using the resource (like in the irrigation scheme case). In the case of club good, the problem is to exclude those who do not pay for the service and to assure the investments necessary for providing the services (similarly to the CPR case).

As a consequence, some of the factors easing the set up of cooperatives of environmental and energy users are similar to those easing the sustainable management of CPR, namely the problem of supply, credible commitment and mutual monitoring (Ostrom, 1990). In the case of EES, the problem of supply consists in the quantity and the quality of service to be provided; the credible commitment refer to the willingness to engage in activities or contributing to costs necessary to provide the service. Finally, the mutual monitoring refer to the ability to control that every member contribute to the provision of the service, either financially or technically.

Regarding the decisions on the kind of service to be provided, two factors seem crucial: the homogeneity of preference and the non existence of a viable alternative already provided by a public or private firm. Regarding the first aspect, the theoretical arguments justifying the diffusion of NPO hold for environmental services as well. Cooperatives could emerge for the provision of environmental services due to the heterogeneity of preferences. In the case of water services, the new technologies based of semi permeable membranes (inverse osmosis, nano and micro-filtration...) could avoid the clorination of water, which altered the water taste, thus leading many consumers to buy bottled water. The second case (cooperatives providing missing services) emerges, for example, some users located in a small island could decide to self-organise for the provision of drinking water through the building of a desalination plant, instead of relying in public provision.

In order to make these cooperatives as an efficient way to provide centralised services not yet available, the total investment necessary to provide the services must offset the individual benefits derived by having the service available. In the case of wind cooperative, for instance, the cost of installing the turbine must be offset by the saving in the electricity bill. Technological development makes the provision of such equipments even more convenient, thus decreasing the minimum efficient scale necessary to provide the service. As a consequence, the number of households necessary to provide the service efficiently decrease and the it becomes easier to organised the service as a cooperative. In the case of wastewater services, for example, the decentralised systems for sanitation and even recycling waste water allow the possibility of developing this model for individual users and communities more or less isolated. In addition, it made possible, i.e. for industrial users, to benefit of a specific system of wastewater treatment.. It is estimated that the systems of natural treatment for communities from 800 to 9,000 inhabitants have an investment cost varying from \$33 and \$60 per inhabitant, with O&M costs ranging from \$1.75 to \$5.5 (WSP, 2006).

For our analysis it is not sufficient to demonstrate that environmental services can be provided by cooperatives, but that, to some extent, this organisational pattern is superior to both public and private provision, by describing their advantages.

Regarding energy services, the advantages associated with community provision are well summarised by Bolinger (2001):

1. community cooperatives provide an additional source of capital, beyond the public finance and the private lenders;
2. they require a lower rate or return compared with commercial financiers. This happen because the opportunity cost of capital for private investors is equivalent to the rate of return on a money market fund or treasury bond. As a consequence, lower financing costs can have a significant impact of cost of energy⁵.
3. the community involvement through ownership of wind turbines raises public awareness and support for wind project, thus lowering transaction costs associated with project development
4. the typical small size of community-owned projects normally does not require any grid reinforcement. This entails a the reducing in transmission costs.

For what concerns water services, following Hansmann's theory of the structure of ownership, Morse () shows how cooperatives are a suitable form for providing water services and this organisational feature makes possible to correct several forms of both market and government failures in the provision of such services. To sum up, he argues that:

1. cooperatives are able to minimise ownership and contracting costs. In particular, regulation costs are avoided when water services are organised as cooperatives, since auto-regulation is both efficient and effective.
2. users save the profit allowed by the regulator.
3. cooperatives face the same interest rate by lenders of capital as water services organised as private or publicly-owned bodies, since the risk is not changing with respect to ownership structure.
4. however, investor-owned utilities tend to have shorter time horizon than cooperatives, thus having a greater risk of long-term under investing.
5. the risk of cost overestimation is minimum: given the open book policy of cooperatives asymmetric information is reduced considerably and the consequent informational rent eliminated.
6. cooperatives should not face higher monitoring costs than investor-owned utilities

⁵ Pickle (1997) estimate that a reduction in return on equity from 18% to 12 % can lower the cost of wind by 22%.

7. provided that consumer owners have similar (homogenous) preferences regarding service provision, the collective decision making produces a decision which reflects social preferences
8. differently to investor-owned utilities, a cooperative has more incentives to invest in environment-related expenses, since its objective is to maximise the service provided, not the profit.

The author concludes that the privatisation to consumers' cooperative is technically feasible, since water infrastructure has been paid by with water rates or taxes.

The pitfall associated with community provision are mainly related to the small size of the services provided at community services. Given this small size, community projects could be a viable alternative to centralised one only if they are able to achieve economies of scale, which is not always the case. In case of water services, for examples, the decrease in market transactions costs associated with community provision could be offset by higher provision costs (due to the fact that fixed costs are split among fewer users). Technology development thus play a crucial role in decreasing the average costs of provision and diminishing the minimum efficient scale.

In all cases in which technological aspects are relevant to the provision of the service, a suitable technical assistance should be envisaged, in order to make possible for the community to deal with up to date technologies.

6. Some examples of cooperative provision of environmental services

In the previous paragraph we stress mainly the theoretical aspects regarding the superiority of the cooperative model to provide environmental services, as supplementary to private and public provision of environmental services. What is missing is the empirical evidence, showing that it is possible for cooperatives, not only to be created ex novo for the provision of environmental services, but also to be thought as innovations of traditional institutional setting. Following Ostrom (1990), in this section we will describe different environmental and energy services considering brand new formed institutional setting or the evolution of existing one in collective management entities. We refer to community management model to consider explicitly the cooperatives set up at community level. In particular, following Mitchell (1994), we define communities of locality as communities made up of people living in a certain geographical area and community of interest as communities of individuals living in different communities that share a common interest. These definition will be useful to extend this management model beyond the local context.

Cooperative management model formed ex novo

As a way to supply the service in areas not previously supplied

Concerning **water services**, in the past some forms of cooperative model developed where the centralised provision of water and sewerage services to disperse population and rural areas does not present a high degree of profitability. This, together with the relatively technical simplicity of these services, leads to the option of assuming a cooperative model.

The cooperative model in its "traditional" form differs from the public management model in the sense that the community participation includes ownership of the services, operation and maintenance and cost sharing of water and sewerage services. It can be a way for an effective water management when centralised water provision is not efficient. It helps to decentralise decisions concerning water services management, by transferring responsibilities to communities. In this management model, it is the community that makes strategic decisions, concerning the level of service and financing. Regarding the operation and

maintenance of water and sewerage services, there are two alternatives: the community may be involved in the day-to-day operation and maintenance or it can delegate this task or some other aspects to a professional (Schouten and Moriarty, 2003).

Generally speaking, the communities have the complete responsibility for the operation of the water services and for the financing. In practice, this means that citizens could become the owners of water system or responsible for strategic decisions (through involvement in water companies governance). The community retains the ownership of the infrastructure, and is responsible for investments needed for pipe maintenance. In the extreme versions of Community Management, the WSM is based on voluntary work. Normally O&M entails the contracting out of some activities.

Financing of water infrastructure depends upon the community organisational arrangements. The community is collectively responsible for cost recovery. This could mean that all expenses are divided between the members. A volumetric system, especially for small communities, could be expensive to be introduced. Both possibilities of a volumetric system with individual meters and a shared payment in proportion to owned property can be introduced.

The role of the community is stronger for infrastructure finance (through ownership and financial decisions). As stated above, for some activities (such as design, construction and provision of some services) the community has not a sufficient know how. In this case, competition can either directly occurs "in" the market, for some inputs, such as materials for long term O&M, or "for" the market by the way of limited contracting out, in designing and building services. However, contracting out is generally restricted to infrastructure provision or for technological expertise demanding tasks. Community retain strategic control over the water system and private partners bring efficiency and technical know how, on the basis of the contractual arrangements.

Some examples of this form of water service management can be found in Italy. Community management is limited to some experiences in mountain areas, where citizens organise the provision of water services collectively. Individual wells, found in the northern part of Italy, can be considered similar to community management, as in this case the centralised water service provision is substituted by a self-organised management solution. In the wastewater treatment sector, community management could developed with reference to septic tanks and other natural systems of waste water treatment.

These forms of management are very rare, and derive from historical and morphological conditions. In Italy, it is not likely that community management will develop in its traditional form, since national legislation oblige to manage water and sewerage services at ATO level. However some example of natural treatment systems will likely develop, in alternative to centralized waste water treatment systems.

A well documented example of cooperative is that of the village of Wittenbach (Switzerland). In fact there are several examples of cooperative for small water supply in Switzerland, all developed in towards the end of the 19th century. In the Wittenbach case, the initiative came from a group of villagers (26 landowners) who set up a co-operative in order to have a pipe water supply in their house. In 1932 the cooperative was transformed in a public body and obliged to provide the service also to non members. Over the years the size of the water scheme increased, requiring new investments. In 1956 the cooperative joined other six water supply, to increase the security of supply.

From an organisational point of view, the cooperative is formed by three bodies: the Members, the Executive Board and the Accounting Board. Every adult inhabitant of the village is member of the cooperative and can elect the members of the Executive Boards. They have to use the water versus the payment of a fee. The Executive Board takes the strategic decisions. All the members (except the President, who receive a salary) are voluntary and receive a small compensation for attendance of the meetings. The President is responsible for approving short term intervention and for checking that counts are in order. The budget is approved annually by the Assembly.

Concerning the financing, tariffs are set by the Executive Board, under the supervision of the financial administration of the Canton. Users pay a connection fee, when they connect to the network and an annual fee, which is composed of a fixed charge and a volumetric charge. Historical development of the network was allowed by the individual contributions of the original members, together with a regional loan. Any profit is devoted to extension projects.

Regarding O&M, this task is delegated to individual water supplier (municipalities and delegated organisations). In the Wittenbach case, these tasks are delegated to different bodies: a private company is responsible for pipe maintenance, another company has the duty to organise the operating system (e.g. guarantee the availability of personnel), engineering companies are involved in the extension of the network. A contractual arrangement regulates the relationship between the cooperative and different companies.

Wastewater services are managed by the municipality of Wittenbach, but tariffs are collected by the cooperative. Another important stakeholder is the fire insurance provider, since from the beginning water scheme can serve simultaneously for water supply and fire protection. It is important since it takes technical knowledge and supervision as well as financial sources (house owners are charged yearly).

From this short description it is straightforward that this particular governance structure is the result of several factors. First of all, the private initiative was then resulted beneficial for all the community, thank to positive externalities which was not restricted to members. A fundamental point here is the strong trust existing among cooperative members. The free riding problem is overcome, since there is the clear perception that benefits are spread among the members and there is the clear perception that the individual effort will receive adequate feedbacks.

However, the cooperative does not act in a vacuum, but has strong relations with municipalities (which continue to be formally responsible for the provision of the water services), private companies and administrative body (which are responsible for regulatory functions, such as controlling the tariffs and standard setting).

Examples of cooperative production exists also in waste and environmental energy services.

Concerning **waste management**, members of a community can participate in solid waste management in several ways. At individual level, residents can be considered as users, which should store waste properly and carry out separate collection. At collective level, individuals could participate through activities like clean up campaigns and awareness raising activities. They can also contribute financially and physically to solid waste management, by paying fees and working as waste operator. The highest level of participation involves becoming a member of committee established in order to take decisions on how to manage waste.

It has been estimated that the number of community waste project in UK amounts at 850, with a strong diffusion after 1995. One example is that of York's Environmental Community Centre (UK). The centre is located in a local Natural Reserve (S. Nicholas Fields) which is managed by a local community group. Until 1974 S. Nicholas Fields was York's landfill site. Once the tipping ceased many wildlife species grew up in the field. The reserve was declared in February 2004 and it is owned by the City of York Council. It is managed by a local community group. They run a community-recycling scheme, which aims to reduce the amount of domestic waste that goes into landfill sites. It started in early 2001 and currently involved 1000 households. The weekly kerbside collection is free, as it is based on voluntary work of the members of the group. It regards the separate collection of paper, glass, cans, plastic drink bottles and green garden waste, which is composted down. It receives financial support by DEFRA and by the municipality of York.

Regarding **energy services**, wind cooperatives are very common in Northern European countries, such as Denmark and Sweden. It is estimated that half of the combined wind capacity in Germany, Denmark, Sweden and UK is community owned, which is equivalent to 28% of the worldwide wind capacity (Bolinger, 2001). The factors that boosted the wind community development are technological, entailing declining turbine costs, and institutional, mainly governing incentives such as feed-in laws and tax advantages. A crucial role was played by the wind manufacturing base, which instigated wind partnerships and cooperatives providing financial assistance and general guidance. Last but not least, the familiarity with cooperative ownership structures ease the transfer of the cooperative organisational model to wind sector.

In Sweden, the *Vindkonsumföreningar* (consumer cooperatives) is the most common form of communal ownership model (33 entities in 1999 with about 9,500 members). Generally speaking, individuals form a cooperative by pooling their capital to install a wind turbine (shares are equivalent to 1000 kwh/year⁶). Consumer cooperatives sold their power to utilities at an agreed feed-in tariff. Each member is

⁶ An household with a monthly consumption of 250 kwh in order to maximise tax benefits would purchase three shares. The average price for a share was at the end of '90 equal to \$450.

billed as normal by local electricity distribution utility for his consumption. The basic organisational principle is that any profit earned by the cooperative is distributed to each member on the basis of the business she conducts with the cooperative (i.e. consumption). At the end of the year, the cooperative calculates the amount of energy each member has purchased from the cooperative (via the local utility) and distributes feed-in tariff plus environmental bonus.

Following the drop of feed in tariffs (due to opening of residential market to competition) the incentives to bypass the utility increase considerably and the *Vindkonsumföreningar* model evolves by selling the cooperative output directly to members. This was made possible, in the case of Sverige Vindkraftkooperativ, by an agreement with a local utility, Flakenberg Energi, which guarantees for a small fee the “balance of responsibility”, i.e. balancing members’ load with a sufficient amount of supply at any given moment, allowing the cooperative to sell wind power directly to members throughout Sweden. This is the first nationwide cooperative case.

Another case of partnership between a cooperative and a utility can be found in Denmark, where the largest wind community project ever has been established in 1999. The 40 MW Middlegrunden project is located 2 km off of Copenhagen’s harbour. The 20 turbines are owned by the local municipal utility (Copenhagen Energy) and a cooperative formed by 9,000 members, who invested DKK 4,250 per share⁷.

As a way to expand existing services

Concerning **water services**, there are several examples showing that this type of model could spread at bigger scale. A first set of examples could be identified in all cases in which different types of users decide to manage collectively the water infrastructure to provide water to different uses.

In Mediterranean countries, like Spain, the linkage between irrigation and urban supply, especially in rural areas, offers an opportunity of extending this model in the irrigation districts. The possibility of covering the urban services by extending the water irrigation management model to the urban services in collaboration with the rural councils could grow with the availability of new decentralised technologies. In fact at present, the farmers of these irrigation districts, who are the majority of the population in these rural areas, have a long tradition of cooperative of their irrigation water and own in many cases the supply networks and canals in the area. The availability of decentralised systems for urban water services at affordable (and diminishing) prices enhance the possibility of assuming the water and sewerage services under community management in these areas. Even being an autonomous management under community responsibility, the basic guarantees of quality and public health continue to be controlled by the public. That is why the regulation will continue to be a public responsibility.

For what concerns large industrial users or groups of firms settled in the same area, the supply comes very often from underground resources through private wells. Under the tradition of this self supply model many of these industrial users can use the market option to get raw water or drinking water for improving the price or the quality of the service. In industrial districts, it would be the case to manage collectively industrial and domestic water provision.

Apart from situations in which different uses could benefit from a collective management of the resource and infrastructure, cooperative could also develop together with centralised water system, in all cases in which particular need have to be satisfied.

In some cases sewerage and sanitation systems use to be also autonomous under community or self management. In situations where users are connected with the centralised urban sewerage network, the interest of working under separated sanitation systems (for improving depuration efficiency or to adequate it to specific needs) is leading to increase the autonomous industrial sanitation systems under Community or self management. The trend towards separating sewerage systems in order to improve the efficiency of sanitation will favour also separated industrial sanitation plants that can be shared by different firms located in the same area (if the typology of returns allows the common treatment).

Concerning water treatment, the increasing level of water quality demanded by the citizens is questioning the chlorination for drinking water. An alternative for improving the quality is to use domestic

⁷ www.middlegrunden.dk

inverse osmosis. Under these circumstances, the extension of this kind of domestic technology will augment the opportunities of developing autonomous community systems for the different typologies of users mentioned before. This phenomenon is already present in California.

The rapid growth of urban areas, especially along the coastal areas (tourist development) is exceeding the capacity of growing the municipal networks. Under this circumstance many of these new urbanisations have assumed the option of building their own systems under common management⁸. Three reasons could push ahead this trend:

- a) Shorter time for implementing the service
- b) Lower costs respect to other alternatives
- c) Better quality of the services under the best available technologies

Even if the cooperative is more outspread in the developing countries (as consequence of inefficient and corrupt governments) some examples can be found in Europe (i.e. Switzerland, see Saladin, 2003).

For developing countries, the cooperative is intended as the communities have the complete responsibility for the operation of the water services and for the financing. However, in practice, it is recognised that some form of external assistance in operation and maintenance is needed. Especially, in the first stage of cooperative development some institutional support is crucial for capacity building. "Rural communities should be able to carry out task such as regular preventive maintenance, tariff collection, book-keeping and sanitary inspections. However, when there are major repairs, when specialised tools and major system components are required, or there is a breakdown of the management structure, some level of external assistance will usually be required" (Lockwood, 2004). The community retains the ownership of the infrastructure, and is responsible for investments needed for pipe maintenance. In the extreme versions of Community Management, the WSM is based on voluntary work. Normally O&M entails the contracting out of some tasks. At the first stage of cooperative development, some institutional support is needed regarding the definition of roles and responsibilities, as well as financing mechanisms. In case of direct control of the community on operation and management tasks, crucial is the training of the people responsible of WSM. This external assistance could come from local-level state agencies, private sector and local NGOs.

Innovation of existing institutional setting: stakeholders involvement in water services' corporate governance

Whilst in the past cooperative model developed as a residual form of water and sewerage services management in areas not served by centralised water services, it is likely that in the next years a development of this form of management can be seen in all the situations in which an increasing involvement of users is experienced at local level through ownership or through participation in strategic decision making.

The cooperative is based on the participation of the community in the provision of water and sewerage services, in different manners:

- water and sewerage services is organised in voluntary organisations (i.e. user co-operatives);
- Customers own water asset or can contribute to water and sewerage services management through representation in water company boards;
- water and sewerage services is a responsibility of water management associations formed by landowners, private enterprise or public corporations.

This should assure the protection of customers' interests as well as the guarantee of adequate capacity investment. The rationale for this increasing involvement of users is for make responsible them of all decisions concerning water and sewerage services management.

Apart for rural or industrial settlements (or for self-supply and sanitation), a cooperative model can be identified also in case of centralised water services. In England and Wales, where there have been a great

⁸ In case of islands, for example, desalinisation treatment capacity can be managed in form of co-operatives of users.

debate on the opportunity to separate O&M from capital expenditures, eventually selling the asset by creating a non-for-profit “community mutual” (Bakker, 2003). In England and Wales, for example, this alternative takes the form of non-for-profit “community mutual”, where consumers own water infrastructure and operation and maintenance of the system is on the private water operator.

A cooperative model can be identified also in case of centralised water services, regarding the asset ownership. In England and Wales there has been a great debate on the opportunity to separate O&M from capital expenditures, eventually selling the asset by creating a non-for-profit “community mutual” (Bakker, 2003). In the British cooperative model, water asset ownership is separated from the day-to-day maintenance.

The community management model has been discussed in United Kingdom, since the constitution of the Glas Cymru (Welsh Water). In the Welsh Water Case, water asset were sold to a non-for-profit company (owned by its members and limited by guarantee), whilst the latter was contracted out.

However, the first attempt of creating a “mutual” company was made by the Kelda Group. In 2000 it proposed to create a “stakeholder” business, by separating ownership from operation, in which consumers would become compulsorily owners of the assets, thus benefiting from control on company governance and from lower water prices (the latter resulting from cheaper cost of capital). Any profit would be reinvested or returned to the customers. The new company would be fully debt-financed, acquiring the assets and debts of Yorkshire Water. Water and wastewater service management would be outsourced for a period of five years to a Kelda subsidiary (Bakker, 2003). Ofwat rejected the proposal on the grounds of the inability of the proposed company to cope with unexpected cost shocks and the lack of incentives towards efficiency gains in water services management. Moreover, it stated that the potential benefit to customers in terms of greater outsourcing and reduction of the cost of capital could proceed under the existing equity model (Ofwat, 2000, p. 5). However, Ofwat recognised that “ownership of a regulated utility in this form would align the interests of the owners of the regulated business with those of its customers and in doing so would minimise political and regulatory risk” (Ofwat, 2000, paragraph 56)

After the Kelda case, the Welsh Water proposal of separation of ownership and operation was successful. After the acquisition of Western Power Distribution Ltd, the Welsh based utility Hyder Group was breaking up through a series of disposals, including the water service activities of Welsh Water.

Despite the Kelda case, the separation has been made through securitization⁹. There were no purchase obligations for the Welsh Water customers. The formal arrangement was to set up a non for-profit company owned by its members and limited by guarantee, similar to that used for Charity NPO. In May 2001 Glas Cymru, a new company, was created with the purpose of purchasing the asset of Dwr Cymru (Welsh Water). Glas activities were restricted to water asset ownership. This company had no share capital and was owned and controlled by its members. This is completely debt financed, through investment bonds. Glas was initially managed by the same team that had run the Welsh Water as a part of the Hyder Group, prior to restructuring. The Board of Glas was independent, with all the non-executive directors having no present or past interest in the Hyder Plc. The members of the Glas Cymru do not receive dividends and have no financial interests in the company. All financial surpluses were to be used for the benefits of Welsh water, its customers and the environment. Customers would not own Welsh Water nor would be required to meet liabilities. The management risk was minimised by prohibition of diversification in other activities.

The day-to-day business was to be contracted out in two parts (Thomas, 2001): one comprising O&M and the other covering customer services (e.g. customer contracts, billing operations and revenue collecting activities). Both contracts were assigned through a competitive bidding on a four year basis.

The company governance structure is formed by a board of directors which has an identical composition to that of the Welsh Water, this to minimise the conflict of interests between the two bodies. The board sets the policy and targets for the executive management and is accountable for performance. Glas is controlled by its members, who behave as shareholders (even if they do not receive dividends and have no financial interests in the company). The appointments of the members are made by the board on the basis of the nomination of an independent panel. Members control the running of the company, monitor the

⁹ Securitization is the financing process whereby assets are transferred to a new company, in order to be sold to investors.

performance, decide the salaries and approve the conduct of the board. They have the power to dismiss and select directors if they fail to reach the targets. Members' appointment reflects a broad array of stakeholders.

Key factors in explaining the Ofwat favourable decision are the strong support of the Welsh Assembly and the proposed financing program (which will decrease significantly water bills). Concerning the latter, the advantage of the debit financing are mainly a lower cost of capital (equity interest rate are greater than bond interest rate). In the case of water industry, which is capital intensive, the decrease of the costs of capital, and the consequent tariff impact, can be significant. Moreover, the surplus investments in the network and in environmental protection, together with the constitution of financial reserves will benefit the customers.

Ofwat approval was linked with strict conditions, including the maintained control over its statutory duties (even when services were outsourced), a commitment to reduce bills, limitation of the activities to the single purpose of the provision of water and sewerage services (and consequent no diversification in other activities) and publication of incentive scheme for the executive management. The objective was clearly to give adequate incentives for an efficient management and to minimise risks. Welsh Water continues to be subject to Ofwat regulation as the other water companies in England and Wales.

During 2001, Glas reinvested £41m and reported a profit of £11.8m. It was estimated that the cost of capital was reduced between 4 and 4.5% in real terms. Before the restructuring, the return on capital invested represented nearly a third of the Welsh annual revenues and customer bills (Thomas, 2001).

Following the approval of Glas Cymru securitization, many companies express an interest in pursuing the same way, on the grounds that equity is an expensive source of finance and that debt finance is more viable in the long term (Bakker, 2003).

7. Concluding remarks

In this paper we argued that cooperative management model (CMM) could be introduced or continue to exist for several reasons:

- 1) because traditionally water and environmental services has been managed in this way;
- 2) because the community opt for this kind of water and environmental services management, instead of publicly or privately water and environmental services management;
- 3) in many cases the diseconomies of scale in large and growing urban areas will make cheaper and more efficient decentralized systems with new technologies, favoring the growth of community management models.

It is important to note that the CMM is not alternative to traditional management model, i.e. direct public provision, private provision via outsourcing or regulated monopoly. We recall them briefly. In delegation contract model, Direct public management (DPM) is gradually being replaced by delegation contracts. Concessions and lease (*affermage*) contracts are the most frequent contractual arrangements in this model. Revenues from tariffs allow concessionaires to recover investments in infrastructure expansion and maintenance or affermage lessees to pay for the leasing and routine repair and replacement of WSS systems. The Regulated Monopoly (RM) model describes all the situations where private companies or autonomous public entities act as monopolists in a given area: the type of operators therefore ranges from private companies to highly autonomous municipal undertakings working at supra-municipal level. Two alternative regulatory settings can be envisaged: on the one hand, private monopolies could face benchmarking with centralized, independent authorities; on the other hand, public monopolies could face benchmarking with decentralized regulation. They are generally organized under private law, with capital private, public or mixed. Assets are owned by operators. Finally, in the DPM framework, the responsible entity overlaps with the management entity, since the public authorities are completely responsible for operating and financing the water supply system. Municipalities exert direct control over the management, operation and financing of WSS services. There is no competition in or for the customer market, since the local operator is allowed to act as a monopolist. However, competition for the market can occur for input supply or some operations. Contracting out is generally restricted to large infrastructure and technology provision.

These management model will continue to exist. Indeed the CMM can be consider as a supplementary model, to various extents. Firstly, cooperatives can be considered as **new entrants** in the market, thus boosting competition in the market. If in the water services case these new entrants are generally very small compared to the incumbent size, in waste and energy services cooperatives could cover a good share of the local or even national (in the case of wind cooperatives) market.

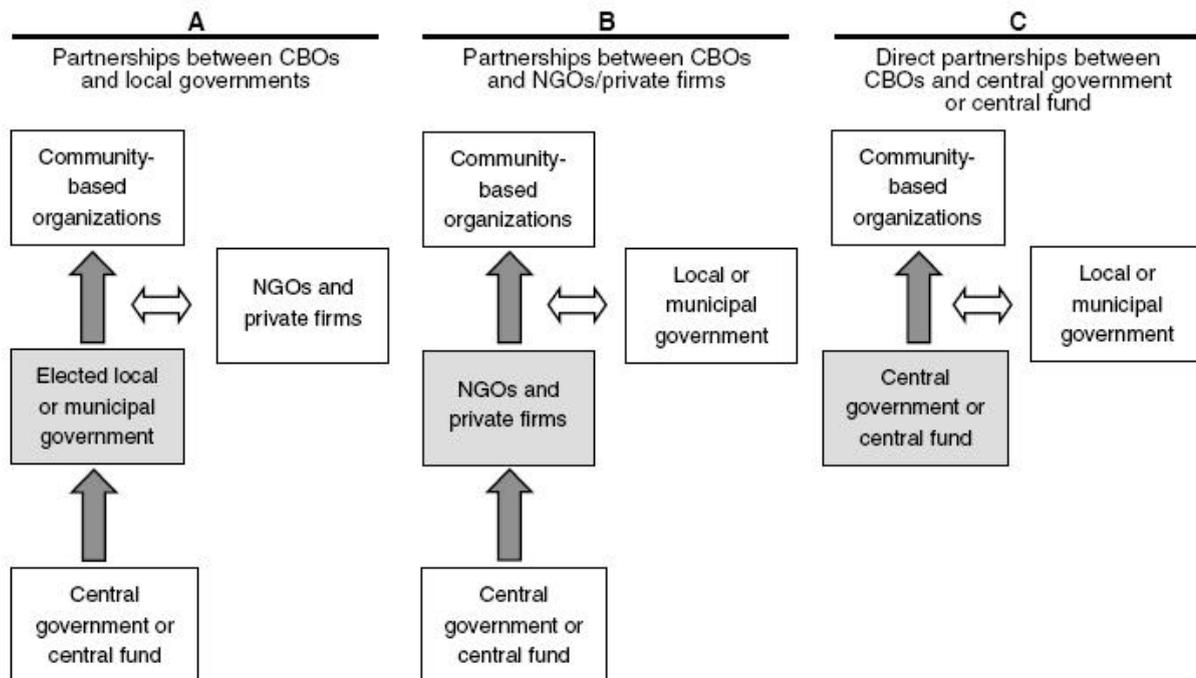
Secondly, considering the welsh case, the cooperative management model can be considered also as an alternative to the direct public management model, where the “public” is the whole community of individuals instead of the municipality. In other words, the management entity responsible for defining investment levels, tariffs and so on is not the municipality or another responsible authority (like the AATO in the Italian case) but the citizens themselves, through an adequate governance structure.

Finally, the cooperative management model is considered as an **alternative to delegated model** in developing countries, where the state lacks the financial capacity to invest in such infrastructures and private companies do not find such markets attractive. Following Dongier et al. (2000) community groups could work in partnership with NGO, local government and service suppliers to provide social and infrastructure services. These authors identify three set of arrangements (see Figure 1) aiming at empowering community based organisations (CBO):

- partnerships between CBOs and elected local or municipal governments;
- partnerships between CBOs and private support organizations (NGOs or private firms);
- direct partnerships between CBOs and central government or a central fund, including other, higher-level governments and funds, for example, states or provinces in federal systems.

In the first case, municipalities support communities in delivering environmental services, by subcontracting with CBOs for the provision of goods and services. In the second case, central government or donors finance and contract with the private organisation to provide support to CBOs. Finally, CBOs access financial resource directly from central government or donors without the assistance of intermediaries. In this arrangement, all support and technical services required for project planning and implementation are purchased directly by the CBO.

Figure 1 – Institutional arrangements to support



Acknowledgements

This paper is the result of the research work done in the EU-financed project EUROMARKET (contract n.). We thus thank the European Commission for its financial support. The usual disclaimer applies.

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