

**Linking sustainability of institutions and the commons:
the process of self-governance for water management in Northern
Italian farming communities**

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Abstract

As broad bodies of literature and empirical evidence have demonstrated, management of common-pool resources implies an institutional construction that would be able to take into account not only physical attributes of the resources, but also attributes of the community facing the collective action problem. Among these attributes, there are values of behavior generally accepted by the community as vehicle of shared learning and foundation of social order, crucial variables of relevance for the institutional analysis.

After a review of the related literature, it was analyzed how internal and shared values can affect the level of cooperation and the institutional evolution in local irrigation systems. The discussed hypothesis sustains that individual values in such communities can interact during the course of time with the process of water management, leading to an institutional evolution that translates individual demands in changing rules in use. Such a topic has been addressed applying IAD Framework and Ostrom's design principles of long-enduring irrigation systems on small self-organized farming communities in Northern Italy, having as support a qualitative methodology of analysis based on in depth interviews.

As a result, it was notable that even if members of the community seem to understand and to accept all such principles, without exception, these principles by themselves have not led to a sustainable water management. This might be due to a

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lack of a well-supported common vision of the resource, besides by a level of trust and of positive social capital not sufficiently widespread on the score of improper leaderships experienced.

Key words: water management, farming communities, institutions, values, Northern Italy

1. Introduction

As broad bodies of literature and empirical evidence (Ostrom 1990, 1998, 1999, 2005; Agrawal and Clark, 2001; Cardenas, 2000) have demonstrated, management of common pool resources implies an institutional construction that would be able to take into account not only physical attributes of the resources, but also attributes of the communities facing the collective action problem. According to Ostrom (1992, 2005; Ostrom and Ahn, 2008) among these attributes there are values of behavior generally accepted by the community, that are vehicle of shared learning and explanation about foundations of social order (Ostrom V., 1980), crucial variables of relevance for the institutional analysis. An embedded institutional design can be considered as a form of social capital, defined by Coleman (1990) as the aspects of the structure of relationships among individuals that enable them to create new values.

After a brief review of related literature, I am going to analyze how can internal and shared values (in particular trust) affect institutional evolution in farming irrigation systems. The discussed hypothesis sustains that in small farm communities individual values can interact in the course of time with the process of water management, leading to an institutional evolution that translates these individual demands for changes in the rules in use applied by the groups. Such a topic has been addressed applying IAD Framework on the analysis of two small self-organized farm communities in Northern Italy, having as support a qualitative methodology of investigation based on in-depth interviews. This allowed me to focus on the internal

values of the appropriators of the resource, key variables for the explanation at the micro level. As a result, the research found out that the existence of a common set of values is extremely useful in increasing the institutional performance and in controlling free-ride behaviors. It is also important to recognize that genuine trustworthiness appeared as independent and non-reducible reason for explaining how communities achieve collective action compliance. Among the variables involved, the one that creates the strongest links between social capital and collective action is trust. Trust is enhanced when individuals have been able to establish strong reputational networks over time with others and act within institutions that reward honest behaviors (Marshall, 2005).

In accordance with Ostrom (1998), the present findings suggest that in addition to learning instrumental heuristics, individuals learn how to adopt and use norms and rules from the group. The results give also support to Ostrom (1998, 1999) idea of a core relationship existing among trust, reputation and reciprocity. It has been founded indeed that these variables are dependent from the community past experiences and from the capacity of its members to recognize a major common interest in preserving the resource. Once in place, those factors enhance in turn the capacity of a community to govern its commons and, especially, to foster the process of institutional adaptation that is necessary for a long term management of the natural resource.

2.Theoretical Background

According to Ostrom (1998), the traditional rational choice models, called “First Generation Models”, are useful representations and predictions of the empirical reality only in the moment in which the strongest competitors succeed in eliminating other players who are maximizing immediate results. Evidence brings us to appraise the fact that all rational choice models have to mingle to a general theory of the human behavior that interprets the actors as complex organisms searching the best result, given the limits of knowledge (Simon, 1947). As a consequence, fundamental limitations for First Generation Collective Action Models do exist, because many make assumptions about individuals being homogeneous and selfish (Ostrom and Ahn, 2008). From such perspective, the meanings of trust and norms can neither be properly understood, nor be captured to a limited extent. According to Ostrom and

Ahn, individuals who are concerned only with their own immediate material gains do exist, but a significant proportion of the population has non-selfish utility functions (Frey, 1997). Further, non-selfish individuals also differ in terms of the extent to which they presuppose universal selfishness. Second Generation Collective Action Theories acknowledge such multiple types of individuals as a core of modelling (Ostrom, 2005), providing an explanation thanks to the concept of social capital. Social capital can be expounded as how cultural, social and institutional aspects of communities of various sizes jointly affect their capacity of dealing with collective-action problems. Alternatively, it is defined as an attribute of individuals and of their relationships that enhances ability to solve collective action problems (Ostrom and Ahn, 2008). But the fundamental ideas to a social capital approach can not entirely be captured by the First Generation Collective Action Theories, that tend to reduce trust, trustworthiness and norms to incentives embedded in social structures of interaction. Ostrom and Ahn (2008) claim that what is important is to recognize genuine trustworthiness, defined in terms of preferences that are consistent with conditional cooperation, as independent and non-reducible reason for which some communities achieve collective action while others fail. According to Torsvik (2000), trust itself is not a form of social capital but an outcome of the forms of social capital linking them to successful collective action. Quoting Gambetta (1988), it is possible to define trust as a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action. As a consequence, trust allows the trustor to take an action involving risk of loss if the trustee does not perform the reciprocating action (Ostrom and Walker, 2003). A crucial aspect for this research is that it involves an opportunity for both the trustor and the trustee to increase their welfare, even taking into account a limitation in perceptions of the daily life. Endowed with a limited rationality, individuals do not calculate a finished set of alternatives for every interactive situation, but the greatest part of the occasions of relationship is lived as an information interchange and a heuristic through which to draw teachings respective of the future. In addition to learning instrumental heuristics, individuals learn how to adopt and use norms and rules. By norms, Ostrom (1998) means that the individual attaches an internal valuation, that could be either positive or negative, to taking particular types of action. Crawford and Ostrom (1995) refer to this internal valuation as a delta parameter that is added to or subtracted from the objective costs of an action. Some norms, in fact,

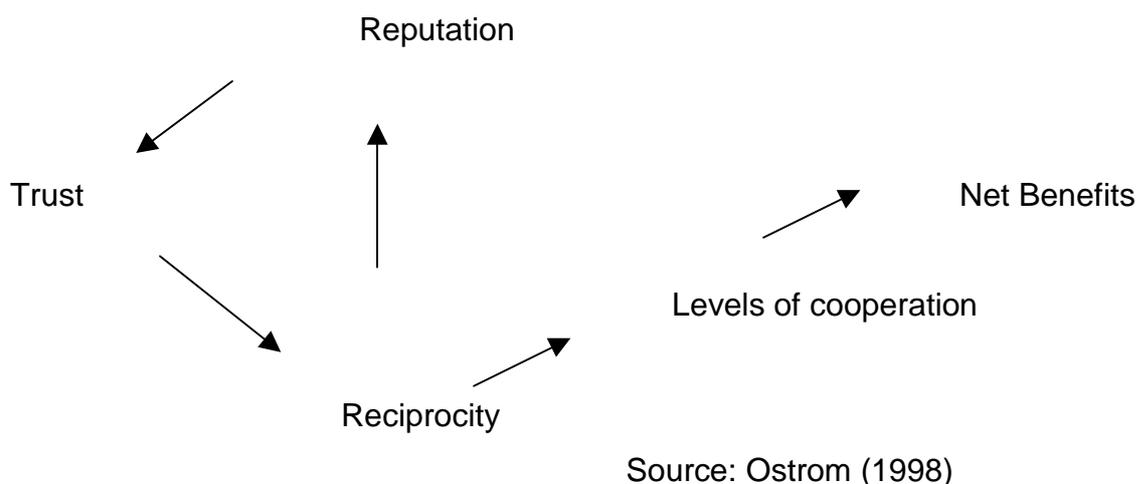
are assumed and interiorized from the relationships that people have with members of different communities, under conditions of mutual interchange where the meaningful behavior is the one expected by other members of the same community. The change in the preferences is the result of an elaboration of particular moral lessons drawn in the daily life. Since norms have their genesis in the partner-community context, the problem of their variation between different cultures and within one unique culture is very complex and still amenable (for instance, the norm of reciprocity is very strong in almost all the cultures and in almost all the individuals, while other norms show greater variations). Because norms are learned in a social environment, they vary across cultures, across individuals within a culture, within individuals across different types of situations they face, and across time within any particular situation. Ostrom (1998) stressed the fact that the behavioral implications of assuming that individuals acquire norms do not vary substantially from the assumption that individuals learn how to use heuristics. Since one can think of norms as heuristics that individuals adopt from a moral perspective, they become the kind of actions people wish to follow in living their life. Once acquired determined norms, the members of a population will influence, through their own behavior, other people's expectations in a circular relationship of internalisation that goes on over for long time, giving origin to the rules.

According to Ostrom (2005), the concept of rule is central to the institutional analysis, and the definition of rule assumed in this work is the one given in 1998. It represents the awareness of a group to the necessity of a sanctioning system approved at the collective level. That means that a group has developed shared understandings that certain actions in particular situations must, must not or may be undertaken and that sanctions will be taken against those who do not conform to the rules. Norms are informal, while the rules are formal. Consequently, the first ones are founded upon spontaneous sanctions and the second ones are based on actors specialized in the monitoring and in the sanctioning (Ostrom V., 1980). The distinction between internalized but widely shared norms and rules that are self-consciously adopted in particular situations could be used as a sample of no current agreed definition over two terms among the scientific community. Elaborating on the core relationship where governing and solving social dilemmas at the micro level happen, it is possible to identify the individual attributes at the core of human behaviors as the following

(Ostrom, 1998, 1999):

- the individual expectations regarding other people's behavior (trust);
- the norms that the individuals learn from socialization and from past experiences (reciprocity);
- the identities that individuals intentionally create through their own behaviors and internalisation of norms (reputation).

Trust, reciprocity and reputation are relationship constructions that fill a gap of indeterminateness of the objective social foundation (Cella, 1994) and can be included in the new model of individual behavior that will cover the interpretative gaps of the previous one. Ostrom (1998) has defined this abstraction as a “Behavioral Approach to the Rational Choice Theory of Collective Action”. At the core of the behavioral explanation there are the relationships found among individuals’ level of trust, long-term deliberate investment in the relationships with the objective to create a reputation, and the probability that this cognitive substratum could produce suitability to the use of reciprocity norms (Ostrom & Walker eds.,2003). The existence of a mutual reinforcement in this value structure will finally depend on the surpassed experiences of the actors who have to express themselves in the action arena through interactive choices. The central relationship of Ostrom (1998) Second Generation Models can dynamically be illustrated as follows:



Reputation, trust and reciprocity act through a positive retroaction circle. Therefore, it

seems impossible to individualize among them dependent and independent elements. Every variation on the single variables strikes again into the chain on the others, amplifying the initial effect, that could be both positive and negative.

The consequential implications for defining a new behavioral model inside the Theory of Commons inevitably stress the necessity to appraise those that are both individual and collective requests biasing the management of the CPRs. Such has been, for a long time, the object of investigation deepened by the sociology, that has developed definitions of it under different aspects. According to Cella (1994), there would exist many difficulties in the substitution process among individual and community interests, that for this reason could result neither fluid or immediate. Ostrom's Behavioral Theory of Collective Action points out a community concept according with the Polanyian analysis, for which the passage from the micro to the macro sphere can happen through the existence of appropriate institutions (Cella, 1997), in absence of which remarkable social effects will not be produced. The remarkable social effects required by managing commons have to do with the overcoming of collective action problems.

In the present work, I will be using the only definitions of reputation, trust and reciprocity considered by the Theory of Commons. In particular, the core definition I am going to base on the current theoretical structure is the one pertaining to trust: a person's expectation on other people's actions that they could influence the proper ones, when the social actor has to take a decision on beforehand to know other people's preferences (Dasgupta, 1997). To understand the mechanisms of biasing the micro-macro management of a common, the experimental empirical contributions results are particularly profitable, as pointed out by authoritative interventions, like Margaret Levi's one (Raisz & Stoker, 2000). According to Ostrom (1998), when many individuals use reciprocity, there exists a diffused incentive to acquire a certain reputation respecting the reliability of ones own promises, which produces mechanisms for reducing costs and for generating long term benefits (Kreps, 1990; Milgrom, North and Weingast, 1990). In this way, developed trust can give origin to social exchanges and mutual productive relationships, also in those situations that appear like social dilemmas. Reputation has to include the concept that people are credit-worthy ("trustworthiness") and able to punish who does not maintain his own promises. In an evolutionary context, this causes improvement of the cooperative

results and the development of further positive expectations in respect to other people's behaviors. So, trust becomes a collective characteristic, whose effects are amplified during time (Fukuyama, 1995; Gambetta, 1988; Putnam, 1993), potentially either in a positive and in a negative path, thanks to the existence of the retroaction mechanism.

As mentioned, the fundamental bond for the behavioral explanation regarding managing commons is the one developed around mutual trust (Hardin, R.,1988), the investment in reputation and the probability that actors are conforming to reciprocity norms. The reinforcement among these individual attributes depends on structural variables like the existence of small communities, their past experiences, the possibility of a direct communication and the existence of symmetrical affairs on the resource. All such factors engrave on the cost of the agreement, from which it derives the cooperation level, initially reached thanks to the individuals' ability to set aside selfishness.

Elster's contribution gives support to this perspective (1993,1995). He analyzes altruistic motivations by identifying three actors' groups with different levels of propensity to cooperation. They are the Kantians, the Utilitarians and the Impartials. The first ones are those people who act according to the categorical imperative of Kant, that answers to the following question: "What happens if all of us would act so?". This powerful person's appeal does not deal with the real results because it is connected to what could be verified if all will abstain themselves from the cooperation. Nevertheless, there exist subjects who are interested neither in results nor in circumstances. They are the Utilitarians, who, motivated by the real consequences of the action in real situations, collaborate less than others do, wanting to collide impelling necessity with own contribution, but also wanting to abstain when the intervention do not necessarily result in anything. The last group of actors distinguishes itself from the precedents since it pays attention to the circumstances but not to the results. They observe the others' behavior and simply follow the majority, through a so-called norm of "impartiality". This means that an internal individual duty does exist, but only if also the other actors do the same. Such motivation would forbid the free-rider behavior, bringing the community exactly to an opposite outcome respect to the utilitarianism. For this reason, these results are particularly important for the delicate contribution in matters of common

management. It is important to point out that, according to Elster (1993), to be rational an action has to spring as a resultant ending of three “optimal” decisions. It has to represent the best manner in order to realize the person’s desire, given the internal belief. The latter must be optimal given available tests, considering that the social actor succeeds in picking up an optimal quantity of them. Such quantity depends on whether ones own desires or beliefs concern advantages and disadvantages connected to obtain further information. In this long and complex trial, desires are the only independent variable. To the goals of my research, Elster’s analysis (1992) can usefully be integrated in the standard Theory of the Commons through the author’s proposal of an opposition between utilitarianism of the action and utilitarianism of the rule. This last concept is what is requested by the evolution of the Rational Theory of Collective Action: acting in base to those rules that would be able to maximize total utility in the long run.

Rationality and values

Since informal ties are equally diffused as structural base of the social relationships also in the contemporary societies, the self-interest point of view does not occupy a core position in the current relational environment. According to Hirsch (1976), the main question is not related to if individuals, taken in their whole, are sociable or altruistic in their objectives, but rather how possible it is to realize the prevailing objectives of sociality and altruism in the community. For the author, constraints of the scarcity and demands of social morality constitute the two social limits to growth. For this work, they can helpfully be interpreted as consequential bonds derived from the missed solution of the social action dilemmas, like the ones we observe in governing common pool resources and as a consequence in water management. Limitation to individual selfish behavior, imposed in the collective interest, could be more effectively respected if the sense of obligation would come interiorized. Hirsch, quoting Boulding (1968), suggests that “the principles of altruism and exchange, further historically be antithetical ones, are supported to” and he stressed the necessity of an interdependence in the social orientation. Already at the mid 1970s, Hirsch pointed out for the generality of the goods an interpretative urgency that has then been developed by Ostrom for the commons’ framework:

“Preferring own interest respect to the social orientation has some characteristics of a dynamic trial, that is started by the social interaction

among individual decisions. The trial can be inverted. The public perception of society's costs in its complex will contribute to encourage the social morality, but it will not be enough to assure it until the individualistic behavior will preserve its own legitimacy in comparison to the broad sphere of the collective action. Once more, the individualistic behavior can be an obstacle to the satisfaction of the individual preferences.”

(Hirsch, 1976 pg.157)

Such overcoming, if it points out a predisposition to sharing of collective beliefs and availability toward a comprehensive vision of cooperative ethic (Sugden,1986), does not require the abandonment of the rationality. In fact, according to the sociological tradition and the modern analysis (Boudon, 1997,2000,2003), actions which are apparently not referable to some consequential explanation or neither analyzable as effects of instrumental reasons, do not have to be viewed as completely detached from every rational logic. In these cases, actors follow principles founded upon reasons that hold solid, to which they simply feel obliged to conform to. This is the case of a collective belief genesis, whose content becomes object of a voluntary adhesion by the individuals. Boudon referred his work to be an assiologic one and quoted Weber's value rationality (Wertrationalität) as a fundamental contribution for contemporary studies focused on moral feelings. For this research, what is more interesting is distinguishing among the assiologic rationality and the instrumental one of economic kind. In this manner, one of the limits of the utilitarian model emerges with greater clarity: not knowing how to explain attribution of values phenomena. Instead, assiologic rationality expressly foresees cases in which the subject does not choose to maximize immediate benefits, but to follow “correct” principles not chosen by the personal will.

These last principles appear as connecting entities which guide action contexts, and are therefore particularly important also in the management of a common pool resource. The way the rationality concept is seen influences in turn the way human behavior is interpreted and collective phenomena make sense while explaining social behavior. According to Weber, social action is intended as a relating turned to other individuals' attitudes and directed in its progress in this way. The unity of sociological analysis is constituted by the individual actions. According to this perspective, the starting point in understanding social action is the sense that is expressly or silently attributed to the dealing by social actors. This does not mean that the goal or the individual motivation are the only causes of human behavior. It means that the

evaluations and the individual purposes have necessarily to be considered as independent variables that determine, together with external conditionings, the social action. According to Weber, a collective belief is formed when its content becomes object of adhesion by individuals (Boudon, 1997); this occurs only if valid reasons for accepting that do exist (“deutend Verstehen”). The theory of collective beliefs can be interpreted in a manner that has to concern with rationality because these beliefs are felt as strong by social actors. According to Boudon, a theory is rational in a cognitive sense when it leans on reasons of theoretical character that the actor feels as strong in that particular context (values rationality, according to Weber). The advantage of this vision in comparison with the irrational one is that it easily explains essential phenomenological data: the actors have a sense of conviction, not internalisation or constraint. The implicit or not directly observable character of the reasons, both at the individual and at the collective level, does not jeopardize the scientific quality of an analysis based on them. Such issue has given support to the present research, since it stresses the fact that when an interaction system has an interest for all the participants, the operation rules derived from it obtain a positive value. The exploitation process linked with governing a common allows to give a content to the concept of axiological rationality. It is important to point out that the objectivity of the value judgments does not exclude their variability (for instance, the so-called “polytheism of the values”), since all the axiological convictions are potentially founded upon systems of predominant reasons that evolve toward greater coherence. To apply this to common-pool resources, I will claim that this aspect is particularly important since it gives support to the following hypothesis.

3. Hypothesis and method of investigation

In accordance with Ostrom assumption regarding learning and adaptation process inherent norms and rules in use, it has been derived the broad statement that prefaces the current research hypothesis: individual values are determining variables in the social networking and in the institutional crafting governing commons. In particular, Ostrom model could explain decisions at the micro level of the interaction affecting substantially the management and the evolution of small self-governing irrigation systems over time. Individual requests can bring the institutions, under

certain conditions, to substitute the search for collective benefits derived from the resolution of commons dilemmas with the pursuit of individual demands. This leads to an erosion of the collective meaning of the institution itself, nullifying the realization of more broad community outcomes. In contrast, under different conditions as suggested by Ostrom and Ahn (2008), internal values (i.e. Boudon's axiological rationality) can be extremely useful in increasing the institutional performance and in controlling free-riding behaviors, developing social capital within the group. According to such a hypothesis, the levels of trust and trustworthiness among community members are important explanative variables because they further the learning process enabling it to generating availability of mutual social interactions. For the achievement of a sustainable institutional arrangement governing environmental resources, the existence of the feedback loop among trust, reputation and reciprocity is highly desirable.

I explored this issue investigating how two small farm communities in Northern Italy have managed water over time, focusing on the values they applied in this self governance process. As far as possible, I have searched groups sharing the same physical attributes of the resource and the same institutional structure, but showing different outcomes in terms of sustainable management of natural irrigation streams. The theoretical purpose is achieved with a qualitative method of investigation to focus on internal values and emotional feelings among the actors involved in the management of the resource. For collecting the data, in-depth interviews techniques combined with participant observation (shadowing) have been used. In-depth, semi-structured interviews were conducted with half of the members of each community, including people currently serving on the board of representatives, other members of the groups, and one surveyor who works regularly with the consortium La Farfenga.

4. Case studies

Both the case studies that have been analyzed for this research (Roggia "La Farfenga" and Roggia "La Gabbiana") are placed in the plain area south of Brescia, city of the region of Lombardy, Northern Italy. They are consortia, i.e. water users associations that are able to independently manage the resource thanks to a public grant that guaranties them completely free intervention in the process of irrigation

and maintenance of the irrigation channels. In other words, a consortium is a self-governed irrigation group whose constitution is provided for at the local and regional government level with the aim of allowing farmers using autonomously the resource available on their land. These institutions have been informally established at the end of the 19th century in the same municipality's territory (Borgo San Giacomo) by autonomous groups of farmers who in common were exploiting irrigation ditches.

The Farfenga consortium ranges on two different local municipalities, Borgo San Giacomo and Orzinuovi, according to the extension of Roggia Farfenga, the spring water river that constitutes the main source of the agriculture community. It is composed of 3 different streams that join in the locality of Rossa, Orzinuovi, the head of the central water basin, for an extension of 2.5, 1.7 and 1.6 km respectively in north-south direction. In this first branch we can find natural spring water fountains that generates sufficient resource for irrigation, while in the second and in the third branches the main part of the natural flow comes from a few natural springs in minor channels. The three branches link at around half km before the first irrigated land. This should assure irrigation equality for the fields, that being rich in sand and poor in clay need important flows of water for the maintenance of a minimum level of exploitation.

The spring water river Gabbiana follows exactly the same oxbows of Farfenga, sharing the head with it and then the main stream, just half km east. It is important to stress the fact that Gabbiana during its flow goes right through the village of Borgo San Giacomo, and that changes for awhile the physical attributes that this second community is going to face, bringing different appeals and requirements during the management process. Both the communities are currently composed of about 40 households, including farmers who grow corn for the food market or for livestock feed. In both groups there is a formal body of representatives, with a president and other officers, whose members are elected every three years. Decision-making happens at the constitutional level through this body, but informal interactions provide the basis for what happens at the formal level. Members are mainly males who hold property on the land, but those who rent land can also be part of the decision-making process. Those who depend on the common pool water resources include farmers and their families who live full-time on the land, extended family members or friends who might help with farmwork, outsiders not living in the local community who

nonetheless own land in the community, and those who rent from landowners. The majority of farmers are over 50 years old, and younger members are departing the communities in large numbers, so the social reality as a whole is aging from year to year. It is relevant stressing that land in this part of Italy is highly valued in the marketplace, and crops consistently bring in high prices. Also, a key role in the price determination of these commodities is held by the European Union. Its politics affect the agricultural market distorting the final prices of the goods, imposing duty or allotting subsidies that generate an artificial allocation of the harvests. Being these lands beneficiaries of the European subsidies, the farm communities are therefore affluent, and there are no members who are at subsistence level. Nevertheless some differences in income among households do exist: members range from the average middle class to upper-middle class. Additionally, while some members' income remains the same from year to year, some other members receive increases in income over time. This happens within the groups, without substantial differences among the communities. It is clear that the two institutions face similar physical and social environment, over which they could crafting autonomously self-governing irrigation systems over time.

The issue that these communities were facing was about sharing a natural irrigation stream trying to have the best outcome in terms of irrigation capacities and maintenance of channels. For doing that, they needed to establish agreements regarding irrigation times, rotation of the cultures and preservation of the main and secondary ditches. Water being a national commodity, these informal arrangements and social ties amount to an attempt to regulate the usage of a natural resource whose primary importance was becoming object of competition among different social-economical alternative uses. Clarifying the inability of a private property right on water, the national and local law gave instead plenty space to the farmers about interventions on managing rules about allocation of the resource, such as rotation time rule among different fields. However, the two communities have developed their own process of institutional construction in different manners.

About the consortium "Roggia Farfenga", we have indications that the institution has risen at the end of the 19th century, but the first official notation of the group was not until 1910. At that time, a population of local farmers created maps of the land and initiated a constitution as a more formal group. The group itself employed an

engineer to work on the maps and to construct a rotation scheme for water use, but these were not officially recorded or regarded seriously by the group. In 1944, they began to discuss a rotation scheme once again, but they were not able to reach consensus with regard to how it would work. Due to problems of scarcity and contestation of rules by those who lived outside of the community but still cultivated land, the community has been able to draft its official statute only in 1993. Even if the constitution formalized the consortium and established rules about keeping records of water usage and approving yearly schedules to facilitate water management, this has not meant an achievement of common understanding among irrigation facilities.

On the other hand, the consortium “La Gabbiana” has been able since the very beginning of its establishment in 1931 to connect a formalization of the institution with a common agreement and a sense of environmental awareness connected with the irrigation practices. In this second case, the farmers have recognized the importance of clarifying immediately in the bylaws what were the objectives of the whole group: the usage, the conservation, the defence and the implementation of the common property, as well as the administration of the property itself. During our in-depth interviews and the shadowing investigation conducted in the consortia, data have been collected for supporting the above mentioned hypothesis. The following are the main results.

5. Results from the case studies

No significant differences in the vision about the resource in the two communities have been noticed. Most of the farmers face the issue of managing water and are able to recognize the physical value of this commodity in the contemporary society. They acknowledge that water has particularities with respect to other assets they use for farming, like the seeds or the land, regarding which they do not see the same issue of scarcity and urgency. Indistinctly all the farmers have noticed a reduction in the availability of water during the past two decades, due to significant changes in agricultural practices that have brought a transformation in the way common pool resources are used. The consortia themselves began as traditional agricultural villages where crops were combined and planted in rotation in order to maximize soil fertility and crop yield. During that time, the farmers paid consistent attention to the

water channels: they were cleaned monthly, and the water patterns were monitored to make sure that excess water was flowing into underground cisterns to provide for future uses. However, a shift occurred in the consortia conception of common pool resource in the 1980's when the European Union pursued a decision to subsidize corn crops, causing corn prices to outpace those of other crops. Following the rational calculations of many other consortia in Italy and the rest of Europe, these two communities ended rotation practices and shifted to a monoculture of corn. As this culture requires water primarily from May to the first half of August when crops are ready, Farfenga stopped monitoring the water channels for the rest of the year to make sure that the water was flowing properly and being appropriately stored by the cistern system. Whereas natural springs and streams had previously been sufficient to irrigate every field in the village, the intensive use of water from May to August necessitated the construction of two new wells, respectively in the late 1980's and late 1990's. The unsustainable water usage persisted, causing the first well to run dry in the first decade of the corn monoculture, and the second well is currently in a state of serious depletion. Farmers are also planting more seeds to increase corn yields, so each field requires more water during peak season. Due to these conditions, all Farfenga farmers are experiencing scarcity. However, their approach to the situation varies from household to household: some of the farmers recognize scarcity as a serious problem and wish to alter usage patterns accordingly, while others do not acknowledge it as a concern and do not wish to alter usage. It is important to recognize that the farmers' attitudes about water management are not related to their own water problems: some farmers face scarcity of water at all times of the year, and do not wish to alter usage patterns, while others who do wish to initiate new practices are not yet facing year-round scarcity. Farfenga has experimented a social environment based on local leaders who have brought the institution to pursue selfish appeals instead of common outcomes. In this group, members have very little trust in the consortium, as well as in the board of representatives, even if elected by themselves. This appears as strictly linked with the recent history of corruption this group has faced, in turn related with selfish behaviors just mentioned: leaders took advantage of power position for rent-seeking for a long time. This cracked the trustworthiness about this figures among the community members, sharing suspicion instead of building network of mutual support and approval among the users.

The current survey also shows a different perception towards the institution itself in the two communities. In the consortium Gabbiana farmers did not stop neither the constant maintenance of the channels nor developing water allocation procedures. The group has experimented with a higher level of trust, probably due to the presence of individual attributes of a different kind among community members and representatives. It has been noticed a common sense of awareness about the mutual benefits of trustworthiness, as well as higher attention and investment in social networks that have allowed the community to establish its institutional development on trust bases. These profitable expectations regarding other people's behaviors could to be grounded on both the individual and the group level. We found that positive past experiences like respects of agreements and successful conclusions of consortium activities have enable members to learn from socialization how to invest more in the community. In turn, these identities that farmers intentionally created through their own behaviors have helped an internalization of common values and social norms we found extremely well shared within all Gabbiana members. It has been recognized a high level of mutual understanding regarding norms violations, probably generated on the same well-established trust bases of the community. This has led to a better sense of affiliation and awareness respect to the group, with a strong feeling of responsibility of the single user about the common. Water streams even ceased to be just an instrument of profit, and became a source of sharing identities: "We have to understand that the channel is our, it is made by us, we are that channel".

6. Discussion and Conclusions

Why have these communities performed in such a different way over time?

According with the discussed hypothesis, what did bring the communities to establish themselves in a different way has been the same reason for which they are performing also now so differently: at the base of the institutional performance there are internal and shared values that mark farmers while managing common pool resources. Therefore, the main goal of these case studies has been to show the role that internal and shared values play in the process of institutional construction for managing a common. In the empirical analysis it has been found a positive

relationship between the achievement of sustainability of the institutional arrangements and the presence of values connected with altruistic behaviors in self-governing irrigation systems. These values are vehicle of collective learning and foundations of social order inside the community of users, as well as instruments of consciousness regarding the necessary institutional adaptation and flexibility. However, free-riding is very likely to find out in such kind of communities. According with Repetto (1986), inevitably most of the available rents are captured by those with power, influence and wealth, and rent-seekers think that using the resource efficiently is much less important than gaining control of the allocation mechanism. Institutional rules that require irrigators to cover the cost of operating and maintaining their systems and to contribute to the recovery of the initial investment in the institution, could help contain rent-seeking behaviors. But that process could be also extremely challenging, as the Farfenga group showed. The norms applied in informal relationships and used in cultural tradition are forms of a shared knowledge and as such implicitly fostered by innermost circle. This process of internal-values establishment has not been achieved in the Farfenga case. The main reason for that could residing in the features of the internal values of the community members. Our data show a clear preference by these farmers towards selfish behaviors and attitudes, carried out in a short-time view of the exploitation process. Probably facilitated by the lack of trust caused by the past leaderships experienced (mentioned above), these appeals brought the community to pursue inequality and self-interest instead of general wellbeing. Not seeing a common and shared benefit in cooperation, members' inability of dialogue and deficiency of reciprocity made the institution to collapse. Farmers who have used a leadership selection mechanism based on rent-seeking have just an initial understanding and basis for evaluation of the likely consequences of using a similar device, that shows a distorted perception of the institution itself. Since investing in new rules is always risky, it is not surprising that investors are more willing to work with rules whose outcomes they have witnessed than with rules whose outcomes are uncertain. Therefore, reducing the level of opportunistic behaviors result to be the major problem for all irrigation systems. Where substantial temptation to engage in opportunistic behavior does exist, no set of rules will be self-organized (Ostrom, V. 1980). In such regard, the present research found out that the existence of a common set of internal values is useful in increasing the institutional performance and in controlling free-ride

behaviors. All opportunistic activities produce short-term costs for others and, potentially, long-term costs for everyone involved in the institution. The major costs of free riding are the many productive activities that have not been undertaken because institutional arrangements and social norms have not been developed to protect individuals against this opportunism.

It is clear that crafting irrigation institutions has much higher costs in some settings because the prevalence of these activities. If participants do not view the specific rules crafted to organize a particular irrigation system as being appropriate, a behavior that violates accepted norms may not be sanctioned. As in the Farfenga case, if formal structure is viewed as illegitimate, behavior that undercuts the maintenance of that structure will not be viewed with disapprobation. Consequently, if free riding becomes the dominant mode of behavior in irrigation systems, all users will be ultimately hurt. Without resource inputs in terms of fees, labor or physical material, the maintenance of the stream during time cannot be assured. Many of the shared conceptions and norms of behavior that are collectively referred to as “culture” or shared values have evolved as a form of social capital to counteract selfishness. These two case studies have brought to evidence that the motivation to invest in social capital is more likely to exist on established irrigation projects if farmers have a more long-time horizons, if they face sufficient scarcity that they are motivated to invest in reorganizing themselves and finally if they are assured that the investment on crafting institution could make a substantial positive difference in their way of living (Ostrom, 1992; Uphoff, Wickramasinghe and Wijayaratna, 1990).

When institutions are well crafted, opportunism is substantially reduced, and even if the temptations involved in free riding can never be totally eliminated, they can be devised to hold these activities in check. Moreover, the data brought at evidence that the existence of a small number of social actors with Kantians aspects in rural irrigation groups has remarkable effects on overcoming collective action problems. In the Gabbiana case, farmers did not stop neither the constant maintenance of the channels nor developing water allocation procedures. The reason seems to reside in a shared awareness regarding responsibilities on the part of the representatives with regards to other members, and personal exposure of long-term planning among them. In particular, the person called to supervise stream maintenance has had a key role in this consciousness of the whole group about the need for constant attention to

water infrastructures. He has been able to recognize the importance of the channels as common pool resource as the water itself. As a consequence, he has directed his efforts on activities, given for free, whose objective was to ensure an optimal level of stream preservation over time. This natural leader has helped the community to overcome short-term exploitation of the resource, bringing it toward a more general level of consciousness about needs of sharing communitarian values among farmers. In his own behaviors, he clearly shows Kantian aspects, as well as a strong consistency with Boudon's axiological rationality. As Gabbiana case shows, in order to decrease opportunistic behavior community members need voluntarily to invest in coordination activities like monitoring and sanctioning, along with constant irrigation channels maintenance. Coordination could be achieved by learning how to do joint tasks better, by assigning one person the responsibility to be in charge others users, and by establishing a rule specifying how particular activities are to be undertaken, along with establishing how that same rule is monitored and enforced by participants, external enforcements or both. However, this research stressed that the existence of a common set of values is extremely useful in increasing the institutional performance and in controlling free-ride behaviors. It is also relatively easy to include this variable in the IAD Framework thanks to the concept of social capital. It can be viewed as an attribute of individuals that enhances their ability to solve collective action problems (Ostrom and Ahn, 2008), usually a product of a past history of tight relationships. A point which is important to recognize is that genuine trustworthiness, i.e. the individual preferences consistent with conditional cooperation, is an independent and non-reducible reason for explaining how do communities achieve collective action compliance. Among the variables involved, the one that creates the strongest links between social capital and collective action is trust. Trust is the most powerful instrument of connection for the feedback loop among institutional performances and values. It is enhanced when individuals are trustworthy, are networked with one another and act within institutions that reward honest behaviors (Marshall, 2005). The present results give also support to Ostrom (1998, 1999) idea of a core relationship existing among trust, reputation and reciprocity. It has been founded out, indeed, that those factors are dependent from the community past experiences and from the capacity of their members to recognize a major common interest in preserving the resource. Once in place, those factors enhance in turn the capacity of a community to govern its commons and, especially, to foster the process

of institutional adaptation that is necessary for a long term management of natural resources.

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