PROTEUS

A Journal of Ideas

Water and Our World

VOLUME 26:1

SPRING 2009

An ancient Greek sea divinity, herdsman of seals, Proteus could be elusive by changing his form at will appearing as a lion, a serpent, a boar, water, or a tall tree. However when those who caught him succeeded in holding him fast, Proteus assumed his proper shape of an old man and told the truth.

Upcoming Issues of *Proteus*

Fall 2009: Vampires, Parasites and Invaders in Nature and Human Society

Upcoming themes:

Submissions, requests for further information, or orders for copies should be addressed to:

Proteus, Managing Editor
University Publications
Shippensburg University
1871 Old Main Drive
Shippensburg PA 17257-2299
717-477-1206
proteus@ship.edu

Cover design: Hess Design.

Cover photographs: Jeremiah Greeland

Jeremiah Greenland is a graduate student in the Geography/Earth Science Department at Shippensburg University who also completed his undergraduate degree in geoenvironmental studies at Shippensburg. His primary photographic subjects are nature and action sports. Both cover photographs were taken at Tumbling Run Game Preserve otherwise known as Lewis Rocks, while hiking. The front cover was taken in September the back cover in October of last year.

• *Proteus* is indexed in
the *MLA International Bibliography*,
*PAIS International (*http://www.pais.org/),
America: History and Life,
ISI Web of Knowledge,
Arts & Humanities Citation Index, and
Historical Abstracts.

• It is a member of the Council of Editors of Learned Journals (CELJ).
• Past issues are available on microfilm from ProQuest, Information and Learning.
• *Proteus* is published semi-annually and is funded by Shippensburg University.

MEMBER

CELJ

Council of Editors
of Learned Journals

 ISSN 0889-6348.

PROTEUS

A JOURNAL OF IDEAS

VOLUME 26 SPRING 2009 NUMBER 1

WATER AND OUR WORLD

Irrigation Systems and Values. Understanding the process of self governing water resources in Northern Italy

Beatrice Marelli
University of Milan
Department of Social Sciences at the University of Brescia

Common-pool resources (CPRs) are natural or man-made resources shared among different users, a condition that produces a competition for their utilization leading often (although not necessarily) to their degradation or even to their destruction (Hardin G. 1968) . A vast number of valuable natural resources falls in this category and shows today chronic problems of overuse. Examples are the world forests, fisheries, water basins, biodiversity and even the atmosphere.

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 called to protect them. According to Ostrom (1992 2005; Ostrom and Ahn 2008) among these attributes generally accepted by the community, there are values of behaviour, vehicle of shared learning and explanations about foundations of social order (Ostrom V. 1980), crucial variables of relevance for institutional analysis. After a brief review of related literature, I am going to analyze how internal and shared values can affect institutional evolution in farming irrigation systems. The discussed hypothesis maintains 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 analyzing two small self-organized farm communities in Northern Italy, having as support a qualitative methodology of investigation based on in-depth interviews. This allowed to focus on the internal values of the appropriators of the resource, key variables for the explanation. 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 opportunistic behaviours. It is also important to recognize that genuine trustworthiness appeared as independent and non-reducible reason for explaining how communities achieve collective action compliance.
The results give also support to Ostrom's (1998 1999) idea of a core relationship existing among trust, reputation and reciprocity. It has been found indeed that these variables are dependent from the community's past experiences and from the capacity of its members to recognize a major common interest in preserving resources. Once in place, those factors enhance the capacity of a community to govern its commons and, particularly, to foster the process of institutional adaptation that is necessary for a long term management of water resources.

Theoretical background

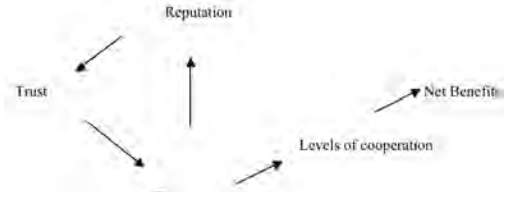
According to Ostrom (1998), elaborating conditions where governing and solving social dilemmas (included common pool resources) successfully happen, it is possible to identify individual attributes at the core of human behaviours as the following (Ostrom 1998 1999):

- the individual expectations regarding other people's behaviour (trust);
- the norms that individuals learn from socialization and past experiences (reciprocity);

Beatrice Marelli is a member of the political science faculty at the University of Milan and on the economics faculty in the Department of Social Sciences at the University of Brescia. She is a guest researcher at Humboldt University of Berlin in the Department of Agricultural Economics and Social Sciences. Her main interests are related to collective action problems, institutional arrangements for environmental sustainability, common-pool resources, and human

- the identities that individuals intentionally create through their own behaviour 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). According to Ostrom's (1998) the existence of a mutual reinforcement among these variables, considered as to be at the core of the general behavioural explanation, can dynamically be illustrated as follows:



Source: Ostrom (1998)

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 a single variable strikes again into the chain on the others, amplifying the initial effect, that could be both positive and negative.

The reinforcement among these individual attributes depends on structural variables, such as existence of small communities, their past experiences, possibilities for a direct communication and the existence of symmetrical affairs on the resource. All such factors engrave on the cost of internal and social agreements, from which it derives the cooperation level, initially reached through individuals' ability to set aside selfishness.

Jon Elster's contribution provides support of this perspective (1993 1995). He analyzes altruistic motivations by identifying different actors' groups according to different levels of propensity to cooperation. The group that appears to be more relevant in terms of accomplishing communal argument are formed by 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 or private purposes, because it is connected to what could be verified if everyone abstains from the cooperation. Such motivation would forbid the egoistic behaviour, bringing the community exactly to an opposite outcome respect to the utilitarianism. For this reason, these results could be extremely important for understanding individual contributions in matters of commons management.

Rationality and values

Since informal ties are broadly diffused as structural base for social relationships, 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 concerned with whether individuals are sociable or altruistic in their objectives, but rather is focused on the possibilities of realizing 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 behaviour, imposed in the collective interest, could be more effectively respected if the sense of obligation would come interiorized. Already in the mid 1970s, Hirsch made emerge an interpretative urgency for the generality of the goods that will be then developed by Ostrom for the common pool resources in mid 1980s:

"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 behaviour will preserve its own legitimacy in comparison to the broad sphere of the collective action. Once more, the individualistic behaviour can be an obstacle to the satisfaction of the individual preference". (Hirsch 1976)

Such overcoming, if it points out a predisposition to share collective beliefs and to be open to a comprehensive vision of cooperative ethic (Sugden 1986), does not require the abandonment of rationality. In fact, according to the sociological tradition, (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 to which they simply feel obliged to conform to. This is the case of a collective belief genesis, whose content becomes an object of voluntary adhesion by the individuals. Boudon referred to his work as an axiological perspective and quoted Weber's value rationality (*Wertrationalität*) as a fundamental contribution to contemporary studies focused on moral feelings. For the present research, what is more interesting is distinguishing between the axiological 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, axiological rationality expressly foresees cases in which the subject does not choose to maximize immediate benefits, but chooses to follow "correct" principles not guided by personal will.

According to Weber, a collective belief is formed when its content becomes an object of adhesion by individuals (Boudon 1997); this occurs only if valid reasons for accepting it 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 (2000), a theory is rational in a cognitive sense when it leans on reasons of theoretical character that the actor believes are 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 pool resource allows a group of users to give a content to the concept of axiological rationality.

Hypothesis and method of investigation

The hypothesis suggests that individual values are the determining variables in social networking and in the institutional crafting of governing natural resources. In particular, Ostrom's model explains 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 common 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, internal values (i.e. Boudon's axiological rationality) can be extremely useful in increasing the institutional performance and in controlling opportunistic behaviours. 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 generate availability of mutual social interactions. For the achievement of a sustainable institutional arrangement governing water 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. I selected these two groups because they share the same physical attributes of the resources in use and the same institutional structure, but show 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 resource management. For collecting the data, in-depth semi-structured interviews were conducted with half of the members of each community.

Case studies

Both the case studies analyzed in this research (Roggia "La Farfenga" and Roggia "La Gabbiana") are based on the plain area south of Brescia, city of the region of Lombardy, Northern Italy. They are *consortia*: self-governed irrigation groups (supported at the local and regional government level) with the aim of allowing farmers to use the resources available on their land autonomously. These organizations were aimed to manage both water naturally available from the basins presented in the ground area of the municipality and the network of man-maid channels necessary for irrigation purposes during the farming dry season. The *consortia* have traditionally occupied substantial part in the agricultural environment of the area, since the land where the two groups are placed in is characterized by richness in sand and poorness in clay. For this reason, the fields have always required important flows of water for the maintenance of a minimum level of productivity of the different cultures developed for the livelihood of the local population, whose main activity is historically been farming. Located in between the Alps and the rich land of the Padana plain, these communities did not faced difficulty in capturing the right quantity of water needed for their fields until they have adopted a traditional rotation of the cultures, based on periodical changes of the exploited areas that guarantied regeneration of the soil and a constant care for the whole network of ditches.

Both the two institutions have been informally established at the end of the 19th century in the same municipality's territory (Borgo San Giacomo) just by autonomous groups of farmers who in common were exploiting irrigation ditches.

The Farfenga consortium spans two different local municipalities, Borgo San Giacomo and Orzinuovi, following the Roggia Farfenga, the spring-fed river that constitutes the main source of water for the agriculture community. It is composed of three 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 springs that generate enough water 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 a kilometre

before the first irrigated land. This should assure irrigation equality for all the fields that make part of the consortium, without oscillations in the availability of the resource according with different locations of the lands to be irrigated.

The spring water river Gabbiana follows exactly the same oxbows of Farfenga, sharing the head with it and then the main stream, just half a kilometre east. It is important to stress the fact that Gabbiana runs right through the village of Borgo San Giacomo, therefore changing the physical attributes that this second community is going to face, bringing different appeals and requirements during the management process.

Both communities are currently composed of about 40 households, including farmers who grow corn for the food market or for livestock feed, in fields of a limited dimensions. In fact, very few members of these groups can be considered big land-owners since the average extension of a farmer's property is around 10 hectares.

The municipality had not been through substantial processes of migration and the communities' members are part of a consistent social environment, sharing a widespread sense of affiliation to the territory also due to the same culture. A high level of attachment to the local community has also been developed thanks to the respect of some religious norms of the Catholicism, that helped the increase of a cognitive substrate among the farmers about an implicit respect about the past and the social tradition.

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 water include farmers and their families who live on the land year round, extended family members or friends who might help with farm-work. 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. The average level of education of these communities is lower than the rest of the population of the village, since the obligation to attend school until the secondary level has only recently been extended in Italy.

It is relevant stressing that land in this part of the country is highly valued in the marketplace, and crops consistently bring in high prices. As said, these lands also benefit from European subsidies and the farm communities are therefore affluent; there are no members who live at subsistence level. However, about economic segmentation 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 craft autonomously self-governing irrigation systems over time. To do 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 an 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 plenty of space to the farmers about interventions on managing rules about allocation of the resource, such as rotation time rules 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 did not appear 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 group 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 its administration. During the 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.

Results from the case studies

No significant differences in the vision of 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 contemporary society. They acknowledge that water has particularities with respect to other assets they use for farming, such as seed and the land, which they do not perceive as 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 more generally 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[1]. 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 with 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[2]. This appears as strictly linked with the recent history of corruption this group has faced, in turn related with selfish behaviours just mentioned: leaders took advantage of power position for rent-seeking for a long time. This broke the trustworthiness of this figures among the community members, sharing suspicion instead of building networks of mutual support and approval among the users.

In the consortium Gabbiana farmers did not stop either the constant maintenance of the channels or 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. A common sense of awareness has been noticed 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[3]. These profitable expectations regarding other people's behaviour could be grounded in both the individual and the group level. We found that positive past experiences such as mutual adherence to agreements and successful conclusions of consortium activities have enable members to learn from socialization how to invest more in the community[4]. In turn, these identities that farmers intentionally created through their own behaviours have helped an internalization of common values and social norms we found extremely well shared within all Gabbiana members. It has been recognized that a high level of mutual understanding regarding norms violations, probably was generated on the same well-established trust bases of the community. This has led to a better sense of affiliation and awareness of respect for 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 ours, it is made by us, and we are that channel[5]".

Discussion and conclusions

Why have these communities performed in such a different way over time? According to the discussed hypothesis, at the base of the institutional performance there are internal and shared values that mark farmers while they are managing natural 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 water management. In the empirical analysis a positive relationship exists between the achievement of sustainability of the institutional arrangements and the presence of values connected with altruistic

behaviours in self-governing irrigation systems. These values are vehicles 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, opportunistic behaviour is very likely to be found in such kind of communities. According to 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 behaviours. However, that process could also be 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 an innermost circle. This process of internal-values establishment with positive outcomes has not been achieved in the Farfenga case. The main reason could reside in the features of the internal values of the community members. Our data show a clear preference by these farmers towards selfish behaviours and attitudes, carried out in a short-time view of the exploitation process. Not seeing a common and shared benefit in cooperation, members' inability of dialogue and deficiency of reciprocity made the institution to collapse. Where substantial temptation to engage in opportunistic behaviour does exist, no set of rules will be self-organized (Ostrom V. 1980). In such regard, the present research found that the existence of a common set of internal values is useful in increasing the institutional performance and in controlling opportunistic behaviours. If participants do not view the specific rules crafted to organize a particular irrigation system as being appropriate, a behaviour that violates accepted norms may not be sanctioned.

As in the Farfenga case, if a formal structure is viewed as illegitimate, behaviour that undercuts the maintenance of that structure will not be viewed with disapprobation. Consequently, if opportunism becomes the dominant mode of behaviour in irrigation systems, all users will be ultimately hurt. When institutions are well crafted, opportunism can be substantially reduced, and even if the temptations 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 Kantian aspects in rural irrigation groups has remarkable effects on overcoming collective action problems.

In the Gabbiana case, farmers did not stop either the constant maintenance of the channels or developing water allocation procedures. The reason seems to reside in a shared awareness regarding responsibilities on the part of the whole community with regards to the resource, as well as 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 that the channels were as important a 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 sort of innovator 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 behaviour, 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 behaviours community members need to invest voluntarily in coordination activities such as 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 of other 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. This research stressed that the existence of a common set of values is extremely useful in increasing the institutional performance and in controlling opportunistic behaviours. 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 communities achieve environmental preservation. Trust is the most powerful instrument of connection between institutional arrangements and values. It is enhanced when individuals are trustworthy, networked with one another and acting within institutions that reward honest behaviours (Marshall 2005). The present results also support Ostrom's (1998, 1999) idea of a core relationship existing among trust, reputation and reciprocity. It has been determinate, indeed, that those factors are dependent on the community's past experiences and on the capacity of their members to recognize a major common interest in preserving the resources. Once in place, those factors enhance the capacity of a community to govern its environment and, in particular, to foster the process of institutional adaptation that is necessary for a long term management of water resources.

ENDNOTES

1 From the comment of one member: "There is no problem. We face the same situation every year and, in any case, we can have another well. I do not see so much urgency. There is no crisis regarding water, overall here".

2 "I do not trust anyone else than the members of my family. Why should I trust them? (one member of Farfenga referred to the board of representatives).

3 From the words of one past leader of Gabbiana: "I trust them, why should not they trust me? I really think all of them are honest. I treat themselves as I am used to behave with myself. They are all friends to me and I hope I am considered a friend by them".

4 From the words of a former secretary: "it is sometimes difficult to make an agreement that could be good for everybody, but the only way is speaking with people, the dialogue, and make that they could understand that there is something that is good for all. I cannot count how many kilometers I did going from one ranch to another one, but once obtained the agreement all is ok, is over, and I am happy, even if it has been hard to make".

5 From the words of the current secretary of the consortium.

REFERENCES

Agrawal, Arun and Clark Gibson (Eds). 2001. *Communities and the Environment: Ethnicity, Gender, and the State in Community-Based Conservation*. New Brunswick: Rutgers University Press.

Boudon, Raymond

1997. *Il vero e il giusto. Saggi sull'obiettività dei valori e della conoscenza*. Milano: Il Mulino.

2000. *Il senso dei valori.* Milano: Il Mulino.

2002. *Sentimenti di giustizia*. Milano: Il Mulino.

2003. *Declino della morale? Declino dei valori?* Milano: Il Mulino

Boulding, Kenneth E. 1968*. Beyond Economics: Essays on Society, Religion, and Ethics*. MI: University of Michigan Press.

Cardenas, J.C. 2000. How do groups solve local commons dilemmas? Lessons from experimental economics in the field. *Environment, Development and Sustainability,* 2: 305-322*.*

Cella, Gian Primo

1994. *Non di solo mercato*. Roma: Origami.

1997. *Le tre forme dello scambio*. Bologna: Il Mulino.

Dasgupta, P.S. 1997. *Economic Development and The Idea of Social Capital*. Working Paper. Faculty of Economics, University of Cambridge.

Elster, Jon.

1992. *Local Justice. How Institutions Allocate Scarce Goods and Necessary Burdens*. New York: Russell Sage Foundation.

1993. *Come si studia la società. Una "cassetta degli attrezzi per le scienze sociali"*. Bologna: Il Mulino.

1995. *Il cemento della società. Uno studio sull'ordine sociale*. Bologna: Il Mulino.

Frey, Bruno S. 1997. *Not just for the money: An economic Theory of Personal Motivation*. Cheltenham: Edward Elgar.

Gambetta, Diego (Eds). 1988. *Trust: Making and Breaking Cooperative Relations*. Oxford: Basil Blackwell.

Hardin, G. 1968. The Tragedy of the Commons. *Science*. 162(3859): 1243-1248.

Hardin, Russell. 1988. *Morality Within the Limits of Reason*. Chicago: University of Chicago Press.

Hirsch, Fred. *Social limits to growth*, London: Routledge.

Kreps, D. 1990. Corporate Culture and Economic Theory. In *Perspectives on Positive Political Economy*, ed. Alt J. E. and Shepsle K., New York:Cambridge University Press.

Marshall Graham, 2005. *Economics for Collaborative Environmental Management: Renegotiating the Commons*. London: Earthscan.

Ostrom, Elinor

1990. *Governing the Commons: The evolution of institutions for collective action*. New York: Cambridge University Press.

1992. *Crafting Institutions for Self-Governing Irrigation System*. San Francisco: ICS Press.

1998. A Behavioural Approach to the Rational Choice Theory of Collective Action, *American Political Science Review*. 92(1):1-22.

1999. Institutional Rational Choice: An Assessment of the IAD Framework. In *Theories of the Policy Process*, ed. P.A. Sabatier, Boulder: Westview Press.

2005. *Understanding Institutional Diversity*. Princeton: Princeton University Press.

Ostrom E. and Ahn T.K. 2008. *The meaning of Social Capital and its link to Collective Action*. In *Handbook on Social Capital*, ed. Svendsen G.T. and Svendsen G.L., Northhampton: Edwar Elgar.

Ostrom Elinor and Walker James (Eds.) 2003. *Trust and Reciprocity. Interdiscipinary Lessons from Experimental Reseach*. New York: Russell Sage Foundation.

Ostrom, V. 1980. Artisanship and Artifact. in *Public Administration Review.* 40(4):309-317.

Putnam, Robert 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.

North, Douglass 1990. *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.

Repetto, R. 1986. *Skimming the Water: Rent-Seeking and the Performance of Public Irrigation Systems*, Research Report n.41 World Resource Institute: Washington D.C.

Simon, Herbert 1947. *Administrative Behavior*, New York: McMillan.

Sugden, Robert 1986. *The Economics of Rights, Co-operation, and Welfare*. Oxford: Blackwell.