PRISMA
Salvadoran Research Program on Development and Environment

Considerations for landscape-level ecosystem restoration

INTRODUCTION

THE CHALLENGE OF ECOSYSTEM RESTORATION

The rural territories of Central American suffer from severe ecosystem degradation as well as the increasingly more evident effects of climate variability; these dynamics have important repercussions on the populations´ livelihoods and food security. Given this scenario, it is necessary to promote institutional innovations to strengthen the adaptation capacity of rural communities (Salazar et al., 2005; Sayer et al., 2008). The Ministry of the Environment and Natural Resources (MARN) of El Salvador has developed a Mitigation based Adaptation (MbA) approach, under which, the focus of the mitigation efforts are determined by the adaptation needs. In this respect, the National Program for Restoration of Ecosystems and Landscapes (PREP) has been formed and designed as part of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) efforts. PREP intends to change the practices and dynamics of agricultural activities to strengthen resilience to climate change and ensure food security while also contributing to climate change mitigation. Its first actions are being conducted in the territories of the Bajo Lempa, La Montañona and Cinquera. (MARN, 2012; Government of El Salvador, 2012; PRISMA-CDKN, 2012).

COLLECTIVE ACTION FOR TRANSFORMING LANDSCAPES

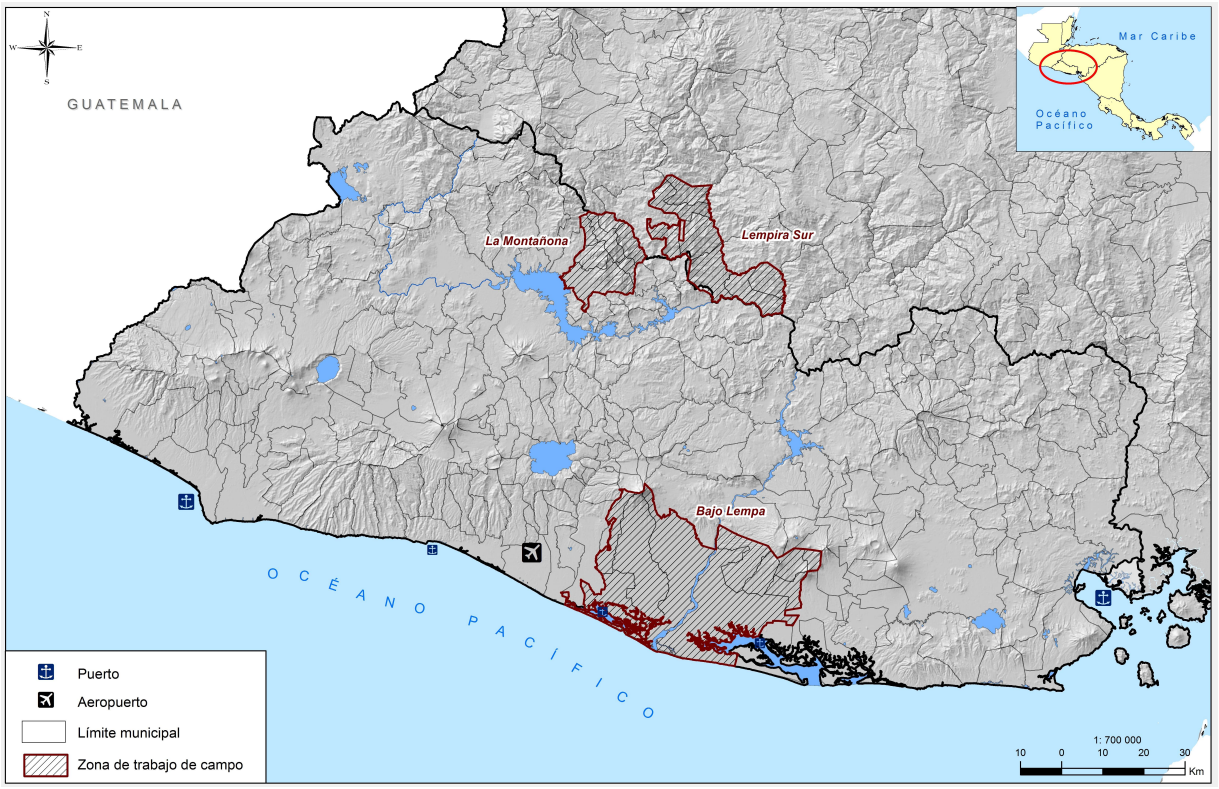
In order to reach these important and ambitious objectives, it is necessary to go beyond limited strategies of promoting "good agricultural practices" at the level of farms and scale up to impacts at a landscape level. Accordingly, collective action is required to ensure the coordination of efforts and to build agreements between the different stakeholders that affect the use of the soil; farmers, cattle breeders, agro-industrial companies, municipalities, local users of ecosystem services and others.[1]

LEMPIRA SUR: AN ILLUSTRATIVE EXPERIENCE

In Central America experiences exist that offer useful lessons for ecosystem restoration and adaptation to climate change. One of these experiences is found in the southern part of the department of Lempira, where an unusually severe drought occurred in 1987, and motivated a series of actions to recover food security and reverse the processes of natural resources degradation (Fernández, 2005). The massive adoption of agroforestry practices such as the Quesungual system, the eradication of agricultural burning practices, extension mechanisms and decentralized technical assistance allowed for the re-vegetation and recovery of the soils resulting in better crops and greater resilience when faced with events such as the 1997 drought and Hurricane Mitch in 1998. Ismail et al, 2005, (PROLESUR, 2004; Flores, 2013: interview).

[1] Collective action is defined as voluntary action undertaken by a group in the achievement of its common interests, whether they act spontaneously or through an organization (Meinzen-Dick R., 2004).

Map 1. Territories of analysis: Lempira Sur, La Montañona and Bajo Lempa



Source: PRISMA.

SOCIOENVIRONMENTAL DYNAMICS IN TWO TERRITORIES OF EL SALVADOR

LA MONTAÑONA

The La Montañona microregion covers seven municipalities located in the Department of Chalatenango, El Salvador, (La Montañona Commonwealth, 2013). This area borders the Department of Lempira in the neighboring country of Honduras.

Most of the La Montañona's landscape is dominated by steep slopes and at its highest alti-tude a pine and oak forest is conserved and covers 12% of the territory. In the forest massif, 75 water springs originate and supply water to the surrounding towns (PNUMA, 2012). Indeed, the reason for establishing the Commonwealth was the result of the shared concern for securing the mountainous massif and, in turn, its water sources.

The degradation dynamics in La Montañona that concern the rural citizens the most, is the loss of fertility in the soils due to burning, deforestation and its impact on the water sources; landslides associated to extreme climate changes; and contamination caused by the excessive use of agrochemicals.

The main reason for the occurrence of forest fires is due to agricultural burning practices, particularly those associated with the Jaraguá pasture management (Hyparrhenia rufa). The main cause of the deforestation of secondary forests is the preparation of the land for growing basic grains and livestock, while the mountainous massif deforestation is caused by the felling of pine trees for wood and fire starter wood (ocote) commercialized at the same Department of Chalatenango.

These dynamics, associated with agricultural and livestock activities, are being carried out by small and medium producers in poor soils and small parcels of land. The average size of these farming cultivations is 2.6 mz, and 93% of these are less than 5 mz. The land extensions dedicated to cash crops are limited and agriculture for export is practically non-existent (MEIC / MAG, 2008).

BAJO LEMPA

The Bajo Lempa area has an important organizational history and a diversity of collective natural resource management actions undertaken by the local actors in a variety of land-scapes:

a) The upper watershed of both hydrographic regions are dominated by slopes with small and medium sized producers of basic grains and coffee. Some 80% of the producers are subsistence farmers, with variations according to the specific municipality (MEIC / MAG, 2008). The area has relatively secure land tenure rights as well as pending processes of land titling.

b) The coastal plains extend from San Luis La Herradura all the way to Jiquilisco. The activities in this area include a combination of family agriculture and small to medium size livestock farming, together with large extensions of land that are dedicated to industrial agriculture, such as sugar cane. The percentage of commercial holdings, including cooperatives and private farms, is about 30%, some of which include extensions of more than 500 mz. On the other hand, the average size of subsistence farming holdings is less than 1.3 mz (MEIC / MAG, 2008). The non-local actors play a key role in the territorial dynamics, particularly the sugar mills. The accelerated expansion of the sugar cane monoculture from medium and long-term rental contacts is notable.

c) The mangroves of the Jaltepeque Estuary and Jiquilisco Bay are State owned conservation areas. Alongside these ecosystems live farmer and fishing communities, some of them have formed as a result of the Agrarian Reform Process and the Land Transfer Program (PTT, for its Spanish initials) after the signing of the Peace Accords. This is the only territory where there are examples of expansion of collective rights over the natural resources, through the first Sustainable Exploitation Plan (PLAS).

LANDSCAPE AND ECOSYSTEM SERVICES

MULTIFUNCTIONAL AGRICULTURE

Although the idea of "landscape" has different connotations and approaches, it usually corresponds to a spatial scale that includes a variety of different vegetation coverage, many times forming a mosaic or matrix of parcels or patches. The ecosystem restoration approach that inspires PREP keeps in mind that ecosystem services do not only derive from "natural" ecosystems and that some very important services can come from heterogeneous landscapes including agricultural lands (Rosa, Kandel and Dimas, 2003; Wade, Geoff y Wratten, 2008; Perfecto and Vandermeer, 2008; MARN, 2012).

Agriculture is multifunctional by nature and its contribution, in terms of ecosystem services (SE),[2] can be more than just the provision of food and other primary products (FAO, 1999). Proof of this is found in Lempira Sur, where they have been able to verify the recovery of micro and macro-fauna species, the natural regeneration of at least 60 thousand hectares and the production

[2] The Millennium Ecosystem Assessment identifies four types of Ecosystem Services: provisioning (food, water, fire wood, medicinal plants and fibers); regulation (of the climate, of the hydrological cycle, etc.); cultural services (recreation, aesthetic, spiritual or identity values); and support services (soil formation, oxygen production, nutrients recycling, pollination, etc.) (Millennium Ecosystem Assessment, 2003).

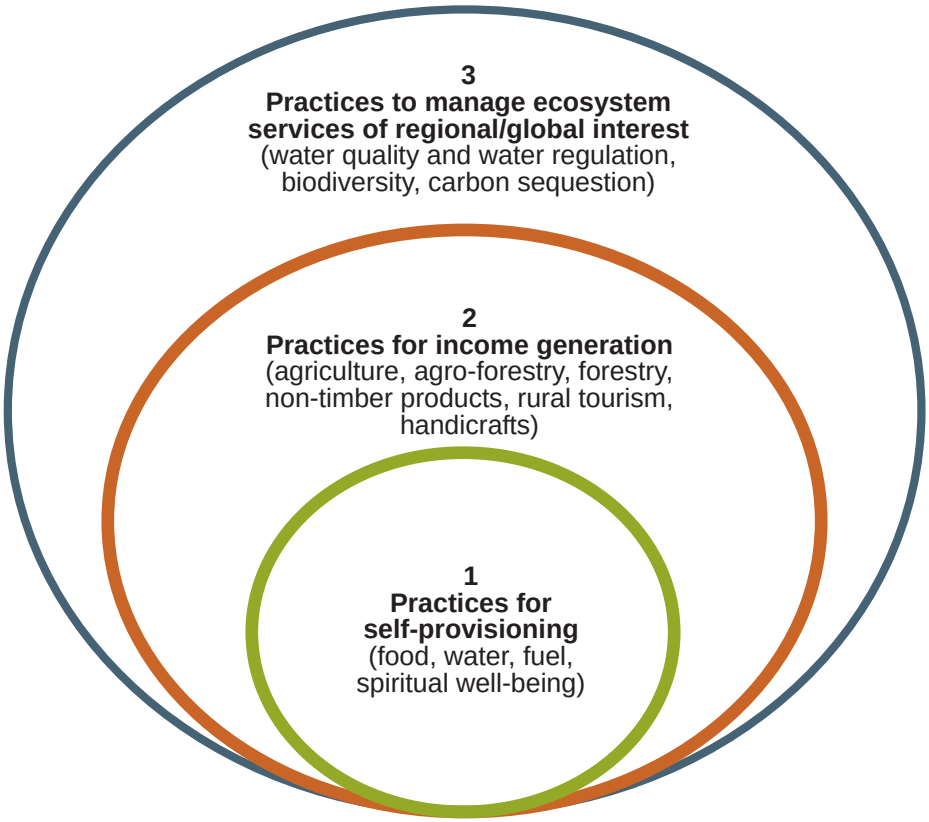
of mitigation co-benefits from climate change through greater accumulation of carbon and lesser methane emission (Fernández, 2005).

3 LEVELS IN THE MANAGEMENT OF ECOSYSTEM SERVICES

Actors whose actions are influential in a territory and its landscapes often have different priorities with regards to the mentioned ES. These priorities can be divided into three levels or logics for natural resource management (Kandel and Cuéllar, 2011; Rosa, Kandel and Dimas, 2003). The first correspond to management activities to ensure self-provisioning such as: agriculture or fishing. This level principally refers to ES of provision, as well as practices to preserve the cultural and spiritual value of certain ecosystems or species. The second level refers to rural population's management of ecosystems to ensure the production of marketable products and services. (Kandel and Cuéllar, 2011).

The third level refers to natural resource management activities that are carried out to guarantee ecosystem services of national, regional or global interest. This is the most complex level for rural communities, and can turn out to be unsustainable or could even harm rural com-munities economic and social rights. However, it could also offer key opportunities if the first and second levels are placed as a priority of these initiatives (Kandel and Cuéllar, 2011), as is evident with the Lempa Sur experience. Figure 1 presents this hierarchy of priorities within these 3 levels demonstrating how the upper levels must be compatible with the first level (self-provision).

Figure 1. Levels in the management of natural resources.



Source: Kandel and Cuéllar (2011); Rosa, Kandel and Dimas (2003).

A BUNDLE OF RIGHTS

It is widely accepted that one of the key elements that influence the use and management of land and other resources is the range of ownership rights that a user has over the resource; under the recognition that there is a number of social or legal attributions given to property rights that are not captured by the concept of private individual ownership (Ostrom, 2000). These attributions can be combined in different ways to achieve the rights / obligations scheme that best favors sustainable management of a resource:

Rights of access, extraction or commercial use: delimit the levels of access or usufruct of the resources.

Management, exclusion and alienation rights: define a hierarchy of attributions that allow them to take decisions regarding resource use and about who can make use of the resources.

Property rights are a crucial issue in interventions seeking the transformation of landscapes, given that most natural resource management practices involve extensive time scales and large spatial scales. A long-term effort requires a high degree of security of usufruct rights, as shown in Figure 2 (Meinzen-Dick R., 2004). One notable fact about the experience in Lempira Sur is that the change in the landscape occurred despite the fact that only 25% of the farmers were land owners or had rights to the common lands (PROLESUR, 2004). This is possible through the negotiation of the bundle of rights betaween the people who use the land (these include owners and renters).

THE EXPANSION OF RIGHTS IN EL SALVADOR

Similar to Lempira Sur, the provision of ecosystem services in El Salvador has to be based on the resource management of individual types of private property, and only in a limited manner with common pool resources (for example, the mangroves).

It is important to understand that historically in El Salvador the expansion of rights over the land has focused on individual private rights. At the end of the XIX century decrees were issued which outlawed communal property and municipal common lands.[3] A century later, reforms were made to expand the rights of the landless: the 1989 Agrarian Reform and the Program of Land Transfer (PTT for its Spanish initials). Nevertheless, the attempt to promote collective property into these processes, led to the fragmentation of most of the collective properties in but a few years (Hernández and Dada, 1997).

This expansion of rights by itself has not led to sustainable natural resource management, but offering tenure security has favored the adoption of sustainable agricultural practices among the beneficiaries of the Agrarian Reform and the PTT. However, nationally, the proportion of producers with their own land barely surpasses 50%.[4]

Land distribution and the relationships established between lessees and owners are absolutely crucial for the dissemination of sustainable agricultural practices. The norm is that the land owners establish the management guidelines that must be followed by the lessees. This is why an ecosystem and rural landscape restoration strategy must influence both owners and lessees.

[3] This reform was made through two decrees: a decree issued in 1881 that abolished collective lands in the rural communities, and a year later another decree was issued on the extinction of communal lands or ejidos and mandated the partition of land that belonged to the Municipalities (Browning, 1971/1998).

[4] Only three municipalities in the Bajo Lempa and La Montañona have a proportion of farmers that own land greater than 50%: San Luis La Herradura and San Francisco Javier, in the Bajo Lempa (55% and 53%, respectively), and Las Vueltas at La Montañona (66%) (MEIC/MAG, 2008).

A VARIETY OF TYPES OF PROPERTY

Notwithstanding the dominance of individual property in the country, there are important properties in the Bajo Lempa that are in the hands of cooperatives and where the State is the owner of the protected areas and mangroves. Also, in La Montañona and Bajo Lempa, there are forests under collective ownership, governed under the status of "proindiviso".[5]

ELEMENTS OF COLLECTIVE ACTION

THE EXPERIENCE OF LEMPIRA SUR

According to Ostrom (2004) one of the first elements for achieving collective action is that an *agreement* should exist between the parties involved regarding the importance of the problem. In the case of Lempa Sur, the process that led to the change of practices arose from an extreme situation where everyone was affected, and as a consequence, the generation of agreements was urgent. However, a crisis of that size could have been dealt with in such a way that it would not have led to collective action: disputes over water source, out migration from the territory (which in fact did occur) or passively accept food aid.

In this case, the collective action surpassed the temptation of short-term individual options, possibly because of the solid base of social capital, understood as an attribute of the relations between individuals that strengthen their capabilities to resolve collective action problems (Ostrom, and others, 2007).

Social capital provides for a dimension that encompasses standards, values, attitudes and beliefs that contributes to cooperative behavior (Uphoff, 2001). In the Lempira Sur case, the local leaders and development agents understood that inadequate practices in agriculture would endanger certain common assets: first of all water and in a more general manner, the existence of the communities. This sense of joint responsibility for the common future can be observed in the municipal citizen consultation processes that established sanctions for those who burn the land, and in the contribution of time and labor by hundreds of families to construct and operate the community water systems. The changes in the roles of the institutions and civic involvement have served both as condition, as well as an outcome, of the stakeholder's cooperation in the process of adopting new agricultural practices.

COLLECTIVE ACTION FOR NATURAL RESOURCE MANAGEMENT AND SUSTAINABLE AGRICULTURE IN EL SALVADOR

Collective actions exist for managing natural resources in La Montañona and Bajo Lempa, as well as other approaches to promote "good practices" in family agricultural. These efforts have been limited to small scales, focused on protecting water sources or plans of individual farms, and do not represent landscape level agreements. However, these actions demonstrate the presence of important social capital and a sense of co-responsibility towards collective well-being. At the same time however, there are some frustrated experiences of collective actions.

For example, at the La Poza micro-watershed of Bajo Lempa, there is an exemplary experience where the communities finance works to protect the water sources, through their Water Boards (Rivera, 2009). The same types of efforts also exist at La Montañona (PRISMA, 2006b), but the Water Boards have not guaranteed the use of the resources on the agreed objectives.

On the other hand, both territories have promoted sustainable agricultural and archeological restoration options through citizen participation with a focus of sustainable management of the territory. At the Bajo Lempa there are collective pioneers on organic agriculture while at La

[5] "Proindiviso" is a figure established with the PTT land distributed under the Peace Accords, and refers to private property given to a group of people who each have a equal share to the land but do not have individual titling rights, thus making it impossible to sell their corresponding piece of the land.

Montañona there are communities where the cultivation of fruit trees has been expanded through the implementation of comprehensive farming plans (Brescia and Chenier, 2012).

INSTITUTIONS OF RIGHTS FOR THE MANGROVES

Historically, extraction activities of useful species at the mangroves have been carried out under an open access regime; in other words in the absence of standards established by the users themselves, or by a state institution, to regulate their use. However since 2011, an instrument that defines the extraction standards for crabs, fire wood, wood and fishing has been in force for the 8 communities located on the western zone of the Jiquilisco Bay. The definition regarding the number of authorized persons and amounts of extraction was done in a participative manner, based on the studies relative to the productivity of the ecosystem (Rivera, 2011).[6]

COLLECTIVE RIGHTS ON REMAINING FORESTS

Both in la Montañona and in the Bajo Lempa, opportunities arose for the collective management of some remnants of forests with the legal figure of property known as "proindivisa" established under the PTT. However, the management of these forests has faced diverse pitfalls. In La Montañona there have been efforts by the Organization of Beneficiaries of the Forest to develop forest management plans, but the costs for this activity was prohibitively high for the organization to assume, who were already weakened by internal conflicts. Similarly, the tourism initiatives undertaken by the local actors have not yet taken off. On the other hand, in the Bajo Lempa, no rules or clear criteria regarding the management of the community "reserves" exist nor, do they have the means to restrict the activities that could be carried out on these reserves. It is expected that the exploitation plan in Jiquilisco will be able to offer lessons for developing similar agreements for managing the remaining forests in Bajo Lempa and in La Montañona.[7]

COLLECTIVE ACTION FOR THE MANAGEMENT OF SOCIO-ENVIRONMENTAL CONFLICTS

Collective action in the Bajo Lempa, is also expressed by the formation of territorial platforms, such as the Permanent Roundtable of Actors from the Bajo Lempa (MESPABAL, for its initials in Spanish),[8] which seeks to generate territorial development proposals for both sides of the Lempa River. One of the main topics prioritized by MESPABAL in recent years has been the environmental and social impacts of the expansion of sugar cane in their territory. In response to advocacy and dialogue efforts by MESPABAL, MARN has taken actions to advance towards the elim-ination of detrimental practices used in its cultivation, highlighting the Green Harvest, where the six existing sugar mills of the country make commitments to cut a certain percentage of the sugar cane under their control when it is green (without burning).[9]

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[6] Approved as a Local Sustainable Extraction Plan (PLES, for its initials in Spanish), and authorized by the MARN Agreement No. 120 of 2010.

[7] Up until now MARN has outlined similar plans to be implemented in other areas of Jiquilisco and Jaltepeque, under the name of Sustainable Restoration Management and Use Plans (PROAS, for its Spanish initials).

[8] MESPABAL is made up by the municipalities from Jiquilisco, Tecoluca, Zacatecoluca and San Luis La Herradura, community based organizations and non-governmental organizations; representatives from MARN and the Technical Secretariat of the Presidency. Several organizations that form part of this Rountable are part of the Movement for the Defense of Life and Natural Resources, such as the Asociación Mangle and the Organic Agricultural Movement (MOPAO, for its Spanish initials).

[9] During 2011-2012 the goal set was of 2,500 mz of the sugar harvest to be done without buening, and in the next cycle this was expanded to 7, 000 mz; the 2013-2014 is expected to reach 12,000 mz (MARN, 2013).

COMMON-POOL RESOURCES AND PUBLIC GOODS

The conceptual basis of PREP is built on the premise that establishing the conditions for providing ecosystem services of national and global interest depends on assuring the management needs are taken into account for the provision of the first and second level of ecosystem services (see Figure 1). In the literature on the commons, most ecosystem services of general public interest fall into the categories of resources known as "common-pool resources" and "public goods" (Muradian and Rival, 2012). Frequently, the ecosystems that provide these services are under a common use regime.

In contrast to private goods or goods susceptible to private appropriation, common-pool resources and public goods are characterized by their difficulty to exclude possible users of the resource. Ostrom (2000) and an extensive amount of literature has proved that user communities are capable of communicating with each other and reaching agreements on specific rules that allow for the sustainable management of common-pool resources. The key to this is that although the exclusion of additional users could be costly and cumbersome, it is not impossible. This makes it possible to clearly define the universe of users and encourage agreements between them to regulate the use of the resource (Ostrom, 2000).

The risks of over using a resource are absent when dealing with pure public goods, as these have low rivalry or subtractability; in other words, the use made by one user of a resource does not rival with the intentions of others. However, public goods show similar or greater difficulties in defining who can and cannot use the resource. These characteristics tend to lead to a deficit of public goods when the costs of the provision of public goods are high (Ostrom, 2000). For example the farmers that implement "good agricultural practices" do not usually receive additional benefits for the public good derived from such practices. If the costs of applying these practices are high with regards to the benefits perceived, a deficit in the provision of public goods could occur such as: carbon fixation, circulation of nutrients, regulation of the climate or of the hydrological cycle.

LEMPIRA SUR

Practically all of the initiatives for the provision of ecosystem services of public interest resulting from agricultural systems require the participation of other governmental and private agents to compensate some of the costs involved, whether that be technical assistance, the management of information and knowledge, incentives or direct payments. (OECD 2013; Isakson 2002).

We can interpret the Lempira Sur experience as a combination of individual agents providing public goods, specifically the restoration of ecosystem services for national and global benefit, through changes in the way they managed their private resources.

This would not have been possible if the new practices would not have offered highly valued benefits for the farmers, particularly obtaining harvests in adverse situations such as the drought during the 1997-1998 years (caused by the El Niño phenomenon), where the people were able to "determine that only those people who use the agro-forestry systems friendly with the environment could harvest". Then in November 1998, they experienced more proof, when their crops withstood the extreme rains of Hurricane Mitch (PROLESUR, 2004: 22).

The above does not mean that direct incentives were not used in the process. However, PROLESUR adopted a very different approach then most of the projects that seek to promote soil protection use. First of all, the use of labor-intensive physical works was not an alternative due to its cost (Flores, 2013: interview). Instead, the improvements in the soil came as a result of the adoption of the Quesungual system. However, the transition towards an agroforestry system that does not use fire had an initial cost for the producer. PROLESUR addressed this situation in such a way

that the value of the compensation delivered to the farmer (fertilizer, tools) would be capitalized as collective assets controlled by the group of producers or by the community. Moreover, the commitment of the local governments with the change of practices was encouraged through the PROLESUR contribution to strengthen the capacities of the Municipalities: there were incentives such as technical assistance, and financial and symbolic recognitions. At the same time, the municipalities applied collective incentives and fines to eradicate the use of burning in agricultural work.

EL SALVADOR

In El Salvador as well, the change of agricultural practices has been facilitated and channeled through non-monetary direct incentives, such as training and technical assistance, inputs such as plant materials (seedlings) or raw materials for the production of organic fertilizer (Brescia and Chenier, 2012). Another incentive used by agricultural development projects were credits and micro credits, especially during the first postwar years.

Some projects have oriented their incentives to the construction of physical soil conservation works, such as barriers, ditches and terraces. Experience indicates that these types of actions that require a lot of hard physical labor are not sustainable in the long run, unless the delivery of direct incentives is on-going; this conclusion coincides with studies carried out in Honduras (Hellin and Schrader, 2003).

In contrast to the physical works for soil protection, the comprehensive farm plans have attracted great interest from the population, as they are an important tool that contributes to food security throughout the year and also generates cash income.

COLLECTIVE ACTION AND TERRITORIAL GOVERNANCE

COORDINATION OF MULTI-LEVEL ACTIONS

In the case of El Salvador, as opposed to Lempira Sur where the efforts to motivate collective actions were channeled through the local institutions, coordination efforts are being linked between local concerns and national policies, specifically, the National Strategy for Climate Change and the National Strategy for Biodiversity.

The most recent efforts of promoting PREP include participatory methodologies that encourage the producers to recognize the relationship they have with landscape outcomes, identifying priority landscapes. This approach builds on a series of principles systematized in previous experiences of ecosystem and landscape restoration. (Sayer J. B., 2008).

A second very important element has been the strengthening of local decision-making processes. The "Roundtable of Local PREP Stakeholders" in La Montañona has been consolidated and there is permanent communication occurring between MARN and the Commonwealth to manage the resources jointly and to build a common vision for the landscape transformation. Also, the La Montañona Commonwealth is undertaking an independent process, aimed at designing instruments to transition towards the mass use of these alternatives; for example, regulations to impose fines for agricultural land burning and a regulatory-financial mechanism to compensate or cover the costs for individuals and communities when their practices improve the ecosystems and the supply of ecosystem services.[10]

[10] These initiatives have built on a proposal elaborated within the framework of the PNUMA sponsored project entitled: "Support to the Mesoamerican protected areas: Development of economic and legal instruments and mechanisms to improve the management of protected areas, including sustainable agricultural practices as a fire prevention strategy" (PNUMA, 2012).

MARN recognizes that these actions require enabling conditions, especially for reinforcing the management skills of local actors, whether community organizations, municipalities or the commonwealths. To develop the conditions necessary for providing this assistance to local actors, the El Salvador Environmental Fund (FONAES for its initials in Spanish) is currently being strengthened in order to be eligible for accessing international funds for mitigation or adaptation to climate change. This is the first step forward towards the creation of a national compensation system resulting from ecosystem restoration actions.

EXTERNAL ACTORS AND THE LANDSCAPE

The Bajo Lempa case shows how the response to climate change requires actions which could in due course include both local and external stakeholders. This is particular evident with regards to the measures taken by MARN on sugar cane harvesting; the Green Harvest program (Zafra Verde), for example, was the result of dialogue process between the MARN, MAG and the sugar cane industry. The commitments resulting from this dialogue will be included in the Action Plan of the National Environmental Strategy (MARN, 2013).[11]

Additionally, a first dialogue was held between organizations from Bajo Lempa and the Sugar Producers' Association of El Salvador. Although this has not resulted in the establishment of a round-table discussion group to deal with the problem, the sugarcane sector has expressed their interest in becoming certified under the Bonsucro[12] label.

Under a long term perspective, where climate change adaptation is a condition for development, there is an urgent need to transform territorial governance to enable the coordination between local entities and Central Government agencies, to jointly design plans for adaptation, monitoring, reporting and verification, as well as plans for financing, managing and jointly producing information on the changing situation due to climate change.

IMPLICATIONS FOR PUBLIC POLICIES

LOCAL ACTIONS COORDINATED WITH CENTRAL GOVERNMENT

The analysis of the Lempira Sur case shows that the collective actions that brought about the landscape transformation, were developed in two levels. On the one hand, there is a level of action that corresponds to the change of practices on the agricultural parcels and the direct motivation was ensuring the subsistence for peasant families.

However, actions at the farm level, that could be coordinated or not among the farmers, required enabling conditions generated by a second level of collective actions, highlighting the role of the local leaders and external actors: professors from middle education institutions, mayors and council members, church leaders, NGO representatives and programs similar to PROLESUR. The coordination of the objectives and methods among these stakeholders gave coherence to the farmers actions, given their limitations for coordinate their efforts beyond the immediate environment of the community.

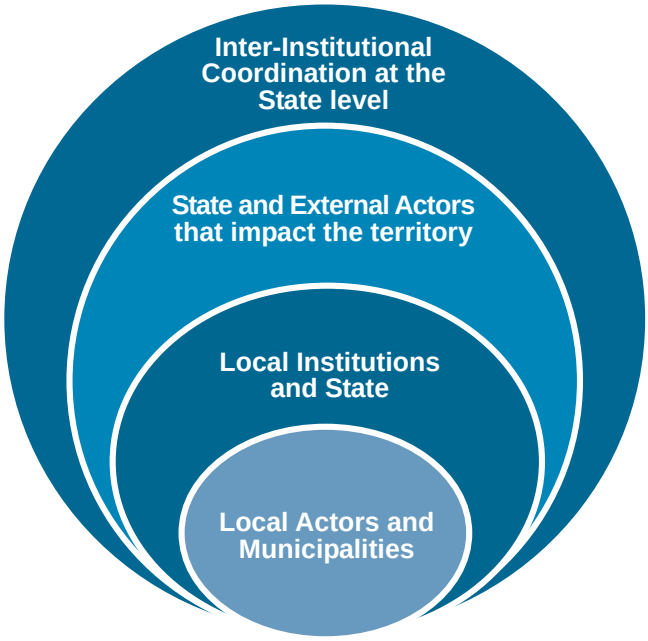
In the case of El Salvador this implies the need to have a multilevel and long-term institutionality to guarantee the conditions and incentives to facilitate the participation of thousands of productive in the transformation of the landscape. It implies creating conditions and facilitating four types of agreements:

[11] The commitments that are being negotiated with the sector are related to the expansion and location of the cultivation in fragile areas: the practice of burning sugarcane fields, use of agrochemicals, use of water, managing waste water, managing waste, alteration of drainages and greenhouse gas emissions (MARN, 2013b).

[12] Bonsucro is a certification system for sustainable sugar cane production promoted by that an organization by the same name, whose Headquarters are located in the United Kingdom.

- Agreements taken between local actors and municipal governments
- Agreements between local actors and institutions with State agencies interested in changing the landscape
- Agreements between State institutions and external actors (for example, sugar mills)
- Coordination between institutions such as MARN and other State ministries: MAG, Finance, etc.

Figure 2. Multi-level Institutionality



Source: Kandel and Cuéllar (2011); Rosa, Kandel and Dimas (2003).

It should be noted that the overall consistency of the objectives and operative mechanisms between different levels could be difficult to achieve through one single actor "guiding" the process, consequently at some point it will become necessary to provide a space for coordination where representatives from all the different levels come together.

However, in the Lempira Sur experience, the continuity of the actions of the Lempira Sur Program for nearly one and a half decades is noteworthy, under an approach where the main principles were defined from the very beginning but were sufficiently flexible to make operational changes or changes of emphasis. This flexible medium / long term perspective was key when building the collective action capabilities between individual producers and institutional actors.

INITIATE A DIALOGUE ON ALTERNATIVES REGARDING INCENTIVES AND COMPENSATION

Dialogues on regulation, compensation or incentive schemes aimed at changing practices are the least developed aspect of the ecosystem restoration efforts at this time. Below are some ideas that should be taken into account for this dialogue process, which must involve different stakeholders in the territories.

In the case of the small and medium agricultural producers, compensation and incentive schemes need to be designed to take into account their immediate interest in food security and income

generation (levels one and two of natural resource management). These schemes need to avoid falling into common traps such as the obsession for short term results and the use of exclusively financial mechanisms. The idea of "compensation" for ecosystem services (in contrast to the concept of "payment") includes a vast array of possible forms of recognition, beyond monetary transfers and direct incentives (Rosa, Kandel and Dimas, 2003), such as: the expansion of rights over land and other natural resources; investment in public goods such as infrastructure; provision of technical assistance, marketing and information / knowledge services.

These options could be used as collective incentives; for example recognizing the communities that eradicate burning activities. Furthermore, these compensations could be designed in a way that benefits landless farmers, such as through investment in public goods. One of the advantages of investing in local public goods is the positive effect it has on rural development, which does not necessarily occur when the incentives are delivered individually, such as with fertilizers and pesticides (De Schutter, 2011).

All actions promoted through incentives must have certain characteristics to allow their continuity even when the incentives and compensations are no longer being given out. In other words, the practices should result in a sufficiently attractive benefit for the producers, independently of the existence of the incentive or lack thereof. As mentioned earlier, physical or other types of works that are labor intensive do not present this inducement.

The Lempira Sur experience suggests the need for promoting incentives and practices that capitalize the producers and their organizations. It could be improvements to the natural capital (improved soils, for instance) and other capitals that allow for recovering and maintaining the resiliency of the natural resource base (social capital, physical capital and eventually financial capital).

The local governments could participate in the design and operation of these types of mechanisms, as is being done at La Montañona. However, limitations of resources and capabilities within a commonwealth can make it difficult to reach a "critical mass" of producers interested in changing practices. It is therefore necessary to have the participation of higher level State agencies, whether for providing direct incentives to local producers or generating instruments (legal, technical, financial) for the municipalities to provide these types of incentives.

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