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Collective Learning in the Governance of Managed Ecological Landscapes

The case of Multifunctional Forest Management

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The case of Multifunctional Forest Management

Tom Dedeurwaerdere

Introduction

Socio-economic research in the last decade has shown that a strict focus on the species diversity concept, and the related policy of strict nature reserves, is not appropriate for the management of the important parts of biodiversity that are situated outside the nature reserves. The research on ecosystems services has developed an alternative concept which seems more appropriate for the management of coupled human and ecological systems. However, the translation of this concept to the reform of institutions for environmental governance is still far from complete.

This chapter analyzes the role of institutional design and collective learning in the transition towards ecosystems management through the question of dynamic

institutional efficiency. A lot of work on institutions has focused on the design of well-adapted systems of rules, which best fit to the biophysical and social environment. In this static approach the goal is to look for the most optimal institutional design given a certain model of the transaction situation. However, there is also another important aspect of institutional analysis, which focuses on what has been called dynamic efficiency (Aoki 2001; North 2005; Eggertsson 2005; Dedeurwaerdere 2006). Dynamic institutional efficiency is concerned with enhancing the efficiency of the process of institutional change, whether in a situation of transition leading to a more optimal institutional configuration, or in a situation of the open-ended evolution of institutions coping with persistent uncertainty on the possible action outcomes. Its focus is on the creation of incentives for knowledge generation about new action possibilities and the creation of mutually supportive dynamics between institutional change and the changes in the social and political domains.

Static institutional design can be sufficient to build adaptive capacities, when the effects of external shocks, the appropriate responses and their outcomes are reasonably well understood. For instance, from an institutional point of view, adaptive capacity can be built in long-term relational contracts (Williamson 1996) or be enhanced by joint information processes amongst sub-units in firms or other organizational hierarchies (Aoki 2001). However, in many situations the effects of the external shocks on the social and the ecological system are not well understood and

the set of options or action possibilities for adaptation not known or not feasible in the actual social and political environment. In those situations, practical incentives for stimulating the exploration of the still uncertain institutional possibilities (in transition to equilibrium or still open-ended evolutions) will become important for the survival of the system.

The case of managed forest landscapes seems an appropriate test field for analyzing the contribution of collective learning to dynamic efficiency. In managed forest landscapes, the slow evolution of the biophysical system is confronted to new rapidly evolving constraints such as the biodiversity crisis and global market pressures. To analyze the transition towards ecosystems management in these managed forest landscapes, we will focus on a specific case study which is the case of joint forest management (JFM) organizations in Flanders. We will focus in particular on three mechanisms of collective learning that have been implemented in the JFM organizations: (1) the recourse to sustainability criteria and indicators as an open ended learning device allowing to redefine the current beliefs around sustainable development, (2) the experimentation with disruptive action strategies to put the new beliefs into practice and (3) the building of new forms of social cooperation around these new beliefs and practices. The hypothesis behind this analysis is that a combination of cognitive and social mechanisms of collective learning is needed to generate effective institutional change.

The research procedure developed in this chapter is based on the comparison of different mechanisms of collective learning, from both a theoretical and an empirical perspective. The chapter aims to show the relevance of the theoretical propositions in governance which explicitly address the question of the organization of collective learning. As well, the chapter investigates the specific case of joint forest management organizations in Flanders, where a specific model of collective learning has been implemented. The analysis of the mechanisms of collective learning in the JFM organizations will be based on a combination of data coming from actor representations, mainly original expert interviews and existing surveys amongst forest owners, and artifacts produced by the organizations, such as internal meeting notes and official reports.

The first section of the chapter presents our case study by analyzing how forest management organizations have been able to adapt to the specific constraints of human-ecological landscapes composed of small-scale forests with fragmented forest ownership. First, we analyze the collective action problems that have to be solved for maintaining the diversity of forest related ecological services in these landscapes. Then, we show that joint forest management (JFM) organizations have been able to successfully address these collective action problems and hence to fill the institutional gap in the forest management regime. Finally, we present the theoretical model that will be used in analyzing the mechanisms of collective learning that have been implemented in the JFM organizations. The second section evaluates the

contribution of these mechanisms of collective learning to the governance of the managed forest landscapes. The subsequent discussion sections draw some conclusion on the role of the forest group coordinator in collective learning, and compare the JFM case study to other initiatives of decentralized network governance in natural resources management.

Multistakeholder Coordination for Governing Managed Forest Landscapes

In Europe, forests have been virtually all altered by man to some extent, with the exception of the boreal zone on the European side of the Russian Federation and some scattered relics in mountainous areas of the Balkan, Alpine and Carpathian regions (Frank et al. 2005, p. 378). Moreover, the majority of forest owners own small or fragmented forest and hence this is an important target group for any forest policy in Europe. This typical patchwork of forests has some peculiar characteristics such as low commercial value of the wood, diverse collective preferences and levels of understanding of sustainability and high transaction costs in the monitoring of the management practices of the different actors. In these managed forest landscapes, collaborative management organizations such as the JFM organizations play an important role in the provision of forest related services. Through collective learning forest owners and users can compromise and build agreement on common objectives and collectively manage services such as selling of wood in a cost-effective manner.

Moreover, and that is precisely the idea we would like to examine in this chapter, these organizations have been able to generate new social possibilities by creating normative change and generating new beliefs amongst individual actors and social groups, which are not represented in the dominant organizations of nature protection. In this section, we will first analyze the collective action problems generated by the specific ecological and management characteristics of these landscapes. In the next section, we will then turn to the contribution of JFM organizations in the building of cost-effective institutions for solving these collective action problems.

The Provision of Local and Global Public Goods in Managed Forest Landscapes

From an ecological point of view, small and fragmented forests play an important role in the provision of different ecosystems services on which forest health, broader nature protection and sustainable use of forest resources depend. Important services such as watershed protection or pollination control are provided in functional diverse landscapes composed of a mosaic of forest patches and other land uses. The relevant criteria for the ecological health of these landscapes is not so much the diversity of tree species as the maintenance of functional diversity in the landscape, (Hassan et al. 2005, p. 29 ; Perrings and Touza-Montero 2004, p. 16). Different types of ecosystem services can be distinguished in small and fragmented forest landscapes,

these include regulating and supporting services, provisioning services, cultural services and forest biodiversity[1] :

- Regulation services (regulation of ecosystems processes providing human material benefits) : water purification, air quality maintenance through the retention or detoxification of pollution, erosion control, climate regulation through carbon storage and microclimatic stabilization ;
- Supporting services (regulation of ecosystems processes providing benefits to other ecosystems) : soil formation, feeding habitat, nutrient recycling, ground cover for key watersheds
- Production services (products obtained from the forest) : timber, wild living resources, medicinal plants ;
- Cultural services (human non-material benefits from the forest) : recreation, aesthetic, educational and scientific information ;
- Forest biodiversity (contribution to the diversity of the global and local gene stock): tree diversity, forest plant diversity and forest wildlife diversity.

These ecological characteristics and the correlative constraints on the management of the small and fragmented forest landscapes generate a set of collective action problems that will have to be addressed by the governance mechanism. Two sets of the collective action problems are especially important for our purpose, which are the

problems generated by the public good character of biodiversity conservation and by spatial externalities.

First, forest biodiversity and the related ecosystems services have public good properties as many services are non-excusive in use. Some services, such as the regulation services and cultural services, have pure public good properties. Forest owners will be inclined to free-ride on the efforts of others, but the consumption of the derived products, such as clean air or a beautiful forest landscape does not lead to the depletion of the forest resources. The main motivation to contribute to the provision of these public goods is to be able to benefit from the ecological services that are provided. However inappropriate uses, such as by hikers or hunters, can lead to a decrease in the quality of the provided service. Other services, such as waste assimilation through detoxification, water provision or the provision of biochemical resources through nutrient recycling have common pool resource characteristics : they are non-exclusive in use (or the costs of exclusion are very high), but over consumption will end up by destroying the resource base. The maintenance of these services will depend on cost-effective means for coordinating amongst forest owners and monitoring the depletion of the common gene stock. Finally, the provision of biodiversity itself by the forest also has common pool resource characteristics, but with one important peculiarity which characterizes the incentive problem: both overexploitation and under exploitation can deplete the forest biodiversity. Indeed, in the case of managed forests, a regular thinning of the forests is an important factor

in enhancing both the tree, plant and the forest wildlife diversity. One of the consequences of the enforcement of the forest regulations in the mid-eighties has been the withdrawal by the small forest owners of any forest management, including thinning, due to the high transaction costs of the new system of felling permits. This has lead to decay in the ecological quality of the forests and was one of the reasons for initiating the JFM initiative in Flanders.

Second, the sustainable management of small and fragmented forests has to deal with spatial externalities. Indeed, the relative importance of genetic, species and ecosystems diversity tends to be rather different at the local level than at the global level (Perrings and Touza-Montero 2004, p. 16). At the global level, the primary concern is with the protection of the global gene pool. At the local level, the primary concern is with the interaction between species and ecosystem types in the provision of ecosystems services.

At the local level, forest ecosystems services are sustained by a dynamic balance between diverse species composition (for their contribution to different ecosystems services) and different age-classes (for obtaining an appropriate temporal distribution of the provision of these services). Management decisions both on the level of a forest stand and on the level of the landscape play a role in maintaining this dynamic balance. On the stand level, biodiversity conservation should focus on enriching the forest structure, through the presence of large trees, snags and woody

debris (Hansen et al. 1991). On the landscape level the ecosystems services should be considered over a larger area and biodiversity conservation should involve having a spatial arrangement of forest patches in different successional stages, including different species and different ages. In forests that are managed by multiple users/owners these spatial interactions on the landscape level give rise to spatial externalities. For example if neighboring stands are owned by different forest owners, they should not clear-cut all the stands at the same time, but coordinate over time to maintain the overall ecosystems services of the whole landscape (Perrings and Touza-Montero 2004, p. 19-20).

Forest Groups as New Policy Instruments in Multifunctional Forest Management

In densely populated regions, such as Flanders, multifunctional forest management appears to be the most to-hand means of extending the forest-related services. Since in Europe and the USA non-industrial private forest (NIPF) owners own more than half of the forests (up to 70% in Flanders), the promotion of multifunctional management depends strongly on the cooperation of NIPF owners. To encourage NIPF owners to adopt the government policy of multifunctional forest management, policy-makers have used a wide range of regulatory, economic and informational instruments. The NIPF owners mostly do not support these instruments because the underlying ideas conflict with their opinions, harvest rights are not protected and

there is too much interference from the federal government (Brunson et al. 1996). More successful instruments should inform and educate forest owners, allow wood trade, involve the owners of neighboring forests and be independent of government. Forest groups (forest cooperatives, forest owner associations or cooperative forest management arrangements) exhibit these characteristics and are used in more than 15 European countries (Kittredge 2005).

In the case of Flanders, JFM has lead to quite impressive outcomes in a relatively short period. The overall region which is covered by the JFM organizations recognized in 2006 is an estimated 100.000 ha which amounts for 75% of the forest cover in Flanders. Each of the JFM organizations (called "bosgroepen") focuses on sub-areas within these regions, where forest degradation is progressing most rapidly or where dispersed ownership is highest. It is not dealing with big public forests or, in principle, with private forests above 5ha[2]. In these focus areas the forest groups have been able to involve private forest owners in extensive coordination on forest management and in common stewardship for the various values of the forest landscape.

Why is this innovative scheme successful, in a policy field where the regulatory and economic incentive policies, already in place from 1990 to 1996, were not able to convince of the private forest owners and produce the expected outcomes? The failure of the transition to sustainable forest management in this first phase of

implementation of the 1990 Forest Decree cannot be explained by an insufficient level of economic incentives such as cost-share policies (Serbruyns and Luyssaert 2006). For example, as pointed out by an in depth study of forest conversion which includes the BZK working area, the economic incentive scheme covers more than the lost revenue of forest conversion to the forest owner (Verheyen et al. 2006, p. 73). The lost revenue is estimated to be between 45 and 96 Euro's/ha/year for conversion from a Corsican pine stand to pedunculate oak under a rotation period of 77 years (Ibid., p. 71), while the direct subsidies are around 150 euro per ha yearly. Nevertheless, between 1990 and 1999 only 200 to 250 owners per year applied and received the reforestation subsidy, while only 133 ha and 317 ha respectively applied and received the subsidy for forest management plans and for opening up their land for private use (Serbruyns and Luyssaerts 2006, p. 287). Second, from an ecological point of view, the 1990 Forest Decree was already based on the detailed set of criteria and indicators for multifunctional forest use and management, which have been agreed upon in the Pan-European Forestry Process, where both forest interests and nature movements were represented (Ministerial Conference on the Protection of Forests in Europe 1998). Hence it seems that the issue at stake here is not the lack of economic incentive policies or inappropriate legal concepts from an ecological point of view.

The main innovation introduced from 1996 on, through the progressive creation of the JFM organizations, is the explicit organization of processes of collective learning amongst the forest owners and stakeholders. The forest groups introduce elements of

joint information processing and collective learning both between the forest owners and the government officials, and amongst the forest owners and the various stakeholders. The main decision making body of the JFM is the general assembly of forest owners, assisted by a JFM coordinator and one administrative staff. All decisions on forest management, felling and negotiations with user organizations are taken by the general assembly, on the basis "one man, one vote", independently of the forest surface of the owner. The JFMs also strive to a balanced membership amongst small public and private forest owners, requiring a majority of private forest owners in the general assembly. The drafting of the forest management plans is realized through the help of the forest group coordinator, whose main role is to involve the owners in the organization of the information coming from the different forest plots. The general assembly of forest owners discusses and approves the specific organization of wood selling and intervention in the forest landscapes, based on the common knowledge base that is build for the specific forest landscape that is managed by the group.

A well-established JFM organization which illustrates the results from combining the incentive and regulatory policy tools, with tools for organizing collective learning, is the bosgroep Zuiderkempen. This JFM organization operates in a landscape containing about 8000 ha of forest. Within this landscape a priority working area of 1134 ha of highly scattered forests has been selected for building cooperative forest services in the period 2003-2006. In the management plan for 2007-2010 another 801

ha is planned to be added to this working area. In the working area, meetings with forest owners are organized, membership to the JFM organization proposed, and forest management plans discussed. As a result of this process, in total 513 ha private forest has been integrated in detailed common forest management plans (45 % of the working area), involving a total of 462 different small private forest owners (an estimated 30% of the total number of owners in the working area). Moreover, through the negotiation of access plans between the JFM organization, user representatives and the local authorities, a total area of 342 ha private forest has been opened up to different user groups (30 % of the working area). If similar results could be accomplished in the other JFM's in Flanders, then an expected total area of 5909 ha could be opened up for walking and recreation in the nearby future, which is more than the total area of the largest remaining public forest in Flanders.

Theoretical Perspectives on Institutional Dynamics and Collective Learning

The main difference between the first phase of implementation of the 1990 Forest Decree (from 1990 to 1996) and the new approach initiated by the creation of the JFM organizations from 1996 onwards is the new focus on the explicit organization of collective learning. This section analyses the mechanisms for organizing the collective learning in the JFM organization. In general, these mechanisms are based on decentralized collective learning in various regional JFM organizations, on the basis of a common set of government targets, the so-called criteria and indicators for

sustainable forestry, which are used for monitoring the progress of the learning process.

The conditions for the use of monitoring as a learning device in open ended situations have been studied in more detail by Charles Sabel, both in the context of firm behavior, in the so-called non-standard firm, and in the context of public policy, in so-called deliberative polyarchies. Because of our interest is in the cooperative learning between non-industrial private forest owners in the forest groups, we will mainly focus here on the theory of the non-standard firm. In his approach, Sabel highlights two conditions for open-ended learning: first, the role of practical incentives for promoting the exploration of "disruptive possibilities" (Dorf and Sabel 1998, p. 286) and, second, a set of institutional rules that define the engagement in the cooperative enterprise. First, to establish initial product designs and production methods, firms turn to benchmarking: exacting survey of current or promising products and processes which identifies those products and processes superior to those the company presently uses, yet are within its capacity to emulate and eventually surpass. Benchmarking allows thus a comparative evaluation with possible improvements and as such provides an incentive to disrupt the current routines and representations of possible outcomes. Further incentives for promoting the exploration of disruptive possibilities are simultaneous engineering based on the initial benchmarking and correction of errors revealed by the new action possibilities. Second, beyond these practical incentives, generating collaboration and change in the

non-standard firm also depends on an institutional context which defines a set of rules of engagement of the actors in the joint enterprise. These rules require mutual monitoring of each participant's contribution, information sharing and the mutual assessment of each participant's reliability in relation to the joint activity.

Based on these two conditions, the practical incentives and the rules of engagement, we can expect increased productive learning in the forest groups to occur when the monitoring process generates (1) a process of joint investigation and comparative evaluation of disruptive possibilities, and (2) a process of mutual comparison to verify the reliability of the outcomes proposed by different groups. In the cases where these conditions are realized, one expects a broadening of the set of possible productive action strategies beyond the current routines and representations of the organization.

The critical element in this process is the change in beliefs and the identification of the specific impact of new beliefs on the management practices in the provision of ecosystems goods and services. Based on the pragmatist model of Sabel, we can distinguish between two different types of successful learning processes: first, incremental learning processes, which lead to improved outcomes, but remain within the current representation of the problem situation and second, disruptive learning processes, which lead to improved outcomes that go beyond the given representations of the forest group. An example of the first type of learning is the adjustment of the level of direct and indirect subsidies to the forest owners in the

framework of the 1990 Forest Decree, which did not reconsider the basic premises of the economic incentive politics. An example of the second type is the disruptive learning within the 1996 pilot project, which has lead to the establishment of the first forest group, and which was based on the idea of the need of cooperative learning beyond the economic incentive politics.

The institutional dynamics, in situations of open-ended learning on multifunctional forestry, does not only depend on the opening of new perspectives within the forest groups. It also depends on the interaction with the broader social and political environment, which can be mutually supportive, neutral or antagonistic. In particular, the concept of multifunctional forest management implies to take into account important components which impact on the broader user communities of the forest ecosystems services.

From the point of view of governance theory, the contribution of the interaction with the broader user communities to forest governance can be modeled as a situation where cooperation is build through a combination of instrumental trust, based on reciprocity and enforced by increased transparency and means of verification, and social trust, based on symbols (languages, rituals, gestures, etc.) and enforced by creating respect and esteem (Tyler 1998). We will focus on these two dimensions in our evaluation. Indeed one of the major challenges that forest policy has to face in building cooperation is the lack of trust of the private forest owners in government and the lack of trust between the different categories of forest owners. As has been

shown by extensive survey in Flanders, the forest owners show a high degree of distrust in the government and place the highest trust in technical engineers from the forest administration. To build trust with the government and amongst the forest owners, the forest groups have focused both on instrumental and social trust, the former by enhancing transparency and mutual monitoring through the C&I process, and the latter by enforcing the social identities of the forest owners, through generating respect for the owners' ideas and interests and bringing owners back to their forest and stimulating a sense of forest stewardship (Bosgroepen 2005).

Case study on Collective Learning in the Joint Forest Management Organizations in Flanders

This section will analyze the contribution of JFM organizations to collective learning on sustainable forestry from the double point of view of the change in the framing of the sustainability debate and the change in the norms of cooperation between the different stakeholders involved in the provision of the forest ecosystems services. First, we will analyze and evaluate the mechanism of collective learning based on the use of criteria and indicators for sustainable forestry, and second the collective learning through mutual monitoring and experimentation between forest owners in various forestry complexes. The third subsection will then address the mechanism of

collective learning generated by the interaction with the various forest user communities.

Organizational Learning Through the Use of Sustainability Criteria and Indicators

The methodology adopted by the JFM institution in Flanders is based on a process of gradual change in understanding by the different stakeholders, from a nature-centered approach of biodiversity to an ecosystem services (and hence human-centered) approach. Three components are central to this process as it is described in the vision document of the JFM groups. First, the project starts from the interests and needs of the forest owners, rather than their position and discourse in regards to nature conservation. Second, the JFM group organizes a learning process on the definition of the sustainability targets. Third, the design of the learning process itself is evaluated at regular intervals by the participants to adapt it to the local circumstances and stakes at hand.

The use of indicators by the JFM organization provides a useful yardstick to measure the progress of the learning process. Indeed, we can compare these indicators, which are the result of a collective learning process within the organization, to the set of formal targets in the legislation on "criteria for sustainable forest management" (CSFM). The formal targets, which came out of the Pan-European Forestry Process and have been adopted by the Flemish government, are compulsory – wherever relevant – for all private forests > 5ha, and for all public forests and for all forests in

the Flemish ecological network. Their adoption is voluntary for the private forests < 5ha, but they are considered to be the official reference standards to be used by the JFM organizations. In practice, however, both for the public and private forests compliance with the CSFM criteria is still extremely weak (Research Institute for Nature and Forests, 2006, p. 30)[3].

JFM has been conceived by its initiators as a process where (1) management objectives are confronted to the perceptions of opportunities by forest owners and where (2) the generated information is used to adapt the operational objectives of the JFM organization. The JFM organization receives support by the government, as long as the operational objectives, formulated through a clear set of indicators, are met and if the indicators show a progress in moving towards the government targets.

The CSFM are a clear expression of what the concept of multifunctional forest management would look like in the ideal case. It defines clear targets organized around 6 main sets of criteria of sustainable forestry. Each set of criteria is measured through a set of legally specified indicators, leading in total to a set of 24 criteria and 52 indicators:

1. Criteria for the implementation of the existing legislation
2. Criteria for the maintaining of the social and cultural functions of the forest
3. Criteria for the maintaining of the economic and productive functions of the forest

4. Criteria for contribution to the protection of the environment

5. Criteria for the contribution to biodiversity conservation

6. Criteria for monitoring and planning of the forest management

To analyze the gap between these sets of legal criteria and the indicators and targets elaborated in the JFM organization, we can use the available data of the "Bosgroep Zuiderkempen" (BZK), which is considered a reference case by the Flemish government and which is a case where the learning process for the translation of the CSFM criteria has already been going on for a fairly long period (from 1999 to 2006). The subsidies to the JFM by the Flemish government are conditioned by the adoption, at regular periods in time, of a management plan with clear indicators. Once adopted by the JFM organization, these operational targets have to be implemented within the timeframe of the management plan. The comparison between the legal criteria and indicators and the operational targets results in a matrix of correspondences and gaps. In the following, we will use this matrix to analyze: (a) what has been learned in the JFM organization (self-evaluation) (b) what are the remaining challenges in the learning process. We use here the indicators and targets adopted by the General Assembly of BZK for their operational management plan 2007-2012.

The main lessons drawn from this matrix are:

(1) Correspondences between CSFM and BZK: mainly within the criteria set 2 (social and cultural functions) and 6 (monitoring and planning); some indicators of criteria set 3 (economic functions) and 5 (forest diversity)

(2) Gaps between CSFM and BZK: no clear reference in BZK to criteria set 4 (environmental services) and very few to criteria set 5 (forest diversity)

The main sustainability indicators and targets that have been adopted by the forest owners' organization concern the social and cultural functions of the forests and the protection of habitat (forest borders and heath landscapes). A clear target of 690ha forest area with selective access of the population to the forest (35 % of the extended working area)[4] and an information and reporting system of the local population's wishes has been put into place (target audience 350/year). Forest management measures for fragile or biodiversity rich habitats have been planned with the use of detailed GIS maps (Geographical Information System), for an area of 150ha/year. Further action for combating invasive species (American bird cherry / *prunus serotina*) will be pursued in the priority working area. These sustainability targets set by the forest owners are the result of awareness building and discussion and negotiation around experimental test cases.

The comparison also reveals some important gaps. For instance, it is interesting to see that tree diversity as such is not taken over as an explicit measure of sustainability by the forest owners. Beyond the habitat protection we mentioned before, most of the indicators within the forest biodiversity category (criteria 5) are

not taken into account. Also the indicators for contribution to environmental protection (set of criteria 4) do not appear in the targets of the management plan.

What kind of limitations does this comparison reveal from a dynamic institutional perspective? First, from the ecological perspective, JFM has clearly shown a gap between the expert build criteria for sustainable forestry and the way that these criteria can be coherently applied in concrete action settings. This gap is shown to be a permanent critical challenge for the JFM organization. The decentralization of the decision making power on the real management decisions has allowed to build an effective context for the translation of some of the sustainability indicators. The selling of timber, resulting from the joint management, is of course an important driver for the activities of the forest groups – albeit also with direct impact on more healthy forests, but this is balanced with a concern for other eco-services such as clear targets for access agreements and combating invasive species.

Second, the comparison shows some of the remaining challenges to be tackled by the forestry group. In particular, the conservation of tree species diversity, beyond the direct social, cultural and economic roles of the forest, remains a difficult issue. A new pilot project will start this year, in order to develop a different methodology for "limited sustainable forest management plans", which includes a concern for tree diversity. The forest legislation has created a frame for the development of these plans, but, again, very few of these have been implemented. The pilot project will reconsider the basic concepts of these plans with the stakeholders in the field.

In summary, the use of indicators allows to create a flexible framework for implementing the forest legislation and for coordinating and monitoring the use of different subsidy and economic incentives from different authorities (both regional and European). The legal framework leaves the different forest groups room to build their own operational management plan by selecting the set of indicators that they consider most relevant for their own forest landscape. As such the use of indicators allows a process of internal self-evaluation around feasible and evolving targets in the collective management organization and a process of feedback to the government, leading to the design of new incentives schemes or adjustment of its policy.

Learning by Mutual Monitoring

The decentralized implementation of the Forest Decree through the creation of the collective management organizations has proved to be an effective tool in fostering collective learning. However, important aspects of sustainable forestry, such as access to private forests in Flanders and biodiversity conservation, still remain underrepresented in this learning process. Moreover broadening the scope of the representation of forest owners in the JFM organizations, which are based on voluntary membership, remains an important challenge to be addressed.

A second mechanism of collective learning in the JFMs focuses on the collective learning generated by the interaction of different sub-groups within the organization. This latter mechanism has played an important role in overcoming some of the

obstacles related to experimenting with forest access management plans in private forests and is expected to help to foster learning on new issues, such as biodiversity. The main difference with the previous mechanism is that learning by monitoring is especially appropriate for more experimental forms of learning, so-called disruptive forms of learning (Sabel 1994). Disruptive learning processes lead to actions that cannot be framed within the current representations of the forest groups. If these experiments lead to successful outcomes, they provide in turn an incentive for the revision of the current representations.

An example of incremental learning in the forest management regime is the increase in the level of direct and indirect subsidies to the forest owners in the implementation of the 1990 Forest Decree. This adjustment of the strategies for implementation was based on extensive socio-economic research, but did not reconsidering the basic premises of the economic incentive politics that prevailed in the first phase of the implementation of the Decree. An example of disruptive learning is the learning within the first 1996 pilot JFM organization. Here the learning, which initially started in a forest group under the 1990 Forest Decree, has lead to new strategies and a new representation of the priorities to be addressed in sustainable forest management. The comparison of the learning that prevailed within the main beliefs under the early implementation of the forest decree (from 1990-1996) to learning that lead to the creation of the JFM organization under the new belief has been schematically represented in figure 11.1

[Figure 11.1 approximately here]

Within BZK, the learning that has lead to the adoption in 2006 of the quinquennial management plan can be qualified as incremental learning. The main belief is the same as the 1996 pilot project, which is the need for organizing cooperative learning amongst private forest owners. Incremental learning within the frame of this belief played a role for instance in the definition of the operational targets in terms of the criteria and indicators which were discussed before. However, this incremental process failed to generate progress on important remaining challenges, such as the access of hikers and cyclers to private forests and forest conversion from planted pine forests to mixed broadleaf forests.

One of the main reasons of poor progress on these issues is the lack of consensus amongst the different sub-groups that compose the JFM organization and the different constraints that are faced by small, medium and larger forest owners. That's why in 2006 an experiment was organized within a sub-group with the outsourcing of the drafting of the management plan to an independent consultant in the case of larger forest owners (Bosgroep Zuiderkempen 2006). This experiment produced some positive outcomes and further experiments will be organized to improve partnership with independent consultants for dealing with large private forest owners. On the other hand, the current sustainable forest management plans are probably too demanding for small forest owners and are often not considered to be a legitimate objective for small private forest owners. In particular, the conservation of

tree species diversity, beyond the direct social, cultural and economic roles of the forest, remains a difficult issue. A new pilot project will start this year, again with some specific sub-groups, in order to develop a specific methodology adapted to small forest owners, which includes a discussion on their understanding of forest diversity. The explicit goal of the pilot project is to reconsider the basic concepts of these plans with the stakeholders in the field and to foster the development of new initiatives that do not directly fall under the current conceptions of sustainable forest management. These and other experiments illustrate the organization of open-ended initiatives by some sub-groups, in an attempt to go beyond the insufficiencies of the incremental learning by questioning the legitimacy of the current conceptions of sustainable forestry in the JFM organizations.

The learning processes in the forest groups have been able to generate both innovation in strategies and diversification of representations within and between the forest groups. Some of these experiments have lead to a change in action strategies and operational targets approved by the general assembly. Other resulted in the rejection of the new proposed action strategies, because they did not lead to improved outcomes. All these changes were not just the result of communication process in the context of existing beliefs [5], but the result of a process of experimentation which aims at broadening the set of workable strategies and objectives considered by the forest group.

The Institutional Dynamics of Change in Social Norms

The third mechanism for organizing collective learning in the JFM organizations goes beyond the learning within the JFM organizations. It addresses the second condition for generating institutional change, which is the social embedding of the new proposed institutional rules and policies. Its main focus is on building trust between different categories of forest owners, in order to broaden the membership of the JFM organizations, and on building trust between the members of the JFM organizations and other stakeholders, mainly the various forest user groups.

The main progress in building new norms of cooperation has been achieved in the involvement of passive forest owners in the forest group. The main divisions amongst social groups as revealed by sociological analysis amongst forest owners in Flanders is between active exploitation (owners in involved in use and management) / active use (owners involved in use, not in management) / passive ownership (ownership only for investment or from heritage) of the forest (Verheyen et al. 2006). The active exploitant is most concerned by his forest and inclined to participate in the forest management plans; the passive the least.

Amongst these forest owners only between 3% and 13% had initially a positive attitude towards collaborative forest management. This situation corresponds to the

one that prevailed between 1990 and 1999, where no Joint Forest Management organization existed (except for the 1996 pilot project). Self-organized forest groupings could already apply for subsidies, but with very low success rates (mainly the environmentalists and the active forest owners). Without collective learning, the JFM would at best represent the active forest exploitant and some public forest owners who own small forests, which would mean a membership rate of around 10% in the BZK priority areas. Through the creation of the forest groups the average involvement rate is between 17% and 34% (in the initial phase) and 41% and 76% (after some years) in the selected focus working areas (boscomplexen). The BZK organization hence was able to involve part of the active users and passive owners in the activities of the joint forest management.

A second case where cooperative learning has been built around the forest groups is in the creation of cooperation between the nature associations on the one hand and the forest owners on the other. These two groups have traditionally very different positions, the first favoring for instance buy back policies of forest to non-profit organizations or to government, allowing implementation of a strict biodiversity protection policy, and the second favoring economic incentives and market mechanisms. However, through building collaborative dialogue around issues of common concern in adjacent forest areas, trust and increasing levels of cooperation have been established in the core working areas of the BZK forest group.

The main characteristic of the methodology used in the JFM organization for rebuilding trust is that all the actors are considered and treated from the perspective of forest owners and forest managers. Indeed, that is the common thread in the way in which nature associations and private owners are brought together or the way cooperation is build between active forest owners and recreationists. However, in these activities, no new action identity is built by the different owners around the concept of multifunctional management. Instead, the old identities are simply reproduced within the new framework. Hence, the limit of this methodology for building social trust is that it is incapable to point to the need of a more profound transformation of the identity of the forest groups, in relation to the remaining challenges for addressing the issues raised by the users of the forest related ecosystems services and the building of cooperation with the local communities.

Within the forest groups, there is also a second approach, which takes into account the limits of this first approach and attempts to address the challenge of broadening cooperative learning with the users as a 'third party', without subordinating this cooperation to the current identity of the forest groups understood as representing forest managers. Indications for such a second approach are clearly present in initiatives such as the experiment with the access negotiations in the Bosgroep Zuiderkempen and the integration of the complaints of the local population in the

working of the forest groups (Bosgroepen Zuiderkempen 2006). This is also reflected in some position statements by the forest groups, on the cultural and social values of the forests, and the concern frequently expressed about the remaining gap between the interests of the nature associations on the one hand and the inhabitants and the forest owners on the other (Bosgroep Zuiderkempen 2005 ; Bosgroepen 2006). Hence, instead of the reproduction of the old social identities, within the context of a new cognitive frame, as is the case in the first approach, this second approach points to a more profound transformation that is going on in the same time, which is a more fundamental transformation of the identity of the forest group as the basis of the cooperative orientation that conditions further productive learning.

By addressing the reconstruction of the collective identity of the forest groups, through experimenting with the association of the forest user groups to its activities, the initiative of BZK is able to address the failure of the cognitive approach to collective learning, which is its incapacity to take into account the interaction with the changes in the social domain. The BZK has been one of the few forest groups to explicitly design experiments for developing new methodologies beyond the issues identified within the forest owner groups. Thanks to the success of this limited experiment, BZK plans to launching a second experiment, in the period 2007-2012, for developing a methodology addressing the problem of enriching the structure of the forest landscape (Perrings and Touza-Montero 2004), which has also shown to

lead to defensive reactions both of the forest owners and the inhabitants (De Maeyer 2007).

The Role of the Forest Group Coordinator in the Process of Change

The hypothesis of this chapter is that joint forest management can address some of the collective action problems that are encountered in the management of forest complexes with multiple small owners. The two type of collective action problems that were discussed in this chapter are the coordination over the provision of ecosystem services and the cooperation between owners and intermediaries in the building of a market for products of small-scale forestry. The different explanations of the role of the forest groups in addressing these problems point to the existence of different potential roles of the forest group coordinator in managing the process of transition towards sustainable forest management. This section draws some implications of this analysis for the evaluation of the role of the forest group coordinator and the members of the forest groups in the process of change.

The analysis of the mechanisms of collective learning in this chapter leads to distinguish three different models of the role of the forest group: first, its role in

gathering information and coordinating the planning, second, its role in generating change in beliefs and, third, its role in generating change in social norms. In the first model, the role of the forest coordinator can be understood as an external monitor of the team work, as developed in several game theoretic approaches of free riding in teams (Alchian and Demsetz 1972; Holmstrom 1982). Indeed, in this first model, the operation of the forest groups is characterized by organizing joint information processing between the owners and the forest administration on the one hand and amongst the forest owners on the other. The role of the forest group coordinator is to organize these joint processes in an efficient way, especially through his contribution to the drafting of the joint forest management plans and the coordination of the wood selling activities. In this first model, the role of the members of the forest group is restricted to their contribution of information to the management and coordination process.

Because of the important role of the forest groups in organizing the process of change in beliefs and norms, the role of the forest coordinator also has to go beyond his role as a monitor of team work. The JFM case clearly establishes two other important roles of the forest group coordinator: his role as a political entrepreneur, who organizes a process of experimentation with new beliefs, and his role as a trusted intermediary.

Political entrepreneurship has been at the heart of the JFM organizations from the very beginning. The 1996 pilot project received early recognition as an instance where new ways of dealing with forest management could be experimented. The main contribution of this political entrepreneurship of the first forest group coordinator was to show the feasibility of combining economic and environmental objectives, by organizing collective selling of the wood that was generated by the management activities. Hence he has played a key role in initiating strategies for building a market in small-scale forest products, which went well beyond the original intent of the 1990 Forest Decree on multifunctional forestry and which did not exist before the operation of the forest groups. The new 1999 forest law was mainly inspired by the lessons that were learned from this project. This sequence of experimentation and change in the policy framework has been re-iterated in the subsequent development of the forest groups.

Finally, the JFM case also establishes the role of the forest coordinator as trusted intermediary in building renewed confidence of forest owner in the government's forest policy. Indeed, throughout the process of change, a clear division of tasks was established: the control function of compliance with government regulation remained with the executive bodies such as the forest administration, the forest rangers and the local authorities, while the collective learning was the specific task of the JFM management organization.

Possible Governance Frameworks for Collaborative Natural Resource Management

The case of joint forest management organizations is an important example of the recourse to decentralized networks in environmental governance. These networks can be characterized by an attempt to take into account the increasing importance of NGOs, the private sector, scientific networks and international institutions in the performance of various functions of governance (Reinicke and Deng 2000; Ostrom 2001; Hajer and Wagenaar 2003; Haas 2004). The aim of network governance is to create a synergy between different competences and sources of knowledge in order to deal with complex and interlinked problems. This section draws some implications of the analysis of decentralized forest management in JFM organizations for the broader context of natural resources governance.

Recent reforms in environmental governance worldwide show some important efforts which recognize the need for devolution of decision making to new actor networks and a correlative need for a new role of the state authorities in their

support to processes of collective learning and building of adaptive competences, beyond their traditional role of regulation of network externalities. This approach seems especially appropriate in cases of the governance of local environmental goods, which has both local and global impacts, but where mechanisms to deal with global ecological interdependencies are often lacking. In those cases the mobilization of new types of non-state collective actors in different functions of governance has proven to be a necessary complement to the state's regulation and economic incentive politics.

In the field of natural resource management in human dominated ecological landscapes, two forms of network governance have emerged. The first is based on the creation of new collective management entities and the second is based on the decentralized coordination between existing constituencies. In order to situate the case of JFM in the broader discussion on new modes of governance, this section briefly gives some salient examples of each of these forms.

The new regional natural resource management approach in Australia is a clear example of the first approach and shows some important similarities with the case of JFM in Flanders. In this ambitious new governance experiment that is taking place, 56 regional natural resource management bodies have been created (Gunningham 2008). These bodies generally comprise a mix of community, rural and other stakeholders and have formal office holders and responsibility for undertaking

consultation, planning and priority setting. In this approach, provision is made to enable each region to develop their own regional plan and regional investment strategy for addressing management challenges within parameters set nationally. These activities are coupled with monitoring, evaluation and oversight by the regional bodies themselves and by State lead steering committees. Crucially, these bodies are aware that should they depart substantially from the parameters laid down by the Federal Government, they risk losing their funding, dissolution and replacement by a new entity.

A more far reaching from of this first form of network governance can be found in cases where the history of state intervention is less prominent. A clear-cut example is the case of Ground Water Management in Los Angeles Metropolitan Area (Ostrom 2008). Here a water association composed of cities, industrial users and farmers was able to gradually build a local public economy around the allocation and management of groundwater rights. In a similar way as the cases of new environmental governance, this process also received some support from the government to facilitate the interaction amongst the different water producers. Indeed, the appointment of a watermaster played an important role in making reliable information available, and also leads to the establishment of new regional entity, the Water Replenishment District.

The second approach focuses on the coordination and cooperation between existing constituencies, without delegating new decision making powers on resource management to regional collective entities. An interesting case in the field of small-scale forestry is the case of the New Forest in South England (Rydin and Falleth 2006). New Forest comprises a landscape of 37,500 ha, with a mixture of forest land and heath land surrounded by large urban areas. Two networks for establishing collective action in this area have been created, the first a consultative panel, with 70 member organizations, including town and parish councils, NGOs, government agencies and local interest groups, and the second a more formal committee, the New Forest Committee, with nine members organizations, all of which have an already existing statutory role in the management of New Forest. The consultative panel has performed a useful function in bringing new issues to public attention, such as the declining economic viability of the grazing in the heath land and the conflict between landscape conservation by the commoners – which are farmers with grazing rights on the heath land – and timber and tourism interests. However, it is the New Forest Committee that was the key network for promoting collective action. The New Forest Committee has been able to establish concrete projects based in partnerships between the different actors, such as the development of a Forest Friendly Farming Accreditation Scheme funded under a European project, and to draft a New Forest Strategy published in 2003 based on intensive public consultation.

These brief examples are of course only illustrations amongst many and show the wide variety of potential forms of network governance in the field of management of human dominated ecological landscapes. However, they all point to the importance of mechanisms of collective learning in the networks creating normative and cognitive change and the new role of the government in facilitating the network dynamics. A crucial issue is to develop more empirical research, which would allow specifying the conditions under which different forms of network governance may succeed in accomplishing these functions and whether such conditions can be affirmatively created.

Conclusion

Based on an in depth case study and theoretical insights from theory of governance this chapter established the contribution of 3 different mechanisms to fostering collective learning on sustainable forest management, respectively through : (1) the recourse to sustainability criteria and indicators as an open-ended learning device, (2) the experimentation with disruptive action strategies to put new beliefs into practice and (3) the building of new forms of social cooperation around these new beliefs and practices.

The main finding of the chapter is the need to combine different mechanisms of collective learning, including both mechanisms based on in-group learning processes and learning processes with external stakeholders. It is only by combining these different mechanisms that it is possible to go beyond the resistance to of the new regulatory and economic incentive policies of the first years of implementation of the new 1990 Forest Decree in Flanders. Indeed, the case study on JFM organizations has shown that, in the absence of these mechanisms, the learning process was restricted by concerns over timber exploitation and independence from government intervention.

From the point of view of the contribution to the provision of global and local ecosystems services, the case study on Joint Forest Management also has shown the effective contribution of this governance mechanism to more integrated ecosystems based management. In particular, the case study has shown that open-ended and disruptive learning in the JFM organizations allowed to integrate important non-market values such as the landscape diversity, spatial externalities (through the joint forest management plans) and concern for species diversity (through the combating of invasive species), in the forest management practices. However, the adaptation to new social demands such as recreation in private forests remains a difficult issue in the highly urbanized forest landscapes in Flanders.

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Notes

[1] We include forest biodiversity as a distinct ecological service, because, tree species and forest plant diversity as such only plays a major role in some, but not all the ecosystems services (Hassan et al. 2005, p. 300)

[2] Managers of forests above 5 ha can be members of the JFM, because of the importance of developing a coherent approach for the whole area. However, the management activities itself have to be targeted in priority to the needs of the small forest owners (mostly between 0.5 and 1.5 ha).

[3] The "gap" that we can measure between the legal standards (the CSFM criteria) and the indicators is not a gap between "expert based" preferences – as revealed in the legal standards – and so-called "subjective" preferences of the individual forest owner. The latter, measured for instance though field surveys, are only a poor indicator of the behaviour of the forest owners involved in the collective management organisation. Indeed, the individual preferences are transformed through the learning process in the collective management organisation and the resulting common indicators reflect the resulting collective preferences of individuals as members of a collective organisation. The gap we measure hence is a gap between beliefs expressed in the government targets and the translation of these beliefs to standards established by the stakeholders involved in the local collective management organisation.

[4] The surface of the extended area is 1134.3 ha + 801 ha (Bosgroepen Zuiderkempen 2006, p. 32)

[5] Whether it are the beliefs of the government (then the forest group would only be the "transmission belt" of the government policies) or the beliefs of the forest owners (then the forest group would be a neo-corporatist model of a private governance architecture). The disruptive learning model allows to combine the appropriation of the criteria and indicators from the point of view of the forest owners cognitive frames, but also to show progress beyond those frames because of the legal

constraint of integrating aspects of multifunctional forestry where relevant (and the requirement to show effort in doing so to be legally recognized as a forest group, and hence entitled to receive the subsidies).