Payments for ecosystem services as a road to sustainability? A case of forest dispute in Muonio, Northern Finland

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Abstract: Payments for Ecosystem Services (PES) have emerged as new promising governance tools for enhancing sustainable use of natural resources. This article looks at the Muonio forestry dispute where local tourism entrepreneurs and the municipality paid compensations for the Finnish state forestry enterprise to not log in state-owned commercial forests. The case also illustrates some more general challenges with PES. Firstly, paying compensations for somebody not to deteriorate ecosystem services is problematic for environmental and sometimes also social sustainability. Secondly, the valuations on which the Payments are based are often biased. Thirdly, the diffusion of benefits from ecosystem services to actors at various scales is difficult to grasp with monetary estimations. Fourthly, there is a challenge to incorporate future costs and benefits to the valuations. If these challenges are not resolved, PES schemes might blind us from the variety of complexities and equity issues behind the use and governance of ecosystem services.

Introduction

Sustainable development, focusing on environmental, economic and social dimensions has been a key policy goal for around two decades and a way to conceptualise relationships between people and the environment. In the new millennium, the concept of ecosystem services has emerged as a new kind of conceptualisation of human-environment relations. Ecosystem services encompass the benefits of nature for people, and it is thought that these benefits ground human well-being (MA 2005). Following the Millennium Ecosystem Assessment (MA 2005), there are four types of services: 1) Provisioning (products obtained from ecosystems, e.g. timber), 2) regulating (e.g. flood control; species balance), 3) cultural (non-material benefits obtained from ecosystems, e.g. ecotourism), and 4) supporting, which maintains all other services by for example primary production and nutrient cycling.

The concept of ecosystem services has its origins in ecological economics (Farber *et al.* 2002), which has resulted in monetary valuations becoming a key characteristic for the ecosystem service approach (e.g. Costanza *et al.* 1997). Relating to the trend of valuating ecosystem services in monetary terms, different kinds of Payments for Ecosystem Services (PES) have been developed for enhancing ecosystem service production (Jack *et al.* 2008; Sommerville *et al.* 2009). PES schemes are seen to have

the potential to balance the inequalities in distributions of costs and benefits related to the use and conservation of natural resources (Bruner *et al.* 2008). In short, PES systems are built to make sustainable use of natural resources attractive also in economic terms (cf. Daily & Matson 2008; Pejchar *et al.* 2007). The ecosystem service framework is increasingly applied with the assumption that the identification and valuation of ecosystem services, and subsequent implementation of PES schemes will contribute to sustainable development. However, it has been argued that the ecosystem service framework moves discussions away from ethical and equity considerations essential to sustainable development towards market-based solutions compatible with current neoliberal developments (Norgaard 2010). Thus, it becomes important to examine the relationships between PES schemes and sustainable development.

The objective of this article is to examine the forest dispute in Muonio, northern Finland, and particularly examine what the challenges for PES schemes illustrated by the Muonio case are, and how the Muonio PES solution can be viewed in terms of equity. In Muonio, the innovative PES solution was used to come up with a resolution to a forest dispute between the Finnish state forestry enterprise Metsähallitus, which manages and logs state-owned commercial forests, and the local coalition opposing the loggings, consisting of local tourism entrepreneurs, representatives of local conservation NGO, a hunting association, reindeer herding and the municipality of Muonio. The solution was that the tourism entrepreneurs and the municipality paid compensation to the state forestry enterprise for not logging in state-owned forests located in northern Muonio. I assume that the challenges illustrated by the Muonio case are more general and might be applicable also to other PES schemes and to some extent to other market-based governance instruments.

Ecosystem service framework is also applied to research for assessing arctic ecosystems and the benefits they deliver (e.g. Leadley *et al.* 2010, 53-59, 111-116; ABA 2011). The common paradigm is shared that climate change and loss of biodiversity can lead to tipping points, after which the recovery to the previous state is impossible and the new system will be controlled by different variables (see Russill & Nyssa 2009). Nevertheless, the increasing acknowledgement of perils caused by climate change and biodiversity loss will probably lead also to policy responses which try to cope with these challenges. It can be assumed that new policies will be implemented, but also creation of market-based mechanisms to safeguard arctic ecosystem services will occur. The Arctic Biodiversity Assessment (ABA 2011) was endorsed by the Arctic Council in 2006, and ABA stressed also relevance of ecosystem services, like the report on Arctic Biodiversity Trends 2010 (2010). Furthermore, in science side the relevance of ecosystem services for traditional livelihoods in the arctic has been noticed, and challenges brought by climate change have been seen as a serious problem also beyond traditional livelihoods. Following the Arctic Climate Impact Assessment (ACIA 2005) Ministers of the Arctic Council stated that there is an urgent

need to reduce greenhouse gas emissions (SWIPA 2011). It will be likely that also market based mechanisms are implemented to mitigate climate change. These might include payments for carbon sink services, and trading schemes for greenhouse gas emissions. It can be assumed that as for example Arctic Council includes science members (Koivurova *et al*. 2009) the issue of ecosystem services and possible development of PES schemes will invade also to the Council leading possibly to policy demand for market-based governance mechanisms, including PES schemes.

The lessons learned from the Muonio case may be applicable to the following domains relevant for arctic environmental governance: 1) oil drilling and mining and the compensation requirements for companies which deteriorate ecosystem services (see Nuttall 2011), 2) compensating and incentivizing tolerance towards harms caused by large predators, such as wolves and polar bears (see Heikkinen *et al.* 2011), 3) various market-based mechanisms for fisheries governance, like individual transferable quotas (see Armstrong & Sumaila 2001), 4) the global climate change mitigation efforts via market-based compensations or incentives (Koivurova *et al.* 2009), and 5) general development of market-mechanisms for the governance of arctic common pool resources. Furthermore, this article examines issues relevant also to other arctic areas: relationships between traditional land-uses (e.g. reindeer herding) and resource extraction (logging), but also stresses growing importance of tourism industry and its implications to local-level environmental decision making.

This article is based on 15 interviews of representatives of Metsähallitus and members of the local coalition opposing the loggings conducted in 2005 and 2007, and the follow-up of media discussion on the issue. This material was analysed with content analysis, and with a question what are the challenges for the PES scheme in the Muonio case especially in terms of equity. I piled the material according to identified challenges. These piles then formed the basis for the sub-sections in section 2 of this article.

This article begins by outlining the backgrounds and developments in Muonio. Next, the challenges regarding the PES solution are outlined. These challenges consist of the following questions: 1) is the use of 'polluters rights' –logic appropriate and non-biased in state-owned and thus public forests, 2) are the valuations on the amount of compensation involved in the PES scheme neutral, 3) how can Payments acknowledge and valuate the flow of benefits from the ecosystem services to multiple actors at various scales, and 4) how to cope with the costs and benefits for future generations of the governance decisions. The article is concluded by considerations about relationships between PES schemes and equity issues essential for sustainable development.

Illustrating challenges for PES through the Muonio case

Forest disputes have been rather common during last two decades regarding state-owned lands in northern Finland. The

disputes have often concentrated on loggings in old-growth forests, which are important reindeer pastures, have high biodiversity values, provide basis for nature-based tourism, and also provide good commercial returns if end-logged. The main parties of the disputes have been the state forestry enterprise Metsähallitus, environmental non-governmental organizations, reindeer herders, and tourism entrepreneurs and other local people (Raitio 2008; Sarkki & Heikkinen 2010).

In Muonio, the forests under dispute are not natural forests in a strict sense, and they were not claimed for area conservation, but the local coalition wanted to exclude them outside commercial loggings because these forests are important for nature-based tourism, reindeer herding, hunting and local recreation. In contrast, Metsähallitus wanted to do loggings in these forests. As a response to finding out Metsähallitus' logging plans, some local actors formed a coalition to oppose loggings in late 2006. These key actors arranged a protest against the planned loggings in Muonio to which some 500 people joined, which is a huge amount in a small municipality with 2500 inhabitants. As a response to wide local opposition, Metsähallitus initiated extra negotiations outside Metsähallitus' Natural Resource Planning processes. There were three rounds of negotiations between Metsähallitus and key actors from the local coalition. Finally, after controversial discussions, Metsähallitus chose to leave the disputed forests outside loggings for the next ten years. Furthermore, it was agreed that tourism entrepreneurs and the municipality of Muonio pay an undisclosed sum of money to Metsähallitus for not logging (Sarkki 2008).

This payment can be considered as a Payment for Ecosystem Services. According to Wunder (2005, 3) Payments for Ecosystem Services include five criteria: 1) The transactions are voluntary, 2) the ecosystem services or the land securing these services is well defined, 3) the service moves to the buyer, 4) from the producer, 5) and the producer of ecosystem service ensures the continuity of the ecosystem services.

In Muonio, the tourism entrepreneurs in fact suggested that they could pay Metsähallitus for not logging. The land securing the ecosystem services (e.g. attractive area for local recreation and tourists, reindeer pastures, nursery and living habitat for game animals, and berry production) was well defined. The services did not in fact move to the buyer, but Metsähallitus ensures the flow of the services by retaining from loggings. Next I outline some challenges for PES and market-based governance tools that are illustrated by the Muonio case.

Problematic 'polluters' rights'

We can talk of 'polluters' rights' when Payments are provided to an actor for not deteriorating the state of ecosystem services relevant for other actors. For example, people or industries using water up-stream may be compensated if they retain from actions that deteriorate the water quality or diminish the water quantity available for down-stream actors. Thus, in this case the Payments for Ecosystem Services are designed with an assumption that

polluters have a right to pollute, and they are entitled to compensations if refraining from doing so (see Vatn 2010). 'Polluters' rights' –logic was also applied in Muonio, and it also resonates with Metsähallitus' current trend to measure how much income they are losing because of taking general societal responsibilities into account in their loggings.

Calculations on how much Metsähallitus loses because of taking general societal responsibilities into account (biodiversity conservation, recreational use and scenic values, reindeer herding, Sámi culture, and employment opportunities) are also done more widely than just in relation to Muonio. The Ministry of Agriculture and Forestry decided in 2006 that Metsähallitus should develop an evaluation system to assess what the costs and benefits are for taking societal responsibilities into account in state-owned commercial forests. The costs, not benefits, were counted for the first time in 2006-2007, and the result was that Metsähallitus forestry unit loses around 38 million Euros annually because of taking account these societal responsibilities, while its profit was 65 million Euros (Schildt 2007).

This trend was heavily criticized by an interviewed member of the local coalition who stated that 'in the beginning God created lands and forests, and in the second day all forests were signed as logging areas for Metsähallitus. And if there is an exception of this holy principle it has to be counted how much Metsähallitus is losing because of taking other land-uses into account.' This quote highlights critique towards the idea of 'polluters' rights'. Why should Metsähallitus have the right to deteriorate the other ecosystem services other than wood production potential in public lands? Why does Metsähallitus calculate only the costs and not the benefits emerging from not logging? Furthermore, in Muonio, tourism entrepreneurs paid for Metsähallitus for not logging. This 'polluters rights' -logic is criticisable as money should not be a pre-requisite for effective participation in decision-making related to public lands.

Politics of valuations in Muonio

Measuring and valuating ecosystem services is important, but it also raises questions about the knowledge production; who generates the knowledge and how is it related to decision-making (Hodgson *et al.* 2007)? Furthermore, we need to think valuations as being integral with institutional context (Vatn 2009): thus, it matters who is doing the valuations. The below illustration from Muonio highlights that the measurements on which the Payments are based on are highly political and various interest groups can produce very different numbers.

Tourism entrepreneurs in Muonio made a suggestion in public to Metsähallitus that they could pay for Metsähallitus for not logging the disputed forests in northern Muonio in ten years. The proposed sum was 100 000 Euros for the ten years (Melamies 2007). According to Suomen Kuvalehti, which used a memo from the meeting between Metsähallitus and local coalition in Muonio as a background, Metsähallitus claims 1 million Euros of rent from the tourism entrepreneurs. According to the memo, Metsähallitus had stated that the total value of the timber in the disputed

area of 2500 ha is some 7.5 million Euros. According to tourism entrepreneurs the value of one hectare of forest in the latitudes of Muonio is around 400 Euros, which would make the market value of the disputed forests some 1 Million Euros. These calculations were based on the studies by Finnish Forest Research Institute (Pöntinen 2007). Thus, in this case both parties produced their own numbers and it is evident that instead of coming up with neutral numbers, the calculations around the value of timber were biased and highly political.

Spatial scale and payments

Valuation of ecosystem services needs to incorporate the multiple stakeholders who benefit from those services at various scales (Hein *et al.* 2006). When comparing management options in terms of the benefits they produce, the management option which is able to attach more actors and benefits to it will be probably in better position when comparing management options in terms of the benefits they deliver.

An interviewed representative of Metsähallitus pointed out that the total value of wood extracted from the forests is something like 15-fold, when processed further. For example, the forestry side's argumentation in public discussions was often concerned about the future of the Kemijärvi factory, which is now closed for other reasons (see Rönkä & Sarkki 2011), but still operated during the Muonio dispute. The point of this kind of argumentation is that the benefits gained from the extracted wood are much larger than just the benefits for Metsähallitus. Thus, taking account of the whole production chain can multiply the value of certain services.

In Muonio many of the interviewed members of the local coalition admitted that forestry might benefit the people working in distant pulp factories, but noted that there are merely few people in the municipality of Muonio employed by forestry. The contested question for sustainability, spatial scale and measurements is: should the benefits for distant people justify deterioration of locally important ecosystem services?

The rather long production chains were also identified for tourism by the local coalition in order to create competitive arguments against forestry. As most of the tourists in Muonio are foreign, they come there by plane, which benefits Finnish airlines. The role of reindeer in creating a positive image about Finland abroad was also stressed. The Finnish tourism industry uses images of reindeer in their advertisement, and thus, free grazing reindeer herding produces some benefits for tourism via the national image. Tourism also keeps the remote villages alive by providing jobs and also contributes to improvements of public services and infrastructure. Valuation of these kinds of benefits is very challenging, but needed to produce realistic accounts on the benefits of tourism. However, it is difficult to asses how the utilization of provisioning services (timber) impacts on the possibility to utilize other services (attractive landscapes for tourism and recreation, reindeer pastures, habitat functions for game, and berry production). This question still lacks an answer (Norgaard 2010), and is also relevant

to the Muonio case. Natural forests certainly attract tourists, but what would actually be the difference between unmanaged and logged forests in terms of attractiveness of Muonio as a tourism destination?

Related to scale issues, members of local coalition noted that Metsähallitus had done some 'revenge' loggings in other areas of Muonio. This was considered to be a response by Metsähallitus to the lost logging possibilities in northern Muonio. Also Tahvonen (2007) has found that in case of decisions to increase the amount of set aside areas for commercial state forestry, forestry actions tend to be intensified in other regions as the overall economic goal of loggings is not reduced. Thus, it is possible that 'polluters' collect the payments for not 'polluting' and then continue and intensify 'pollution' in other areas. In this case, the whole idea of using Payments for improving sustainable use of natural resources becomes somewhat diluted.

Temporal scale and one-sided measurements

Time has been labelled as a key dimension to sustainability: the current utilisation of natural resources should not diminish the future possibilities for well-being (e.g. Hodgson *et al.* 2007). However, it is often a problem in valuations of ecosystem services that the future depletion or appreciation of the services is not being accounted for. This might lead to incorrect indications about the state of well-being, and also to misinformed policy actions (MA 2005, 131).

The temporal scale was taken into account in the local coalition's argumentation. It takes some 150 years for the forests to regenerate at the latitudes of Muonio. Thus, the coalition argued that the loggings would 'steal their future', referring to deteriorated opportunities for nature-based tourism. They also pointed out that while tourism entrepreneurs can enjoy a steady annual flow of income from nature-based tourism, forestry would log there once and then come again after 150 years. The local coalition also argued that Metsähallitus should have not only counted the losses for forestry, but also the long and short term benefits to other ecosystem services due to refraining from loggings. This would have enabled a fair comparison between the different management options. These kinds of comparisons should be standard when designing PES especially in dispute situations, because a one-sided view will likely produce biased results and mask the benefits deriving from the 'non-calculated' land-uses.

Conclusions: PES and equity

Payments for Ecosystem Services are seen as promising tools to enhance governance and come up with sustainable solutions. However, we noticed above that there are serious challenges for PES to contribute to sustainability. In this section I will consider the argument that application of ecosystem service framework and implementation of PES schemes will in fact move us away from considerations on equity, towards thinking that market-based mechanisms will solve the questions of sustainability (Norgaard

2010). How do PES and ecosystem services blind us from seeing equity issues?

Firstly, the Muonio case stresses the idea that when there is increasing interest toward certain areas, their ownership relations become more acute and actors begin to claim property rights to these areas (see Bromley 2006, 103). Metsähallitus' ownership was confirmed with the Payment, and in a sense, public lands moved a step closer to 'private state ownership', where citizens have to pay to participate effectively into decision-making. This reflects an argument that PES are benefitting the rich more, and might further marginalize the poor (Norgaard 2010). In Muonio, tourism entrepreneurs had the money, but what if they would not have been participating, would the reindeer herders, hunters and other locals been able to halt logging plans?

Secondly, the different ecosystem services differ in relation to the ability to valuate them. Forestry related benefits seem more easily countable than for example the landscape's value for tourism and recreation, value of free grazing reindeer herding for the image of Finland, or intrinsic values of recreation and biodiversity. While these issues together with intergenerational justice are key factors for sustainable development, their monetary value is hard to grasp. This complicates building equitable market-based governance solutions for sustainability. Market-based solutions might hinder more radical institutional and economic change, which some argue is needed to move towards a sustainable world (Norgaard 2010). In Muonio and in Finnish state-owned commercial forests, this more radical change could take place in respect to taking other than commercial values for forestry increasingly into account. The calculations on general societal responsibilities are a step forward, but at least in Muonio they were applied in an incomplete and biased form and as such, they shadow the equity and ethical considerations rather than induce more radical change.

Thirdly, when counting the values of ecosystem services, spatial scales to which the benefits diffuse would also be good to take into account in order to produce realistic accounts of the real value of utilization of a particular service. However, sustainability is also about equity, and taking account of the benefits throughout production chains might produce a bias in favour of land-uses with long production chains (e.g. forestry: from loggings to book stores) over land-uses, which do not include such long production chains or if the values of ecosystem service for a particular land-use is hard to be measured (e.g. nature-based tourism). Furthermore, when comparing different management options with scale sensitive value assessments, these valuations mask the question whether local people should have more rights to local environments than far-away actors. Should the benefits for distant people justify deterioration of locally important ecosystem services?

If these challenges are solved by valuation methods used as a basis for Payments for Ecosystem Services, it would be a really promising tool to enhance governance for sustainability. However, it seems that these challenges are serious and cannot be easily resolved. In Finland, this might be the reason why the 'Muonio PES model' has not been applied to other areas. If the valuations are used in one-sided or incomplete manner,

it is possible that governance strategies based on those valuations blind us from various complexities behind the idea of ecosystem services (see Norgaard 2010) and as a result, environmental sustainability and equity become diluted by the emerging PES schemes.

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