

# Positive mountain externalities:

Valorisation through policies and markets

Discussion Paper for the Third Meeting of the Adelboden Group

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# Foreword

The FAO multi-stakeholder Project (2005–2007) for Sustainable Agriculture and Rural Development in Mountain Regions (SARD-M) aims to support the rural livelihoods of mountain peoples by facilitating the design, review, implementation and evaluation of relevant policy packages and institutional processes promoting SARD in mountain regions at global, regional and national levels.

In line with its purpose of “***strengthening mountain populations’ livelihoods with improved policies for sustainable agriculture and rural development***”, the project work plan focused on the following three **interrelated priorities**:

- **Assessing the strengths and weaknesses of mountain policies**, including social, economic, institutional and environmental aspects, in relation to sustainable agriculture and rural development principles;
- **Analysing positive and negative externalities of mountain regions** through a comparative review of existing methods and tools;
- **Strengthening local institutions**, by developing training materials and sessions, in close collaboration with NGOs, producers’ associations, cooperatives, etc.

The project relies on a network of **Regional Focal Points**, among which is **EUROMONTANA for Europe**. Focal points facilitate the sharing of information, communication, and coordination and networking with other partners, while supporting the design and implementation of priority activities, namely the valorisation of positive externalities of mountain regions in EUROMONTANA’s case.

The project also benefits from the **counsel and support of the Adelboden Group** created at the end of the International Conference on SARD in mountain regions organized by the Swiss Government in June 2002.

The successes and failures of policies rely not only on the contents of the policies themselves, but also on the context in which policies are developed and implemented. The SARD-M Project thus place a particular emphasis on examining the processes and institutions that are involved in the formulation, implementation, and evaluation of policies (i.e. the so-called **Policies, Institutions and Processes - PIPs – framework**, see FAO SARD-M (2007)) .



# Introduction

Most people have an idea of what the positive externalities of mountain economies are, though they may not use economic language to describe them. Clean water, nature, places to enjoy hiking, traditional communities and ways of life - these are some of the most widely recognised. In economic terms they are positive externalities. Although at first sight they seem quite obvious their role in local and national economies is complex.

Externalities have been part of the rural policy debate for at least 20 years. The increasing focus at global level on international trade negotiations and sustainable development has given them particular emphasis. Many policy makers in mountain areas now see positive externalities as a key feature, and one that offers great opportunities for sustainable mountain development.

Mountain areas are subject to rapid change, socially, economically, and environmentally. Many of their distinctive characteristics and values are in danger of being lost, even though they are highly valued by society. In many mountain areas cultural landscapes have developed, with associated positive externalities such as biodiversity and water supply. External economic and environmental pressures are leading to radical changes in these except where appropriate policies are in place to ensure the continued supply of externalities. At the heart of this is the question of whether mountain communities can survive, and if so, how. **Positive externalities can help communities survive; without communities many of the positive externalities will not survive.**

A wide range of experience is relevant to this field, and there are some sophisticated theories. This can make it hard to see the whole picture so the paper does not attempt to deal with all the details. Instead it is **aimed at policy actors who have to deal with immediate practical issues**. This is a discussion paper, so it **invites further debate**, notably through questions to be addressed during the Third meeting of the Adelboden Group. It should provide them with a general overview of the key principles and the state of the art in different regional<sup>1</sup> and local circumstances.

The paper begins by outlining the background to the issues. It goes on to identify key issues and make recommendations. It also poses some questions and suggests areas of further research and development. Annex 1 of the paper refers to examples from around the world to highlight the link between theory and practice. Annex 2 draws on academic literature to explain the current state of our understanding of the theory of externalities and their role in sustainable development.

Many of the examples quoted here are drawn from existing case studies and reviews by Euromontana<sup>2</sup> and the FAO sustainable agriculture and rural development in the mountains project (SARD-M)<sup>3</sup>. These sources are referred to in the text where relevant.

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<sup>1</sup> "Regional" is used in this paper for areas such as Central America, EU, Hindu-Kush Himalayas. "Area" and "local" are used for areas within countries.

<sup>2</sup> <http://www.euromontana.org/>

<sup>3</sup> <http://www.fao.org/sard/en/sardm/home/index.html>

# Setting the scene

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## The role of mountain externalities

*Externalities* are defined as being side effects of an economic activity. They may be *positive* (preventing floods) or *negative* (causing them). In the first place there is no market for externalities, so they cannot be bought and sold. However it may be possible to create a market, in which case they are *internalised* or *valorised*. This covers payments for environmental services (PES - farmers being paid to maintain a flood plain) as well as the process of adding value to commodities. For example a cultural landscape is valorised when images of the area are used to market local cheese. The concept of externalities is closely linked with other terms described in Box 1.

Externalities are important in mountain areas for a number of reasons:

- low-intensity farming and forestry systems with strong positive externalities have persisted more than elsewhere
- traditional cultures and settlements are more common
- mountain areas cannot compete in mass markets because of communications difficulties and lack of scale
- mountain areas have a competitive advantage because of the environmental and cultural qualities resulting from positive externalities

The main types of mountain externality are shown in Table 1 and discussed in detail on page 32.

**Table 1 - Main types of externality in mountains**

| Positive                                  | Negative   |
|---|--|
| Biodiversity                              |  |
| Flood and soil protection                 | Flooding and erosion/sedimentation   |
| Water quality and supply                  | Pollution (especially in water)  |
| Carbon sequestration                      |  |
| Avalanche protection                      |  |
| Fire protection                           | Fire   |
| Cultural landscapes                       |  |
| Outdoor recreation                        |  |
| Rural communities and cultural traditions | Out-migration to urban poverty; Cost of supporting non-viable mountain communities |

**Box 1 - Words**

Amenities, ecosystem services, externalities and public goods are related but differing terms.

**Amenities** has been used by OECD (OECD, 1999) to describe cultural and natural assets of rural areas. Whilst it describes luxury “heritage” resources well, the term is rather a weak way of describing some of the environmental resources essential to life.

An alternative is **ecosystem services**, commonly used in environmental economics (eftec, 2005). This term does not include cultural resources.

**Externalities and public goods** both have strict economic definitions though all the requirements are rarely met in practice.

A range of work has addressed **multi-functionality**, by analyzing the extent to which the production of commodities and the provision of services are linked, and the respective role of markets and policies (OECD, 2001).

The What do we mean? section (p29) outlines the relationships between some of these terms. This paper sticks with the term externalities, but most of the content is also relevant to the other terms.

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## People and processes involved in externalities

Before discussing the role of positive externalities in sustainable mountain development it is important to have a clear view of **who is involved**. Equally, the role of **institutions, laws, and groups** must be understood.

Externalities are produced jointly with other products so a wide range of people are involved in production and consumption. They fall into three groups:

- Beneficiaries (of positive externalities) such as tourists, downstream water users, food consumers.
- Providers (of positive externalities) such as farmers and other mountain dwellers.
- Third parties involved in valorisation, such as tourism operators.

One of the processes involving these individuals is that the beneficiaries should pay the providers for the positive externalities they receive<sup>4</sup>. Two resulting issues are what value beneficiaries place on positive externalities, and how much it costs providers to continue to produce them.

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<sup>4</sup> The principles involved are described on page p34. It is important to distinguish between beneficiaries of the positive externalities (such as environment) and those who benefit economically from valorisation. The term “beneficiaries” is used here only in the first sense.

Another important process is the way **property rights** are dealt with by law. Some externalities are controlled through property rights, restricting anyone's right to pollute for example. Positive externalities are more often dealt with through payments. However property rights vary between countries. For example in some countries people have a legal right to use land for recreation. In other countries this use is provided through voluntary agreements with landowners, underpinned by payments. In some countries property rights, particularly those of indigenous people, are poorly defined and this may limit the scope to pay them for providing positive externalities. The distinction between property rights and financial incentives for externalities is discussed on page 35.

These processes are often discussed in terms of the individuals involved – beneficiaries and providers for example. But in many mountain areas there are strong traditions of **communal activity**, and some resources are held in **common ownership**. This can make externality policy rather complex, but it is a strength that many non-mountainous areas do not have. The fact that many positive externalities are public goods suggests that community approaches to production and consumption may be particularly appropriate. The communal traditions are of course themselves a positive externality, from a cultural point of view. Experiences of communal rights are described on page 25, and the underlying principles on page 42.

The term **governance** covers a more general set of processes that are critical factors in externality policy. It includes formal government at national, area and local level, the roles of NGOs, private sector groups, and community organisations, and public participation generally. The special character of mountain areas, and the nature of externalities and valorisation, mean that good governance is a critical factor in successful positive externality policy.

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## A potential contribution to sustainable mountain development

The greatest similarity between mountain areas around the world is that they tend to be rich in positive externalities but otherwise disadvantaged compared with areas on the plains. In other respects they vary widely depending on their latitude and the economic status of the country.

Opportunities for sustainable mountain development are closely linked with positive externalities, in four main ways:

- Better **environmental management through payments** for the supply of positive externalities, such as PES<sup>5</sup>.
- Valorisation of positive externalities to **add value to commodities**. Marketing, branding, and labelling of mountain food, forest products, crafts, and tourism are common examples.
- Maintaining **cultural heritage** and indigenous knowledge.
- Maintaining **sustainable communities** by retaining and attracting population because of the high quality of life, based on positive

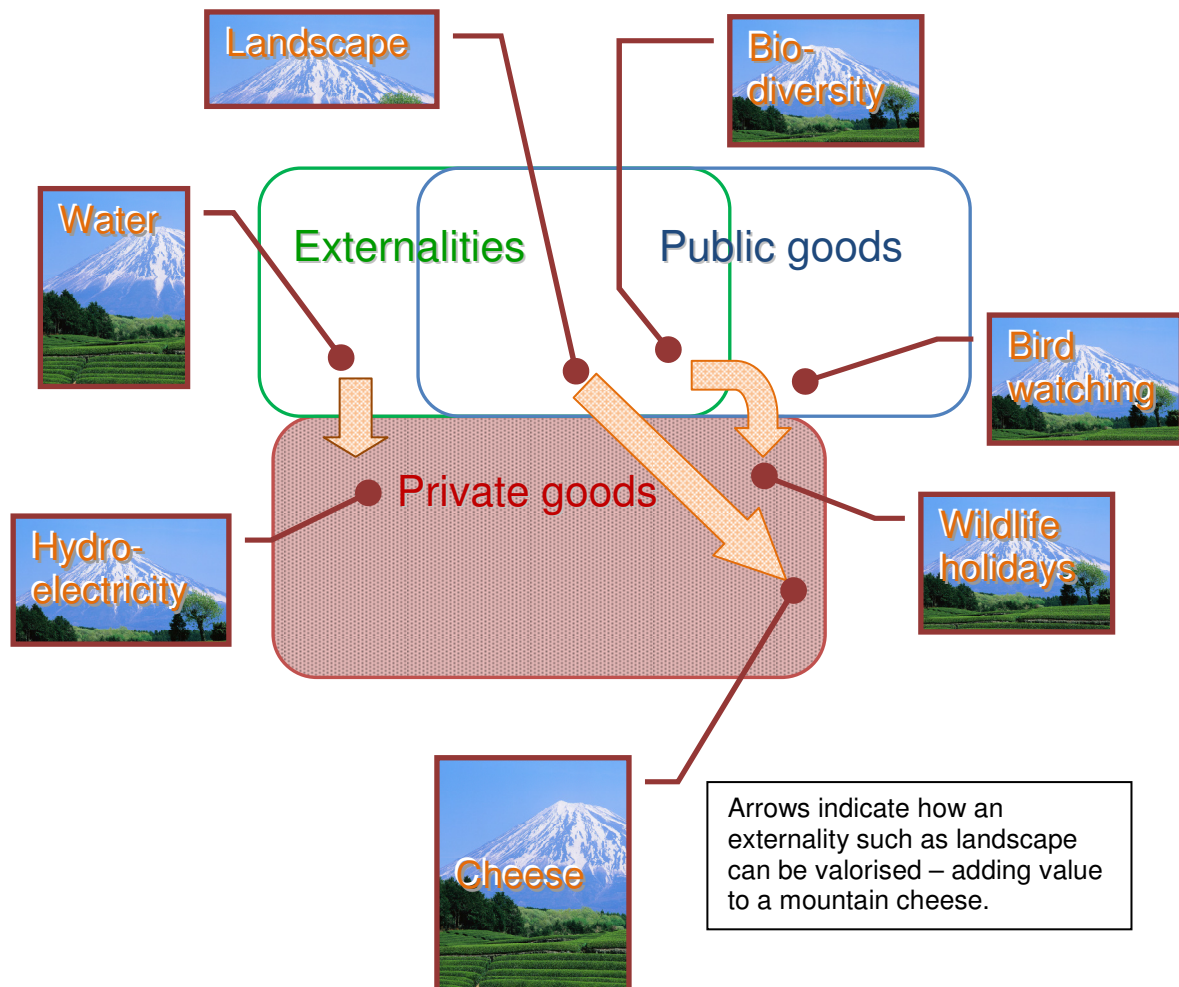
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<sup>5</sup> Payments for Environmental Services: for example paying farmers to continue to make hay, and by doing so retain<sup>ing</sup> biodiversity in the hay field.

## externalities

These factors often act in synergy. Increased economic activity through valorisation provides funds to pay providers of environmental services. Better environmental management increases the value of marketing and branding. A prosperous economy and investment in public goods discourages migration from the mountains and encourages in-comers. These people provide labour and capital for valorisation and environmental and cultural services.

**Figure 1 - externalities and valorisation**



If this combined approach is successful the overall economic status of the area will improve. However there may still be problems with the distribution of wealth. Wealthier and more powerful individuals and groups may capture the benefits, leaving the poorest no better off. In fact if positive externalities such as water supply are valorised by introducing charges the poor may be worse off. This applies to the poor in mountain areas as well as to those outside the mountains who benefit from positive externalities such as water supply.

The evidence reviewed in this report shows that well designed **policies for positive externalities can be pro-poor**. However badly constructed policies and inadequate institutions must be remedied if the poor are to benefit.

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## Mechanisms

The annex to this report shows that a wide range of mechanisms have been used to create development benefits from positive externalities. The most common are outlined here:

- PES may be arranged through private contracts between beneficiaries (water users, environmental NGOs) and providers (farmers, foresters), or by the state through public programmes. Sometimes beneficiaries pay direct: per litre of water, or each time they use a footpath. Alternatively an intermediate body such as an NGO or the state may set up a general agreement with providers to allow beneficiaries free access to the resource, such as biodiversity. In this case the agreements may be with individual providers, or with local groups such as agricultural associations.
- Valorisation may be done by individual businesses, such as when a farmer sets up tourist accommodation. It may also involve communal activity to market an area for tourism, or to set up facilities for local processing of milk to produce cheese. Public institutions may play a part by establishing brands that are protected in law (products of guaranteed origin for example).

These examples show that **both private and public sectors** have roles to play, and that they must act in a co-ordinated way.

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## The policy debate

At global level the policies that dominate mountain externalities and development are the drive for **sustainable development** (Gardiner, 2002) and **liberalisation of international trade** (World Trade Organisation, 2007). They are reflected in the OECD New Rural Paradigm which identifies the need for “place based policy” to replace sectoral rural policy based on agriculture (OECD, 2006). Mollard (2003) has suggested that territorially “specific markets” are better able to provide positive externalities from agriculture than more sectoral “generic markets”, and that this should be reflected in trade agreements.

Within trading blocks and countries a variety of policy responses exists. Some look forward and take account of global policy shifts, others remain backward looking, and many are in a transitional stage with unresolved contradictions (Bryden et al., 2006).

Some mountainous countries have mountain policies, which may incorporate the concepts and development aspirations described here. Other national policies may nevertheless influence mountain areas and conflict with the mountain policies themselves.

# Issues, recommendations, questions

## **A limited number of successful policies and programmes**

The material presented here has been drawn from existing literature and case studies, so it is clear that there has already been considerable discussion and research about positive externalities and sustainable mountain development. Yet there are relatively few successful policies and programmes.

What then is the problem? Are wider policy and environmental pressures so strong that they hinder externality-based development in the mountains? Is understanding of positive mountain externalities limited to a few enthusiastic development experts? Are the issues still too complex to allow reliable solutions to be developed? Or is the role of positive externalities in sustainable mountain development insufficiently recognised in national and international policy? These are the general questions. The following sections also raise more specific ones. Many of the issues were raised in the e-consultation conducted by the FAO SARD-M Project in collaboration with the Mountain Forum (SARD-M project/Mountain Forum, 2007) and some specific references to it are included below.

## **Environment and culture: highly valued but threatened**

A wide range of evidence presented here suggests that the environment and culture of mountain areas throughout the world are highly valued by society but that they are subject to rapid change and loss. Market mechanisms will not prevent the decline because these factors are positive externalities (and often public goods).

External pressures include economic competition, international trade policy, climate change, and social change. National policies may have perverse effects in mountain areas. Taken together, these influences erode positive environmental, social and cultural externalities, reducing their value to society and undermining the sustainability of mountain communities. The recommendations that follow are all designed to remedy these problems.

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## **Key economic issues: development stage and poverty reduction**

### **Development stage influences values and valorisation mechanisms**

The economic development stage of a country has an influence on the importance attached to positive externalities and the policy mechanisms used to influence them. Developing countries are likely to put more emphasis on environmental services such as water supply, and use privately negotiated mechanisms to manage them. Developed countries often give high priority to “amenities” such as biodiversity and use government funding programmes to deliver them.

There is not a complete distinction between the two types, so private negotiations are sometimes used in developed countries and public programmes are found in some developing countries. Global trading also means that amenities are becoming more important in developing countries, through wildlife tourism for example.

The balance between valorisation through the market (tourism, water, food processing) and payments for services through public/private funding (such as PES) varies between developed and developing countries. The mountain economy is likely to have a more diverse and stable base if the two are combined. Payments for services can help to ensure the continued supply of externalities, and thus underpin other valorisation in the long term. This link is highlighted in some of the recommendations and questions below.

### **A way to reduce poverty**

Poverty is a dominant issue in developing countries, but the relative prosperity of mountain areas is also an issue within developed countries. The distribution of wealth and power in mountain communities is an issue in both cases. Positive externalities may be a benefit that poor people have traditionally enjoyed without payment, and externality policies are quite likely to lead to an adjustment of property rights. Pro-poor policies may need to take account of this. At the same time, these policies may offer economic opportunities for the poor, through valorisations/PES, though they may simply favour the richer and more powerful members of the mountain communities.

Although it is obvious that developing countries often have significant problems with poverty levels, sometimes described as “absolute poverty”, the concept of poverty is complex and socially defined. So relative poverty, or deprivation, is also a problem in developed countries. It is an ethical issue that national policies seek to tackle, but it is also a development problem. Areas with high levels of deprivation tend to have weak economies, are a drain on public finances, do not make a full contribution to national well-being, and because of migration will exacerbate urban problems.

Some mountain areas in developed countries may in this sense present problems of deprivation, and that may undermine their ability to retain sustainable communities. Ultimately, this can reduce their potential to continue to generate positive externalities that benefit wider society.

**Recommendation – Policies dealing with externalities should include a poverty reduction objective. They should address equity in the distribution of benefits from positive externalities and from valorisation and payments for services**

Any successful policy or programme must be designed to address poverty issues. If this is done, poverty reduction can be an explicit objective of an externality-based approach. In some areas institutions are weak and poor governance contributes to poverty. This must be remedied before positive externality policies can be successful.

***Question – Can positive externalities trigger basic pro-poor actions by creating effective institutional structures that reduce poverty?***

*The importance of poverty reduction, and the role of institutions in addressing it, is widely recognised. Many policies and programmes already tackle the issue. Improving the delivery of positive externalities is likely to require institutional change, and if so can this provide a new stimulus for actions that will be pro-poor?*

## **Improving benefits from valorisation of positive externalities**

### **Beneficiaries pay, providers get**

Positive externalities are defined by their value to beneficiaries, yet we often know little about who these people are, what they want, or how much they want it. When we try to find out we descend into a jungle of economic theory and methods, and are often none the wiser. We should not abandon hope, however.

There should not be too much of a problem when positive externalities are used to add value to mountain products and services. This process requires good market intelligence, which is just another term for describing what beneficiaries want. There is more of a problem when environmental services and cultural heritage are delivered through PES or similar programmes. In these cases more effort is needed to identify beneficiaries and what they value. This information should provide the basis for any private or public funding programme.

The economic methods available to do so can be seen as a set of tools, none of which are definitive (see page 36). If chosen carefully there is usually one to illuminate the picture. They all have shortcomings so it is important to monitor beneficiaries and their values, not least because change may be rapid.

The issue of quality of life presents even more difficulty, though it is widely recognised as an important factor in sustainable mountain development. Economic tools are less reliable here, though systems modelling may at least illustrate some of the key influences (Bryden et al., 2006).

Finally, the distribution of externality benefits between social groups is critical for pro-poor policies. For this reason Sakuyama (2006a) highlights the need to clearly identify who benefits from services provided by PES. In a wider sense a highly inequitable distribution of benefits may pose fundamental problems for sustainable mountain development in any community. Policies can target assistance to poorer sections of society, so long as their needs are recognised in the first place.

### **Recommendation - Find out about beneficiaries**

This may require innovative thinking:

- Existing beneficiaries may take mountain externalities so much for granted that they are not aware of them (water users for example). Some of them may be poorer people who currently receive the benefits for free.
- Potential beneficiaries may not be aware of the opportunities (tourists for example)
- Changing conditions and uncertainty (climate change, for example) may create new beneficiaries. This may happen during a policy's development, during its life, or at some more distant time - people increasingly exposed to risk of flooding for example.

Valuation is an important part of this information gathering, but it should be used as a pointer, not a definitive judgement. Qualitative valuations may be more reliable pointers than quantitative ones in some cases.

The appropriate approach in a specific situation may be determined by its acceptability to the local actors. This is not necessarily a bad thing so long as techniques are used skilfully and their shortcomings are understood.

Improved understanding of beneficiaries is linked with the need to refine definitions and concepts of positive externalities, covered below under Evaluation.

### **Recommendation - Find out about providers**

Information about providers and beneficiaries are equally important, though the first may be easier to obtain. Some hidden processes may exist which conceal who influences externalities, though. Good understanding of local environmental and social processes is needed to uncover the relevant providers. For instance, a hunting association may not be the most obvious supporter of biodiversity, but if it manages a forest to provide game for shooting there may also be hidden advantages for rare plant species.

Providers' costs are an important issue, as they are likely to determine a minimum price for the externality<sup>6</sup>. If a PES programme does not offer sufficient incentives to cover the costs of the land management activities, farmers will not sign up to it for example. Some of the providers may be poor, and payments to them could alleviate poverty.

### **Linking payment for services with added-value valorisation**

Some types of positive externality can be valorised by adding value to products such as cheese and tourism. Others can be valorised by creating a new market, such as for water. Some positive externalities do not lend themselves to either of these approaches, yet they may play a critical role in mountain environment or culture, and they may underpin market-based opportunities. In this case specific programmes are required to ensure beneficiaries pay, and providers get. PES are the classic example of this.

However sustainable mountain development policies that rely on PES alone do not capture the full value of the externalities. So a mixed approach is needed. As well as making the most use of externalities a number of other advantages arise from a mixed approach:

- PES require assessment of demand from beneficiaries. This is also useful as market intelligence for other valorisation.
- Valorisation that adds value will benefit those involved in suitable businesses, such as tourism. Other groups in mountain communities may have little opportunity to benefit. PES help to widen the range of mountain people that benefit from positive externalities, allowing the policy to be more pro-poor.
- Local institutions can be involved in both PES and other valorisation. Positive and negative externalities, property rights, adding value, and PES can then be dealt with as linked issues.

### **Recommendation - Develop payments for services and valorisation through markets, and ensure there is synergy between them**

Wherever feasible PES or similar programmes should be used to bring positive externalities within the market and so ensure the sustainable supply of certain services. This does not necessarily require large public funding programmes. A variety of approaches to funding PES exists in mountain areas around the world. PES may involve foreign beneficiaries who provide funds through NGOs and agencies, national beneficiaries and funds, or local transfers between tourism providers and farmers.

So long as the stream of funding is sufficiently secure, and is based on the willingness of beneficiaries and providers to participate, it should be possible to meet local PES objectives.

<sup>6</sup> Where the purchaser is the state, prices may be forced to the lowest level because of the unequal bargaining power of the providers.

PES are unlikely to be sufficient on their own to take full advantage of the potential of externalities. Other valorisation activities are also likely to be needed. If so, synergy should be possible between the two: information from PES can contribute to product marketing and branding, for example.

**Question - How can the public and private sectors be brought together?**

*This paper argues that the PES must be combined with other valorisation if the supply of externalities is to be sustainable and they are to contribute to sustainable mountain development. It also argues that the private sector plays a key role in delivering positive externalities and valorising them. However the different cultures in public institutions and the private sector are likely to lead to tension because of different attitudes to risk, speed of response, and time horizons. What methods are available to bring them together?*

**The transaction costs of payments for services (such as PES)**

While PES and similar schemes are an obvious answer to the issue of positive externalities, the best way of delivering them is less clear. Transaction costs<sup>7</sup> are a fundamental problem that is central to the economic concept of externalities (Hodge, 2000). Sakuyama (2006b) identifies them as a particular issue for pro-poor PES. Although headline figures such as the cost of administering payments are important, it is more important still to establish how the costs relate to the stated objectives.

A PES programme with low transaction costs may spend most of its money in the wrong area and be paying the wrong people, compared with a programme that is carefully targeted but which results in high transaction costs. High transaction costs could also result if a programme has a strong participation and capacity building element. In these cases high costs may be justified.

Careful targeting is likely to improve transaction costs. Information on the resources (cultural and environmental) and providers is likely to be most useful, so Geographical Information System (GIS) analysis will help to identify priority areas. Transaction costs of PES schemes are discussed in detail on page 43.

**Recommendation – Assess the effectiveness of transaction costs and their contribution to sustainable development**

Two criteria should be used to assess them: the effectiveness of the budget in achieving PES (or similar schemes') objectives, and its contribution to sustainable mountain development. Innovative approaches such as involving local people in extension programmes, and offering incentives to communities that achieve PES objectives, may improve transaction costs.

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<sup>7</sup> The cost of establishing a contract between provider and purchaser, of verifying its delivery, and making payment - the administrative cost of a public funding programme, for example.

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## **Governance: a broad range of stakeholders at all levels**

Sustainable mountain development and the delivery of positive externalities are influenced by every level of governance. Trade agreements and international treaties, national and local laws policies and institutions, local communities and institutions, are all important.

The diversity of governance is so great that every mountain community seems to be different, and it is hard to identify any general principles. Perhaps the most important thing to understand is that there is a “nested series”<sup>8</sup> of institutions and that in most cases all of them will have some part to play in positive mountain externalities and development.

### **The private sector: a major stakeholder**

Externalities mainly arise from private sector activities, such as forestry and farming. As a result, the continued and increased supply of positive externalities is heavily dependent on private businesses. The private sector is also the main actor in valorising positive externalities to yield market benefits, such as by branding mountain products.

However simple definitions of government-private-community are inadequate to define the range of communal rights and activities (see p25). The definition “private sector” must be flexible enough to include a range of community ownership and management.

While the private sector is sometimes portrayed as independent and market led, it is also very dependent on institutional arrangements. Opportunities for branding are enhanced by appropriate legislation that can only be done by government, for example. Changing property rights, and changes to the reference point for environmental services (see p35), are important to businesses but are controlled by the state.

### **Participation and capacity building: two keys for success**

It is standard development theory to encourage wide participation from local actors, though practice varies. However positive externalities are especially dependent on effective participation because they are mostly public goods and are often managed in common. Community organisations of all types, including community businesses and communal-rights groups, should participate in planning and delivery.

Private sector businesses are likely to be key actors (forestry, processing, tourism, for example) though they may be unfamiliar with the concept of development based on externalities. Support and animation for this sector is likely to be particularly important.

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<sup>8</sup> Ostrom (2003) uses this term in relation to communal systems

Capacity building is a standard development tool, and here it particularly refers to the needs of the private sector and of communal-rights arrangements. Although they may be portrayed as being at opposite ends of the property spectrum, both have important roles to play in the delivery and valorisation of externalities<sup>9</sup>. There is a tendency for these roles to be neglected in comparison with higher level institutions and governance. Several examples quoted here highlight how capacity building has been critical to the effectiveness of policies and programmes, and that local institutions are an important resource in mountain areas.

**Recommendation - Ensure wide participation, especially of the private sector and community groups, and increase their capacity to play their part.**

Policies and programmes that do not use participation to take account of these characteristics at the planning stage are unlikely to be successful in the short term or sustainable in the long term. Special measures should be used to help private sector and community groups participate fully.

***Question - How can policies and the capacities of institutions be strengthened to take advantage of opportunities for communal activity?***

*Communal (collective) activity is a valued part of mountain culture. It is also essential to the achievement of some positive externality objectives. Are institutions and policies able to take advantage of the opportunities? If not, how can they be improved?*

**Recommendation – Increased efforts should be made to raise awareness of the general public and policy makers about the value and needs of mountain areas.**

Participation is not only important as an internal activity within mountain areas. Recognition and valorisation of positive externalities depends on people in wider society participating. By doing so they are likely to recognise the benefits and needs of mountain areas. The problems of lack of awareness of mountain issues was highlighted in the mountain e-consultation (SARD-M project/Mountain Forum, 2007). The evidence needed to allow better awareness is referred to below under Evaluation.

## **Effects of institutions and laws on mountain areas**

It is clear that institutions play a central role in successful mountain externality policies. The legal basis of property rights, protection of local products, planning controls, etc. is equally important. However the structure and nature of these influences is often based on models that do not suit the mountain situation. Institutions at all levels must be prepared to co-operate to achieve the goals of mountain externality policy, and appropriate laws must be developed where necessary.

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<sup>9</sup> Communal-rights groups are as much a part of the market as any other business.

**Recommendation – The structure of the institutions, their capacity to achieve mountain externality policy objectives, and their commitment to work together to do so, should be reviewed and changed as necessary. Relevant laws should be enacted, or existing strategies, policies or laws reviewed/implemented.**

## Evaluation, monitoring, adaptation, and research

Evaluation and monitoring are common development tools, but they are especially important for complex and novel issues such as externalities. Policy and programme adaptation is also an advantage in a changing climate.

**Recommendation – Monitor, evaluate and adapt. Communicate findings.**

Good evaluation allows externality related policies and programmes to be adapted in the light of experience. Multiple outcomes are desirable (and inevitable), so SMART<sup>10</sup> objectives can be used to ensure they are achieved. The information that results should be communicated to wider society to improve recognition of positive externalities.

**Question – What practical needs should R&D focus on, and are there new concepts and experience that should also be addressed?**

*Externalities raise some interesting economic issues, and a range of research is underway. Only a limited amount of it will relate to mountains, and little of that will be of direct practical use. At the same time mountain policies and programmes are under continuous development, and monitoring and evaluation information is available. Is it possible to achieve better links between research and policy development? In particular would more “action oriented research<sup>11</sup>” help in the evaluation of current initiatives, as well as contributing to the development of theory and practice more widely?*

*There is also a need to refine concepts in this field. Perhaps heterodox economic theory has something to offer here (see p1)?*

*Although general principles have been identified by the SARD-M project, dissemination of detailed practical experience is difficult. There is such diversity of mountain conditions around the world that it is not easy to identify the most relevant analogous cases. Is there a need for more effort to go into mountain networks, at the regional or global scale? If so, how should the networks disseminate information? Would a standard set of case study topics be helpful?*

<sup>10</sup> A widely used description of well defined objectives, that are: **S**pecific, **M**easurable, **A**chievable, **R**ealistic, and **T**ime-bound.

<sup>11</sup> Problem solving action combined with analysis, often based strongly on participation

## **An integrated and holistic approach to the mountain system**

The logic of market economics tends to lead to an atomistic approach to describing externalities, providers, beneficiaries, and so on. Yet it is clear that mountain communities and economies have a strong identity and differ from the wider areas that surround them. So it is also important to think of this system as an entity in itself.

This helps in understating how external pressures, particularly economic competition and climate change, could lead to complete collapse of some communities and abandonment of land and settlements. When this happens the positive externalities, and the scope for society to benefit from them, are likely to disappear. There will be no facilities for tourists to enjoy the mountains, and both landscape and biodiversity will have changed radically, for example.

There is thus an argument to be made that the basic mountain infrastructure of human settlement must also be supported by any policies aimed at externalities and valorisation (Levret and Viatte, 2007). This can also be described as maintaining occupation of the land, or maintenance of the cultural landscape.

### **Recommendation - Look at the whole development and policy system**

It may not be possible to map out all the links between externalities and economic social and environmental development factors, but they exist and it is wise to take account of this. Participation may be a way of bring multiple perspectives and experience to bear, from the bottom up. Systems modelling as used in the Top-Mard programme (Bryden et al., 2006) may be possible in some cases.

Mountains are not as isolated as we sometimes think, so international, national and local policies may have perverse or distinct impacts in mountain areas. It is particularly important to examine how these policies currently affect the delivery and valorisation of positive mountain externalities. Equally, it is important to check how they might affect proposals for externality related policies and programmes.

### **Recommendation - Use cross-sectoral programmes**

It may appear administratively simpler to tackle narrow issues with narrow plans. Results are easier to measure and programmes are more focused (the standard approach of one policy – one measure). However the complexity of mountain communities, the links between externalities and the market, and the scope for synergy, suggest that a simple approach will not be the most effective. OECD (2001) highlights the need to assess whether the standard approach is appropriate when multifunctionality is involved.

Development approaches such as sustainable-livelihoods highlight both the need to tackle multiple issues and the scope to achieve multiple objectives. Even within a relatively narrow field such as PES it is normal to deliver several positive externalities at the same time – forestry measures can provide biodiversity, soil protection, water services and carbon sequestration for instance. This is a strength rather than a weakness, so long as the policy or programme is well managed. Heimlich (2000) suggests that, in practice, multiple objectives are better served by analysis of their cost-effectiveness in meeting specific objectives, rather than by attempts at valuation of the benefits delivered.

**Question – How can integrated policies and programmes be combined with precision about the outcomes they should achieve? How can institutions be persuaded that integration will deliver better results?**

*Interdependencies exist between different positive mountain externalities, and between them and aspects of sustainable mountain development. This leads to the conclusion that policies must recognise multifunctionality and aim to achieve a broad range of objectives. This maximises the potential to create synergy between different factors. Yet it is difficult to deliver positive externalities effectively without being able to measure specific sectoral outcomes, based on SMART targets, etc.*

*Many past examples have tended either to be integrated and to address broad objectives, or to be narrowly sectoral and precisely targeted. Is it possible to develop policies which both support multifunctionality and are sufficiently precise?*

*How can development institutions accept that this approach is best, despite the greater difficulties of tying specific sources of funding to specific outcomes?*

**Question – How important is “quality of life” to sustainable mountain development?**

*This expression includes many of the more intangible factors in sustainable mountain development, yet it may be a key factor in development for many areas, particularly in developed countries. Can we use our growing understanding of what beneficiaries seek from externalities to improve our understanding of quality of life and its role in sustainable mountain development?*

The scope and importance of quality of life is illustrated by the example of mountain dwellers who are pluri-active: they have one or more jobs generating income, and also do other more traditional work that often creates positive externalities. The balance between their need for income, their wish to continue cultural traditions, and the place they choose to live, is a reflection of their perception of quality of life. It has direct impacts on the provision of positive externalities and on the sustainability of the community. Income levels are an important factor in quality of life.

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## Summary of recommendations

- Policies dealing with externalities should include a poverty reduction objective. They should address equity in the distribution of benefits from positive externalities and from valorisation and payments for services
- Find out about beneficiaries
- Find out about providers
- Develop payments for services and valorisation through markets, and ensure there is synergy between them
- Assess the effectiveness of transaction costs and their contribution to sustainable development
- Ensure wide participation, especially of the private sector and community groups, and increase their capacity to play their part
- Increased efforts should be made to raise awareness of the general public and policy makers about the value and needs of mountain areas.
- The structure of the institutions, their capacity to achieve mountain externality policy objectives, and their commitment to work together to do so, should be reviewed and changed as necessary. Relevant laws should be enacted, or existing strategies, policies or laws reviewed/implemented.
- Monitor, evaluate and adapt. Communicate findings.
- Look at the whole development and policy system
- Use cross-sectoral programmes

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## Summary of questions

- Can positive externalities trigger basic pro-poor actions by creating effective institutional structures that reduce poverty?
- How can the public and private sectors be brought together?
- How can policies and the capacities of institutions be strengthened to take advantage of opportunities for communal activity?
- What practical needs should R&D focus on, and are there new concepts and experience that should also be addressed?
- How can integrated policies and programmes be combined with precision about the outcomes they should achieve? How can institutions be persuaded that integration will deliver better results?
- How important is “quality of life” to sustainable mountain development?

# Annex 1: Evidence and experiences

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## Positive externalities

Inhabited mountains exist across most latitudes and from continental interior to oceanic islands. The UNEP mountain map (UNEP, 2000) shows steep and high alpine terrain, plateaus, and older rounded areas. Despite this range, which takes in Norway, Equador, and Patagonia, mountain areas have similarities and are distinct from neighbouring plains.

Strathspey estate in Scotland (57°N 4°W, 300-700m) has biodiversity conservation as one of its main land management objectives (Euromontana, 2005). Large areas are protected under EU and national law, and the state finances regeneration of forest and moorland through PES. The same issues are being tackled in a completely different context in Colombia (4°N 75°W, 900-1300m) where a silvo-pastoral project is encouraging biodiversity conservation on degraded pasture areas using PES (Pagiola et al., 2005a).

Water is also a unifying feature. The PASOLAC programme aims to improve water supply in pilot areas in Central America. It does so by working with water consumers and land managers, and supporting farming and forestry techniques that improve water supply (Euromontana, 2005). In the EU, the Italian province of Turino has developed a programme of land and watercourse management to reduce flooding (Euromountains.net, 2006), which provides funding for farmers and mountain communities. It is intended as a more effective and less expensive alternative to emergency works in response to flooding.

Mountain cultures and traditions vary widely, but every country and area recognises their importance. In Japan the terraced rice fields known as Tanada are a valued tradition, which allows urban dwellers to be a part of their cultural history (Euromontana, 2005). In Norway the Jostedal community created the “Use of Nature” project, which celebrates the traditions associated with life around Europe’s largest glacier (Euromontana, 2005).

Although these environmental and cultural features differ between the mountain areas, they are all locally distinct. They are valued because of their high quality. Across all mountain regions these services are in demand.

## Economic development stage and the value of positive externalities

The stage of a country’s development may be an important influence on the value attached to its mountains. The overall wealth of its citizens is likely to have a strong influence on demand for positive externalities. The wealth of mountain communities may affect their ability to deliver positive externalities and to valorise them into market goods and services.

A study of tourists in Austria (Pruckner, 1995) asked them to state how much they would be willing to pay to retain the agricultural landscape (contingent valuation). The overall response was about \$1 per day, with Austrians offering slightly higher rates. Multiplying this by the number of tourists gave a total value similar to the public funding of mountain farmers in Austria at that time (1991). Some local communities had recognised the association between tourism and farming, and were voluntarily offering their farmers financial support at about the same rate.

An alternative approach to the same question has been reported from Morocco (Khalil, 2004). This study compared the prices of farmhouse accommodation in the High Atlas mountains to estimate how much tourists pay for better landscape and environment (hedonic pricing). The highest prices seemed to be for farmhouses near both forest and agricultural cultivation, with farm animals nearby. Each of these increased rents by about \$2-3 per week, around 10-15% more than the average.

The two studies deal with the same broad category of beneficiaries – tourists with high levels of disposable income – and the values they attach to landscape and environment are of the same order. Pezzini and Wojan (2002) have pointed out that this type of amenity is a luxury good for which demand emerges after basic needs are met. If this is so, the development stage of a country should influence the value attached to different positive mountain externalities, with “amenities” differing from “regulating services”<sup>12</sup>, such as flood prevention and water quality (UNECE, 2006).

Rojas and Aylward (2002) describe how services in La Esperanza watershed, Costa Rica, are negotiated. The aim is to conserve the watershed forest in order to maintain stable streamflow to a hydro scheme and reduce sedimentation. The agreement is long term and adds around 20% to the operating costs of the power plant, with payments linked to inflation, power production, and area of forest maintained. The service provider in this case is a landowning NGO, established to conserve natural forest. Only a few households use the forest, and none live in it, so there is limited land management activity.

Water services feature strongly in a review of eight studies of forest environmental service projects in Central and South America (Grieg-Gran et al., 2005), particularly in mountain areas. In several cases the payments cover a basket of forest environment services. Local water companies or municipalities pay for water services, whilst external companies and NGOs fund carbon sequestration and biodiversity.

Levret and Viatte’s (2007) synthesis of views from mountain development specialists around the world suggested that positive externalities tend to be better recognised in developed countries. In developing countries there are some positive cases, but there is a wide range including negative experiences. Participants from all regions highlighted the need for better measurement of positive externalities, and the importance of explaining the benefits to society at large.

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<sup>12</sup> Or “life-support systems”.

These examples and other evidence suggest that the development stage of the country does indeed have an effect on the value attached to positive externalities, with beneficiaries in less developed countries attaching highest value to essential environmental services such as water. It is nevertheless clear that in the global economy such projects can also attract payments from foreign beneficiaries seeking “amenity” values such as biodiversity. Carbon sequestration fits neither category as it concerns an essential environmental service but is largely funded by carbon-offsetting measures in industrial economies.

## Economy and valorisation

Every area, and every business, has a different set of economic opportunities and constraints. Balliefurth farm in the Scottish Highlands (Euromontana, 2005) is an example of how to benefit from a variety of opportunities determined by the locality. The farm is located in a national park where there is demand for recreation and accommodation. PES are available for managing biodiversity and maintaining the flood plain. The agricultural commodity opportunities are limited but there is a market for high quality beef, sold direct to the consumer. A mix of payments for externalities combined with other valorisation activities has allowed the farm to use local opportunities to maintain both economic activity and the supply of externalities.

Rodriguez and Pascual (2004) describe a contrasting example in Ayacucho, Peru. Here the opportunity to develop a high value product, cochineal, through forest clearance has created economic benefit for certain social groups. Some negative externalities result, including loss of biodiversity and water services, and soil erosion. These costs are imposed on other groups locally and more widely. In this case some of the locally specific opportunities are being pursued, though it is not clear that positive externalities are being used to add value to the product. The value of existing environmental services does not seem to have been taken into account.

In another part of Europe, the Haut-Jura Regional Park (France), has a variety of opportunities that provides the economic base. Market based agricultural and forest production continue whilst providing a range of externalities (Institut d'Elevage, 2006). These include the cultural landscape, biodiversity, and opportunities for hiking and skiing. Added value products such as Bleu de Gex cheese and tourism are integrated with PES to provide a combination of valorisation activities.

The most obvious difference between these cases is the availability of PES. Without these payments it is hard to maintain the flow of positive externalities. Another question is whether the opportunities for valorisation have been fully exploited. In the Scottish national park and the French regional park, with strong market identities and accessible high spending consumers, it is perhaps easier to do so than in the Peruvian Andes.

Sakuyama (2006b) compares the role of PES in developing and developed countries. They are less common in developing countries, where they are more common in forestry than agriculture, and where they rely more on privately negotiated contracts than government programmes.

## Mountain culture

Mountain areas have strong cultural identity and tradition, which as we have seen are themselves positive externalities. The “providers” culture also influences their valuation of externalities. In the same way cultural variation amongst beneficiaries influences their valuation. The ways in which the two groups value culture inevitably influences the opportunities for valorisation. This is a complex interaction, and it varies widely from one area to another, so it requires particular emphasis.

### The value of mountain culture

In the UK, hill farmers in Cumbria had quite a different idea about their role compared with urban residents only 100km away (Euromontana, 2005). Farmers valued their farming skills and farming networks much more highly than did the urban population. On the other hand farmers valued scenery and tranquillity much less than the urbanites.

A study in SE Spain (Sayadi et al., 2005) shows a more positive link between visitors’ attitudes and active agriculture. Visitors ranked active small scale farming as the most highly landscape feature, and abandoned fields the least. The farmers would probably agree.

In developing countries the cultural values of indigenous people may link with positive externalities. Indigenous farmers from the Purhepecha community of Mexico strongly value their land and soil management traditions (Barrera-Bassols and Zinck, 2003). These contrast with modern agricultural principles, which place less emphasis on externalities (positive and negative).

With this degree of variability it is important to establish the cultural values of both the providers and beneficiaries of externalities, on a case by case basis.

### Culture and valorisation

Certain characteristics of mountain culture are both a positive externality valued by the rest of society and an important factor in endogenous development. Pezzini and Wojan (2002) emphasise the importance of trust and reciprocity between local actors, who must work together to deliver amenities or to valorise them. These behavioural norms are traditionally strong in mountain communities and are the basis of communal activities. Pezzini and Wojan (2002) point out that they will not necessarily be transferred to new activities, and that institutions must be designed to support and not threaten these values.

Ostrom (2003) cites classic examples of mountain communities where communal property rights are long established. She emphasises that a variety of communal rights can exist and describes attributes that are most conducive to them. This suggests that cultural traditions of this type are important for obtaining positive externalities from traditional activities. Cultural traditions should also provide a basis for the development of new community based approaches to externalities. But a firm grasp of the principles involved is required if new approaches are to be successful. Dietz, Ostrom et al. (2003) point out that more governance tools are available to manage common resources than is often recognised, and that community based approaches can make an important contribution to sustainable mountain development.

Traditional mountain cultures would seem to have an important role to play in externalities. The distinction between this and the previous section on governance is rather artificial, because local culture and institutions interact so strongly (or at least, they should).

A final point concerns the importance of change, which was highlighted above. Traditional culture provides social capital that should help in coping with change. It may also present some barriers to development. Gender issues, highlighted in the Mountain Forum e-consultation (SARD-M project/Mountain Forum, 2007), may be one example.

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## **Institutions and governance**

The “ideal” economic market is self-organising. However externalities are by definition non-market so a variety of institutions and governance processes are likely to be involved in their management. The way institutions value positive externalities is significant. Equally, they have an important role to play in valorisation. This obviously applies at local level, but Levret and Viatte’s (2007) review also highlights the need for a national vision supported by national action.

### **Institutions role in assessing value**

Several of the examples here illustrate the role of NGOs, which may be small national groups, perhaps dealing with only one or two sites, or large international bodies active in many countries. The presence of NGOs, the scale of their funding, their objectives, and they extent to which they engage with other development actors varies widely from one mountain area to another. In many developing countries their valuation of positive externalities has an important influence on sustainable mountain development.

A range of governmental bodies may also be involved, if their valuation of the positive externalities is sufficiently high. The Maasin watershed rehabilitation project in the Philippines illustrates the complex range of local and national government institutions that may contribute (Garnache, 2006). Here the objective was to reforest and manage an upland watershed to improve water supply and quality for Iloilo City, and to maintain farmland irrigation. The regional government initiated the project and secured assistance from national departments for environment and economic development. The work was delivered through contracts with community partners. Communities were encouraged to engage with the work through a major information campaign, supported by an international NGO. All these actors had to be satisfied that the benefits were of sufficient value to justify their involvement, and inevitably some conflicts arose about this (Rosales, 2003).

At supra-national level government bodies may also have a role to play in valuation. EU agricultural policy has long included special measures for “less-favoured areas”, most of which are mountainous (Council of the European Union, 2005). With increasing pressure to focus on the value and supply of public benefits, rather than on compensation for agricultural disadvantage, new approaches are being tested. One of these is based on the concept of High Nature Value farmland (HNV). This defines areas of high biodiversity that are dependent on agricultural management (European Environment Agency, 2004). Although not confined to mountains, HNV is relatively abundant in mountain areas. The HNV map being developed may provide a basis for targeting agri-environment payments (PES) in the future.

Institutions and governance are probably the most variable features of mountain areas, with considerable differences even between neighbouring countries. Within a single country different types of positive externality may require different institutional actors to be involved. Their valuation of externalities is a critical issue for successful policy and programme development.

## **Institutions’ role in valorisation**

If policies can do anything, they can surely influence the institutions involved in development. So this is a critical group of factors for positive mountain externalities. Although it is not possible to describe all the relevant issues here, the following three examples highlight the range and importance of institutional issues.

In Costa Rica PES were established through the 1997 Forestry Law, and are administered by the National Fund for Forest Financing (Pagiola et al., 2005b). This provides a national approach, and also establishes a standard that is reflected in some privately negotiated PES, such as La Esperanza watershed discussed above.

China's Grain for Green Program provides payments to mountain farmers for returning steep agricultural land to forest. This provides ecosystem services of water, soil, and biodiversity management. However it reduces the area of cultivated land for many subsistence farmers which could have increased unemployment and poverty. In order to make this scheme work in Songpan County (Hindu-Kush Himalaya region), the regional government ensured participants received grain, had technical assistance with forestry, and had access to new job creation schemes such hydro-power development (Luo, 2006). The combination of central government funding and regional government development projects and advice has ensured the programme met economic, social and environmental objectives.

Merlo, Milocco et al. (2000) reviewed the valorisation of forest recreational services in four EU countries and identified three institutional factors.

- Legislation at state and national level determines property rights such as the right to collect fungi, and the right to label and certify products by their origin.
- Land use is controlled by development planning through zoning and protective designations.
- At local level licences and standards control detailed aspects of production and marketing.

Their work showed that in some countries changes were required in these factors to facilitate valorisation of externalities.

In another part of the Hindu-Kush Himalaya region shifting cultivation presents a challenge which institutions may not be well equipped to tackle. Policies here encourage agricultural settlement in place of the traditional shifting cultivation pattern. This may lead to loss of externalities such as forest biodiversity, increased poverty by exclusion from land rights, and loss of local food security (Choudhury, 2007). The relevant institutions may have particular difficulty with the issue of communal land-rights.

An extreme example of how things can go badly wrong is reported in Alston, Libecap et al.(2000), though not from a mountain area. Here, policies and institutions designed to protect Brazilian forest, to encourage redistribution of land, and to avoid conflict had the opposite effect. Deforestation and violent conflict were encouraged by the institutional arrangements.

The Turkish concept of Mountain Zone Management is one approach to tackling governance difficulties (Gönençgil, 2007). Like Coastal Zone Management (see OECD (1992) for example) it may provide a useful way of linking diverse governance processes.

This small set of examples shows how institutions are key factors in both the management of externalities and their valorisation.

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## Change

Perhaps the most unifying feature of mountain areas is the extent to which they are now subject to change. Economy, politics, and environment are all changing rapidly. Mountain traditions may be strengths in certain ways, for example through strong social capital and communal traditions. In other respects mountains are exposed to novel economic and environmental trends for which they are not prepared. Intensified economic competition arising from globalisation, and environmental pressure from climate change, are the most obvious.

Change is likely to increase the value society attaches to mountain culture and environmental services. At the same time change will severely threaten the extent to which mountains can maintain the quality of these externalities. MacDonald, Crabtree et al (2000) have highlighted how land abandonment in Europe can lead to environmental degradation.

# Annex 2: Definition and elements of problematique

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## Externalities

### What do we mean?

*Externalities* are defined as being a side effect of an economic activity such as agriculture. This means that they are external to the transaction of meat or crops, for example. When farming practices change, the supply of externalities also changes, often in an unplanned and uncontrolled way. This is typical of externalities. A number of similar terms and definitions exist and there is considerable overlap between them. For simplicity this paper refers to externalities, but most of the discussion is equally relevant to the wider definitions.

Externalities are not always benefits like the ones listed above. They can be negative, such as pollution or floods. A high level of human migration from the mountains may lead to social problems and be considered an externality. The economic term for this is *negative externality*. This paper suggests that human activity in the mountains mostly produces *positive externalities*, but it is important to remember to look at the whole picture and to assess the net effect resulting from both types.

Many externalities are also *public goods*. This means they cannot be bought and sold in the normal way, but are freely available to everyone. Because there is no market for them it is hard to estimate their value and cost. This presents a challenge for economists and policy makers. It also means that individuals are not normally motivated to produce public good externalities even when other people benefit from them.

The picture becomes more complex when we look in detail at specific resources. Take water as an example: it flows from the mountains, it is influenced by many land management practices, but it is not owned by individual or groups of land owners. However its value can be captured in various ways, and the products can then be sold in markets for hydro-power, irrigation, and drinking water. Is it an externality and a public good? The answer is yes, and no. Like most other resources in this category it is not a pure externality, nor is it a pure public good, because it has some links with the market.

This is an important issue because it affects the mechanisms available to manage the supply of externalities – to increase the supply of water for example. It also affects the role an externality can play in sustainable mountain development – is it an asset that can be marketed in the local economy for example?

*Multi-functionality* is a useful term to describe the way a single activity, such as farming, can deliver several types of economic output including externalities. These are termed *joint* outputs. Many rural activities are multi-functional (Pezzini and Wojan, 2002) and in the mountains this is particularly so. OECD (2001) identifies that joint outputs may be inseparably linked, and highlights territorially specific links. This is consistent with the idea that mountain areas may have particular characteristics, such as joint production of externalities through agriculture, and that these are different from non-mountain areas.

From a multi-functionality perspective, it is difficult to influence the supply of the externality without also influencing the main commodity. The biodiversity of hay meadows is inextricably linked to animal production, for instance.

OECD work on multi-functionality (OECD, 2001) has identified that both difficulties and advantages arise as a result. Efforts to control the externality (biodiversity) can lead to market distortion for the commodity (sheep). On the other hand it is possible to develop good policies for specific areas and they can be quite efficient to deliver. A policy for the sheep/hay meadow system in an Alpine valley would be an example.

One of the key issues associated with externalities and public goods is market failure. If water is free, for instance, people use large quantities. At the same time farmers are not paid to produce water so they may not manage the soil to maximise streamflow. If the value of the positive externality can be internalised by creating a market for it, by pricing water for instance, it will be used and produced more efficiently. The term *valorisation* is used here to describe this process (economists also describe this as *transformation*).

Tourism based on biodiversity is a classic example of valorisation. Food products marketed using images of mountain landscape and communities are another. Valorisation not only improves the supply of the externality but also plays a crucial role in local economic development

## Public goods

[“Good” is used here to mean a commodity or service. It does not mean the opposite of “bad”.]

Two economic concepts determine the extent to which a resource is classified as a public good:

- Excludability – is it possible to prevent anyone from benefiting from the resource? In the case of clean air it is hard to see how it can be parcelled up and controlled, so no-one can be excluded from it, and it is a very pure public good. Water is rather different because some people can be excluded from it by building dams and diverting rivers. So in some ways it is part of the market, and not solely a public good.
- Rivalry – if more people use a resource will there be less or none left for anyone else? In most cases the beauty of a mountain landscape is not rivalrous because there is no limit to the number of people that can enjoy it. Particular sites or trails may become overcrowded though, in which case people’s enjoyment declines. So there is some rivalry in outdoor recreation, and to a lesser extent in enjoyment of the landscape.

Goods which are not completely excludable and rivalrous are public goods, to some extent.

## What are mountain externalities?

Over the past decade a number of reports and meetings have considered externalities created in the mountains and there is broad agreement about what they are. One or two factors are still subject to debate. The likely list of externalities includes the following (drawing on Crabtree, MacDonald et al (2002), Moxey (2006)):

**Table 2 - Main types of externality in mountains**

| Positive                                  | Negative   |
|---|--|
| Biodiversity                              |  |
| Flood and soil protection                 | Flooding and erosion/sedimentation   |
| Water quality and supply                  | Pollution (especially in water)  |
| Carbon sequestration                      |  |
| Avalanche protection                      |  |
| Fire protection                           | Fire   |
| Cultural landscapes                       |  |
| Outdoor recreation                        |  |
| Rural communities and cultural traditions | Out-migration to urban poverty; Cost of supporting non-viable mountain communities |

Other possible externalities include food and timber security, poverty reduction, employment, health, and education. These are not always pure externalities as defined above. FAO (2007) points out that when minimum standards for poverty have been set any failure to meet them can be seen as a negative externality. In France, the Permanent Assembly of Chambers of Agriculture (APCA) has documented a number of ways in which farms offer health and social benefits to disadvantaged people and those with disabilities (Bigourdan, 2007).

Some externalities listed in the table are not pure either: both water and recreation may be deliberately provided, and charged for. Increasingly there is a market for carbon sequestration.

This shows how a flexible approach to understanding and managing externalities and public goods is required, because of problems of definition and changes over time. It also shows that there is potential to valorise them in ways that will benefit economic and social development. The list of externalities does not seem very specific to mountains though – does it not apply to other rural areas too? Only in part. In mountain areas cultural landscapes and traditional land-uses are common, whereas the scope for intensive land-use and mechanisation is limited. So the positive externalities in mountain areas tend to be higher than in most plains areas. Hodge (2000) cites mountain areas as classic examples of agriculture's positive externalities, with high cultural and environmental value and a reliance on collective activity.

## Who is involved?

Any externality has a benefit or cost to someone, so it is important to identify who that is<sup>13</sup>. For instance the beneficiaries of mountain culture are mainly residents and visitors who participate in cultural events, and non-visitors who wish to know that cultural traditions continue.

<sup>13</sup> This paper uses the term beneficiary because of the emphasis on positive externalities.

Externalities are provided as side-effects of other activities so it is also important to identify who is providing them. For biodiversity, the providers are mainly farmers, foresters, and other land managers. Their management practices influence the quality and quantity of biodiversity.

**Table 3- main providers of positive externalities in mountains**

| Positive externality                      | Produced by |           |                          |                     |                          |
|---|-------------|-----------|--------------------------|---------------------|--------------------------|
|   | Farmers     | Foresters | Hunters and associations | Other land managers | Wider mountain community |
| Biodiversity and cultural landscape       | ✓           | ✓         | ✓                        | ✓                   |                          |
| Outdoor recreation                        | ✓           | ✓         | ✓                        | ✓                   |                          |
| Flood and soil protection                 | ✓           | ✓         |                          | ✓                   |                          |
| Water quality and supply                  | ✓           | ✓         |                          | ✓                   |                          |
| Carbon sequestration                      |             | ✓         |                          |                     |                          |
| Avalanche protection                      | ✓           | ✓         |                          |                     |                          |
| Fire protection                           | ✓           | ✓         |                          |                     |                          |
| Rural communities and cultural traditions | ✓           | ✓         | ✓                        | ✓                   | ✓                        |

Third parties are particularly important in valorisation of externalities by adding value to goods and services in mountain areas. For outdoor recreation, third parties are the tourism operators. They provide tours, market destinations, and provide accommodation. Externality providers are often also involved in valorisation, through farm tourism and local product marketing. The following table distinguishes between providers who are simply land managers, and those who have diversified businesses and therefore also act as third parties in valorisation.

**Table 4 – Examples of roles in valorisation**

| Product                                   | Land managers – land based | Land managers' diversified activity and non-land based businesses |
|---|----------------------------|---|
| Food processing                           | ✓                          | ✓   |
| Tourist accomodation                      |                            | ✓   |
| Other tourism services                    |                            | ✓   |
| Forest product processing                 | ✓                          | ✓   |
| Water supply                              | ✓                          | ✓   |
| PES (Payments for Environmental Services) | ✓                          |   |
| Quality/origin branding                   | ✓                          | ✓   |
| Arts and cultural products                |                            | ✓   |

In practice there is often a lack of information about the providers' beneficiaries' and third parties' roles in positive externalities and the values they attach to them. Where information does exist there is often a lack of information flow between the groups. Both factors reduce the potential to create benefits from positive externalities.

Many externalities are also public goods so a number of economic principles must be followed if externalities are to play a full role in development (Pezzini and Wojan, 2002).

- The first concerns beneficiaries. They should pay for the benefits they receive, which is known as the Beneficiary Pays Principle (BPP).
- The second concerns providers. They should be paid for the work they do in providing the benefit. This is known as the Provider Gets Principle (PGP).
- The third also concerns providers, but relates to negative externalities. In this case providers should pay the costs, which is the more familiar Polluter Pays Principle (PPP).

The last of these is well established in laws around the world, though it is less commonly applied to diffuse pollution from rural activities. The other two principles are not so common. A range of experience of using them is now available and is discussed in this paper.

The PGP and BPP principles do not only apply to new services and activities: existing positive externalities can be secured and provided more efficiently by making payments for them. Indeed if these principles are only applied to new activities then they are likely to have perverse effects. For example payments to establish forestry for water management may lead farmers to stop keeping livestock, leading to loss of biodiversity.

Sakuyama (2006b) has highlighted the balance between supply and demand that should influence payments for positive externalities. He also describes the prevailing trend for increasing demand and reducing supply.

One important influence on these points is property rights (Hodge, 2000). A person's right to receive certain benefits from externalities (access to land for recreation), their right to create disbenefits (pollution), and their duties to create benefits (protect biodiversity), may all be established as property rights.

For instance, in some countries landowners can prevent other people using their land for hiking. They may then be paid to maintain paths and allow people to use them (payment for an externality). In other countries everyone has free access to land for hiking, by law, and landowners cannot prevent it and are not paid for it. Hodge (2000) describes the distinction between property rights and non-market goods as a reference point that changes over time. It is important to remember that this is not simply a question of individual rights - a wide range of types including common rights also exist in law (Ostrom, 2003).

## **What are positive externalities worth?**

Valuing externalities is not just a sterile economic exercise, nor does it simply involve giving them a price. Many policies that affect mountain areas will influence the supply of externalities, so policy makers have choices about what to encourage and what to discourage. Should the priority be to encourage farming practices that reduce flooding, or to support farming that favours biodiversity, for instance? Unless there is some evidence about the value that groups in society attach to mountain externalities there is no way of comparing options.

Different types of externality need different types of valuation, and what might be good for valuing biodiversity is unlikely to be good for valuing pollution. Some approaches attempt to assign a price to the externality, whilst others adopt a more "open" approach to discovering value (Foster and Grove-White, 2000). When valuation does estimate a price it may be a notional one based on what people say they would pay (stated preference). Alternatively it may be based on trying to separate out the proportion of people's actual spending that is related to an externality (revealed preference).

The choice of valuation method is extremely important as inappropriate methods can lead to biased estimates. It may also be better to value a package of benefits, such as a cultural landscape, and not attempt to break it down into elements (Santos, 2000).

## Valuation

### Types of value

OECD (1999) describe four types. The appropriate valuation methods will depend on what type of value is of interest. The types are:

- Use value – where people obtain direct benefits from using something (e.g. watching birds near your home)
- Option value – where people benefit from knowing they can use something in the future (e.g. possibility of going somewhere new to watch birds)
- Existence value – where people benefit because they know something exists (e.g. knowing birds exist far away, although you will never go there to watch them)
- Bequest value – where people in the future may obtain benefits (e.g. your grandchildren will be able to watch birds)

### Valuation methods

- Stated preference valuation is based on asking people how much they value a non-market good which they do not at present pay for directly. It provides a monetary value: “on average people say they would pay \$x to preserve this landscape”.
- Revealed preference valuation identifies the proportion of people’s existing spending that can be attributed to a non-market aspect of a traded good: for instance the proportion of the price of a house that arises from the view of the landscape, or the amount someone will pay to travel to enjoy a beautiful place.

From a development point of view, stated preferences only involve “theoretical money” whereas revealed preferences are “real money”. The second are already part of the local economy, whereas the first are only a potential part of it. Unless the potential can be realised in some way (through PES and/or other valorisation) the value cannot contribute to economic development.

## Other approaches

There is also an alternative way to approach externalities, based on capital stocks. Sustainable development theory draws heavily on this concept (Parris and Kates, 2003; Pearce and Atkinson, 1993). Rather than focusing on the services provided as externalities, this approach looks at the extent to which capital assets are increasing or declining. In practice there is little difference between the policies that result.

An externality based approach focuses on maintaining the service – water flow – and pays farmers for an appropriate level of grazing. A capital stock approach focuses on maintaining the resource – soil – because it delivers a range of services including water flow. The result would still be to pay farmers for appropriate grazing.

The capital stock approach presents significant problems, often to do with gathering sufficient information about stock levels and trends. It is also difficult to relate to policy choices at the local level. It is only considered here as one of the possible areas for further work.

### **Heterodox economics**

Most of the economic concepts described in this paper are based on what has been described as neo-classical welfare economics (Gowdy and Erickson, 2005). This provides the broad economic paradigm within which economic development is usually framed at present, and in practice. Some of the basic assumptions of this approach are now criticised, and its capacity to deal with issues such as externalities is a particular problem.

Gowdy and Erickson (2005) argue that the developing field of ecological economics provides an alternative and better theoretical basis. Bryden, Refsgaard et al. (2006) are engaged in developing practical rural development tools that take account of these new approaches.

Although it is beyond the scope of this paper to offer alternative analysis of this kind (and case study material is very limited), policy development should look for new economic tools to illuminate and guide work in the future.

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## Sustainable mountain development

### Needs and challenges

Parvez and Rasmussen (2004) highlight the geographical and economic variety of mountain areas on the earth that make it virtually impossible to identify consistent development issues. They also point out that mountain areas' economic status is very dependent on the wider area. They propose that the sustainable-livelihoods approach (DFID, 1999) is the most appropriate way to link natural resource, social, and economic development. A key feature of this is the identification of 5 types of capital: human, natural, financial, social, and physical. Both needs and opportunities can be identified through this approach.

In certain respects mountains share their development difficulties with some non-mountainous rural areas. Peripherality, lack of centres of population, communications and population loss are common problems (Kohler et al., 2004). Mountains are likely to show the same trends as other rural areas, including lower than average (and often declining) GDP/head, declining agricultural employment, and the challenge of diversification (OECD, 2006).

Development opportunities that address these issues while maintaining the 5 types of capital are likely to benefit mountain areas.

### The development role of positive externalities

Sustainable mountain development may be linked to positive externalities in three main ways:

- Based on the provider gets (PGP) and beneficiary pays (BPP) principles, measures are created to transfer funds from one to the other. Payments for environmental services (PES) are the most common form and several examples are described in Annex 1 above. They are often based on payments made by government from taxes, and received by farmers for certain types of land management. PES can also be organized directly between beneficiaries and providers<sup>14</sup>. Some environmental NGOs do so.

This generates more income for the providers. In many cases it also increases their economic activity as well as increasing the supply of the externality concerned. If so, this will have positive effects on development. However there is evidence that PES can make a limited direct contribution to economic development, so they are unlikely to be enough on their own.

- The positive externality is valorised by linking it with market products and so increasing their value and market share. This contributes directly to sustainable mountain development. Mountain tourism,

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<sup>14</sup> The two approaches broadly correspond with the Coasian and Pigouvian economic theories.

cheese, meat, and craft products are a few of the many possible examples.

- Quality of life in the mountain area is high because of the provision of positive externalities, and this can retain inhabitants and attract new ones. The effect on development is more indirect, but if population levels can be maintained then services such as education and transport remain viable. In some cases average incomes and social capital are enhanced because a mountain area is attractive to a “creative class” (McGranahan and Wojan, 2007). If quality of life is not sufficient, people migrate from mountain areas resulting in depopulation. This is an issue in both developing and developed countries.

These three contributions to development are rarely if ever separate (and if they are a development opportunity is being missed). PES could increase the quality of biodiversity in an area for instance. If so, that can be used to raise the value of products and attract or retain population. If the economic status of the area improves there is likely to be more scope for investment in environmental resources. Synergy can in this way create even greater benefits for local sustainable mountain development.

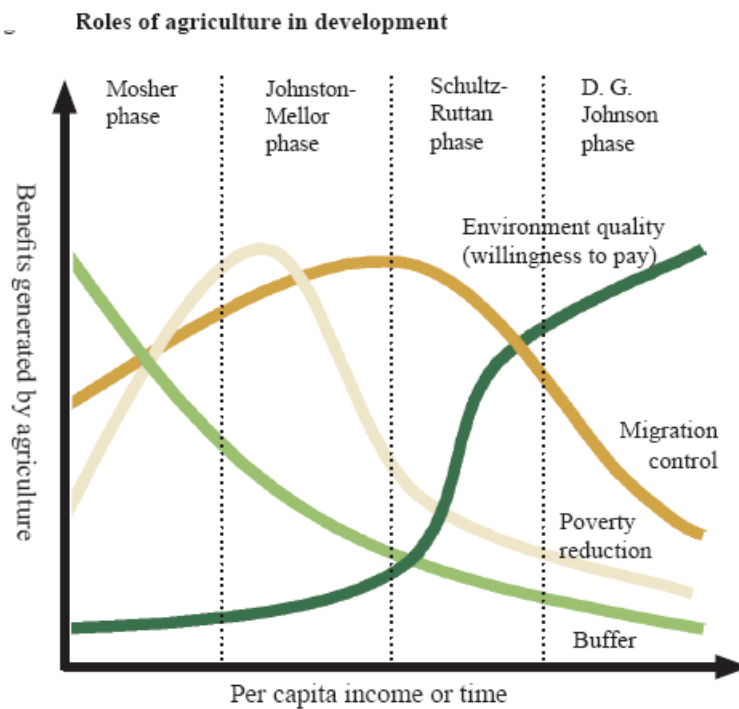
Poverty is an inevitable consequence of low development status, but will not necessarily be ameliorated by improving the local economy. So the distribution of benefits must be taken into account when considering externalities. Both the benefit and the economic value of the benefit must be available to the poor if development based on externalities is to be counted a success. Pagiola, Arcenas et al. (2005b) have highlighted the range of ways in which the poor may benefit or be penalised by policies relating to externalities.

In this case we must also think about the impact of beneficiaries outside mountain areas, some of whom may be poor. Measures to internalise the value of a previously free water supply by raising charges may penalise poor urban dwellers. Any pro-poor policy for mountain externalities must be designed to address this problem.

### Development Stages

The FAO Roles of Agriculture project led to the following description of how agriculture contributes different benefits at different development stages (FAO, 2007):

**Figure 2 (from FAO, 2007)**



Hodge (2000) describes two views of the externalities of agriculture. An input model sees agriculture as causing pollution in proportion to agricultural production. This is typical of intensive modern agriculture without a long historical tradition. An output model sees an optimum level of environmental benefit, with both high and low levels of production causing environmental problems. This is typical of less intensive agriculture with a long cultural tradition. The diagram describing the output model is as follows:

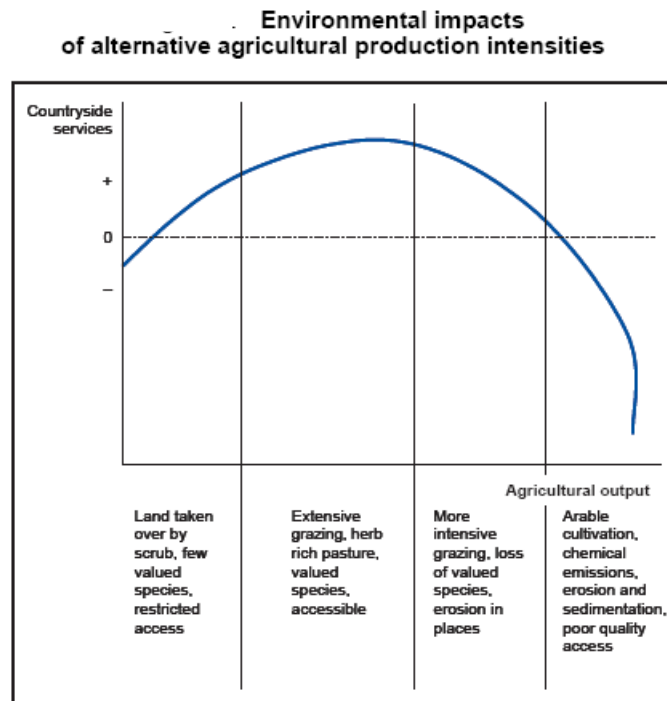
**Figure 3 (from Hodge, 2000)**

Figure 2 refers to the value of environmental services provided by agriculture, in terms of willingness to pay. Figure 3 is a picture of the environmental impacts, largely defined in terms of natural science. The value of positive externalities in mountain areas can be thought of as a combination of these two: certain physical, ecological, and cultural products are defined by the second graph and their value is influenced by the development stage of the area and state to which it belongs in accordance with the first graph.

However some of the beneficiaries of the externalities may come from countries at other development stages, as in the cases of tourism, or NGO investment in forest conservation. In that case the valuation of the externality is more complex and the environmental quality curve in Figure 2 may be moved to the left. Some of the value is derived from willingness to pay from more developed countries, and this increases the potential value of environmental quality at a given development stage.

Figure 3 also illustrates a more general point, which is that depopulation and land abandonment can reduce the supply of benefits. This would also apply to cultural externalities. The validity of this argument depends on how well the area fits Hodge's definition of the output model of agriculture. Development stage and history are important criteria. MacDonald, Crabtree et al.'s (2000) review of the environmental impacts of land abandonment in European mountain areas is a useful example.

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## Governance

Governance is particularly relevant to positive externalities because of communal use and provision: in many cases the beneficiaries have interests that are better dealt with in common, and the providers can play their part most effectively by acting together. However many institutions and other governance mechanisms are designed to work with individuals rather than groups.

Ostrom (2003) emphasises that there is not a complete dichotomy between systems that are based on communal rights and those based on the individual. In most cases a combination exists, and from a sustainable mountain development point of view it is very important to understand when communal rights are likely to be important, and how they can be supported.

Ostrom quotes 5 key attributes conducive to the development of communal property rights, including low productivity and return on investment, high local variability in resources, substantial economies of scale for management and infrastructure investment. She also identifies 7 variables that enhance the performance of communal property-rights systems. These are

- accurate and low cost information on the resource, its costs and benefits
- a shared understanding of risks and benefits of a communal approach compared with alternatives
- norms of reciprocity and trust
- the group is stable
- participants plan to remain in the area for a long time
- decision making rules that do not depend on unanimity or control by a few
- accurate and low cost monitoring and sanctioning arrangements

These provide important practical rules for deciding when communal-rights systems are likely to be successful in delivering positive externalities, and how they can be supported to achieve the best results.

Communal rights and community activity also have some bearing on the question of transaction costs of PES, which are explained below. There are three ways in which these costs could be reduced by a strong community role:

- If compliance with the terms of the PES contract is well established as a cultural norm there will be less need for monitoring. Community ethos and individual reputation and identity are involved in this type of norm.
- If community businesses exist and are involved in adding value by valorisation (tourism, food processing) they will experience a market benefit if their members also deliver PES effectively.
- PES could offer incentives to whole communities for compliance with the PES contracts. This internalises the compliance question, and is linked with the first point about a cultural norm. Sakuyama (2006a) highlights how this may reduce transaction costs.

## Transaction costs (including targeting)

Transaction costs for PES are often high, for a number of reasons:

- The way in which resource management (farming, forestry) controls the supply of externalities (quantity of water) is not fully understood. So a high level of monitoring is needed to assess whether the PES are delivering their objectives.
- The location of the relevant resources is not fully understood, so payments are made to a wider range of areas or individuals than is necessary.
- The providers do not benefit from the externality, so they have no incentive to deliver the contract. Enforcement activity is high.
- The concept of PES may be new to the providers, so capacity building and advice measures are required.
- The beneficiaries of PES are not clearly defined and their views are not well understood, so valuation work has to be undertaken.
- Delivery of the externalities depends on joint action by providers on a communal basis. Negotiation and management costs of collective action can be significant.
- Complex prescriptions are required (e.g. for land management) which require research, extension services, enforcement and monitoring.
- Multiple positive externalities are sought through a single PES system. Monitoring requirements are therefore high.

For example Vatn, Kvakkestad et al. (2002) argue that transaction costs of policies addressing multi-functionality are relatively low (“a few percent”) if they can be attached to goods that are uniform, easy to observe, and common. Payments per head of sheep are an example. If they are attached to more obscure services or proxies such as landscape or organic production they are much greater (“some/several tens %”).

This illustrates the trade off between transaction costs and precision. The more precise the management of externalities needs to be, the more transaction costs will be incurred.

“The transaction costs” (p14) discusses how costs can be managed to achieve the best results taking into account policy objectives.

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