

Developing Markets for Watershed Protection Services and Improved Livelihoods

Implementation Phase Planning Workshop Report

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Summary: Market-based mechanisms for environmental services (MMES) seek to value and compensate land managers, owners and communities for the environmental services provided by forests and healthy ecosystems, in order to improve land use, especially in critical areas. They represent an attractive option because they can be applied at multiple scales (local, national, regional and globally). They can also be applied for different purposes, such as a biodiversity, watershed management, landscape beauty and carbon sequestration.

This workshop report documents the discussions held at a workshop facilitated by IIED to plan the implementation phase of the project “Developing Markets for Watershed Protection Services and Improved Livelihoods”. The project is particularly concerned with the potential impacts on the rural livelihoods of the markets and payments for environmental services in watershed services. Interested readers will find copies of the presentations made at the workshop on the Forestry and Land Use website:

www.iied.org/forestry/research/projects/water.html

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1 Section 1: Information Exchange

1.1 Introduction and background to the workshop

In October 2001, IIED embarked on a DFID-funded project to explore the potential of market based approaches to the maintenance of watershed services that support local livelihoods. Through this Project four diagnostic reviews of markets for watershed services were carried out in the Caribbean (Grenada, Jamaica, St. Lucia, Trinidad), India, Indonesia and South Africa¹. Prior to this, IIED carried out a global review of 287 examples of market-based initiatives for environmental services (which included carbon sequestration, watershed protection, biodiversity conservation and landscape beauty), with emphasis on developing countries. The results of this survey were published as "Silver Bullet of Fools Gold? A global review of markets for forest environmental services and their impacts on the poor" (Landell-Mills and Porras, 2002)².

The inception phase of the Project (October 2001 to March 2003) offered insights into the:

- Range of opportunities within watershed management and poverty alleviation that exist for market-based initiatives for environmental services (MMES).
- Range of commodities and market-mechanisms that might be used, both in developing and developed country scenarios for watershed management.
- Emergence of market or exchange platforms in which some of the commodities can be traded as well as the opportunities and threats that markets bring with them
- Interest in the market-based mechanisms for poverty alleviation and watershed management that might complement traditional regulation.

Following the success of the first phase of the project, DFID and other donors agreed to the funding of the second phase in mid-2003. In the second phase of the project, IIED continues to expand the emerging policy community and deepen the work and seek to shape markets in four action-learning countries and develop two new diagnostic countries³, and liaise strongly with on-going initiatives in Mexico. Through this action orientated approach, IIED and partners expect to produce:

- Working papers and policy briefings on key themes
- Group-to-group exchanges facilitated between those in locations at different stages of market-shaping to help create creative solutions to common challenges
- Methods guidance materials and learning events on making market mechanisms for watershed management effective as complements to existing regulatory approaches
- Online information and active websites

¹ Diagnostic reports available in www.iied.org/forestry/research/projects/water.html

² Landell-Mills, N. and I.T. Porras (2002) "Silver Bullet of Fools Gold? A Global Review of Markets for forest environmental services and their impacts on the poor" Instruments for sustainable private sector forestry series. International Institute for Environment and Development. London. U.K. pp 254.

³ "Action-learning" countries are here identified as those where initiatives are being considered and experimentation is underway (India, Indonesia, South Africa and the Caribbean). "Diagnostic countries" (Bolivia and China) are those where a local team of experts will be looking at the possibilities and challenges to market-based initiatives and how can these support and improve local livelihoods.

This document summarises the proceedings of the third workshop facilitated by IIED in London, January 2004 (see **Appendix 1** for the Workshop Programme) The workshop was attended by the representatives from the four proposed action-learning studies, the potential partners for diagnostic study (Bolivia, China and Mexico) as well as collaborators and representatives from DFID (see **Appendix 2** for a list of workshop participants and contact details). The workshop was divided into three sessions, namely:

Day One, Section 1: *"Information exchange"*

Day Two, Section 2: *"Thematic and methodological work"*

Day Three, Section 3: *"Planning action-learning and diagnostic country work"*

This document records some of the key issues emerging from the presentations and discussions held over the three days. Ideally this report should be read in conjunction with the copies of the presentations that were made at the workshop. These presentations are available at www.iied.org/forestry/research/projects/water.html and on CD-ROM in PDF format. For additional information please contact Ivan Bond at IIED <<ivan.bond@iied.org>>.

Table 1 Summary of Project's Logical Framework

Project Goal	To promote the maintenance of watershed services that support local livelihoods
Project Objective	To increase understanding of the role of market mechanisms in promoting the provision of watershed services to improve livelihoods
Project Outputs	<p>Output 1. Action-learning processes for the development of equitable market mechanisms for watershed services supported in four countries</p> <p>Output 2. Diagnostics, plans and preparedness established in two further countries wishing to adopt market mechanisms for watershed protection</p> <p>Output 3. Knowledge of market mechanisms improved through networking, development of guidance and dissemination with other countries and institutions</p>

It is anticipated that the action learning process will begin to provide answers to some of the challenges that face market-based instruments for watershed services, these include understanding:

- how upstream poor communities might benefit from markets for watershed services;
- how both those supplying and demanding watershed services might be able to negotiate and set prices for relatively intangible services;
- what kind of investment needs to be made in land use management in watersheds in order to ensure that downstream users needs are met;
- what organisations and institutions are necessary for the management of payments to service providers to ensure that there is compliance with the agreements and that there is no free-riding. This is especially important in the design stages so that transaction and management costs of the proposed markets are minimised;
- how markets might work in cases where there is a need for environmental services but there is no capacity or willingness to pay for these services.

Market-based mechanisms for other environmental services are spreading rapidly across the world, and while it might be inevitable that they will develop in many watershed situations in developing countries, it is important to consider what the appropriate balance of market-based

instruments, regulations, and other institutional arrangements might be necessary to ensure long term development and conservation.

1.2 Action Learning Country Plans: Presentations and Discussion

Through the first phase of the project, IIED facilitated diagnostic surveys in the Caribbean, India, Indonesia and South Africa. During this workshop the outputs of the diagnostic surveys were reviewed and the subsequent draft plans for the action-learning phase were outlined. The notes presented below highlight some of the key aspects of these surveys. In certain cases, and in order to aid clarity, the key points below have been supplemented by information from the reports in the diagnostic process. They are not meant to be a comprehensive summary of the presentations. The full presentations and background material can be downloaded from the Forestry and Land Use (FLU) website www.iied.org/forestry/research/projects/water.html or can be requested directly from IIED on CD-ROM.

1.2.1 The Caribbean

Context: The Caribbean diagnostic was conducted across four countries, Grenada, Jamaica, St. Lucia and Trinidad. The aim of the diagnostic was to identify suppliers and users of watershed services, assess management & needs, gauge interests in markets and incentive led approaches, and to identify the needs and opportunities⁴.

Findings: The main results of the diagnostic survey were that:

- There was little experience of market-based mechanisms for environmental services.
- That there were weak relationships and linkages between upstream and downstream users.
- There was an interest in financial instruments but the concept of markets for watershed services was not well understood and needed to be approached with caution.
- There were important capacity gaps that needed to be addressed if financial incentives were to be developed for watershed management.

Opportunities: The diagnostic also identified several opportunities for market-based mechanisms for watershed environmental services, including:

- There are trends throughout the Caribbean to more integrated approaches to catchment management, which include much greater participation by the residents of the catchments and market-based mechanisms.
- That there is recognition that incentives are needed to "marshall" the support of local watershed service providers.
- Within some countries in the Caribbean there are moves to rationalise the water sector that includes the full costing of water.

Phase Two: The small scale of the Caribbean is ideally suited to establishing national dialogue on water and land management issues. The second phase of the project will have four common outputs. These are:

- Establishment of action learning groups
- Action learning pilot projects in Jamaica and St. Lucia

⁴ It is important to note that at the time of the workshop, the Caribbean group was the most advanced in terms of planning its action-learning phase of the project.

- Research on key sectors
- Dissemination of the lessons learned.

The action learning sites for the pilot projects that will be used in the next phase of the project are:

Jamaica: Within Jamaica MMES are consistent with newly introduced participatory approaches for watershed management. It is important to consider the conflicting land use demands. The upper-catchment areas are used for the production of Blue Mountain Coffee. Downstream areas are used for tourism. Both sectors are critical to the Jamaican economy. It is therefore important to balance the short- and long-term needs of the residents. Currently water suppliers only charge for the abstraction, transport and purification of water. Land tenure will however be a major issue in developing appropriate incentives for management.

St. Lucia: Land use within St. Lucia has been severely affected by changes in the banana market with the consequence that farmers are abandoning their land and moving to urban areas. Within this context however, the Talvern Water Catchment Group has embarked on a programme of managing and protecting the communities water resources by upstream tree planting, relocation of pit latrines and community education. Water reform in St. Lucia provides the opportunity to assess the success of this initiative and to determine whether it can be scaled up to other watersheds in the St. Lucia.

In addition to the action learning sites, the Caribbean team will consider two case studies. These will be based around the Findes Amandes Community in Trinidad, where squatters have successfully secured tenure from the government in recognition of their contribution to reforestation. In Grenada, the case study will most likely look at the water charge rebates for farmers that implement good watershed practices and reduced pesticide use. This will provide other action learning members with extremely interesting information on compliance measures and transaction costs.

1.2.2 South Africa

Context: In South Africa individuals do not have rights over water, as all water resources are owned by the Government. The Government is in the process of decentralising the management of catchments to "catchment management agencies (CMAs). There will eventually be 19 CMAs but it might take up to 20 years for them to be effective.

Proposed project sites: The diagnostic survey has identified some potential sites for further work, these are: St. Lucia, the Klip River and the Phalaborwa Barrage.

St. Lucia: Landuse in the catchment is creating a silt problem that is blocking the mouth of the estuary requiring dredging. Potential to make payments from users of the St. Lucia and some of the money spent on dredging to landusers for improved land management activities.

Klip river: Important wetlands in the Klip River catchment are threatened by uncontrolled urban development in the Gauteng Province. This site provides an opportunity to facilitate payments between water supply companies and the urban poor.

Oliphants River (Phalaborwa Barrage): Scouring of the Phalaborwa Barrage results in high silt loads entering the riverine areas of the Kruger National Park, which have a negative impact on aquatic and riverine ecosystems. This site presents

interesting opportunities to influence landuse in the upper reaches of the catchment and thereby reduce the silt loads at the Barrage.

The "Working for Water Programme": An on-going study on control and removal of invading alien species in the Tisitsikamma Mountain catchment, with the aim of removing water consuming alien vegetation and restore low-water consuming vegetation.

A number of important constraints MMES in Watershed Protection in South Africa have been identified. These include:

- The problems of establishing functional catchment management agencies
- The high transaction costs of managing water in a South Africa
- The diverse cultural views of water in South Africa
- The poorly defined property rights that exist in South Africa

At the same time a number of important opportunities to MMES for Watershed Protection in South Africa have been identified. These include:

- Informal markets for water trading already exist between some irrigation farmers in South Africa.
- There is significant potential for increasing standards of living through improving the current very low levels of sanitation in some catchments
- Many catchments are currently stressed and new approaches to water and catchment management are required.
- The constitution of South Africa guarantees each citizen access to 25l of water per day as well as making provision for an environmental reserve.

Demand management: There has been a lot of work conducted in South Africa on demand side management. Markets for water however are politically sensitive. There is however a real question as to whether demand side strategies are really effective. Agriculture is a major user, but low value, of water in South Africa.

1.2.3 India

Context: The Indian diagnostic survey was conducted at three levels, micro-, meso- and macro-levels. It is important to appreciate just how un-popular the concept of markets for water is in India. However, watershed in India are face tremendous pressures from clearance for cultivation and livestock production from growing human population. Market-based mechanisms for environmental services or incentives provide an important option. They also complement current participatory approaches to watershed management by Government of India. The case studies used for the diagnostic survey come from Himachal Pradesh (HP) and Madhya Pradesh (MP).

Sukhomarji Village (micro): Water rights in Sukhomarji Village were allocated equally to every household in the village in exchange for watershed protection activities on common land. It meant that water rights could be traded by the landless, forming the basis for an emerging market. It was found that this significantly improved equity and improved livelihoods at village level. Overtime however, water rights have been replaced by user fees.

Inter – village transfers (meso): At the meso-level the diagnostic study identified a number of interesting inter-village transactions involving water sharing between upstream and downstream villages. For example the traditional canal or *kuhl* systems

in HP that are based on well defined rules, rights and responsibilities between upstream and down stream villages for water sharing and watershed protection. Importantly, these traditional systems are perceived to be far more effective than those *kuhls* that are being managed by government.

Macro-level markets: The highest potential for the development of market based payments for watershed services was found to be at the macro-level in both HP and MP. Such markets would be based on the use of water by large down stream commercial enterprises such as hydroelectric power (HEP) stations and urban water supply agencies. Current regulations require HEP projects to make payments for catchment area treatment and compensatory afforestation. These payments are commonly perceived to be unused or not used for the purposes for which they were intended.

Opportunities: Through the diagnostic study was determined that there is potential for developing market based incentive mechanisms for the payment of environmental services in India. These would essentially complement existing "regulatory mechanisms". There is a perception that the presence of forests and indigenous vegetation in the upstream areas does provide down stream benefits. Importantly however these linkages have not been fully established at any meaningful scale.

Forestry policy: The National Forestry Policy aims at ensuring that 23% of India is under forest cover by 2012. The policy does not differentiate between the hydrological impact of different species. Due to the different hydrological impacts of different species, the impacts of the policy could be counter-productive. This Project should be able to contribute to a greater understanding of these issues.

1.2.4 Indonesia

Context: For the Indonesian diagnostic study, the current decentralisation process that is talking place in the country is the most important contextual issue. Other important contextual issues are the strong religious beliefs that still guide water and landuse in Indonesia. There is also a general acceptance that consumers pay for water. These payments have however generally only dealt with the supply of water and not with the full costs of supplying water that include watershed protection.

Policy reform: In 1999, the Government of Indonesia initiated the "Indonesia Water Resources Sector Adjustment Program (WATSAP) in recognition of the increasingly complex and long-term challenges facing this sector. Through this process central government will be limited to an enabling and regulatory role while sectoral mandates and implementation will be devolved to provincial and district levels.

Through the decentralisation process, water management in Indonesia will:

- Have a much greater focus on the conservation rather than exploitation
- Increasingly involve public – private sector relationship
- Focus more on integrated water resource management through the development of basin management units.

Three possible areas have been selected for action-learning. These are presented in **Table 2**. These areas are the Segara River, the Brantas River and the Cidanau River. All three cases had important opportunities for learning about payments for watershed environmental services. For financial reasons, the diagnostic only collected information in the Segara River Basin.

Table 2. Selection criteria for sites in Indonesia

Site	Potential lessons	Willingness to pay directly	Potential sellers	Relationship upstream and downstream	Local interest	PSDAL interest and practicality
Segara River	Mechanisms for sharing rights and responsibility	Payment mechanism exists for one village – potential for scaling up	Farmers with help of NGOs	Hydrology: some info Institutions: early in process	High for buyers and sellers	Experience and ongoing work
Brantas River	Large-scale governance, management coordination	Payment mechanism already exists but could be improved	Via Forest Services (livelihood challenge)	Hydrology: some info Institutions: PJT1 river authority	High for buyers Sellers not yet involved directly	New challenges
Cidanau River	Mechanism for shared management among different agencies	KTI is willing to pay – has local monopoly	Sellers not clear: both farmers and protected area	Hydrology: some info Institutions: early in process	High for buyers Sellers not yet involved directly	Experience and new stakeholder forum

Summary results from Segara Basin: There are 2 important villages in the Segara Basin, Bentek and Gondang with a combined population of 15,000. Water use is for irrigation (approx. 341ha). Upland farmers produce high value plantation crops while lowland farmers grow paddy rice. The infrastructure supplying irrigation water was severely damaged by floods in 1999. Water is also used for domestic purposes by PDAM. In addition the Segara River is used by a rafting company. Landuse in the basin was severely affected by a Government granted concession that allowed a private company to clear 4,000 ha of forest.

Opportunities: Through the diagnostic several opportunities and challenges for further work have emerged, these include:

- There is a very strong holistic / religious dynamic that can be developed for landuse and water management. This is complemented by the developing proprietorship over land and resources at the village level.
- Payments and incentives for watershed management are already being made by the Lombok Inter-Rafting Company and PDAM.
- Although there is little hydrological / scientific evidence there is a strong belief that upstream landuse affects water quantity and quality.
- The development of a formal market based system will be constrained by the relatively higher incomes earned by the upland farmers vis a vis the lowland rice producers.
- The large number of landless people and the limited tenure over land will be a severe constraint.

1.3 Diagnostic Country Plans: Presentations and Discussion

The presentations by the action-learning countries was complemented by introduction from Bolivia and China, which will embark on diagnostic studies of their own over the next 18

months. An additional presentation from Mexico was done, where we expect to strengthen links and support on-going efforts for the use of market-based mechanisms for watershed protection. These countries were selected to take part in the Implementation Phase because of the innovative landuse and catchment programmes that are currently being implemented.

1.3.1 Bolivia

Context: Bolivia is characterised by paradoxes. For example:

- Bolivia is the poorest country in South America but has the most open markets in the region
- Legally government owns all the natural resource but in reality has little authority over land and natural resource use.
- Decentralisation has given local governments grteater power but no resources which to act.

Using the traditional term "markets" in the water sector in Bolivia have been discredited by several recent situations, including the Cochabamba Water War, where the use of privatisation failed and discredited the use of markets, and the failure to regulate water use between Bolivia and Chile. The current policy and legislative vacuum suggests that local innovative solutions are highly appropriate.

Examples of local level management are being developed by; NGOs (PROMETA, Agua Activa, Fundacion Natura Bolivia), Muncaplities (Comarapa, Vallegrande, Rio San Juan) and private sector enterprises such as hydroelectricity producers.

- Tarija: NGO (PROMETA) working with municipality to develop a direct payment system to conserve a National Park that protects drinking water supplies
- "Agua Activa": Prodem (NGO set up by government) helps poor farmers to pay for transporting water into dry areas
- Two hydroelectric companies: are trying to set up systems to pay upstream landowners
- Comarapa Municipality: downstream users have built a dam and are encouraging upstream users to manage landuse change
- Vallegrande Municipality: community has purchased important watersheds
- Rio San Juan: and many other communities have complex distribution systems for water management within their communities
- Los Negros-Santa Rosa Watershed: Downstream land values highly dependent on the availability of water. Fundacion Natura Bolivia (FNB) has facilitated agreement between the down and upstream farmers for the protection of upstream forests. Current agreement is valued at US\$3 per hectare payable in beehives (the actual incentive is one beehive per 10 ha). Payments are subsidised by the donor funds. This project is an example of the innovative, local level environmental action characteristic of Bolivia. The aim of the initiative is to build the organisations and institutions necessary for functioning payments for environmental services. It is also an example of "seizing the policy moment" that currently exists in Bolivia. Sustainability will be an issue when the payments for landuse are no longer subsidised by donor funds.

1.3.2 China

Context: The scale of natural resource management and development issues in China are enormous, for example:

- Soil erosion affects 33.87 million hectares annually, causing an estimated loss of some US\$1.2 billion annually
- Nationally there is an annual water deficit of 50 billion m³
- There are between 128 million and 400 million hectares of degraded grasslands

Current national initiatives: There are a number of national natural resource management initiatives relevant to market-based mechanisms for environmental services. These include:

- National land conversion programme from agriculture to forestry that involves an estimated 6.5 million hectares and approximately 53 million households
- Programmes for the protection of natural and plantation forests
- Soil, water and grassland conservation programmes
- The development of "green food" (organic products and markets)
- Nationally there are 22 laws that deal with environment and natural resource management.

Current MMES and water initiatives: In addition to the market-based mechanisms for environmental services in national initiatives, there are numerous other local and community level initiatives in China, these include:

- Inter-regional compensation as well as watershed compensation mechanisms that involve compensation payments (An example of which is being implemented around Beijing)
- Community level compensation schemes for cooperation in natural resource management
- Household level mechanisms that involve cash payments, barter as well as exchanges of labour.

Challenges to MMES in China: Despite the extensive economic changes that have taken place in China in recent times, there are a number of serious challenges that face the development of MES and natural resource management in general, these include:

- **Tenure:** There are complex mix of tenure regimes that include, state, collective and individual regimes
- **Administrative and ecological boundaries:** There are overlapping administrative and ecological boundaries that cause conflicts. These are compounded in some cases by a low recognition of watershed services.
- **Markets:** There are a number of constraints with respect to the development of markets including; the valuation of watershed services, demand side issues with respect to water and watershed services and the absence of regulations to govern the emerging markets for MMES.

It is expected that this project will help to identify the current situation of watershed services, identify the opportunities for the development of market-based mechanisms, identify successful stories of the use of these mechanism, initiate the dialog among the stakeholders to reach the consensus and culminate with the development of a follow-up plan for action learning.

1.3.3 Mexico

Context: Like Bolivia, Mexico provided the workshop with another example of where practical case of where payments for environmental services are being implemented. The programme aims to conserve forests on private land by making payments to landowners to avoid its transformation for other uses, such as agriculture and cattle raising.. It targets those forests critical to watershed and/or water sources.

Criteria for payments: Payments in Mexico are guided by a set of criteria that considers the location of the forests in relation to over exploited aquifers, scarce surface water, high risk hydrological zones, urban populations or priority forests.

Project implementation: In 2003, the approximately US\$19 million was allocated towards the scheme in Mexico. The revenue was extracted from national payments for water. In the design phase over applications for 560,000 hectares were received. Applications were assessed by high resolution satellite images. However, these were only available for 50% of the areas applied for. Eventually 271 contracts for 126,818 hectares were signed of which 53% were private property and 47 social property. Payments were scaled by the type of forest being conserved.

Implementation problems : The efficacy of the programme was constrained by:

- The unexpected demand
- The very short opportunity to operationalise the programme (2 months)
- Constraints on the capacity and resources for CONAFOR to implement the programme or to effectively monitor the programme.

Currently a series of steps for future work have been identified, and efforts will concentrate on monitoring and evaluation on current contracts to decide renewal, enhancing CONAFOR 's present structure for implementation, introduction of deforestation risk as one of the criteria, continue scientific work on the linkages between forests and water, and communicate results to water users in the watershed for continuing political support.

1.4 Collaborating agencies in payments for environmental services

The workshop was attended by representatives of organisations with which this project has, or seeks close collaboration (several others were not able to attend the workshop). Summaries of these agencies stakes in markets for environmental services are presented below.

1.4.1 The Edinburgh Centre for Carbon Management (ECCM):

ECCM has 12 years of experience in carbon management that includes; carbon related projects, national and international policy development. ECCM works in close cooperation with other environment and development organisations such as University of Edinburgh and IIED. ECCM's work has three related themes:

- Carbon management: ECCM works with clients to plan and develop carbon management systems.
- Adapting to climate change: ECCM works with local communities to develop sustainable forestry and landuse projects.
- Policy and research: In partnership with other organisations conducts research and provides policy advice to governments, NGOs and companies.

For further information on ECCM and its activities please see www.eccm.uk.com

1.4.2 RUPES Programme

RUPES is a multi-stakeholder partnership led by the World Agro-Forestry Centre (ICRAF) funded by the International Fund for Agricultural Development (IFAD)⁵. The RUPES Programme aims to build working models of best practice for successful environmental transfer agreements in Asia. These models should provide information on how environmental rewards (incentives or PES) can both promote sound environmental management and improve the livelihoods of poor upland communities.

Through a research programme, RUPES will be looking at whom the rewards (incentives) will go to, who will pay them and what form they should take. The best practice models will emphasise workable easily understood, financially and institutionally sound approaches. RUPES has identified 6 challenges, these are:

- quantifying environmental services
- developing successful environmental service agreements
- supporting a transparent and enabling environment
- raising awareness of environmental services
- forming effective partnerships
- establishment of a viable "facility"

For further information on RUPES and its activities please contact <<rupes@cgiar.org>>

1.4.3 The FRP FLOWS cluster of Projects

DFID, through the Forestry Research programmes is funding a cluster of research projects coordinated by the Centre for Land Use and Water Resources Research at the University of Newcastle. These projects are investigating the relationship between forests, water and people in order to evaluate policy options that will improve livelihoods and maintain ecological and hydrological processes. The projects are being implemented across a notioanal altitudinal gradient from cloud forests in Costa Rica, through upland water catchment zone in South Africa to semi-arid zones in India.

For further information on Centre for Land Use and Water Resources Research and its activities please visit www.cluwrr.ncl.ac.uk.

1.4.4 IUCN and the Conservation Finance Alliance (CFA)

IUCN is a member of the CFA. The Alliance is an informal network of environmental NGOs established in February 2002. Members organizations at present include The Nature Conservancy, The Convention on Wetlands, Wildlife Conservation Society, WWF, IUCN, Conservation International, the Latin American and the Caribbean Network of Environmental Funds, GTZ and a few others.

The objective of the CFA is to promote innovative sustainable finance mechanisms that support conservation enterprises. Carbon investment projects and ecosystems service payment schemes are some of the mechanisms that are being explored and promoted. The Alliance is

⁵ Other organisations in the partnership are CIFOR, WRI, CI, EEPsAE, IUCN, IRDNC, Ford Foundation, WWF, IIED, and the Nature Conservancy.

in the process of developing a guide on the various mechanisms. Additional information available on <http://guide.conservationfinance.org>).

Another component of IUCN's work is the Water and Nature Initiative (WANI). This is a 5 year action plan (2001-2006) implemented through 28 projects across 5 regions of the world (South East Asia, West Africa, Eastern Africa, Southern Africa and Central America). Its objective is to mainstream the ecosystem approach to river basin management using a learning by doing approach (www.waterandnature.org).

A third and directly relevant component of IUCN's work is the project "Integrating Wetland Economic Values into River Basin Management". This project aims at testing and applying economic valuation tools and results to river basin management. The importance of wetlands to local livelihoods and the feasibility to develop Payments for Ecosystem Services of Watersheds are being explored.

1.5 Summary and lessons of Information Exchange

Some of the key issues emerging from the day's presentations include:

Arbitrary payments and arrangements: Payments that have been made to date appear somewhat arbitrary and are not rationally determined. Will these payments have an impact on human activities? Is it possible to value a combination of watershed services or other services (biodiversity, etc)? Should payments be considered as opportunity cost of land, or the actual value of the environmental service?

Diversity within the project: There is considerable diversity in terms of scales, parameters, etc, within the project amongst the diagnostic studies that have been presented. This can be viewed as both an opportunity and as a constraint.

Issues of terminology: There are different interpretations of some of the words and phrases that are being used. Examples being; "compensation", "action research", "pro-poor markets", "watershed" and "catchment", "poor", etc.

Upstream/downstream: there seems to be an assumption about poor people living in the uplands, which might not be the case. How do we monitor these situations? Perhaps the best approach is to use the term winners and losers, or providers of the service and beneficiaries of the service.

Livelihoods : There is no consistency with respect to "livelihoods". Need to define appropriate indicators, criteria, measurements, for example income, poverty etc. Need to know whether the payments that are being made and/or proposed will really change behaviour.

Monitoring compliance : The process being described assumes that there is some change in the way land is used or managed. It is important to consider what changes are expected, who will monitor these changes and what sanctions will be applied to those that fail to comply?

Hydrological services and environmental services: How can the current hydrological services be quantified? Is it possible to improve the current environmental services? Are services being provided or are good intentions enough?

Care with key sustainable development principles: Providing incentives for watershed management has to be carefully worked such that it is in tune with key principles, such as "polluter pays" and "user pays" principle. Country teams need support and advice on access to the appropriate mix of market tools and regulations.

Networking: One of the strengths of the project is its diversity. Need to ensure that there is a good network between project partners so that they can learn from each other.

Watershed management: It is important to understand the market based incentives as a complement to regulatory mechanisms. Project should be looking for an appropriate mix between the two.

Regular payments: Payments for environmental services need to be sustained on an annual basis. Within the project sites will it be possible to maintain these?

The implementation approach: The "just do it-and learn by doing" approach discussed by Bolivia is very much in line with many other cases around the world. It is important to realise however that markets are developing and many are having similar problems. Must aim for this project to inform the process. It is also important to recognise the differences that exist between carbon and water in terms of being able to "trade".

Mexico: Mexico has implemented a massive programme of payment for environmental services and now need to work out whether it is doing the right thing and what to do next.

Knowledge base: The impression of the participants was that there had been a great increase in the knowledge base from which the project was working since the last workshop.

2 Section 2: Thematic and methodological work

The second day of the workshop was allocated to thematic and methodological reviews of payments for environmental services. Some of the key issues that new initiatives should try to consider include:

- **Are market-based mechanisms for watershed services good for the poor?** There are potential significant benefits, such as new forms of income, diversification, technological transfer, increased land security, capacity building, improved natural condition, etc; but the constraints that poor people face and restrict their ability to benefit are high, and include high transaction costs, unclear property rights, weak bargaining power, unclear regulatory framework, inadequate skills, market contacts, knowledge, coordination, etc.
- **Are MM for watershed services good for the environment?** It is important to know whether or not a service being delivered, and science is key for determining what are the land use impacts on water services, and which is the most appropriate mix of land uses that deliver a service. It is important to understand the role of forest (is forestry always good?), and above all, are good intentions enough if the aim is to improve watershed management and livelihoods?
- **Are MM for watershed services economically efficient?** It is important to consider the different options for providing a watershed service (best versus feasible), the value of the service - rather than the opportunity cost of land, whether or not it is possible to "market" services as individual commodities or bundled, what's the willingness to accept for LU changes, and are market-based mechanisms even feasible? (intermediaries, institutions, information, is there a demand??)

The key issues that were covered in the presentations and discussions included:

- The relationship between land use (especially forest) and water,
- The quantification of the relationship between land use and water (quantity and quality),
- Applied example of valuation of watershed service;
- The role of markets in alleviating poverty,
- Commodities and market mechanisms used in watershed protection services.

2.1 Hydrology and land use

The background session on hydrology and land use was presented in two sections. The first considered the relationship between hydrology and land use while the second examined the policy implications for basing land use charges on "green and blue water" in South Africa. While most of the first section puts an emphasis on forests, the Project at its wider scale considers forests as a component of a different mix of land uses. For more information about the studies presented below and other work by CLUWRR (Centre for Land Use and Water Resource Research of the University of Newcastle) visit the website at <http://www.cluwrr.ncl.ac.uk/>

2.1.1 Forest and Water Interactions

Background: On-going research made by CLUWRR recognises the differences between public perception and the science with respect to forests and water resources. It therefore aims to improve the understanding between the forests and water. While it is difficult to establish with precision the direction and magnitudes of effects arising from forest conversion, as they largely depend on local soil characteristics and other land use

management rather than land use cover, some of the main effects are roughly presented in **Table 3**.

Table 3. Summary of public perceptions and the scientific observations.

Perception	Observations	Comments
Forests increase run-off	Evidence suggests that annual run-off is generally decreased by forests. Losses by evapotranspiration from forests can be up to two times different to shorter vegetation.	In wet environments there is greater evaporation as a result of interception. In dry environments forests reduce run-off because of increased root depth.
Forests regulate water flows	Competing process of higher evaporation and transpiration against (possible) higher infiltration rates - especially in natural forests- could result in either increased or decreased dry season water flows. Results will be highly site specific, but it's generally true that forests are not "sponges".	Wet environments showed that drainage ditches increased dry season flows. Dry environments show that forests decrease water flows.
Forests reduce erosion	Competing process may result in either increased or decreased erosion from forests. Results will be highly site specific. It's more the economic activities in the place that could affect erosion (for example mines, bad roads, bad drainage, etc).	Conditions existing in many natural forests, of high infiltration rates and low soil erosion, are not necessarily the same for forest plantations. Contrary to beliefs forest canopy does not necessarily protect soil from raindrop impact, it's more the combined effect of species, sizes, floor cover, etc.
Forests reduce floods	Increased evapotranspiration may reduce floods by removing a percentage of the rainfall and allowing soil moisture deficit to build up, but this effect is expected to be significant only in small-scale events. Competing process may result in either increased or decreased floods. Results will be highly site specific.	Management activities within forests are likely to influence the outcome. Size of the climatic event will also determine the outcome.
Forests increase rainfall	Not proven - but cloud forest increase precipitation by trapping moisture from clouds.	
Forests sterilise water and improve water quality	Forests do not necessarily sterilise water in high pollution environments	

Conflicting policy objectives – 3 case studies: The scientific evidence indicates that there are complex multi-variable relationship between land cover and hydrology in most cases. Three case studies were used to highlight how changes in landuse might have had negative hydrological impacts.

- **Case 1: Proposal to double lowland forests in the U.K.:** Modelling showed that a proposal to double the lowland forests in the U.K. would have had a serious impact on the soil water and run-off. Consequently, the proposal was not implemented.
- **Case 2: Integrated water resource management:** The Government of South Africa recognised the impact of fast growing trees and invaders in riverine areas. The working for water programme was used to eradicate invaders with expected ecological and economic benefits. Question arises of how to devise Integrated water resource management policies that have positive impacts on natural resources and livelihoods. Tengwe catchment has been modelled to investigate the relationships

between blue water (water flowing out of the catchment) green water (evapo-transpiration) and landuse. Decrease in forest cover would increase "blue water" and decrease "green water". Provides a basis from which it might be possible to quantify water use by landuse activity by avoiding the complex hydrological relationships that have been presented (See Table #1).

- **Case 3: Panama Canal:** Used HYLUC model to investigate the impact of "Law 21" that proposed a US\$200 million re-forestation programme in the Panama Canal Watershed. Model indicated that programme would reduce transit capacity of the Canal by 10% in addition to uncertain erosion, water quality, biodiversity and poverty impacts.

Comment: The complex hydrological relationships demonstrated present a major challenge to developing market-based mechanisms for environmental services. The nature of the relationships and the influence of highly variable external factors (i.e. climatic events) make it very difficult to develop simple relationships upon which MMES might be based.

2.1.2 Data requirements for modelling

If "hard data" is very limited for hydrological studies, modelling based on existing parameters could be an option to determine basic magnitude and direction of impacts. HYLUC, designed by CLUWRR, uses default parameters that have been tested in different contexts and respond with a reasonable degree of accuracy (approximately 10%). While this model only considers water quantity, it provides a good basis to estimate magnitude effects of land uses on available flows.

Some of the basic data requirements for the use of the HYLUC model are:

- Daily rainfall;
- Estimates of potential evapotranspiration;
- Land use maps

2.1.3 Policy Instruments for Land and Water Management:

Challenge: Is it possible to design policy for land and water management that:

- Meet human needs whilst maintaining hydrological and biological processes and maintaining bio-diversity?
- Address issues of equity between land and resource managers within watersheds?
- Address the conflicting demands of competing landuses

Policy review: South Africa has experience with both regulatory (SFRA) and market based policy instruments (WfW) (Table 4).

Table 4. Comparison of regulatory and market based mechanisms for land and water management in South Africa.

Policy	Objectives	Drivers	Perceptions	Problems
1. Stream flow reduction activities – charge levied on certain land uses deemed to reduce steam flow	To meet ecological and economic objectives of the National Water Act (NWA)	Downstream stakeholders concerned about the reduction in flow due to forestry	Reductions based on scientific evidence	Commercial land-users question the veracity of methodologies to estimate stream flow reduction

2. Markets for watershed services (typically downstream rich to upstream poor)	To meet ecological, economic and equity issues.	Forestry interests see PES as an option for promoting: Forest protection and benefiting from subsidies	Traditional beliefs that forests are goods for water management	Few willing to pay for ES Concern over sustainability Little evidence that poor benefit
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Policy opportunity: Builds on the proposal that policy should consider two forms of water namely, green (evapo-transpiration) and blue (run-off). Hydrological impact of the landuse will be judged on the difference in green water between the indigenous vegetation and the current landuse. Where the current landuse exceeds the baseline of the indigenous vegetation then the land-manager will pay a charge. The policy proposal will:

- Simplify the legislation and the implementation of the current SFRA policy and legislation
- Identifies the importance of water use by different forms of landuse
- Assists in identifying the most beneficial uses of water in the interests of the public and in respect of the National Water Act.
- Simplify the development of compensation mechanisms based on water use.
- Would promote those forms of landuse that were "water providing" and would assist in meeting the environmental and human reserve requirements.

2.2 Valuing Hydrological Services

A) Case study of the Panama Canal Watershed (cross reference to 2.1 Case Study 3)

The hydrological impact assessment of the proposed afforestation on the Panama Canal Watershed predicted that there would be, on average, a 10% decline in the transit capacity of the Canal due to reduced water availability, as well as uncertain implications for erosion, water quality, biodiversity and poverty impacts.

The economic component of the study aimed to value the implications of the afforestation proposal. Based on a series of demand studies, the three main uses of water in the canal and the volumes required and the average value of these uses was calculated and summarised in **Table 5**.

Table 5 Volume and value of water uses in the in the Panama Canal by

Use	Volumes	Calculated average value/m ³
Transit of ships	7.87 million m ³ per day	US\$0.195 (or US\$558 million/yr)
Drinking water	0.8 million m ³ per day	\$0.112 (or US\$35 m/yr)
HEP	only when there is surplus water	\$0.004 and \$0.01 (approx US\$35 m/yr)
Opportunity cost for not using the canal	7.87 million m ³ per day	US\$1.22 (or US\$3500 m/yr)

The HYLUC model was used to predict the water flows over a 35-year period under both the current land use and under the impact of afforestation under Law 21. The hydrological impacts showed that even under the current land use system there will be insufficient water to satisfy future requirements, and that the afforestation programme as suggested by Law 21 would result in further result in a decline in water available for drinking, transits and generation of hydroelectric power. The estimated average values of water by use were applied to calculate the economic impact of Law 21. The total economic impact of the programme over 35 years, discounted at 8% per annum was estimated to be approximately US\$7000 million compared with the present land use (**Table 6**).

Table 6. Economic implications of the re-afforestation in the Panama Canal (US\$ million)

Use	NPV of present land use	NPV of afforestation	Impact (losses)
Drinking water	647.6	612.8	34.8
Shipping	9,344	8,798	523.9
HEP	435	289	145.7
Total	10,426.9	9,700.5	726.4

It was noted that despite the results of the economic impact of the afforestation, the proposed project for the Panama Canal was proceeding.

B) Markets opportunities associated with land use changes in Monteverde, Costa Rica.

This project is a joint research of IIED, CLUWRR; Free University (Amsterdam); National University and Technological Institute (Costa Rica), and it is funded by DFID-FRP (R8174). The study is looking at:

- a) Direction and magnitude of the effects on water flows caused by different land uses in upper and middle parts of watershed, through the use of two models: the from companion FIESTA hydrological model for cloud forest, and HYLUC model to determine effects of the combination of different land uses on water flows.
- b) Externalities analysis using hydrological information and market information of downstream users to estimate Willingness to Pay for improved hydrological benefits.
- c) Willingness to accept for changes in land use through analysis of livelihood strategies in upper part of watershed, in order to estimate the best or most plausible land uses that maximise welfare in the upper parts and water flows in the lower parts of the watershed.
- d) Narrative study on land use changes and analysis of perceptions on land use and water in order to identify what's the best way to put such changes forward?

Some initial results from studies suggest that people's perceptions on the role of forest is basic: "more forest-more water", and that forest increase dry-season flows. However there is also the perception that more forest is not always good, as farmers living in upper watershed complain of the increase in fog and humidity conditions; and that water flows have decreased in rivers not because of more deforestation but from more water users. There is also a large suspicion to government intervention, a suggestion to concentrate in areas with lower profitability, such as pastures while improving other land uses, such as shade-coffee. Compensation must be attractive enough, but it is not enough to engage, and engagement might be encouraged if investment was also directed to improved roads and communications. Most properties in the area are relatively small (less than 20ha), raising issues on transaction fees and need to guarantee a threshold level.

2.3 Identifying circumstances where pro-poor markets could exist

Markets and livelihoods : Whether markets can increase livelihoods depends on; the definition of markets, the context in which they are introduced and the way they are designed. The evidence to date on the impact of markets on livelihoods is mixed.

Market based mechanisms : Market based mechanisms are of interest because they can be used to achieve watershed management at lower costs, increase equity, increase the effectiveness of regulatory approaches and tap into new sources of finance.

Potential livelihood improvements : Markets have the potential to provide direct and indirect benefits to the residents. Direct benefits will include financial and in kind benefits. Indirect benefits will be design dependent but could include: strengthened property rights, capacity, community organisations and income from other forest based activities.

Constraints to pro-poor markets : Markets are likely to exacerbate poverty when, land and natural resource tenure are not formalised, there are landless people, there are high transaction costs involved that reduce incentives.

Impracticable : Market based mechanisms are likely to be impracticable when; there is little demand for environmental services, there are difficulties in establishing the links between landuse / land management and the services provides and there are no supporting organisations and institutions.

Design principles of pro-poor markets for environmental services : If markets for environmental services are to be "pro-poor, then they need to:

- What's the role of market-based mechanisms (rather than "pure" markets) when ability to pay is limited.
- Secure property rights of the participants
- Ensure market access through capacity building and information
- Reduce transaction costs by strengthening cooperative institutions and organisations and bargaining power among stakeholders.
- Define appropriate commodities that are simple, flexible, and transparent
- Reduce conflicts between stakeholders

2.4 Understanding linkages between livelihoods and watershed services to identify market based mechanisms for poverty reduction

The linkages between livelihoods and market-based mechanisms for poverty reduction were examined through two case studies from South Africa and Costa Rica.

Luvuvhu Catchment in South Africa: is located in the north of South Africa as part of the Limpopo Basin. The area is semi-arid with highly variable rainfall. Livelihoods are largely based on an agro-pastoral production system. Remittances and state pensions are an important source of cash income to households. Some upstream households have access water through an irrigation scheme. In general the case study showed:

- That greater access to water is a necessary but not a sufficient condition for the eradication of rural poverty. This is because the residents do not have the capital (or land) to use increased water.
- Increased supply will primarily benefit those residents that already have access to it through the irrigation scheme. For those households outside of the irrigation scheme

increased water (i.e. above the 25 liters per capita per day) will be used primarily for convenience rather than productive purposes.

- In the context of Luvuvhu, the livelihoods of the residents depend on the resources that can be harvested from the rangelands more than the physical water resources.

Payment for environmental (PES) services in Costa Rica: The study in Costa Rica considered the possible impact on livelihoods of payments for environmental services from an hydro-electricity producer and upstream farmers in the Monteverde/Arenal region. The lessons learned from the study indicate that:

- A clear dynamic exists between the upstream farmers and land managers and the HEP station as the downstream user of water.
- PES, or wider forms of market-based mechanisms for watershed services, in the study area in Monteverde are constrained by suspicion of the government's long-term motives and the restrictions (opportunity costs) of PES contracts.
- Market based mechanisms for environmental services in this context are most likely to be taken up by farmers where the opportunity costs of the alternative land uses are low (i.e. livestock and pasture)

Overall comments: MMES can improve livelihoods if the watershed service can be measured and linked with an agreed change in land and resource management through a suitable institution / organisation with the appropriate capacity. Where these conditions do not apply, then MMES are unlikely to improve livelihoods.

2.5 Converting hydrological services into marketable commodities

Who demands what? It is important to know or understand, that:

- there is a demand for the services
- the water quantity, quality and flow of services
- the different services that different users might demand

Table 7. Demand for environmental services

Water users	Service demanded	Other
1. Hydroelectric producers	Water supply (annual, seasonal, daily)	Reduced sedimentation
2. Population centers	Constant supply (annual, seasonal, daily) Reduced risks of floods	Improved water quality that reduces costs of purification
3. Industrial users agriculture wet industries transport tourism	Constant supply (annual, seasonal, daily) Reduced risks of floods	Improved quality Reduced siltation
4. Ecological uses	Constant supply to maintain ecological integrity of aquatic and riverine habitats	Reduced sedimentation and destruction of reefs etc.

Converting services into commodities: Markets for environmental services require that the "services" are converted in commodities that can be traded. These commodities must:

- tangible. While the use of proxies is highly important, there are some issues that must be considered with care, for example problems with non-rivalry and non-excludability;
- take into account existing legislation
- be based on the sound science

The commodities that are being developed will depend on the macro-economic context. In developed countries relatively complex mechanisms such as salinity credits are beginning to be traded, but even there it is still nascent. In developing countries simpler commodities are being developed and packed as "water regulation services", through land acquisitions, management contracts, and in less degree water rights. **Table 8** presents a list of some commodities used in existing markets as presented by Landell-Mills and Porrás (2002).

Table 8. Converting watershed services into tradeable commodities

Service	Commodities
Surface water quality	Best land management contracts
	Water quality credits
	Land acquisition
	Conservation easements
Ground water regulation	Salinity credits
	Flow reduction licences
Protection of aquatic habitat	Land easements
	Habitat restoration
	Habitat contracts
	Water rights

A more detailed description is presented below:

- Best management practice contracts – detailed "Best Management Practices" contracts in return for set payments.
- Conservation easements. Contracts between landowners and those who wish to protect or expand certain natural ecosystems whereby the landowner is paid to manage their land in ways that achieve the desired conservation objective. (perpetuity, transferable when land sold, usually not tradable).
- Land lease/conservation concession. Essentially a land lease, involving the allocation of forest use rights in a defined area to the lessor who commits to protecting the forest from unsustainable timber and NTFP harvesting. The right to protect forests is purchased from the government for an up-front payment and annual fees.
- Land acquisition. Purchase of the land on which biodiversity/ES exists.
- Ecolotree plantings –trees' and vegetative systems that filter and absorb contaminated water from the soil.
- Salinity-friendly products - where payments for forests' salinity control function are piggy-backed onto sales of exiting commodities.
- Salinity credits –Tree planting in critical areas reduces water tables and thus salinisation of surface soil and water bodies. Salinity emission limits are issued and can be traded.
- Salmon Safe products –payments for forests salmon habitat protection function are piggy-backed onto sales of agricultural produce. Farmers who invest in salmon-sensitive land management get financially rewarded for their efforts.
- Stream flow reduction licenses – Tradable permits for land-based activities that reduce water availability for downstream users in South Africa.
- Transpiration credits – Credits used to commercialise forests' role in evapo-transpiration and water table regulation.

- Water rights –Normally used to regulate demand for water, but may be extended to create incentives for activities that increase water delivery where additional rights can be awarded for sale
- Water quality credits - commercialises forests' water quality maintenance services. Pollution permits allocated to point source polluters and trade is allowed.
- Watershed lease – where land in watersheds is leased by downstream beneficiaries to undertake watershed protection activities.
- Watershed protection contract – contract negotiated between watershed landholder and downstream beneficiaries that specifies watershed management activities that will be undertaken in return for set payments.

Developing and maximising demand: It can be very difficult, but it is not impossible to develop demand for watershed services / commodities because of:

- conflicting laws and regulations
- water is often considered a right rather than a commodity and therefore should not be paid for

A summary of steps in developing a developing demand include:

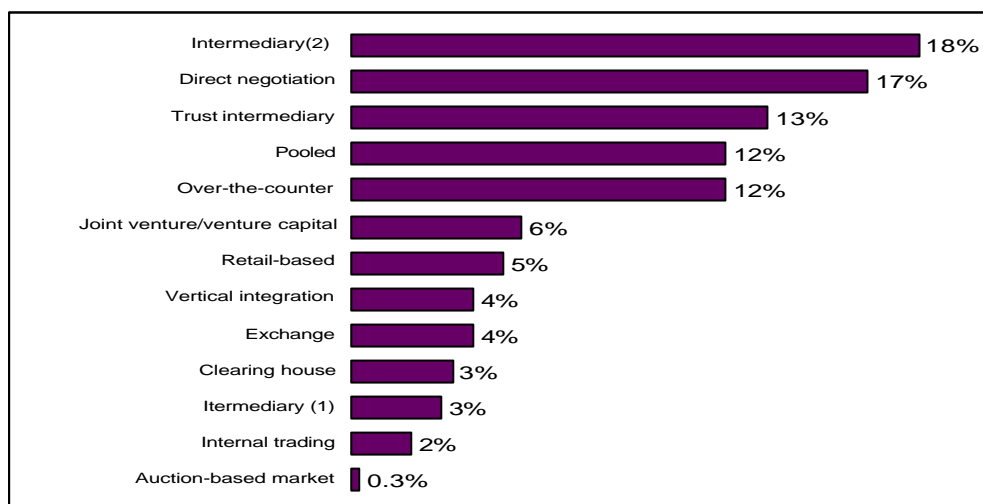
1. Analyse the stakeholders in the watershed (landowners and decision-makers, water users, government agencies, policy makers, environmental NGOs, etc); what are their interests, requirements (present and future), threats to their interests, etc.
2. Determine policy impacts on water flows; current and planned policies that affect landuse and water, investigate efficient and feasible landuse options, identify conflicts, interests, motivation and incentives.
3. Estimate willingness to pay; importantly this is not for the water per se, but for the marginal values of improved water quality, quantity and regulation. Identify which of the stakeholders has the highest willingness to pay.
4. Improve willingness to pay: The willingness to pay can be increased through promoting the awareness of the importance of the environmental services, the long-term benefits of watershed management, the indirect benefits to the private sector of working with communities etc. It should always been remembered that for the private sector purchasing environmental services should be considered as a business transaction.

Finally, it is important to remember that the possibility for exchange depends on whether or not there's a potential demand, in the existence of a willingness and ability to pay, and the existence (and not just assumption) of a service. It is very important to understand that supplier will not spring up from nowhere. A lot of work will have to go in to landowners.

2.6 Reward mechanisms for market watershed services

Diversity of mechanisms : There is a diversity of market-based mechanisms for the marketing watershed services.

Figure 1. Distribution of market mechanisms for the the payment of watershed services (source: Landell-Mills and Porrás, 2002).



Simpler mechanisms are more popular: Of the 287 cases reviewed, 70% used simple mechanisms. These include:

- Direct negotiation
 - payments embedded within larger projects
 - Usually long bargaining;
 - Use of detailed Best Management Contracts
- Intermediary transactions
 - Help reduce transaction costs
 - Lower risk by improving skills
 - Trust funds, local and international NGOs, and the government
 - Can be used with other mechanisms, such as pooled transactions.
- Pooled transactions
 - Controls risk by sharing among investors;
 - Used where minimum threshold required or when investors are interested in different commodities;
- Retail based trade
 - Capitalised in consumer's Willingness to Pay
 - Used in BD, Carbon, and in Watersheds for the Salmon Safe. Usually requires certification.

Sophisticated mechanisms: These are generally only used in developed countries and include:

- OTC and user fees
 - Commodity pre-packaged for sale (eg. water quality credits, park entrance fees, carbon offsets);

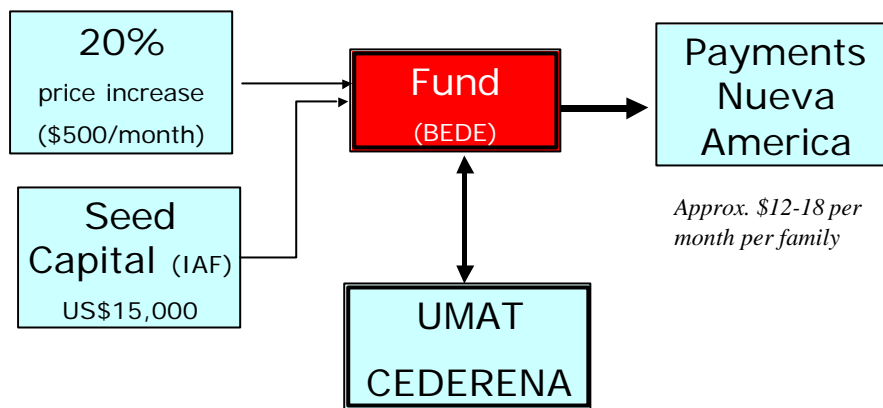
- Services sold by user fees, usually non-refundable, set at standard rate, and imposed on beneficiaries
- Joint venture/venture capital:
 - investors offer equity input into a start-up company and channelling PES through it.
 - Used in BD, Carbon and less in Landscape beauty. None in WS.
- Exchange-Based Trade:
 - Standardised commodity that can be resold
 - Possible when the companies are already (or expecting to be) profitable
 - Requires more advance systems like exchange platforms. Mostly used in carbon.
- Vertical integration:
 - Used only in landscape beauty (so far)
 - By developing their own tourism operations, local land stewards seek to bypass tour operators to capture WTP.
- Clearing-house transactions
 - Offers a trading platform or centralised system for buyers and sellers of standardised products
 - transparent system for price discovery
 - Must have government legislation to standardise commodity
 - In WS only used in developed countries, and still nascent.
- Internal Trading:
 - transactions that occurs within an organisation, for example, intra-governmental payments
 - Help companies find their WTP before doing external trading
- Auctions
 - Often associated with clearing-house mechanisms and over-the-counter trading;
 - Attempt to move closer to competitive market
 - Proposed for determining the supply of watershed services as well as for allocating obligations to pay

Case study one: Ecuador, Pimampiro: The municipality of Pimampiro has 17,000 residents of whom 6,000 live in the town. Estimated that 13,000ha of forests have been cleared since 1985 leaving about 7,000 hectares. Approximately 638 ha in the headwaters of the municipal water systems is controlled by the Nueva America Association (NAA). Demand for the services comes from: Community-forestry project funded by FAO and the Interamerican Foundation (US) (both of which provided seed capital for fund); a local NGO CEDERENA which administers the system, and the Municipality of Pimampiro, which charges 20% of water fees for watershed management, collecting about \$500/month.

The following payments are made to the families owning the land:

- Primary forest and paramo– US\$1 per hectare per month
- Old secondary – US\$0.75 per hectare per month
- New secondary forest – US\$0.50 per hectare per moth

Figure 2. Institutional arrangement for Pimampiro case

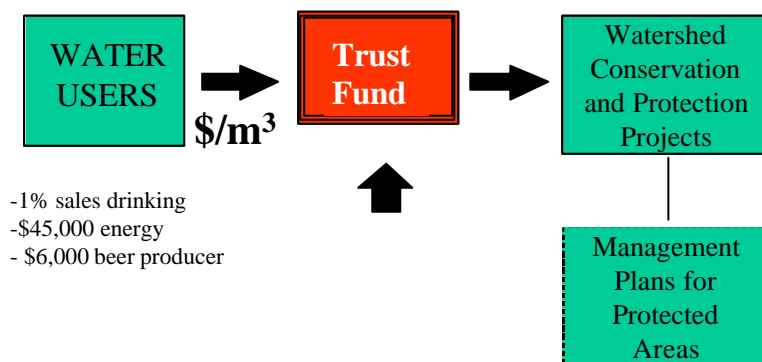


Case study two: Quito Watershed Fund, Ecuador: The city of Quito has a population of over 1.5 million. Two major projects to ensure supply beyond 2020. Watersheds are under pressure from changes in land use. Funds from water sales and commercial users channelled into a Fund. Fund used to pay for approved watershed protection projects including management plans for protected areas. Some advantages of the fund include:

- Ability to co-ordinate and enhance individual efforts
- Use skills of all stakeholders
- Provides transparency and sustainability of funding

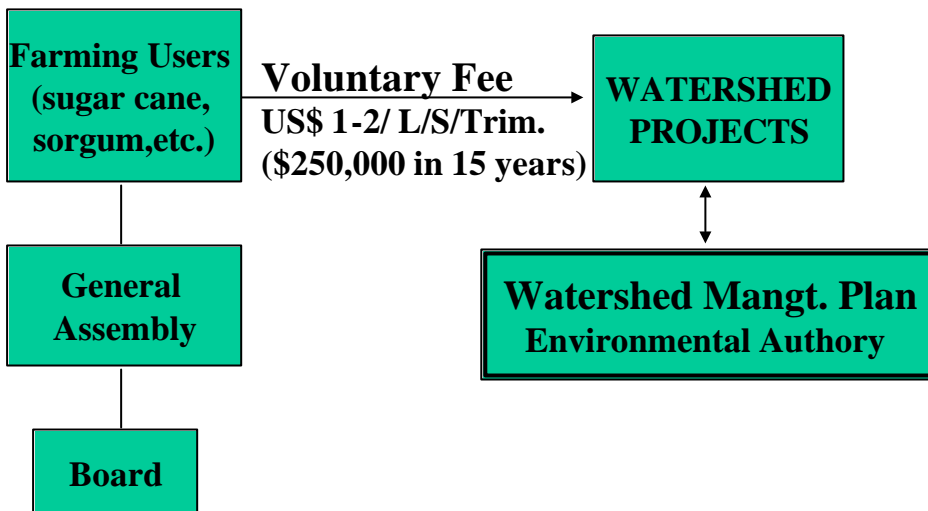
Figure 3. Institutional arrangement for the Quito Fund, Ecuador

Administration: (1) board, (2) technical secretariat, and (3) FONAG financial manager



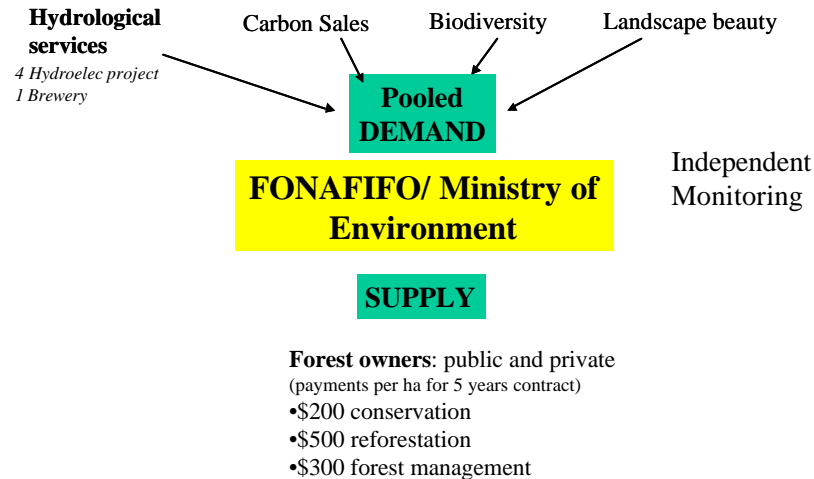
Case study three: Cauca Valley, Columbia: Is an example of a long running arrangement between lowland and upland farmers. Watershed management activities have been ongoing since 1960's. Lowland sugar cane and sorghum farmers have collected US\$250,000 in 15 years to fund watershed projects.

Figure 4. Institutional arrangement for the Cauca Valley Fund, Colombia



Case 4: Costa Rica. In Costa Rica there exist several payment mechanisms and institutional arrangements for MMES. The most important ones are transfer payments, voluntary contracts and user payments. The first case corresponds to the scheme adopted by FONAFIFO, acting as the State's main intermediary by pooling demand from different ES users (watershed services, biodiversity, landscape beauty and carbon sequestration), and channelling these funds to forest owners around the country (see **Figure 5**).

Figure 5. Institutional arrangements for transfer payments in Costa Rica (FONAFIFO)



FONAFIFO has entered some individual voluntary agreements with companies, whereby these companies pay for a portion of the full payment for conservation (i.e. \$10 or \$15/ha), and FONAFIFO covers the rest of the payment from other sources. Some of the main aspects of the hydrological service agreements with private companies include:

- Energia Global: (Hydroelectric Project) concentrates on forest management, conservation and reforestation. Pays \$10/ha for 1400 ha
- Platanar: (Hydroelectric Project). concentrates on forest management, conservation and reforestation. Pays \$10/ha for 3600 ha or \$30/ha as only payment if no titles, plus 1000/month to FUNDECOR for intermediation and monitoring.

- Florida ICE&FARM (Brewery industry), concentrates on conservation and pays \$45/ha for 1000 ha plus \$30 for every new ha to FONAFIFO for intermediation and FUNDECOR for monitoring and technical/legal advice.
- CNFL (Hydroelectric Project): concentrates on forest management, conservation and reforestation, pays \$40/ha for 11000 ha, plus a large environmental education programme, efforts to improve agricultural practices and waste management. Property rights are not fully necessary as rights of land possession are enough. Pays FONAFIFO for promotion costs
- No other intermediaries.

A direct voluntary agreement, outside the FONAFIFO umbrella, has been made by La Esperanza Hydroelectric company and the Monteverde Conservation League (MCL). This agreement protects 3000 ha of cloud forest located in the catchment. There is a 99-year contract signed in 1998 – stating that the plant build in lands belonging to MCL to be fully used by La Esperanza during the contract, and after the contract expires the infrastructure will belong to MCL. Payments: during construction: \$3/ha/year, increasing during the first five years to \$10/ha/yr and then based on production, using \$10/ha as reference value. No intermediaries

Lessons learned from MMES: The lessons learned from the ongoing initiatives include:

- Sophisticated mechanisms: These maybe appropriate in some cases but the set-up costs can be high especially if there is little government / NGO / community capacity. Developing countries with restricted ability might do better to start with simpler systems
- Evolution is non-linear: sophisticated methods can co-exist in developing countries (ie pooled transactions), however more advanced systems will require improved government regulatory framework, an efficient financial sector, the development of a specialised service support sector, and/or improved communication infrastructure
- Different mechanisms can exist: It is possible to run different systems in parallel depending on the needs.

2.7 Summary and comments of thematic and methodological session

Complexity: Simple representation of what a watershed represents is not easy. Using the term "upstream and down stream users" is not very useful in economic and social terms, especially if there is a perception that poor people live in the upper parts of the watersheds, which is not always the case. Using the concept "winners and losers" could help identify social strengths and weaknesses of the project.

Hydrology: In many ways it's the land management and activities that take place what really matters in terms of hydrological effects, rather than the vegetation per se. However, despite the expense and time required for developing good hydrological information, it is important to know that even basic work can be done and is very useful for resolving issues at a project level.

Land use and vegetation: Important to recognise that land cover and vegetation exist in variety of forms. It is important to consider the mixes and degrees within any one type of vegetation cover.

Public perception: Generally public perception and policy makers' perceptions are shaped by crises and big events, not the day-to-day processes. This presents both opportunities and challenges.

Messages: Each project team should think about their target audiences and how they might be influenced. There exist a lot of useful information that needs to be re-arranged and re-written according the each country's requirements. For example, writing about success stories, problems, and how they have been solved.

Participatory hydrology: Local participatory assessments of hydrological effects can be effective, efficient and more "deeply recognised" (legitimate). These types of study can be used to complement the "external" science based approaches. It is important however to be particularly careful when hydrological information is limited and the project decides to focus only on water quality, ignoring the possible effects on water quantity.

Terms and phrases: Terms and phrases used all have different meanings and can be value laden. For example: "Forests", "Agriculture" Degraded Land", "market".

Existence value : Key underlying principle but difficult to make practical for watersheds. "Mars missions": Cost of Mars missions gives one (very high) proxy value which humans put for water!.

Markets continuum: There is a continuum of market-based mechanism from payments, compensations, through to incentives and subsidies, etc.

Bundling: Bundling water with other environmental services – what contexts?

Sources of income : Need to list and profile sources and potential sources of cash that can be used for market-based mechanisms for environmental services systems.

Water as a focus: The project is still focussed on water. Other watershed services still developing.

Livelihoods issues. While it is important to keep economic efficiency and environmental effects in hand, this project presents an unique opportunity for country teams to shape up the discussion alongside the search for poverty-reduction tools.

Experience from CBNRM in southern Africa: A huge body of knowledge exists within southern Africa on the potential for market-based incentives for natural resource and land management. It is important that these experiences are considered by the watershed management project because they are directly relevant to the issues. For example in Zimbabwe, some community-based organisations have been receiving annual payments derived from their wildlife resources. In addition, these payments are market related, although in many cases heavily taxed by the rural district councils through whom the payments are channelled. Even after 13 years it is very difficult to make causal relationships between the payments, the management of natural resources and poverty / livelihoods.

3 Section 3: Planning action learning and diagnostic country work

3.1 Basic steps in action-learning

In the second phase of the project, the four diagnostic countries will move into a process of action "action learning" while two further countries (China and Bolivia) will carry out comprehensive diagnostic reviews of the potential for MMES. Action learning is based around energising and expanding a incipient policy community within a national level in the chosen countries and at a global level. The presentation below reviews the generic steps envisaged for the second phase of the project.

Why have common steps? A common approach or set of steps across the project will:

- Increase the chance of comparability across countries in analysis, and
- Allows key changes or process modifications to be shared to avoid reinventing wheel or repeating mistakes

It is however important that where necessary the common steps can be modified, expanded and made specific in each region. The order in which the steps are carried out is also flexible.

What are the initial steps? The first steps that are recommended are:

- Use diagnostic report – to build a wider 'community' of those engaged
- Record feedback and share further information generated – to update diagnostic & inform actions of key groups "
- Formalise learning group and establish its focus and "fit" with other initiatives – review and modify participation, focus and useful synergies "
- Finalise watershed sites for action-learning – review criteria for selecting sites and ensure that policy moment still exists

What are the steps in each selected watershed? Following the initial steps at the national level, each country should:

- Clarify the science – investigate land uses and hydrological information
- Develop detailed social and policy mapping – situation analysis of stakeholders and policy, market and institutional influences
- Support engagement between upstream land users and downstream water users – face to face exchanges
- Assess feasibility of market mechanism options – conduct a transparent feasibility study of existing and potential market mechanisms (Social CBA, WTP etc)

- Help strengthen the willingness to pay – develop an approach that: (a) fits with regulation (b) pro-poor (c) improves information on benefits and threats (d) supports environmental standards"
- Support formalisation of property rights for services held by poor people
- Define appropriate commodities – identify commodities i.e. watershed protection contracts, watershed leases, water use rights, stream flow reduction licenses, water quality/salinity credits and tree-planting contracts
- Support establishment of a payment mechanism – keep it simple at first: direct negotiated payments or intermediary-managed payments rather than auctions, retail based mechanisms
- Strengthen cooperative institutions – direct costs and indirect costs of association and institutional cooperation
- Improve capability and skills development – aim to combine a little judicious direct support for capacity development in watershed service delivery, marketing, finance, contracts & conflict.

What happens next? It is important that the lessons learned from the selected interventions at the watershed sites are disseminated both at a national and global level. At the national level the country teams should;

- Install cross-watershed learning mechanisms – ensure that useful knowledge and lessons between sites are shared
- Develop "products" based on the lessons learned – prepare draft guidance materials, tools, briefs etc
- Invest in the 'policy community' – continue with watershed awareness and joint action (momentum)
- Lay out best bet options market development and equity – synthesise the learning on required conditions

3.2 Country plans and discussions

3.2.1 South Africa: Workplan

Goal: Promote maintenance of watersheds that support livelihoods

Purpose: Increase understanding and role of MMES for watershed in the Republic of South Africa.

Output 1: Market based mechanisms included in planning, policy, development and practice of key institutions.

- policy brief
- recommendations to DWAF re what they need to put in place for MMES.

Output 2: Key constraints and opportunities are identified for selected catchments.

- finalisation of criteria and final selection of case study sites
- analysis of critical success and boundary factors including service and commodities

Output 3: Markets and MMES are enabled and monitored in South Africa.

- Institutional analysis to identify the actors
- Economic, hydrological, social and financial assessment
- Relevant tools identified
- Pilot trades or frameworks influenced.

Output 4: Alignment and knowledge sharing

Other aspects that the project will consider include:

- Learning group workshops including advisory group
- Sharing workshops
- Broad team composition (hydrologist, social, economist and market practitioners)
- Licensing allocations – RDMs and IWMP

3.2.2 India: Discussions and ideas

Next steps: Completed work plan, sites confirmed, team formalised

Issues for discussion:

Role of the outside subsidy: There is an important methodological issue, namely whether or not market based mechanisms for environmental services can be jump-started by the payment of subsidies or should payments be restricted to market incentives only.

Monitoring and evaluation: The action learning steps that have been set out do not deal with an important component of ecological monitoring.

Policy feedback and exchange learning: It has been noted that there is great diversity within the project between the different countries. This presents an ideal opportunity for exchange visits between the different countries.

Focus of IIEDs work: Making Market-based Mechanisms work: There are many projects and organisations that are considering the role of market based mechanisms for the management (and protection of watersheds). The focus of this project is at the interface between the MBS and the impacts on the livelihoods of the poorest residents of these watersheds.

- It may well be impossible to have a positive outcome
- Experimentation is essential

3.2.3 China

There is the possibility of working with a larger consortium of institutions (CIAD, ICRAF, Chinese Academy of AG Science – policy economics), government agencies, Forestry, water conservation, Environment (transferable pollution quota).

Need to define the "What, When and Where". Begin by making a quick review of projects, policies, current initiatives. Then prioritise watersheds for diagnostic, develop framework proposal by the end of March 04, and a detailed work plan – methodological framework; identify stakeholders, site-specific workshops 2 sites.

Main Questions:

- How to tackle diversity of watersheds? -large, one polluted, one with quotas
- How to balance research with action tool/feedback activities – if want to get support from stakeholders need feedback.

- How to find the appropriate level of interaction- township, county, province etc

Comments

What can we add to what is already going on? Regional aspect eg for the Mekong which is in China and Thailand.

Opportunity – sloping lands programme – huge changes

Large watersheds often have more data available on them.

3.2.4 Indonesia

First challenge – how to structure work plan to fit in practically with developments in Indonesia, RUPES and other initiatives. Used suggested action steps but expand those steps that were most relevant to Indonesia context and contracted others. BACKBONE facilitating transactions between upstream and downstream

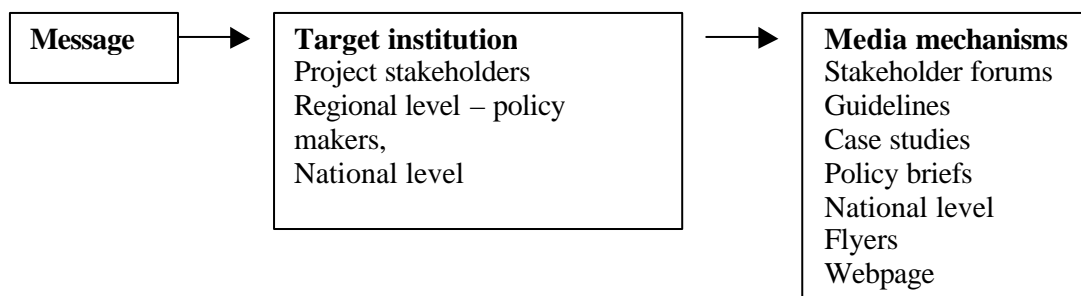
Define team members, facilitators at each site, and a learning group. This learning group will concentrate on MMES for maintaining and protecting watersheds, with 20 people at most with range of agencies. Group has to be small enough to convene regularly. Mimic model of WATSAN.

3.2.5 The Caribbean

The Caribbean team have already designed quite a detailed workplan (information available in IIED website). One of the first activities to do is to strengthen contacts with DFID regional office. In terms of time it is important to avoid bunching the activities in the last year of the project, and the key will be to keep it simple because of the time frame. Need a coherent strategy for communications.

In terms of training, it is important to combine theoretical and how theory would work in practice. Team must be able to identify and capacitate facilitators to broker arrangements between stakeholders but need to be credible through technical competence or being known to local stakeholders. Help will be required in terms of institutions and livelihoods - IIED to provide training on institutional arrangements for MMES and help in interpreting livelihoods framework and developing indicators.

Communication strategy (the objective is to sensitise, advocate and evaluate). Need to design monitoring and evaluation.



3.2.6 Bolivia

Team will begin by preparing a workplan for the next 18 months, with a draft to be presented at the end of March 04. The formation of a learning group together at an early stage is key, as well as designing ways to obtain the perspectives of the poor. Practical guidance and support from action-learning countries will be highly beneficial. One suggestion is to develop a quick,

simple, list of "do's and don'ts" on diagnostic studies and circulate by email. The use of terminology is very important, as the term "markets" made people stiffen. Another important start-up material will be a policy brief based on Silver Bullet, in Spanish. The team will plan learning exchanges with neighbouring countries, such as the case of Pimampiro in Ecuador.

3.2.7 Mexico

The next step of work with IIED will be the preparation and design of a workshop in Mexico, in order to raise concern on the social agenda and how can they be included in the existing payment system. It is important to join efforts with other institutions, such as CI and IUCN. There will be a proposal for follow-up from the workshop. Evaluation of impact will be done at a later stage, as it is too early to think about impacts. One issue to pursue is exchanges with other countries, such as Ecuador.

3.3 Summary of Project's next steps

For moving forward with an action learning process:

Contracts: One group, namely the Caribbean has successfully negotiated a contract with IIED. For the project to deliver its objectives it is vitally important that the other country groups complete their work plans and proposals as soon as possible. The model that has been developed by the Caribbean group is extremely useful and is based around a logical framework which will be needed in all cases.

Workplan for IIED: IIED will continue to provide technical support for the project. IIED will also be developing a work plan that will be sent to all the collaborating partners with details of the proposed country visits, technical support, communications strategy, opportunities for the dissemination of the lessons learned and exchange visits.

Overall Project Monitoring and Evaluation: An overall project monitoring and evaluation framework needs to be developed in the near future without it becoming a burden for the project.

Importance of partnerships : The success of the project depends on developing partnerships and encouraging participation and feedback from key allies. This can be thought of at different levels: within the project itself, by engaging direct participants in the initiative and other similar existing projects; at country level by engaging a series of alliances from different sectors and institutions to promote information sharing and political buy-in; and at a more international level, with IIED, partner countries in the project and learning from on-going similar initiatives around the world.

Capacity building and the project: The development of capacity to engage in discussions about market-based mechanisms for watershed management is an important component of the project. Capacity building and how it will be achieved should be explicitly dealt with in each of the country level plans. One suggestion is a training workshop for the use of HYLUC and "blue water-green water" modelling prepared by CLUWRR.

Appendix 1. Programme with cross reference to presentations

Dates: January 28th-30th 2004

Venues: 28th January - The Charity Centre, 24 Stephenson Way, London,
29th and 30th January - Friends House, 173 Euston Rd, London,

Chair: John Hudson, DFID – 28th
Ivan Bond, IIED – 29th
James Mayers, IIED – 30th

Day 1: Information exchange

Time	Topic	Presenter	Section (x-ref)
9:00 - 9:30 am	Coffee		
9:30 - 10:00 am	Self-introduction of all participants Name, institution, country, link to the project		
10:00 – 11:00 am	Why we are doing this project, what we are doing, and how far we have got with it Initial rationale, global review, key issues, work being done by others Inception phase of this project – what was done, main findings and challenges ahead Implementation phase of this project – what are the objectives, who is involved, what are their roles?	James Mayers,	1.1
11:00 - 11:30 am	Coffee break		
11:30 - 11:40 am	Introduction to Action Learning country sessions	Chair	1.2
11:40 - 12:20	The Caribbean	Vijay Krishnarayan, Tighe Geogeghan, Lyndon John, Marilyn Headley	1.2.1
12:20-1:00 pm	South Africa	Nicola King, Jenny Cooper	1.2.2
1:00 – 2:00 pm	Lunch		
2:00 - 2:40 pm	India	Sushil Saigal, Chetan Agarwal	1.2.3
2:40 – 3:20 pm	Indonesia	Pak Munawir and Mohamad Ali	1.2.4
3:20 - 3:40 pm	Coffee Break		
3:40 – 3:50 pm	Introduction to Diagnostic country sessions	Chair	
3:50 - 4:10 pm	Bolivia	Maria Teresa Vargas	1.3.1
4:10 – 4:30 pm	China	Lubiao Zhang, Li Xiaoyun,	1.3.2
4:30 – 4:50 pm	Mexico	Josefina Braa Varela	1.3.3
4:50 – 5:00 pm	Wrap up for the day and announcements	Chair	

Day 2 – Thematic and methodological work

Time	Topic	Person responsible	Section (x-ref)
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Time	Topic	Person responsible	Section (x-ref)
9:00 - 9:30 am	Coffee		
9:30 – 9:50 am	Summary of Day 1, introduction of Day 2	I. Bond	1.5
9:50 –10:20 am	Shaping markets for watershed services – key thematic/methodological challenges	Ina Porras	2
10:20 - 11:10 am	Hydrology and land use	Ian Calder	2.1
11:10-11:40 am	Coffee break		
12:40 – 1:00 pm	Putting a value on hydrological services – the example of modelling used in the Panama Canal Watershed and Monteverde, Costa Rica	Ian Calder, Ina Porras	2.2
1:00 – 2:00 pm	Lunch		
2:00 - 2:45 pm	<p>Preparing the ground for markets to benefit livelihoods</p> <ul style="list-style-type: none"> Identifying the circumstances under which is it wise/unwise to even consider commoditising watershed services? Understanding linkages between livelihoods and watershed services to identify market based mechanisms for poverty reduction 	<p>M. Grieg-Gran,</p> <p>Rob Hope</p>	<p>2.3</p> <p>2.4</p>
2:45 – 3:15 pm	Converting watershed services into market commodities. demand necessarily create supply?	Ina Porras	2.5
3:15-3:45 pm	Coffee Break		
3:45 – 4:50 pm	<p>Market/payment mechanisms and other institutional arrangements. Focused mainly on water services, and using case examples:</p> <ul style="list-style-type: none"> Different mechanisms for managing 	Ina Porras	2.6
4:50 – 5:00 pm	Wrap up for the day and announcements	Chair	
7:30 pm	Dinner – all participants are invited to a restaurant to be announced		

Day 3: Planning action-learning and diagnostic country work

Time	Topic	Person responsible	Section (x-ref)
9-9:30	Coffee		
9:30 – 9:50 am	Summary of Day 2, introduction of Day 3	J. Mayers	2.7
9:50 – 10:20 am	Plenary session: basic steps anticipated in action learning processes and diagnostic processes	Duncan Macqueen	3.1
10:20 -11 am	Working groups: planning action learning and diagnostic processes in each of the countries	Relevant IIED staff in each group	3.2
11:00 - 11:30	Coffee break		
11:30 - 1:00 pm	Working groups continue	As above	
1:00 – 2:00 pm	Lunch		
2:00 – 3:15 pm	Working groups continue	As above	
3:15 - 3:45 pm	Coffee Break		
3:45 – 5:00 pm	Plenary session: <ul style="list-style-type: none"> • Highlights from working groups on key features and key needs of the planned work in each country • Participants' conclusions from the workshop • Summing up. 	Chair	3.3

Appendix 2. Workshop participants

**DEVELOPING MARKETS FOR FOREST WATERSHED PROTECTION SERVICES
AND IMPROVED LIVELIHOODS
INFORMATION SHARING DAY
28-30th JANUARY 2004
THE CHARITY CENTRE AND FRIENDS HOUSE, LONDON**

Participant contact details

Contact Person	Country	Institution	Contact details
Project Members			
Pak Munawir	Indonesia	LP3ES	Jalan S. Parman 81, Slipi Jakarta 11420 Indonesia tel: +62 21 5674211-13 (7hr time difference) fax: +62 21 568 3785 email: psdal@lp3es.or.id
Mohamad Ali	Indonesia	Ministry of Settlement and Regional Infrastructure	Jalan Pattimura No.20 Jakarta 12110 Indonesia tel/fax: +62 21 7221907 email: ali_12110@yahoo.com
Kinsuk Mitra	India	Winrock International - India	1, Navjeevan Vihar, New Delhi 110017 India tel. +91 11 26693868; fax. +91 11 26693881; email:kinsuk@winrockindia.org
Sushil Saigal	India	Winrock International- India	1, Navjeevan Vihar, New Delhi 110017 India tel. +91 11 26693868; fax. +91 11 26693881; email: sushil@winrockindia.org
Chetan Agarwal	India	Winrock International- India	1, Navjeevan Vihar, New Delhi 110017 India tel. +91 11 266938; fax. +91 11 614 6004 email: chetan@winrockindia.org
Vijay Krishnarayan	Trinidad and Tobago	Caribbean Natural Resources Institute	Administration Building, Fernandes Industrial Centre, Eastern Main Rd, Laventille, Trinidad and Tobago, W.I tel: +868 626 6062 fax: +868 626 1788 email: vijay@trinidad.net www.canari.org
Tighe Geoghegan	U.S Virgin Islands	Caribbean Natural Resources	P.O. Box 644 Christiansted, St. Croix U.S. Virgin Islands 00821

		Institute	Email: tigde@islands.vi; Telephone/fax: 340 778-2278 For courier services - 44 Estate St. John Christiansted, St. Croix U.S. Virgin Islands 00820
Lyndon John	Caribbean	Caribbean Natural Resources Institute	Administration Building, Fernandes Industrial Centre, Eastern Main Rd, Laventille, Trinidad and Tobago, W.I. tel: +868 626 6062 fax: +868 626 1788 email: lyndon@canari.org
Marilyn Headley	Caribbean		Forestry Department, 173 Constant Spring Road, Kingston 8, Jamaica Tel: +876 924 2125 Fax: +876 924 2626 Email: mheadley@forestry.gov.jm
Nicola King	South Africa	CSIR- Environmentek	Environmental Economist, PO Box 395, Pretoria, 0001, South Africa tel: +27 (0)12 841 2842 fax: +27 (0)12 841 2689 email: NAKing@csir.co.za
Jenny Gilbert	South Africa	CSIR- Environmentek	Environmental Economist, PO Box 395, Pretoria, 0001, South Africa tel: +27 (0)12 841 2978 fax: +27 (0)12 841 2689 email: JCooper@csir.co.za
Harrison Pienaar	South Africa	DWAF	Private Bag X313, Pretoria, South Africa, 0001 email: vandermerwej@dwaf.gov.za (Secretary: Julie Van der Merwe)
Willie McGhee	Edinburgh	Edinburgh Centre for Carbon Management	Unit 2, Tower Mains studios, 18 Liberton Brae, Edinburgh EH16 6AE tel: +44 (0)131 666 5070 fax: +44 (0)131 666 5055 email: willie.mcghee@eccm.uk.com
Diagnostic country members			
Dr. Li Xiaoyun	China	China Agricultural University	College of Humanities and Development, No. 2 Yuanmingyuan West Road, Haidian District, Beijing 100094 PR, China tel: +8610 6289 3094 email: xiaoyun@cau.edu.cn
Professor Zhang Lubiao	China	Chinese Academy of Agricultural Sciences	Institute of Agricultural Sciences, No. 12 Zhongguancun South Street, Beijing 100081 PR, China fax: +86 10 68976148 Mobile: 13601058984 email: zhanglb@lead.org.cn or lzhang@worldbank.org
Dr. Li Ou	China	China Agricultural University	Dept. of Development Management, Centre for Integrated Agricultural Development (CIAD), College of Humanities and Development (COHD), Beijing 100094, PR China Email: liouc@163bj.com

Maria Teresa Vargas	Bolivia		Fundacion Natura Bolivia Calle Campero 247 Santa Cruz Bolivia Or Temporary address (Jan-May 2004) - Yale School of Forestry 205 Prospect Street New Haven, CT 06511, USA tel/fax: +591 (3) 333 0018 or USA numbers are - tel: +1 203 464 9340 fax: +1 203 432 5942 email: maria.vargas@yale.edu
Mariana Machicao	Bolivia	Natura	Home:591 02 222 0636 mobile: 591 705 37225 email:marianamachicao@hotmail.com or marianamachicao@yahoo.es
Nigel Asquith	Bolivia		Fundacion Natura Bolivia c/o Conservation International, 1919 M Street NW, Washington DC 20036 email: nasquith@conservation.org
Daniele Perrot-Maitre	Switzerland	IUCN	Wetlands and Water Resources Programme, IUCN The World Conservation Union, Rue Mauvemey 28 CH 1196 Gland Switzerland email: daniele.perrot-maitre@iucn.org
Josefina Braña Varela	Mexico	Instituto Nacional de Ecologia	Periferico 5000, 3rd floor Insurgentes Cuicuilco, 04530, Coyoacan, Mexico City, Mexico tel: (52) 55 54 24 64 00 ext 13143 fax: (52) 55 54 24 54 08 email:jbrana@ine.gob.mx
Donor Agencies			
John Hudson	UK	DFID	1 Palace Street London SW1E 5HE tel: +44 (0)20 7023 0000 fax: +44 (0)20 7023 0016 email: j-Hudson@dfid.gov.uk
Mike Harrison -	UK	DFID	1 Palace Street London SW1E 5HE email: mike-harrison@dfid.gov.uk
John Palmer	UK	FRP	NR International, Park House, Bradbourne Lane, Ditton, Aylesford, Kent, ME20 6SN tel: (01732) 87 86 60 email: j.palmer@nrint.co.uk
Broader Network			
Rob Hope	UK	CAMP	CLWRR, University of Newcastle upon Tyne, Peter Building, St. Thomas' School, Newcastle Upon Tyne, NE1 7RU tel: 00-44-(0)191-222-7116; fax: (0)191 222 6563; email: robert.hope@ncl.ac.uk
Ian Calder	UK	CAMP	CLWRR, University of Newcastle upon Tyne, Peter Building, St. Thomas' School, Newcastle Upon Tyne, NE1 7RU tel: 00-44-(0)191-222-7116; fax: (0)191 222 6563

			email: I.r.calder@ncl.ac.uk
Dr. Dennis Garrity -	UK	World Agroforestry Centre	PO Box 30677 Nairobi Kenya tel:+254 20 524000 fax: +254 20 524001 email: d.garrity@cgiar.org
Dr. Horst Weyerhaeuser	China	World Agroforestry Centre	ICRAF-Kunming, floor 3, building A, Zhonghuandasha Yanjiadi 650034, Kunming Yunnan, PR China tel: +86 871 4164076 fax: +86 871 4164124 email: horst@loxinfo.co.th
Josh Bishop	Switzerland	IUCN	Economics and Environment Rue Mauverney 28 Gland CH-1196 Switzerland Joshua.bishop@iucn.org Tel:+41 22 999 0000
IIED			
Ivan Bond	UK	IIED	3 Endsleigh St London SW3 5AF tel: +44 (0)20 7388 2117 fax: +44 (0)20 7388 2826 email:ivan.bond@iied.org
Duncan Macqueen	UK	IIED	4 Hanover Street Edinburgh EH2 2EN tel: +44 (0)131 226 7040 fax: +44 (0)131 624 7050 email: duncan.macqueen@iied.org
Maryanne Grieg-Gran	UK	IIED	3 Endsleigh St London SW3 5AF tel: +44 (0)20 7388 2117 fax: +44 (0)20 7388 2826 email: maryanne.grieg-gran@iied.org
Ina Porras	UK	IIED	4 Hanover Street Edinburgh EH2 2EN tel: +44 (0)131 226 7040 fax: +44 (0)131 624 7050 email: ina.porras@iied.org
James Mayers	UK-Scotland	IIED-Edinburgh	4 Hanover Street Edinburgh EH2 2EN tel: +44 (0)131 226 7040 fax: +44 (0)131 624 7050 email:james.mayers@iied.org
Elaine Morrison	UK	IIED	3 Endsleigh St London SW3 5AF tel: +44 (0)20 7388 2117 fax: +44 (0)20 7388 2826 email: elaine.Morrison@iied.org
Chi-Chi Tang	UK	IIED	3 Endsleigh St London SW3 5AF Tel: +44 (0)20 7388 2117

			Fax: +44 (0)20 7388 2826
Sonja Vermeulen	UK	IIED	3 Endsleigh St London SW3 5AF tel: +44 (0)20 7388 2117 fax: +44 (0)20 7388 2826 email: Sonja.vermeulen@iied.org
James Macgregor	UK	IIED	3 Endsleigh St London SW3 5AF Tel: +44 (0)20 7388 2117 Fax: +44 (0)20 7388 2826
Camilla Toulmin	UK	IIED	3 Endsleigh St London SW3 5AF Tel: +44 (0)20 7388 2117 Fax: +44 (0)20 7388 2826
Annie Dufey	UK	IIED	3 Endsleigh St London SW3 5AF Tel: +44 (0)20 7388 2117 Fax: +44 (0)20 7388 2826