



Tool 4: Investments in the protection and improvement of biodiversity

Case and region	Issue	Type of tool	Description	Economic and financial benefits	Environmental benefits	Social /poverty alleviation benefits	Governance changes	Scaling up and relevance for developing/ transition countries	Concerns
<p>(1) Fund for the Protection of Water (Fondo para la Protección del Agua – FONAG), Ecuador</p> <p>LAC</p>	Watersheds	Investments in the protection and improvement of biodiversity	<p>FONAG was established in 2000 as a trust fund into which water users in Quito Metropolitan District could contribute to support watershed conservation and management activities to protect the supply of water.</p> <p>The Fund constitutes a Payment for Environmental Services scheme, in which local water users, including hydropower and water supply companies contribute regularly under a self-taxing arrangement.</p> <p>Activities involve land purchase in critical areas to sustain ecosystem services and improvement of agricultural management practices, but no direct payments to farmers.</p>	<p>Water users who pay into FONAG safeguard their future economic performance by securing long-term quantity and quality of the natural resource (i.e. water) on which their businesses depend.</p> <p>Yields on FONAG's capital and investments are utilized for watershed protection, including payments to landowners to protect ecosystem services.</p>	<p>Improved forest conservation, especially in key forested corridor between existing protected areas.</p> <p>Maintenance of water quality and quantity in river and associated ecosystems improves conservation status of freshwater habitats and the species that depend on them.</p>	Improved animal husbandry and agricultural management practices increase productivity; more direct involvement of local communities in management of local resources; access to financial services.	The National Water Secretariat (SENAGUA) was established by Executive Decree in 2008. SENAGUA is responsible for sustainable and integrated water management. One of its main objectives is to promote policies for watershed protection, with an emphasis on the conservation of native forests and maintenance of water quality at source (rather than through water treatment).	<p>Following the successful establishment and operation of FONAG, more than 10 similar 'water funds' have been or are being established in the Latin America & Caribbean region.</p> <p>Replication of this initiative in watersheds elsewhere in the LAC region (and in other regions) is highly possible.</p>	Restricting use of the fund to yields from interest and investments – NOT capital – meant that the fund grew slowly (but sustainably).
<p>(2) Payment for Environmental Services pilot project in Lake Naivasha basin, Kenya</p> <p>Africa</p>	Watersheds	Investments in the protection and improvement of biodiversity	<p>Economic activities around Lake Naivasha include agriculture, horticulture, ranching, pastoralism, tourism, fishing and geothermal power production. Over 50 km² is under intensive, commercial horticulture and flower farming. Together, these activities provide livelihoods for over 500,000 people living within the basin.</p> <p>Significant environmental threats come from poor land-use practices, unregulated and excessive water abstraction for domestic and agricultural/ horticultural use, weak policy enforcement, and population pressure on natural resources, water pollution and climate change. These have resulted in degradation of ecosystem services, economic losses, worsening poverty and reduction of biodiversity.</p> <p>Lake Naivasha Water Resource Users Association – on behalf of ecosystem service beneficiaries, notably the</p>	<p>The two WRUAs were provided with an initial financial incentive of USD 10,000, followed by a second payment of USD 10,000. The first incentive rewarded 470 farmers and the second benefited 504 farmers.</p>	<p>Land management changes aimed at improving downstream water quality and quantity include: rehabilitation and maintenance of riparian zones;</p> <p>establishment of grass strips/terraces to reduce runoff and erosion on steep slopes; reduced use of fertilizers and pesticides; planting of native trees, high-yielding fruit trees and cover crops to reduce runoff/erosion and increased biodiversity.</p> <p>Increased fodder production has</p>	As well as the direct payments to the WRUAs, participating communities have seen a number of livelihood improvements. Grasses planted for soil conservation purposes have increased fodder supply resulting in increased milk production Planting of fruit trees and use of higher quality material bring additional income.	Relevant policy makers will be engaged through dialogue and advocacy with the goal of PES schemes being integrated into natural resource management policies. The Water Resource Management Authority –WRMA is already engaged in the current project.	<p>The project has continued to receive overwhelming support from Lake Naivasha Water Resources Users Association.</p> <p>The scheme will be upscaled in future and linked with efforts to reduce carbon emissions through improved forest management.</p>	<p>The pilot farmers' on-farm benefits have triggered very high demand for change in the region. More than 300 additional farmers have joined the projects stretching the project resources.</p> <p>Climate change has disrupted the seasons resulting in adverse effects within the pilot area.</p> <p>Diffuse sedimentation from degraded public land may threaten efforts to prove a business case for PES through water quality monitoring since such sedimentation may obscure the hydrological benefits arising from land-</p>



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			region's major floriculture & horticulture industry – agreed to compensate small-scale landowners/farmers, represented by two upstream Water Resource Users' Associations, to forego some potential income for managing their land to provide good quality water to downstream users.		<p>reduced pressure on forests from grazing.</p> <p>The structures introduced in the farms have dramatically reduced soil erosion and surface water run-off. Soil fertility has been enhanced by on-farm planting of appropriate trees.</p> <p>Farmers along the target tributaries are reporting positive changes in water clarity though there is not yet empirical evidence for this (hydrological data collection is on-going).</p>				<p>management improvements on the targeted hot-spot farms.</p> <p>Complex land ownership – there is much dynamic of land ownership in the pilot area due to inheritance, subdivision and use changes. These threaten the main pillar of the project, namely farm ownership</p> <p>Securing commitment from beneficiaries is challenging; especially in a situation where they are already paying a statutory water fee to the regulating body and therefore payment for PES appears as if it is a 'double' payment.</p>
(3) Payment for Forest Environmental services (PFES): pilot implementation in Lam Dong Province, Vietnam Asia	Watersheds	Investments in the protection and improvement of biodiversity	Following the Vietnamese Government's adoption of a pilot policy on Payment for Forest Environmental Services, pilot implementation took place in Lam Dong Province in 2009-2010 with support from USAID's Asia Regional Biodiversity Conservation Programme (ARBCP). Two hydropower companies, two water-supply companies and various tourism businesses were identified as buyers of Forest Environmental Services (FES). As determined under the pilot policy, the hydropower companies were required to pay VND 20 per	Early in 2009 hydropower, water supply and tourism businesses signed MoUs committing payments of USD 3.4 million to protect more than 220,000 hectares of forests and the ecosystem services they provide. By the end of the pilot implementation phase in December 2010, a total of approximately VND 108 billion (over USD 5.5 million) had	With support from ARBCP, Lam Dong Province established a watershed monitoring system in sub-catchments of the Da Nhim watershed. This action supports the scientific premise that effectively maintaining and managing forest cover will reduce soil erosion and enhance water regulation, and in	The income of households involved in the implementation of the policy was shown to have increased significantly. PFES payments were becoming an important source of income for poor households, especially those of ethnic minorities.	In 2007 ARBCP assisted the Vietnamese Ministry of Agriculture and Rural Development to develop a pilot policy PFES. The policy came into effect in April 2008 paving the way for implementation of pilot testing activities. In September, 2010, the successful trialling of the PFES policy in Lam Dong Province	In September, 2010, the successful trialling of the PFES policy in Lam Dong Province culminated in the Prime Minister's announcement of Vietnam that a National PFES Decree had been approved. This transforms the way forests are seen and managed in Vietnam. This regionally and globally significant achievement serves as a model for other countries	The identification and emergence of champions at all levels of the implementation process (national, provincial, district, and commune) was a key factor for success. The limited number of environmental services implemented under the pilot policy (water regulation, soil conservation, and landscape visual quality) reduced the



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			<p>kilowatt-hour into a specially established Lam Dong Forest Protection and Development Fund (FPDF). In January 2009 (start of project implementation) 100 Vietnamese Dong (VND) was equivalent to just over half of one United States cent (USD 0.005). Water supply companies had to pay VND 40 per cubic metre, while tourism companies contributed 1% of their annual gross revenues.</p>	<p>been paid into the PFDF, which is overseen by a governing board composed of national and provincial authorities and monitored by independent auditors.</p>	<p>turn reduce future production costs for hydropower and water supply companies.</p>		<p>culminated in the Prime Minister's announcement of Vietnam that a National PFES Decree had been approved. This transforms the way forests are seen and managed in Vietnam. This regionally and globally significant achievement serves as a model for other countries in South-east Asia struggling to find economically viable approaches to support biodiversity conservation.</p> <p>Vietnam is now developing as a regional centre of knowledge and experience of PES.</p>	<p>in South-east Asia struggling to find economically viable approaches to support biodiversity conservation.</p> <p>Vietnam is now developing as a regional centre of knowledge and experience of PES.</p>	<p>risk of implementation failure.</p> <p>Despite the fact that extensive scientific/technical studies were carried out to value ecosystem services, the final payment structure had to take into consideration the socioeconomic and socio-political context of the communities in question. Strictly adhering to the valuation studies, while scientifically robust, would not have guaranteed the uptake of the project and the backing of the community and payers.</p> <p>The proper and equitable distribution of payments is contingent on the equitable and precise allocation of forest parcels to households. However, lacking a private land tenure system and integrated land-use planning system, the process of forest demarcation, allocation, filing, and approval in Lam Dong Province required</p>



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									<p>significant time and money, at times impeding the proper and timely disbursement of payments to households.</p> <p>There was an issue of whether payments under PFES should be considered as being made from the state budget or whether they replaced the water-resource tax that hydropower plants had to pay. These and many other issues, connected to the innovative concept of PES, took time to resolve among various stakeholders.</p> <p>Establishing automated gauging stations in a relatively remote provincial river basin was a great challenge.</p>
<p>(4) Payment for Ecosystem Services and alternative livelihoods in rural China</p> <p>Asia</p>	Watersheds	Investments in the protection and improvement of biodiversity	<p>Yujiashan (in Sichuan province) is a forested area that constitutes the watershed for water supply to Pingwu town, the seat of Pingwu county administration. Yujiashan, most of which is a designated Nature Reserve, also includes habitat for the critically endangered giant panda.</p> <p>Pingwu county and Conservation International recognized that</p>	<p>The Pingwu Water Conservation Fund is the first of its kind in China. The Fund provides income from a hydroelectric dam – which depends on the continued flow of freshwater and the avoidance of erosion</p>	<p>By establishing viable livelihood alternatives, the project aims to tackle the drivers of environmental degradation in the watershed and, in particular, to reduce deforestation,</p>	<p>Villagers have been provided with start-up capital and training to cultivate mushrooms and keep bees as “forest and water-friendly” alternative livelihood options.</p>			



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			<p>quantity and quality of freshwater resources from the Yujiaohan watershed was directly linked to the effectiveness of land and water conservation efforts and in turn impacted the degree of treatment – and hence unit price – necessary in order to deliver clean, safe water to industrial and domestic consumers. The county was faced by deteriorating water quality, rising consumption and rising prices.</p> <p>While total fertilizer applications in the watershed decreased from 1997 to 2007, the quantity per unit area rose dramatically. Total usage of pesticides and herbicides grew rapidly between 2002 and 2007. Increasing erosion and runoff resulted in serious diffuse pollution of water courses. Deforestation for timber and firewood exacerbated the problem.</p> <p>In the past the water fees collected from consumers and companies were not reinvested in watershed conservation. This project aimed to re-establish the link between water users and water supply areas and to lay the groundwork for developing sustainable PES schemes by demonstrating a viable long-term conservation financing model.</p>	<p>and sedimentation – to the communities outside Pingwu City responsible for protecting the watershed. Representatives from the Government of Pingwu County, as well as Conservation International and local NGO partners serve on the board of the Water Conservation Fund, which helps communities embrace sustainable livelihoods like honey and mushroom farming, replacing income generated by practices such as deforestation for farming or grazing.</p>	<p>sedimentation and pollution by agro-chemicals.</p>				
<p>(5) Conserving and managing forests as source of water for Fukuoka City, Japan Asia</p>	Watersheds / cities	Investments in the protection and improvement of biodiversity	<p>Fukuoka City is the only major city in Japan without a large river flowing through it. It has relied on extraction from the nearby Chikugogawa River for one-third of its needs, as well as on desalination of seawater and on supplies from eight dams. However, the degradation of forests surrounding the dams began to impairing their water recharge functions, jeopardizing a key part of the city's water supply.</p>	<p>The Fukuoka City Waterworks Bureau allocates JPY 1.00 per ton of water consumed in the city to the Watershed Conservation Fund. Half of this amount is derived from water-use charges and half from the city's budget. From its revenue, JPY100 million (approx. USD</p>	<p>Fukuoka City is improving watershed forests in catchment areas near the dams developed to source drinking water only, by planting broad-leaved forests, clearing underbrush and tree thinning. For other dams, the</p>	<p>The project also includes awareness-raising amongst the citizens of Fukuoka City about the origin of its water supply and the value of forest ecosystem services; exchange programs for citizens to participate in activities such as silvicultural management, rice</p>	<p>The initiative fosters collaboration between Fukuoka City and neighboring municipalities to implement joint conservation activities in the water source areas</p>		



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			The Fukuoka City Foundation for Water Resource Conservation Projects was established in 1997 to serve as a fund for forest conservation and management in catchments where the city's water supply originates.	1.3 million) is allocated annually for initiatives which promote forest conservation and management in watershed areas. The total fund stood at JPY 1.06 billion yen in 2009). The project fosters cooperation between local governments upstream and downstream, with conservation activities implemented jointly by Fukuoka City and municipalities in water source areas.	Waterworks Bureau is engaged in efforts to purchase forests in catchment areas in order to enhance water recharge capacities and prevent water contamination from excessive development. As of fiscal year 2008, approximately 30 percent (505 hectares) of the catchment areas of the three local dams has been bought by the city. For the appropriate management of these forests, the city formulated the Fukuoka City Water Source Forest Management Plan covering 60 years in fiscal 2004.	planting and trout fishing in the water source areas; and offers grants for tree planting and clearing underbrush.			
(6) PROCUENCAS Payment for Ecosystem Services scheme, Costa Rica LAC	Watersheds	Investments in the protection and improvement of biodiversity	PROCUENCAS is a private PES scheme (independent of the government's National Forestry Financing Fund) set up in 2000 and operated by the Public Services Enterprise of Heredia (ESPH) in Heredia province. It covers the five micro-watersheds from which ESPH obtains the water for public supply to 188,000 citizens in three municipalities. PROCUENCAS receives revenues from a government-approved 'hydrological fee' included in each user's water bill, as well as from partnerships between ESPH and	Landowners enter into 10-year contracts and receive (2011 payment rates) about USD 140 per hectare for participating in one of four activities: (i) conservation of existing natural forest; (ii) supporting natural forest regeneration; (iii) reforestation through tree planting; and (iv) caring for established plantations. From 2014, onwards the emphasis will be on	Enhanced forest conservation. Improved status of surface and ground water.	PROCUENCAS currently has 30 contracts with landowners covering some 830 ha (806 ha through conservation of existing natural forests, 7 ha through reforestation and 27 ha through management of established plantations). These contracts provide important sources of income to local landowners, rewarding them for measures to	National legislation on environment (law no. 7554 of 1995) forestry (law no. 7575 of 1996), regulation of public services (law no. 7593 of 1996), and biodiversity (law no. 7788 of 1998), all helped successful development of PES approaches in Costa Rica. The forest law identifies a range of environmental services	Other local water companies and municipalities have approached ESPH to acquire knowledge about the programme and implement similar approaches in their territories. The success of PROCUENCAS inspired the Costa Rican Ministry of Environment to apply and upscale this financial mechanism to the national level, creating an	There were some evident weaknesses in the early stages of the programme – due to a lack of communication of the objectives and benefits to the users, people being unaware of the new fee or even the importance of preserving upstream watersheds. Municipalities are allowing (illegal) new development projects close to water sources –



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			<p>other private companies, and additional private contributions.</p> <p>PROCUENCAS supports forest conservation, reforestation programmes, environmental education programmes and protection of ground-water sources.</p>	<p>conservation and natural regeneration, rather than on new plantations.</p>		<p>manage the upper parts of the five micro-watersheds sustainably.</p>	<p>derived from natural forests, tree plantations, and agro-forestry systems, such as carbon fixation, hydrological services, biodiversity protection, and provision of scenic beauty.</p>	<p>additional income for the governmental PES programme.</p>	<p>could jeopardize achievements made</p>
<p>(7) Programme for Payment of Hydrological Environmental Services (Programa de Pago por Servicios Ambientales-Hidrológicos – PSAH), Mexico LAC</p>	Watershed	Investment in the protection and improvement of biodiversity	<p>Between 1993 and 2000, 8.2 million hectares of Mexico's forests were converted for agriculture or grazing, exacerbating problems of water quantity and quality in many areas.</p> <p>Since 2003 landowners have been able to apply for public payments in exchange for commitments to conserve forested land and to forego certain uses, such as agriculture and cattle raising.</p> <p>The scheme focuses on areas that are important for aquifer recharge, maintaining surface-water quality and reducing the frequency and scale of flood damage.</p> <p>The main actors are the forest-owning communities and individuals on one hand and the different water users (companies, municipalities and citizens, and their respective associations through which they influence public policy) on the other.</p>	<p>More than 3,000 forest owners have been enrolled in the scheme and payments to them total more than USD 300 million.</p> <p>The scheme is funded through an earmarked percentage of the federal fiscal revenue derived from water fees.</p> <p>Primary forest owners receive 300 pesos/ha/yr (about USD 27.) and cloud forests owners receive 400 pesos/ha/year (USD 36) due to the perceived higher delivery of hydrological services associated with this type of forest.</p>	<p>By 2005, deforestation had been reduced by some 1,800 km² and the annual rate of deforestation had been more than halved, from 1.6% to 0.6%. The scheme had contributed to protecting water catchments and the biodiversity of cloud forests, in addition to cutting emissions of carbon dioxide by about 3.2 million tonnes of CO₂ equivalent.</p> <p>Between 2003 and 2005, satellite images showed that less than 0.1% of the nearly 300,000 ha covered by PSAH was deforested.</p>	<p>Poverty reduction: Payments were targeted at owners who were not already deriving an income from their forests and who would have "nothing to lose" from converting the land to other – environmentally damaging – uses.</p>	<p>A change in the Federal Rights Law allowed a portion of federal water revenues to be used to support watershed conservation through payments for forest environmental services. This was initially set at 2.5% of annual revenues.</p>	<p>The principles of the scheme could be applied elsewhere in the region and beyond.</p>	<p>Constraints that the scheme has had to deal with included identifying contract conditions/ indicators that could actually be monitored (e.g. rates of deforestation via satellite photos) against a baseline scenario.</p> <p>Criteria also had to be developed set geographical priorities so that over-subscription of the scheme could be dealt with. In this case a points system was used to prioritize areas according to the value of environmental service, as well as the level of poverty and risk of deforestation.</p> <p>A special feature of forest ownership in Mexico is that almost 80% of forests are held as common property by groups of peasant farmers. This brings both opportunities and challenges.</p>
(8) Economic value	Watershed	Investment	In 1994 a government master plan for	The annual (minimum)	The IUCN study	Responses were	IUCN recommended	The overall approach is	The valuation study



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of the Sourou valley, Burkina Faso – a preliminary evaluation Africa	ds	in the protection and improvement of biodiversity	<p>agricultural development of the Sourou river valley identified 30,000 ha of wetlands as having potential for conversion to agricultural use. About 13% of this area had been converted by 2010.</p> <p>Assuming that increased agricultural production would have economic benefits, including increased food security, little attention was paid to other ecosystem values – partly due to lack of information.</p> <p>While economic benefits did not meet expectations, the natural resource base was being continuously depleted.</p> <p>IUCN conducted an economic valuation of ecosystem services to raise awareness of decision makers about the true existing economic value of the region's wetlands with a view to influencing future development policies.</p>	<p>value of the ecosystem services evaluated was about 15 million Euros (USD 21.2 million) for a population of 62,224 people.</p> <p>Timber products for fuelwood and construction accounted for 37% of this total value, non-timber forest products 21%, grazing 18%, fisheries 10% and fluvial transport 10%. Agriculture accounted for only 3% proving that crop production is not the major economic good to be drawn from the region, despite the policy decisions and investments of successive governments since 1970.</p>	<p>suggests that any agricultural policy that does not take into consideration the interlinkages with other ecosystem functions might work against the policy's objective.</p> <p>In fact, field surveys revealed that current agricultural practices threaten ecological services such as flood control, biodiversity conservation and climate regulation. This could compromise the other economic values provided by the Sourou valley.</p>	<p>gathered from focus-groups and workshops, plus individual surveys with men & women from >300 households close to the Sourou river.</p> <p>In spite of two decades of agricultural development, benefits had not materialised for local communities. On the other hand, such communities are reliant on other ecosystem goods and services for their livelihoods and income generation.</p>	<p>that policy makers in Burkina Faso should reshape agricultural policy to adopt approaches that integrate environmental and economic factors.</p> <p>The current master plan for the Sourou Valley should be reviewed to better highlight the interrelation between economic development of the region and conservation of its natural resources.</p> <p>Because of the transboundary nature of the Sourou River, it seemed particularly important to promote water-resource management approaches that take into account the needs of communities in Mali.</p>	<p>relevant as an essential preliminary stage of all PES projects. Ecosystem services must be identified and valued before they can be paid for.</p> <p>>20 national institutions and socio-professional groups participated in an event to share results from the study. All of them expressed willingness to use the information to define properly the role of natural ecosystems in the new national strategy for</p> <p>growth and sustainable development as well as in local plans.</p>	<p>happened after conversion of natural ecosystems was already underway and significant investment in agriculture development made. Ecosystem valuation should be used as a proactive, not reactive tool.</p>
(9) Payment for Ecosystem Services (PES): Feasibility and Implementation in the Maloti-Drakensberg Transfrontier Project Area, South Africa Africa	Watersheds	Investment in the protection and improvement of biodiversity	<p>Water is predicted to be the single biggest future development constraint in South Africa. A new water supply augmentation option has been identified which can promote local economic development in rural areas and create hundreds of jobs.</p> <p>The Maloti Drakensberg bioregion falls within the country's most important water supply area. River catchments within the bioregion form the source or contribute to a number of major rivers, including the Mzimvubu, Mzimkulu, Mkomazi and Thukela on the South African side, and the Vaal and Orange Rivers on</p>	<p>The following services have high value, and can be traded:</p> <p>additional and more regular water supply for users - improving assurance of supply and adding value to both reticulated and raw water users;</p> <p>reduced sedimentation of water infrastructure and river ecosystems which reduces water storage and abstraction costs – thereby making</p>	<p>Recent research in the Drakensberg shows that robust vegetation cover in the upper catchments – through rehabilitating degraded areas, maintaining the recommended cattle carrying capacity and by burning the mountain grasslands in the spring every second year can enhance water resources by: reducing summer</p>	<p>Improved management and rehabilitation will result in 1800 restoration jobs in the first 7 years, with some 500 permanent jobs, making it socially compelling.</p>	<p>The feasibility study and pilot implementation was part funded by the South African Department of Water Affairs' <i>Working for Water</i> programme, which has pioneered other innovative approaches to sustainable water management.</p>	<p>This is a pilot project in its early stage of implementation, so it may be too early to speak of scaling up - especially beyond the region.</p> <p>However, Working for Water has committed to funding the project for a further three years.</p> <p>The 2011/12 implementation plan includes budget for grazing and fire management, aims to begin to develop the</p>	<p>Approx 40% less funding obtained than required.</p> <p>Administrative delays with obtaining funding, signing agreements and administering the project – hence delayed start.</p> <p>Only degraded land rehabilitation and alien plant clearing were initiated during 2010/11. Grazing and fire management could not be addressed.</p>



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			<p>the Lesotho side.</p> <p>Paying people to manage the Maloti Drakensberg transfrontier catchments for enhanced water supply has been shown to be a financially feasible.</p> <p>In this pilot project, the first PES implementation in South Africa, funding (ZAR 3.3 million = approx USD 0.46 million) was obtained from the South African Government's <i>Working for Water</i> Programme for the first year. Approximately 546 people were employed, 15 hectares of degraded land rehabilitated and 15 hectares of alien plants along water courses were cleared.</p>	<p>cost savings; and</p> <p>additional carbon sequestration which is tradable, and which also improves grassland productivity.</p> <p>Management costs are at the most 20% of the direct value of tradable benefits, making this a financially attractive option.</p> <p>A range of other ecosystem services are economically beneficial to society but cannot be traded yet in this location. These include as flood control, improved water quality, improved fishing, biodiversity conservation and improved grazing.</p>	<p>stormflows; increasing winter baseflows by an additional 13 million m³ in the upper Thukela catchments; reducing annual sediment yields by 1.3 million m³ in the upper Thukela rivers, and sequestering 134,000 tonnes of carbon per year in the upper Thukela catchments.</p>			<p>framework necessary to establish a market (beyond payment for labour) for the sale of ecosystem services from these catchments for the benefit of the upper uThukela communities.</p>	<p>Local political and "vested interest" issues interfering with progress.</p> <p>Co-ordination of project and implementing monitoring.</p> <p>Capacity at community level to manage a business relationship, contracts etc.</p>
<p>(10) Rewards for watershed services in Sumberjaya, Indonesia</p> <p>Asia</p>	Watersheds	Investment in the protection and improvement of biodiversity	<p>Government perception that uncontrolled deforestation and conversion to coffee farming on the slopes of Sumberjaya has led to increased soil erosion, threatening the operation of the Way Besai hydropower dam and reducing water availability for irrigated paddy rice downstream has resulted in the eviction of thousands of farmers between 1991 to 1996. More recent studies show that in fact multi-strata coffee farms provide livelihoods and also control erosion in a way similar to that of natural forest.</p> <p>The 'Rewards for Use of, and shared investment in Pro-poor Environmental Services' (RUPES)</p>	<p>Local people directly benefit from higher yields in the multi-strata coffee production system and cash payments from soil erosion control and sediment reduction. The payments may be small, but could represent an increment in household incomes.</p>	<p>All programmes have a strong 'conditionality', which is essential in a contract-mediated ES reward scheme. The payments or rewards are conditional, subject to environmental performance in the area of forest protection, soil and water conservation and sediment reduction. The benefits to the environment are thus manifold. The HKM</p>	<p>Experience from the implementation of RUPES suggests that reward schemes for delivery of environmental services, supporting coffee farmers as partners in forest and watershed management, is a better option than 'eviction' of forest people.</p> <p>All programmes have had positive social impacts. Because poverty is multi-dimensional, the conditional land tenure</p>	<p>The HKM is implemented by the Local Forest Department following the rules and regulations of community forestry, hence the implementation scheme was clarified at the very beginning of the program</p> <p>Both the RiverCare and Soil Conservation Program are governed by Forum Committees—both receive technical advice</p>	<p>Particularly relevant for forest contested areas in developing countries where poor people eke-out a living from small-scale cultivation and extraction of forest products.</p> <p>The experience is very relevant for governments who often have full control, but have limited capability to manage forests and watersheds. It shows that educating decision-makers and stakeholders with research-based</p>	<p>The potential constraint for scaling up however, is the amount of research and information gathering needed to structure an ES reward scheme. Substantial data is needed to inform decisions and to agree on the conditions binding the ES contract. However, research collaboration can be developed by governments intending to initiate a PES program—they can also streamline their line</p>



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			<p>project in Asia, facilitated the design and implementation of environmental services (ES) rewards schemes in Sumberjaya.</p> <p>The scheme was based on rigorous research and modelling of the impacts of coffee farming on erosion and sedimentation to generate evidence of the relations between land use and watershed functions</p> <p>RUPES comprised of three programs: the Community Forestry Program (HKM), providing farmers with conditional land tenure for forest protection; the Rive Care Program wherein a hydropower company finances activities which improve water quality through sedimentation reduction; and a Soil Conservation Program which pays farmers for reducing erosion and sedimentation.</p>		<p>conditional land tenure scheme requires protection of remaining natural forest and adoption of sustainable coffee production techniques whereas the RiverCare and the Soil Conservation Programs involve soil and water conservation technologies to reduce on-and off-farm soil erosion and sedimentation in waterways.</p>	<p>acquired by forest people was a step towards emancipation from poverty. Local people are no longer threatened from eviction, giving them a sense of protection and security for their livelihoods. Members of the RiverCare program and farmers involved in the Soil Conservation Program not only earn additional income from soil erosion control and ediment reduction activities, but also raise their profile and value from doing extra work for the community.</p>	<p>and organizational capacity building to ensure that the contracts are complied.</p>	<p>information can lead to changes in attitudes and actions towards sustainable forest/watershed management. It also shows the business case for private-sector engagement in ES rewards schemes.</p> <p>The case demonstrates that rather than coercion, provisioning environmental services can be secured through negotiated arrangements amongst the government, private sector, local people, and scientists with a shared understanding on the relations between land use and watershed functions as a first step.</p>	<p>ministries and mainstream the PES concept in sectoral plans, and using common sense knowledge and available data, a PES program or policy can be designed at the national level.</p>
<p>(11) Las Pinas-Zapote River System Rehabilitation Program, the Philippines</p> <p>Asia</p> <p>Source: UN 'Water for Life' best practice awards</p>	Watersheds	Investment in the protection and improvement of biodiversity	<p>Water and air pollution are major problems in Las Pinas City, driven by population growth and industrial development. The cities rivers – Las Pinas and Zapote – were heavily silted and polluted, used as a dumping site for waste, and void of life. There was frequent flooding due to siltation and clogged drainage systems</p> <p>A congressional representative of Las Pinas City developed and implemented a comprehensive management scheme for the rehabilitation of the Las Pinas-Zapote River system focused on dredging, clean-up and re-greening.</p> <p>Activities included: river cleaning, installation of wire mesh strainers to filter waste and debris, solid waste and river management, re-greening</p>	<p>62 jobs created for river dredging, clean-up and re-greening activities</p> <p>Income generated through harvesting bamboo poles</p> <p>Social enterprises: composting or production of organic fertilizer from wet garbage; making lanterns from bamboo; weaving baskets from water lilies impeded the river's flow and contributed to flooding; production of coco nets and coco peat from coconut husks thrown into the river</p>	<p>Siltation of the river system reduced as a result of soil erosion control efforts</p> <p>Dredging and clean-up resulted in notable improvements in the catchment areas of the rivers, and reduced the incidence of flooding in the city</p> <p>Fish have returned to the river</p>	<p>A number of training, education and communication initiatives were implemented with participation of local government officials and local communities, successfully generating change in attitudes and behaviour towards river and water conservation</p> <p>From 2002 to 2005, 9,070 people from communities on or near river banks were trained in ecological solid waste and river management</p>	<p>Co-management of program from central government agencies, local government units and the communities of Las Pinas City. The program came about by virtue of strong support and funding from municipal authorities.</p>	<p>The water lily livelihood project has been replicated in several other cities and towns</p>	<p>One challenge which still exists is the persistence of informal settlers and illegal infrastructures along the length of the river, due to weak enforcement of law.s</p> <p>Some factories and malls continue to discharge untreated wastewater directly into rivers. Resistant residents from nearby communities throw garbage into rivers. Some of the village local government units were not very supportive of the program, especially in with regards to</p>



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			of river banks with bamboo and mangroves for soil erosion control.			Establishment of river watch volunteer groups to attend to the areas bordering the rivers High female participation Program resulted in a reduction of health-related problems			imposing penalties for residents caught throwing trash into the river.
(12) Restoring the health of the Yellow River, China Asia <i>Source: UN 'Water for Life' best practice awards</i>	Watersheds	Investment in the protection and improvement of biodiversity	The Yellow River Basin has suffered severe water shortages – in 1997 the river ran dry, causing social, economic and ecological crisis. The river has the highest sediment load of any river worldwide, causing the river bed to rise, the river's course to change and severe flooding. The Yellow River Conservancy Commission initiated the Yellow River Environmental Flow Management Program with 3 parts: water allocation scheme; water and sediment regulation; ecological restoration projects. Watershed management in the Loess Plateau addresses soil erosion, including massive reforestation, agro-measures and sediment control structures.	Flood risk significantly reduced by regulation of water and sediment flow, through structural (e.g. embankments) and non-structural measures (e.g. monitoring and warning systems), preventing economic losses. Water allocation program secures water for domestic supplies, agriculture and industry.	In 1999 the continuous flow of the river was restored and has not dried up again since. Environmental flows for wetlands and sediment flow are guaranteed, increasing the wetland area and restoring biodiversity and ecosystem health. Significant reduction in erosion and of 300 million tons of sediment inflow.	Watershed management initiatives in the Loess Plateau jointly with local people over the last 10 years have helped lift one million people out of poverty.	The Yellow River Conservancy Commission is a government agency of the Ministry of Water Resources and has full control over water resources for the entire basin. A key part of the program included building the necessary legal framework and institutional capacity for environmental management of the Yellow River basin.		