

The Kikuyu Escarpment is vital in capturing water for the lower lying areas, but springs have been drying up because of indiscriminate destruction of forest cover. Payment for environmental services (PES) would definitely help to restore the tree vegetation. (Photo KFWG)

Is it time to pay more for water?

Offering incentives for environmental conservation seems the way to stop watershed degradation

By James B. Kung'u and Joram Kagombe

The five main water towers in Kenya, namely the Aberdares, Mt Kenya, Mau, Cherangani and Mt Elgon, are under great threat due to watershed degradation, change in land use and unsustainable management practices. Degradation and destruction of catchment areas has led to serious water shortages in Kenyan urban areas especially Nairobi, Mombasa and other surrounding towns.

Due to these shortages, the water providers turn to water rationing, leaving the residents with little option but to buy water from vendors who get the precious commodity from boreholes and other unknown sources. The quality of these waters is not guaranteed and many a time people have contacted water-borne diseases like diarrhoea, cholera, typhoid and others.

Internationally, Kenya is classified as a water scarce country with a water endowment at 647 m³ per capita. This is far below the global benchmark of 1000 m³ per capita.

Water shortages have largely been attributed to climate change and catchment degradation (Hughes and Hughes, 1992). Forests and trees affect the hydrologic behaviour of a watershed, including the quantity and quality of stream flow, erosion and sedimentation. In general, natural forests yield the highest quality of water of any ecosystem. The lowest erosion and sedimentation rates are usually associated with forested watersheds in natural conditions.

Stream flow from forested watersheds tends to be uniform, with peak flows lower than those from watersheds with other vegetative cover.

Given this background, the role of trees and forests can be viewed in terms of watershed protection, enhancement of water resources and watershed rehabilitation. One way of avoiding the degradation of water resources, and achieving millennium development goals (MDG) is the payment by the beneficiaries of environmental services to the providers of these services as a way of reducing negative externalities and protecting the resources. This concept of Payments of Environmental Services (PES) can be an innovative tool for the financing of sustainable management watershed areas in Kenya.

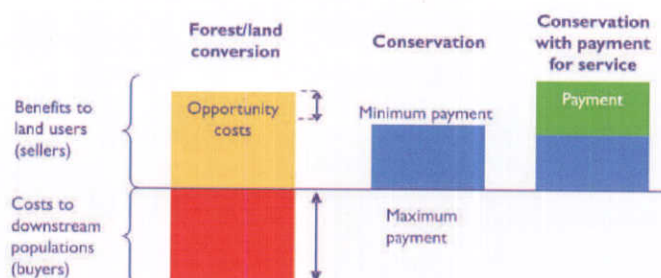
Payment of Environmental Services (PES)

The payment for environmental services concept has evolved over time as the discipline developed. Wunder (2005) classifies PES as a voluntary transaction where a well-defined environmental service (ES) is bought by a minimum of one buyer from a minimum of one ES provider, if the ES provider secures the ES provision.

Recent evaluation of PES has shown that it is difficult to meet all the above criteria. Swallow et al., (2007) redefined PES as an approach that aims at transferring a positive incentive to the environmental service providers and are conditional on the provision of the service,

Figure 1. "Beneficiary Pays" Model*

Source: Based on Pagiola 2003.



*Note: The "beneficiary pays" model does not incorporate transaction costs, an important factor to consider in designing PES programs.

where successful implementation is based on consideration of additional and varying institutional contexts. The use of positive incentives, including and not limited to payment, is the core ideology of PES.

Ecosystem services or ecosystem goods and services are the benefits people get from ecosystems. The benefits can be direct or indirect. Ecosystem values are measures of how important ecosystem services are to people and what they are worth (Biggs et al., 2004). To ensure sustainable conservation of water catchments areas, it is important to link the providers of environmental goods and services to the users.

The concept of payment for ecosystem services and especially Payment for Water Services (PWS) has been adopted widely since the mid 1980s. PES can be viewed as an "incentive" based mechanism that has also evolved into diverse patterns. To realise the importance of PES to ecosystem management, its practice should be developed gradually to tackle the key questions of ecosystem management that include its complexity, adaptability and integrity to the goal of sustainable development (Leimona et al., 2007; Waage et al., 2005).

The concept of PES is very new in Kenya although it is increasingly being adopted in many other countries in Asia, South America and Europe as a way of providing incentives for conservation of watershed areas.

PES should be seen as a way of achieving environmental policy objectives through according monetary value to the environmental services involved, in other words, making a "market evaluation". PES is normally a voluntary

transaction where a well-defined environmental service (often a land use) is bought by one or more service buyer(s) from one or more service provider(s) if the provider(s) continuously secure the provision of that service.

PES programmes where the actual user is the buyer are more efficient because they act with most information on the value of the service, are directly involved and have clear incentives in ensuring that they function well. Sellers or providers of environmental services are actors who are in a position to secure the delivery of environmental services. Sellers could be land managers who are paid for specific land use practices that generate the desired environmental service.

An important component of the PES scheme is that the targeted service is threatened. Although PES instruments are primarily developed to improve the efficiency of natural resource management and to realise an environmental objective, the effect on income redistribution is often an important side objective, especially in developing countries, since those who provide environmental services often constitute the poor groups in society (Hengsdijk et al., 2008).

Concepts of payment of economic services

Ecosystems provide valuable services to the local, regional and international communities (Costanza et al. 1997, Millennium Ecosystem Assessment (MEA) 2005). However, traditional markets are underdeveloped or lacking for many environmental services such as watershed

benefits, biodiversity conservation and carbon sequestration and hence decisions to convert or alter the habitat fail to take into account the total service loss (Westman 1977, Hanley 1992, Loomis et al., 2000).

When taken into account, these services may tip the scale in favour of environmental service particularly if the competing resource use such as agriculture and timber are only marginally profitable (Pearce and Moran 1994).

In cognizance of worth of ecosystem services, PES (also called ecosystem or ecological services) has emerged over the last decade as an approach that provides positive incentives in management of ecosystems. The incentives under PES may be used to compensate those currently providing an environmental service or those who have foregone some of their land use practices that are detrimental to provision of the ecosystem service.

Ecosystem services payments could include both monetary and non-monetary transactions (such deals as related to shifting property rights) between an individual (or a group of people) who provides services ("sellers"), and an individual (or a group) who pays for maintenance of those services. The key characteristic of these buyer/seller transactions is that the focus is on maintaining a flow of a specified ecological "service," such as retaining high quantity and quality clean water, biodiversity and carbon sequestration capabilities.

To ensure that the ecological service is indeed maintained - as buyers expect for their money - the transactions require independent verification of sellers' actions and effects on the resource (Katoomba, 2008). Economic value is one of many possible ways to define and measure value. Economists and ecologists agree largely that measures that combine ecological and economic information can help in identifying strategies that reverse biodiversity and ecosystem loss. PES is seen as a direct and efficient way to promote conservation of biodiversity since it bridges the interest of the local people and external actors (Wunder, 2006).

Most water users would prefer water to be enough, of good quality and free of charge, while people living in watershed areas would prefer their economic activities i.e. farming or logging, to be unrestricted. People living in the upstream carry out activities that are sometimes in conflict with water management (Asquith et al., 2008). If watersheds are to be improved, then people managing the catchment areas should be given incentives. A reward-based approach that incorporates the upstream communities has the potential to reverse degradation of watershed areas.



A small stream originating from a highland bamboo forest. The water is slightly muddy because of cattle coming to drink. Land use can improve if there are incentives. (Photo KEFRI)

The prevailing attitude towards watershed management is that water will always flow from the mountains freely and so there is no urgency or incentive to institute sustainable use of land and water. As a result, we do not recognise the role of farmers or even Kenya Forest Service in the provision of water. Consequently, land degradation at the catchment areas continues, inflicting heavy costs to downstream areas through siltation of reservoirs, damage to infrastructure and reduced flows during dry seasons.

The creation of a payment scheme for ecosystem service depends on the existence of beneficiaries that are willing to pay the costs of these services. A recent study by Stanton et al., (2010) indicates that PES programmes are still at an initial stage with 288 programmes globally, while Africa has only 20. Latin America has the highest number of PES programmes.

Payment for Water Services (PWS) programmes are either demand or supply driven. In many programmes, the main players are sellers, administrators and buyers. The sellers in Kenya could be the upstream landowners as either individuals, groups, communities, county councils, Kenya Forest Service and Kenya Wildlife Service. The buyers can be municipal councils, city councils, industries, big farms, water companies and the Kenya Electricity Generation Company (Kengen). Payment could vary, depending on land management requirement, the type of programme, whether local, national or regional and whether the programme incorporates poverty alleviation goals.

The growing trend in PWS programmes is not strictly limited to cash payment but also includes other types of compensations, supporting a range of activities. These range from adjusting land management practices to improving and protecting water quality, flow and storage, poverty alleviation and institutional capacity building, technical assistance, overall social concerns and community development. The role of government is therefore very critical in developing policies and regulations in PWS.

Process in development of PES programmes

The factors that influence the development of PES programmes include governance structures, population density, land tenure systems, availability of hydrological data and level of awareness (Marjorie et al., 2007). These factors are bound to influence the development of PES programmes in Kenya. PES could work with well-defined environmental services. The most common services



under the programme could include improved water yield, augmentation of seasonal river flow, improved water quality, general watershed rehabilitation and soil erosion control.

While the environment services are based purely on downstream hydrological needs, the actual PES mechanisms adopted are an indicator of whether market mechanisms are at work or whether the government could regulate goods and services.

In Asian countries, the widespread lack of land tenure has been cited as a key constraint to PES (Landell-mills and Porras, 2002) unlike in Kenya where there are clear land tenure systems. In developing a watershed PES, the ES must be well defined, valued economically and be easily measured and monitored.

Studies on water utilities in other countries like the United States of America show that every dollar invested in watershed protection saves tens to hundreds of dollars in water treatment costs (Greenwalt and McGrath, 2009). In designing a PES scheme, there is need to determine the length of contract, type of payment or rewards, fee structure, targeting and transaction costs.

The contract between buyers and sellers should be initially negotiated for a couple of years with a provision for extension if the demand still exists. In most cases, the reward systems could be cash payments to a group. There should be well laid down rules and cash should rarely be given to individuals. Instead, cash payments could be complimented with in-kind rewards such as provision of services like roads, schools, hospitals, electricity, piped water and even technical advice.

Conclusion

Payment for Environmental Services (PES) has the potential to contribute effectively to the conservation of Kenya's five water towers. The design of a performance-based payment scheme should combine the land use index and associated cost of each land use.

The underlying logic is that incentives offered to KFS, KWS, private companies and farmers to maintain or improve water quality and quantity should be positively correlated both to magnitude of cost involved and most important, to the generation of the environmental service which should be reflected in the land use index (Francisco and Roger, 2008).

If designed as targeted incentives, PES has the potential to become a highly cost-efficient environmental management tool. It can also attract new sources of conservation financing especially the private sector. Compensation for environmental services presents an opportunity for incentive-based conservation, enabling livelihood and conservation goals to be more easily reconciled.

To achieve the benefits of PES, there is need to sign conservation incentive agreements between the buyers and the sellers. These agreements have to be evaluated on the basis not only of their efficiency to achieve conservation objectives but also on the criteria of equity.

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Note: This article contains 22 references that, for reasons of space, are not retained but can be consulted at the Miti offices.