ERSA Research Brief

October 2017

Economic Valuation of Forest Ecosystem Services in Kenya: Implication for Design of PES Schemes and Participatory Forest Management

By Boscow Okumu and Edwin Muchapondwa

Kenya has five major water towers classified as montane forests namely; Mount Kenya, the Abardares range, the Mau forest complex, Mount Elgon and Cherengani Hills. These forests are mostly surrounded by densely populated areas because they provide water for intensive agriculture. They form the upper catchment of all major rivers in Kenya and supply a range of ecosystem services such as: river flow regulation; flood mitigation; water storage; wildlife habitat; and water purification among others. However, despite the significance of these forest resources, they have continued to be degraded due to the rising population and increasing demand for these services. For instance, between 2000 and 2010, deforestation in Kenya's water towers amounted to an estimated 50,000 hectares equivalent to a cash revenue of ksh. 1,362 million in 2010 hence the incentive for rampant deforestation. Whereas, the cumulative negative effects of deforestation on the economy through reduction in regulating services was estimated at ksh 3,652 million/year more than 2.8 times the cash revenue of deforestation. This is in light of government incentives aimed at deepening community participation through participatory forest management (PFM).

These ecosystem services are often, although not exclusively, public goods that are enjoyed by populations free of charge since they are not traded in the market or market prices are non-existent. The existence of market failure in regulation and provision of these services thus means depletion of the environments that provide ecosystem services is often greater than socially optimal, while the production of ecosystem services by economic agents is less than socially optimal. In Kenya, market and policy failures are some of the underlying threats of conservation and protection of important forest ecosystem.

Moreover, the contribution of the forestry sector to Kenya's economy is still based on formal market based transactions. The values attached to various ecosystem services by forest adjacent communities is generally unknown in Kenya and the knowledge about the extent of the benefits of these forest ecosystem services is also quite scant. The value of non-marketed forest products is therefore not accounted for. We have all along valued the forest for things that have tangible monetary worth e.g. timber and wood products but have not been able to demonstrate and capture the values of its services that are hard to measure e.g. value of a vista of pristine grove of pine, clean water, clean air etc. This means that the contribution of the forestry sector to the GDP is undervalued. Conservation areas therefore receive inadequate public support for participatory management and other approaches. To obtain public support for conservation programs, an understanding of the values, attitudes and preferences towards various environmental services is necessary for realization of the goals of PFM. The

Ecosystem services trade-offs have also received limited attention in terms of ecosystem management. Policy makers need to know the social benefits and trade-offs if they are to incorporate public values and preferences into forest management and conservation.

Using a case study of the Mau forest conservancy the study applied a choice experiment technique to value selected forest ecosystem services among forest adjacent communities through the Community Forest Associations(CFAs) and assess the implication for design of Payment for Ecosystem Services (PES) schemes and PFM. The study revealed that forest adjacent communities have higher willingness to pay for improvement in forest cover/forests structure, reduction of flood risk, and water purification and storage but would experience loss in welfare for choosing an alternative with medium wildlife population. One significant finding from the study is the altruistic nature of forest adjacent communities as revealed by their high willingness to pay for flood mitigation showing that they are not just concerned with the private benefits accruing to them but also the welfare of the society hence an incentive for devolution of forest management. Overall we found that there is much appreciation for the role of forest ecosystem services and that forest adjacent communities are more pro conservation mainly motivated by the direct use and non-use values.

The information on willingness to pay can therefore be used to inform the design of market based incentives such as PES for example through raising water tariff to compensate the service providers and incentivize forest adjacent communities This can be achieved through partnership with the private sector players. There is also need to enhance the roll out, design and scale up of PFM to communities that have been reluctant to adopt the scheme. Policy makers also need to focus on options with higher mean welfare impacts to deepen community involvement in forest conservation. Finally, a demonstration of the value of ecosystem services as input in the production process can play a role in increasing environmental awareness and motivating forest adjacent communities to conserve forest resources through PFM.