PAYMENT FOR ENVIRONMENTAL SERVICES; AN INTERGRATED APPROACH TO NATURAL RESOURCE MANAGEMENT AND LIVELIHOOD IMPROVEMENT, A CASE OF NAVASHA-MALEWA PROJECT, KENYA

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Abstract

Naivasha-Malewa catchment environmental degradation and loss of biodiversity as manifested by the deterioration and decrease of the natural resource base is the major threat to the sustainability of residents' livelihoods. The principle features of degradation has been decreasing water quantity and quality, decrease in forest cover and deterioration in habitat and biodiversity. The project's conservation efforts includes rehabilitation and maintenance of riparian zones, establishment of grass strips and terraces, reduction of fertilizers and pesticide use and tree planting. The community involved developed criteria for selection of hotspot farms in the pilot area, selected the 565 hotspot farms after intensive sensitization in which conservation structures were established. The sellers signed a one year renewable contract with buyers, each participating farmer receiving 17USD. The incentives in form of dedicated vouchers were redeemable at contracted agro-input outlets. The projects has embarked on livelihood improvement strategies in addition to intensive training on good farming practices; demonstration and trials on new fodder materials, new crop varieties, introduction of commercial apple production. Intervention impacts are monitored through on-farm verifications, water quality and quantity and livelihood assessments. The realized impacts includes reduced degradation, reduced sediments load in water bodies, increased farm yields and reduced farm related workload among households. There has been much spillover effects in the catchment with future potentials of livelihood improvement, expansion and replication being focused.

1. INTRODUCTION

1.0. Project Background.

1.1. Project location

The PES project is being implemented in the Malewa River basin situated in the Rift Valley and Central Provinces of Kenya. The Malewa river basin which comprises both Lake Naivasha Basin and the Malewa catchments covers an area of approximately 5,100 Km2. The Lake basin approximates 4,300 km^2 while upper catchment approximate 1,700km^2. The upper Malewa catchment is located on the South Western Abadare ranges and contains the South Kinangop forest. The catchment is also the source of two perennial rivers that feed Lake Naivasha, namely Malewa and Gilgil. River Malewa, the major source of water entering Lake Naivasha originates from the north-western slopes of the Aberdares. . The main tributaries of the Malewa river are the Turasha and Wanjohi rivers which drains the Nyandarua range, Kipipiri Mountain and Kinangop plateau which are the main focus of the project.

1.2. Project Rationale

Payment for Environmental Services (PES) is a market based scheme whose rationale is that downstream beneficiaries of environmental service should provide incentives to upstream land managers for the services resulting from voluntary conservation efforts. Conservation efforts includes rehabilitation and maintenance of riparian zones, establishment of grass strips and terracing along steep slopes, reduction of fertilizers and pesticide use and tree planting which results in improved quality and quantity of river water. The upstream land managers/owners, who are small scale farmers, are therefore the producers and sellers of the environmental service while the downstream water users are service buyers and consist of economic entities such as flower farms, tourist establishments and government related institutions. The scheme is administered in a mutual agreement in form of legal contract between buyers Lake Naivasha Water Resource Users Association (LANAWRUA) and Tulaga and Geta WRUAs on behalf of farmers in respective areas.

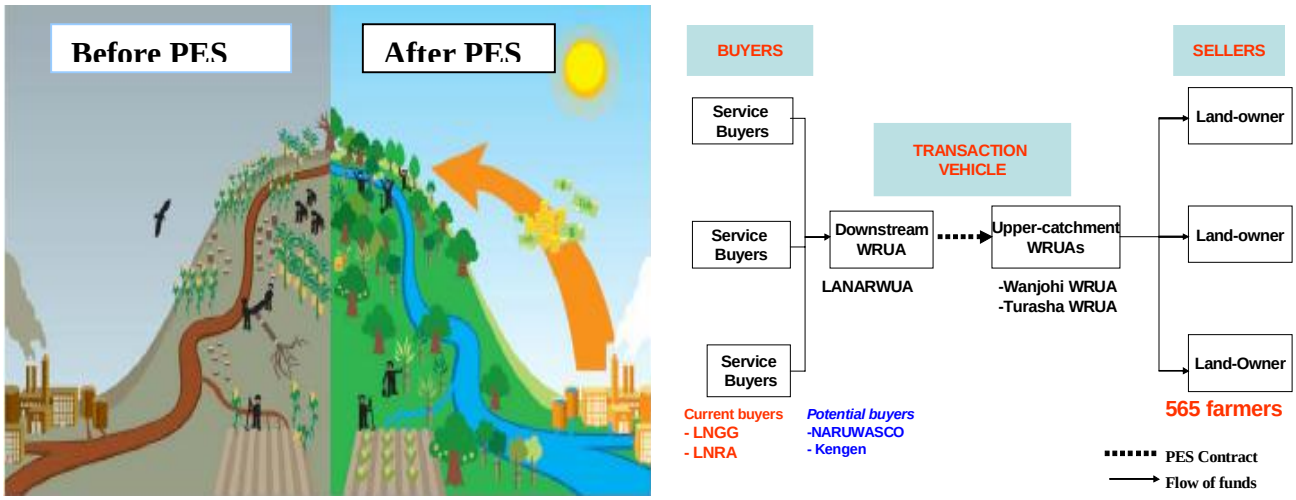


Fig 1.The PES Principle in Naivasha-Malewa sub-catchment

2. METHODOLOGY

2.1. Pilot sites selection

Site selection in the current pilot phase was based on various considerations, including: (i) Water yield from the sub-basin-surface and ground flow (ii) Sediment yield from sub-basin (iii) Population density and poverty (iv) Land use/land cover dynamics and (v) Potential buyers and sellers. Based on the above criteria, five sub-basins were selected (Gathenya, 2007) namely ;

1. Geta/Wanjohi area on Wanjohi river

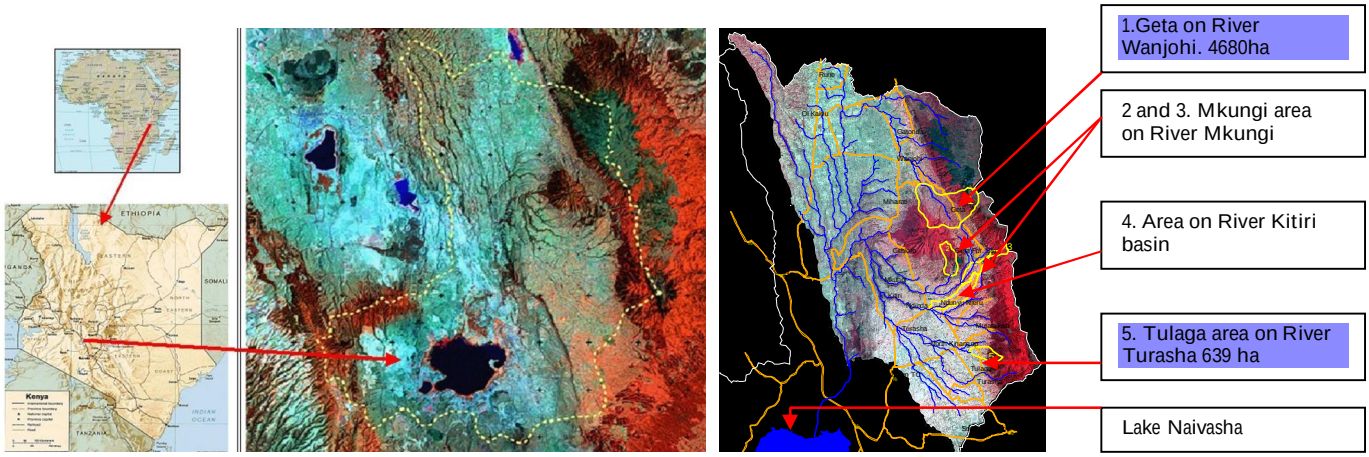
2 and 3 Mkungi area on river Mkungi

4 Kitiri on river Kitiri

5. Tulaga on river Turasha.

From the five sub-basins, two critical focus PES pilot sites were identified based on consideration of all other factors covering river Wanjohi and river Turasha and their tributaries.

Fig.2 Relative location of Naivasha-Malewa PES project



PES Project sub-basin targets

Source: (Gathenya, 2007)

2.2. Community entry point

PES mechanism being a business case required entities which can enter into legal contractual agreement (Jones 2009). Thus Water Resource Users Associations (WRUA) already formed through Water Act 2002 (Laws of Kenya) facilitated by Water Resources Management Authority (WARMA) were the entry institutions. In the catchment of interest the two pilot WRUAs are Upper Turasha–Kinja WRUA covering Turasha river and Wanjohi WRUA covering River Wanjohi and their tributaries.

2.2.1 community Sensitization

Initial sensitization meetings were strategized and held as follows:

Ist level meeting ….WRUA executive (each WRUA separately)

2nd ,, ,, ….District heads (Provincial administration, district ministries heads)

3rd ,, ,, ….WRUA members (Both WRUA separately)

4th ,, ,, ... Selected target farmers (each respective area)

5th ,, ,, …. All groups in workshops, Seminars, barazas and field days

In each of the above meetings, the following were discussed on:

1. Possible causes and potential solutions of environmental degradation in the area.
2. Types and value of environmental services.
3. Payment for Environmental Service concept.
4. Stakeholders' roles and contribution in implementation of PES scheme.
5. Project intervention focus.

Thereafter intensive awareness and sensitization were done on-farm, in grass root meetings, seminars, workshops, field days, public meetings (Barazars) to enhance understanding and buy-in by the community and all stakeholders.

2.2.2 Hot spot farms selection

During the meeting with WRUA members, (individual farmers, water projects officials, tree nursery operators, group leaders) criteria for selection of the hotspot farms were developed consultatively based on understanding of PES concept and respective target areas. The following criteria were developed which were further used to identify and select the critical hot spot farms within the pilot sites;

1. Steep farms without soil conservation structures i.e. terraces, grass strips and trees.
2. Farms cultivated too close and next to the rivers and valleys.
3. Farm with unprotected riverbanks.
4. Poorly cultivated farms.

5. Farm with water unfriendly trees close to the river- specifically Eucalyptus trees

6. Farmer must be the land owner and willing to adopt the change.

Unprotected riverbanks

Water unfriendly trees

2.2.3. Mapping

Mapping involved geo-referencing the hotspot farms by taking the waypoints and tracks along the farm boundaries and important features of the selected farms. This helped to locate the target farms reference to other features in the area within the specified map. During mapping exercise, verification of the status of the selected farms was made where non-critical farms are dropped and other un-identified farms were selected based on the laid down criteria and farmers willingness to participate. The exercise was the earth-breaking activities as it also gave the opportunity to interact with the farmers on-site and orient with the landscape. The mapping exercise provided opportunity to confirm the land ownership, approximate size, history of farm farming activities, and more so develop rapport with farmers and the community at large. The exercise was used to further clarify on the project objectives and approach. WRUA members and opinion leaders were involved as guides to the selected target farms, further enhancing buy-in by the farmers as they are well known and respected by the community members. All the 565 pilot farms were mapped.

2.2.4. Laying out

This is the laying out of the conservation structures i.e. establishing the specific places within the farm where the contour grass strips will be established and riverbank area to be put under conservation. This was done in consultation with the Ministry of agriculture (MOA) whose extension staff did the technical measurements and design. The MOA team was assisted by WRUA members who were previously involved in mapping exercise who got trained in the process. Land owners were given hands-on training in soil and water conservation though their involvement in the exercise. The number, closeness and shape of the grass strips depended on the slope, land size and the area under cultivation. A total area of 365,803 m^2 (216,125m^2 grass strips and 149,678m^2 riverbanks protection) was laid out for conservation.

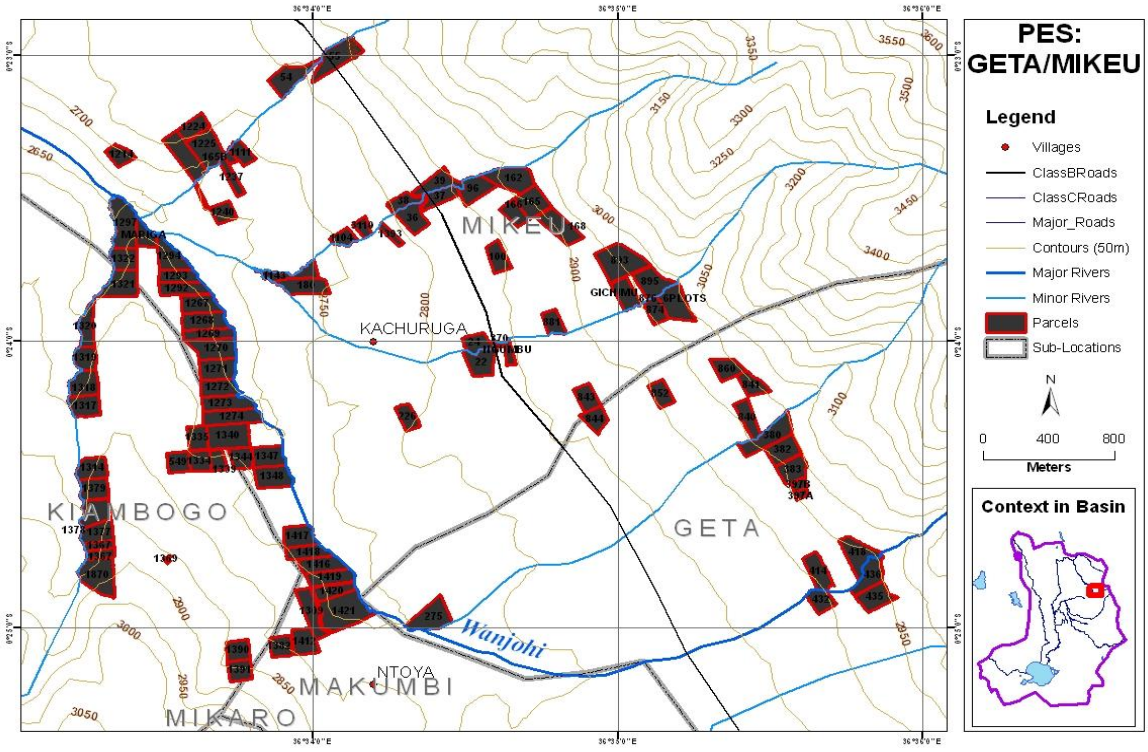
2.3 Planting Materials

2.3.1. Conservation grass

Farmers collecting KK1 for planting

Scientifically grass has been found to be the best filter and cover material in soil and water conservation. For this reason and to improve farmer's livelihoods, Kakamega 1 (KK 1) Napier, Cock's foot grass varieties were agreed upon with the community after advice from the Ministry of Agriculture. Napier grass for the relatively warmer areas and Cock's foot grass for relatively cold areas such as Geta, Mikeu, Parts of Kiambogo and Kianjogu areas covered by Wanjohi WRUA. In addition to soil and water conservation, these grasses were targeted as fodder crops for milk production in these areas. Giant grass was also introduced and obtained locally.

Fig 3. A typical GIS Map of one pilot site showing the selected hot spot pilot farms



2.3.2. Agro forestry trees

A wide variety of agro-forestry trees were identified for planting along the riparian lands. Olives, Cedar, *Dombeya*, *Prunas Africanas,* Rosewood, *Gravellia* and tree lucern are among the most popular in these areas as further recommended by Ministry of Agriculture, and Kenya Forest

Farmers collecting Tree seedlings

Services. Over 100,000 tree seedlings and over 15,000 tree tomatoes fruit seedlings have been planted to supplement the conservation grass. These are envisaged to improve the farmers livelihood through the provision of firewood, sale of fruits, reduced cost of fruits purchase and health improvement within the household. There has been over 95% survival rate of the agro forestry trees.

2.4 Project impact Assessment and Monitoring

2,4.1 Hydrology monitoring

In pursuit of the monitoring the intervention impacts to prove a business case, the project has installed four staff gauges in respective rivers of intervention namely: Wanjohi, Kinja, Karoroha and Turasha. These are purposely for water quantity monitoring. Four respective gauge readers has been trained on staff gauge reading and water sample collection and recording. For the purpose of water quality monitoring, a turbid meter was acquired in which water samples collected daily are assessed for sediment load.

Farmer collecting gauge readings

2.5. On-farm monitoring and training on good agricultural practices

To ensure the right practices are going on, on-farm follow-up has been intensified in all the farms. For the project to achieve the goal of livelihood improvement training has been conducted using area and farm specific needs approach. Areas trained on include: contour planting, riverbank protection, organic farming, proper use of agricultural chemicals, good farm planning, adoption of high value crops, farming as a business, contact farming, coping with climate change, and farming diversification, among others.

2.6.Livelihood Improvement

Established fruit trees on farm

In addition to soil and water conservation the project envisage improving the livelihoods of the target farmers being one of the consideration for the selection of these pilot sites. For this purpose, Elmba Rhodes grass, tree tomatoes fruits production has been intensified. Over 15,000 fruit seedlings have been supplied with survival rate of over 95%. Further, 16 Elmba Rhodes grass demos sites were established each quarter an acre.

Elmba Rhodes demo farm – woman harvesting for hay

12 out of 16 were successful (75% success). The four unsuccessful sites were found in relatively cold areas of the pilot sites (Geta), low temperatures caused low germination. In addition trials of new improved potatoes varieties are on–going, introduction of Lucerne and desmodium as proteinous supplements to Napier grass and Rhodes for livestock.

3. RESULTS AND ACHIVEMENTS

3.0. Equitable Payment for Watershed Services financial transfer

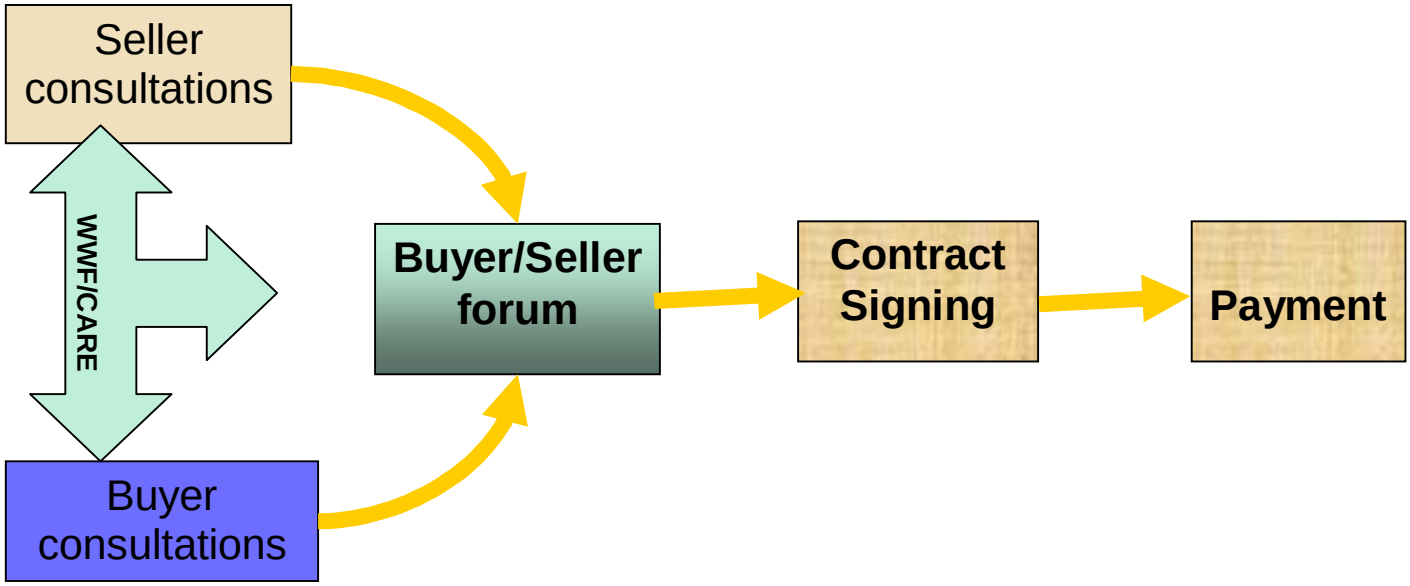
The projects objective that is "to develop a viable mechanism for payments for watershed services that delivers sustainable natural resource management and improved livelihoods and serves as a pilot and learning model for further expansion and replication". have been achieved. Before actual payment was made, a series of activities were carried out namely.

1. Negotiation for optimal payment option between buyers and sellers.
2. Contract signing by both buyers and sellers.
3. Verification of conservation implementation by both buyers and sellers.
4. Publicizing the project.
5. Payment.

3.1. Negotiation for optimal payment option between buyers and sellers

A series of negotiation meetings were held by both buyers and sellers to discuss issues of concern especially related to the contract. Such included various provisions in the contract. Among agreements were, an equal payment for each participating farmer for one year per farm, leading contract language to be in English with an interpreted Kiswahili and local language, payment to be made after both parties verification of conservation implementation level, and presentation of a monitoring plan by Upstream WRUA among others. The sellers inputs to the draft contract was presented to the buyers and a harmonised contract was obtained with all parties inputs. An independent opinion (legal services) was sought for interpretation of the said provisions in the contract.

Fig 4.Diagramatic representation of the Naivasha-Malewa PES negotiation process



Source: CARE/WWF-KCO, 2010

3.2.Contact signing

Upon agreements on contract provisions both parties signed the contract. The sellers sought the legal advice before signing. This was to ensure all the clauses in the contract were understood before commitment. Authorised representatives of both organisation signed the contract on behalf of the beneficiaries in presence of a lawyer.

UTK WRUA chairman signing PES Contract for sellers

3.3. Verification of conservation implementation

This exercise preceded the payment. A provision in the contract " Incentive shall be given upon verification of the implementation level by an authorised LANARWUA representative". Both buyers and sellers did separate on farm verification. The payment was done subject to verification by the buyers that the conservation structures were in place and could provide the desired environmental services. The sellers did the verification to ensure that the right participating farmers get their incentives equitably.

LanaWRUA Chairman verifying onfarm conservation

This verification included confirmation of the number and establishment level of the grass strips and agro forestry trees, riparian land restoration and the survival rates of the fruit trees. The farmers were

ranked in a five scale from Excellent, very good, good, fair, bad where each participating farmer signed the verification form confirming that the information contained was true thus transparency in verification was maintained and ensured that the person verified visited the actual farm. A total of 470 out of 565 farmers were identified having satisfied to receive the incentives.

3.4 Publicizing the project.

The project activities were made public on a media event. The activity involved bringing public to light of the new innovative approach to conservation through the media. It entailed two stages which followed each other consecutively. All the media houses were invited and briefed on the PES approach, activities and achievements. They also had the first hand on-farm witness and interaction with pilot farmers. The day after, a media day event was organised in which the general public was invited to witness the presentation of the cheque of appreciation to the sellers by the buyers of environmental services.

WRUAs receive dummy check on behalf of farmers

3.5 Payment


Farmers receive PES Vouchers

Payment was made in an equitable manner. All the participating farmers were paid a flat rate per each enrolled farm as per the agreement settled during the buyer-seller negotiation. The agreement stipulated was 17 USD arrived at through the buyers willingness and ability to pay for the environmental services though the opportunity cost was relatively higher per farm. The payment was made by Lake Naivasha Water Resource Users Association (LANAWRUA) which constitutes Lake Naivasha Growres Group (LNGG), fruits ,vegetables and flower grower around lake Naivasha and Lake Naivasha Riparian Association (LNRA) who constitutes the other business community around the lake. Upstream WRUAs through facilitation by CARE/WWF presented the payments to the sellers on behalf of LANAWRUA. The payment was made through the voucher system which is more equitable and safer than cash payment. The dedicated voucher were redeemable with agro-inputs at agreed and convenient outlets.

4. CHALLENGES

1.Very high demand for change.

This has risen from the farmers realization of the degradation level on their farms despite the initial inertial of disbelief about the projects approach. The pilot farmers' on-farm benefits has triggered very high demand for change in the region. Additional over 200 farmers have joined the projects.

2.Unpredictable weather pattern

Climate change has disrupted the seasons resulting to adverse effects in the pilot area. Prolonged drought caused much of the conservation material to dry, this was followed by heavy rainfall which caused much degradation. These has disrupted the plans of the project activities.

3.Degraded public lands

Non-point sources of sediments threatens the projects efforts to prove a business case through water quality monitoring as they tamper with on-farm intervention.

4.Complex land ownership

There is much dynamic of land ownership in the pilot area due to inheritance, subdivision and use changes. These threatens the main pillar of the project- farm ownership

5.Low buyers buy-in

Like other PES schemes around the world especially for watershed services, getting direct committed beneficiaries is a challenge, especially in a situation where these beneficiaries pay statutory water fee to the regulating body, thereby payment for PES appear as double payment.

5. WAY FORWARD

1.Up-scaling the scheme internally and externally.

2.Engaging more buyers & sellers.

3.Combining Reducing Emissions from Deforestation and Degradation (REDD) and PES.

4.Institutionalizing PES in policy framework.

5. Linking the pilot farmers to markets.

6. PES LESSONS

1.Desired land use change & equitable incentives that address livelihoods ensures sustainable provision of environmental services.

2.Strong stakeholder partnership leads to successful implementation.

3.Establishment of hydrology problem, commitment & ability to sell & pay for environmental services is a preliquisite for success.

4.Community cohesion and ownership of the project stimulates adoption of the scheme.

5.Involvement of the private sector is a key sustainability mechanism for the project.

6.Appropriate and adequate capacity building of environmental service providers and beneficiaries builds confidence in the scheme implementation.

References

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