



Pro-poor Rewards for Environmental Services in Africa (PRESA)

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Semi-annual Project Progress Report

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Acronyms and abbreviations

ASB	Partnership for the Tropical Forest Margins
AWSB	Athi Water Services Board
CERE	University of Conakry
CGIAR	Consultative Group on International Agricultural Research
CIS	co-investment in and shared responsibility
CSR	Cooperate Social Responsibility
EPWS	Equitable payments for watershed services
FAO	Food and Agriculture Organization
FORMAS	The Swedish Research Council
GWC	Green Water Credits
IAC	International Advisory Committee
ICRAF	The World Agroforestry Centre
MoU	Memorandum of Understanding
NAHI	Nature Harness Initiatives (Uganda)
NCWSC	Nairobi City Water and Sewerage Company,
NEMA	National Environment Management Authority
NGOs	Non-governmental Organization
PES	Payments for Environmental Services
PRESA	Pro-poor Rewards for Environmental Services in Africa
REDD	Reducing Emissions from Deforestation and Degradation
RES	Rewards for environmental services
RUPES	Rewarding the Upland Poor for Environmental Services that they provide
SLU	Swedish University of Agriculture Sciences
TANRMP	Tana River Natural Resource Management Project
UNDP	United Nations Development Programme
WOCAT	World Overview of Conservation Approaches and Technologies
WRMA	Water Resources Management Authority
WRUA	Water Resource Users' Association
WSPA	Water Service Providers Association
WSREB	Water Services Regulatory Board
WSTF	Water Services Trust Fund
WTA	Willingness to accept
WTP	Willingness to pay
WWF	World Wide Fund for nature

1. Introduction and grant background

The four-year programme for *Pro-poor Rewards for Environmental Services in Africa (PRESA)* seeks to facilitate *‘hundreds of thousands of smallholder farmers and residents living in the highlands of East and West Africa benefit from fair and effective agreements between stewards and beneficiaries of ecosystem services’*. The three specific project objectives and expected outputs are:

Objective 1: Landscape-level engagement (L). Foster the development, implementation and assessment of workable environmental service agreements landscapes in the highlands of East and West Africa.

Expected outcome 1: A set of landscapes in the highlands of East and West Africa, have workable environmental service agreements and provides fair rewards to ecosystem stewards.

Objective 2: Private sector and policy engagement (P). Catalyze policy support and private-sector participation in environmental service agreements in Kenya, Tanzania, Uganda and Guinea.

Expected outcome 2: Private companies have become increasingly involved in a range of initiatives for ecosystem management in the highlands of Kenya, Tanzania, Uganda and Guinea, including policy dialog with public agencies and fair contracts for ecosystem management.

Objective 3: Community of practice (C). Provide proactive and responsive support to the **dissemination** and application of assessment tools, negotiation methodologies, prototype payment mechanisms and monitoring tools among a PRESA community of practice, including other IFAD projects, regional and national Katoomba networks, NGOs and national organizations active in the innovation of new approaches to pro-poor rewards for environmental services in the highlands of East and West Africa.

Expected outcome 3: Improved quality and increased number of environmental service reward mechanisms in place and operational in the highlands of East and West Africa.

PRESA operates in the following landscapes:

- Mount Kenya East/upper Tana River catchment in Central Kenya;
- Ulugurus Mountains in the Eastern Arc of Tanzania
- Fouta Djallon upper catchment area in Guinea
- Usambaras Mountains in Tanzania;
- Upper Aberdares catchments in Central Kenya – focusing on Sasumua watershed;
- Nyando and Yala River basins in Western Kenya; and
- South western highlands in the Albertine Rift of Uganda.

PRESA seeks to generate evidence and facilitate mechanisms that enable rewarding of environmental service providers for engaging in sustainable land use practices. These are often small-scale, resource-poor farmers living within or along margins of important ecosystems whose income options are restrained due to the perceived potential consequences that downstream stakeholders may experience. PRESA uses scientific evidence to examine the extent to which such restraints often embedded in policy are called for, recommends effective land use practices and seeks for fair ways of rewarding or compensating the upstream stakeholders in order to achieve sustained landscape management. It seeks for partnership avenues to work with farmers, policy makers and the private sector to enhance management of ecosystems in a landscape by promoting fair and evidence-based reward mechanisms for environmental services.

2. Progress and Performance

A. The PRESA core team

Over this reporting period, PRESA activities were coordinated by Sara Namirembe with oversight from Delia Catacutan and Meine van-Noordwijk. Other PRESA core team members are Dr. John Gathenya a hydrologist on a sabbatical contract with ICRAF from JKUAT, John Mwangi a PhD student from JKUAT, Miika Makela and Heini Vihemaki, (Associates from Finland), Godfrey Mwaloma (communications assistant), Catherine Kimengu (administrator), and Adimo Ochieng (student intern).

B. Key accomplishments during January-June 2011

(1) Landscape level engagements

1.1 Upper Tana, Kapingazi, Kenya

Scenario analyses of the impacts of land use conversion from tea or coffee to annual crops or woodlots or agroforestry on water balance and water quality were conducted using Genriver model. It was found that land use change is unlikely to change the water yield by more than 10%. For instance, converting all tea farms to annual crops (an extreme scenario) would increase the water yield by 10%.

A study to assess population as a driver of land use change was planned relating population data of 1979, 1989, 1999 and 2009 with land-cover GIS files. However, this has been hampered so far by unsuccessful attempts to obtain GIS-shape files showing administrative delineations of the sub-locations in Upper Tana from the Kenya National Bureau of Statistics.

Socio-economic survey data and the GenRiver hydrological data were linked to a joint study between PRESA and FORMAS (a project between ICRAF Vietnam and SLU) on local coping mechanisms to climate variability. The study also involved use of the tool developed by RUPES for harmonising multiple knowledge systems at scientist, local and policy levels in understanding indicators for climate variability and developing negotiated actions. The scientific findings showed that the extreme seasonal reduction in stream flow, which local farmers and policy makers had believed was due to climate change was in fact due to high water abstraction rates arising from demand for irrigated horticultural farming. Even in this climate change adaptation study, the potential for using a RES approach featured strongly.

Presentations:

[Climate variability adaptation strategies at the local level](#)

[Climate change, land use, water abstraction and river flow in Kapingazi catchment](#)

Existing reward mechanisms through eco-certification were evaluated to assess their potential effectiveness in achieving watershed service provision. It was found that although eco-certified tea farmers were able to receive premium prices, eco-certified coffee farmers were not. Since the requirements for producing ecocertified tea and coffee includes soil and water conservation practices, there is opportunity for creating a case for farmers to receive a additional payments via PES for watershed services.

As a way forward, PRESA is participating in the design of the TANRMP projects. The issue of building PES agenda into that of ecocertification will be followed up focusing on quantifying water flow increase and sediment reduction achieved through ecocertification not only for Kapingazi, but for the whole of Upper Tana. The advantage is that tea and coffee farmers are already organized in cooperative societies and are being assisted to improve governance by Technoserve. The work from land use scenarios analysis will also feed into this.

The likely buyer would be KENGEN. The potential for creation of a PES fund where other private sector players (e.g., industries that rely heavily on electricity) contribute via CSR will be explored.

1.2 Usambara Mountain, Tanzania

The feasibility study on REDD in the Usambara mountains landscape continued in collaboration with ASB, involving four researchers. Small group meetings to share work in progress and develop the studies were held. Collection of materials was initiated for two research plans (on *delineation of landscape for REDD and trade-offs between land uses that maximize Carbon and other land uses*). A draft paper on prospects for benefit-sharing was submitted and further developed in an ICRAF write shop in April in Tanzania (*Will the poor benefit? Livelihood implications of REDD in the light of past conservation efforts and forest governance in Tanzania*). The paper will be updated based on comments and additional material, and will be submitted for external review.

(2) Conservation auctions, conjoint analysis and contingent valuation (WTA) as tools to determine farmer/seller behaviour and willingness to participate in PES contracts

2.1 Mt. Kenya East

2.1.1 From previous Willingness to Accept auctions, a journal article was published:

Bedru Babulo Balana, Thomas Yatich and Miika Mäkelä 2011. A conjoint analysis of landholder preferences for reward-based land-management contracts in Kapingazi watershed, Eastern Mount Kenya. *Journal of Environmental Management* 92 (2011): 2634-2646

Also accessible on: <http://www.sciencedirect.com/science/article/pii/S0301479711001976>

2.1.2 Analysing effectiveness and fairness of reverse auctions

A PhD student Lucie Andeltova has designed experiments and is collecting data aimed at examining the cost-effectiveness of outcome-based versus action-based schemes, and whether in these two schemes uncertainties regarding opportunity costs, gender, trust, and other socio-economic characteristics have a significant effect on auction cost-effectiveness.

2.2 Usambara Mountains

A MSc thesis by David Kaczan on *Designing an incentive program to reduce on-farm deforestation in the East Usambara Mountains, Tanzania* was completed at the University of Alberta on two related studies of farmers' interests in incentive mechanisms for conserving cardamom agro-forests. One study to understand mechanism design attributes that farmers would favour most / least found that people preferred "co-investments" and were disinterested in group or monetary payments. People mostly volunteered readily to enter into conventional contracts. The second study sought to explore whether farmers have innate motivations to contribute to the public good and how those motivations were affected by financial conservation incentives or punishments. The study found that payments and punishments could both prompt good practices. Together these studies provide a wealth of input into the design of conservation contracts in the East Usambaras.

A research brief has been produced. This is being developed into an ICRAF Working Paper (Designing an incentive program to reduce on-farm deforestation in the East Usambara Mountains, Tanzania), which is now undergoing internal review, and will be published by the end of 2011. In addition, a research note has been drafted and will be turned into an electronic publication to summarize the results to a wider audience.

[View thesis by David Kaczan.](#)

(3) Prototype development and farmer level capacity building

Uluguru Mountains

PRESA has been undertaking prototype payments to farmers who had won the auction bids (from Jindal's WTA work) to test effectiveness and farmers' perspectives on the performance based payments. Monitoring of the farmers is conducted every six months and payments made according to performance. The second payment tranche was made in June 2011.

So far the general observations are that farmers do not seem to understand the issue of conditionality, and are not particularly concerned about regular payments. The capacity building gained, the free tree

seedlings received and the foreseen value of trees were more important. The low importance of regular incentive payments to farmers could be due to:

- A historical mindset on action-based/input-based approaches
- The auction bids being too low to make much difference in the farmers' commitment to perform
- High start-up investment and the perceived benefits of actions at household level, which may have dwarfed the need for further regular payments, either weakening the performance-based agenda or ensuring future performance.

(4) Willingness to pay

A survey was conducted in partnership with Macauley Institute on the willingness by Nairobi water users to pay (WTP) an increased tariff in contribution to water resource management by landowners through a PES mechanism. As Nairobi is highly segregated in high income and low income areas, a sampling strategy using GIS methods was used to generate 200 samples of the respondents receiving water from the Sasumua reservoir from completely heterogeneous socioeconomic background.

There was overwhelming willingness to pay extra, provided this would increase quantity and regularity in water flow. A report from this study is available on the PRESA website. The challenge is that land use change impacts are more likely to be achieved in terms of improving water quality than water quantity. Another snag is that, the authority to increase water tariffs does not rest with the direct beneficiary, Nairobi Water Company, but with the Water Services Regulatory Board. These institutional challenges are being followed up through dialogue with policy makers now that the Land Policy, within which water resource management falls, is being reviewed.

The report is [available here](#) (PDF, 3.6MB):

(5) Public-private engagement

5.1 Sasumua

A multi-stakeholder dialogue meeting was held with top leaders from the Water Resources Management Authority (WRMA), Water Services Trust Fund (WSTF), Water Services Regulatory Board (WSREB), Athi Water Services Board (AWSB), Nairobi City Water and Sewerage Company, the Sasumua Water Resource Users' Association (WRUA), CARE, WWF and Ministry of Water. The meeting aimed at exploring the potential for achieving a more efficient approach to water resource management via PES. Evidence was presented on the delineation of the watershed and erosion hotspots, land use changes, potential for influencing water quality and flows from land use change, WRUA's willingness to accept payments, Nairobi water users' willingness to pay extra tariff and the business case if the Nairobi Water Company invested in RES with WRUAs in controlling sedimentation.

In spite of a strong business case for NCWSC to engage in PES, the company noted that it was already contributing to water resource management via substantial abstraction fees to WRMA as required by the Water Act 2002. Since these fees are collected in the WSTF to which even other donors contribute, the possibility for WSTF to pilot a RES mechanism with WRUAs was discussed. **The meeting report is available by [clicking here](#).**

PRESA engaged John Mwangi who mobilized willing WRUA community members in hotspots in close consultation with CARE EPWS (Equitable payments for watershed services) project in neighboring Naivasha. A draft memorandum of understanding (MoU) was developed for ICRAF (PRESA) to provide technical backstopping to the WRUA in developing a RES to be submitted to the WSTF. The seller vehicle was to be the Sasumua WRUA community members while the buyers would be the WRUA leadership who would pay the sellers (using funds from WSTF) on condition that sellers implemented the recommended land uses. The WRUA leaders would then account for the payments to the WSTF.

However, in order to move forward with this, another multi-stakeholder dialogue was scheduled to address institutional limitations in institutional mandates due to policy gaps. A policy brief highlighting policy and institutional changes required to enable use of a rewards-based approach in water resources management is almost finalized. Other landscape stakeholders PRESA will target for dialogue are: Athi Water Services Board, National Environment Management Authority (NEMA), Water Services Regulatory Board, Water Service Providers Association (WSPA) and local governments.

5.2 Fouta Djallon, Guinea

Building on dialogues initiated in 2010, PRESA held meetings and tele-discussions with the top management of the Coyah Water Bottling Company supplying mineral water to Conakry (Guinea), Sierra Leone, Liberia and Guinea Bissau. The company expresses strong willing to invest in the PES because it acquired modern equipment to expand its production, but it is threatened by the falling water table. The catchment from which the company abstracts its water includes the Coyah forest block and an area with unsustainable agricultural practices and uncontrolled settlements. The Company's previous efforts to improve watershed management - including enhancement of forest protection and community development activities such as building schools, subsidization of electricity bills and renovation of water wells – have not been successful.

PRESA agreed with the company to generate the following evidence for PES: delineation of the watershed, community willingness to accept payment, identification of appropriate land use practices and quantitative proof of their potential impact on watershed services. PRESA also agreed with the company to conduct prototype PES contracts with a sample of community members to test their performance and perspectives on conditionality. This has been initiated through partnership with the University of Conakry.

The catchment area of the Coyah water bottling company was delineated, covering only 25.8 km². However, this area may need to be adjusted given that water is extracted from up to 50 meters below the ground surface. A draft land use map was produced using ENVI software and a rapid eye image obtained free from the provider. A request has been made from CERE to provide a good quality version to enable hydrological modelling of the catchment. A simple time series of land use will also be attempted (if data can be acquired) to illustrate the decline of forests in the site.

6) Community of Practice

- 6.1 An updated version of the PRESA brochure was published to reflect progress in focus sites, as well as remaining opportunities for establishing payments for environmental services (PES). The publication is primarily targetted at multi-lateral institutions interested in PES as a tool for environmental conservation, but has also been useful for researchers, site-level stakeholders and policy makers. The brochure can be [downloaded here](#) (PDF, 1.4 MB).
- 6.2 The PRESA newsletter was merged with that of the Eastern and Southern Africa Katoomba Group, expanding PRESA's reach and ensuring continuity in joint learning and communication on PES as this Phase of PRESA winds up. Subscribers to the joint newsletter consist of researchers with an interest in PES, policy makers, private sector readers – including senior executives, and journalists. The newsletter carries PES news from Africa, while providing case studies and tools for natural resource management from the World Agroforestry Centre and other PRESA partners. The newsletter also provides relevant news from other continents. The first edition of the newsletter can be seen through [this link](#).
- 6.3 A technology targeting tool has been drafted and is to be refined using socio-economic information using WOCAT tool and shared with GWC

Website:

The PRESA website, <http://presa.worldagroforestry.org>, continues to be a useful tool for researchers, students and journalists to find information about PES and about us. The website receives an average of approximately 150 *unique visits* a day (*hit numbers* are much higher but a less accurate indicator of performance).

The PRESA website contains an online library of PES and REDD+ tools and resources developed by PRESA, the World Agroforestry Centre and partners, and other PES researchers. There are currently 154 titles in the online library, a number that is growing every month.

<http://presa.worldagroforestry.org/resource-materials/>

7) Publications

1. Results from the Auctions experiment comparing auction results from the PRESA site with WWF/CARE's work in Tanzania, were published in a FAO publication on PES. The book can be downloaded from: <http://www.fao.org/rio20/special-features/payments-for-ecosystem-services/en/>
2. A PhD thesis, Agricultural Economics on *Design of conservation contracts at the Ulugurus site in Tanzania* was completed by Rohit Jindal, Indian national, Michigan State University, USA. A Technical Advisory Note has been drafted from the thesis and is being revised. [View dissertation.](#)
3. A PhD thesis, Rural Sociology on *Alternative institutions for land and forest management at the Ulugurus site in Tanzania* was completed by Mamta Vardhan, Indian national, Michigan State University, USA. A policy brief will be developed from the thesis. [View dissertation](#)
4. A paper on the agroforestry potential through conditional payments in western Kenya, coming out of PRESA's work, was also published in a FAO publication on PES. The book can be downloaded from the following site:
5. <http://www.fao.org/rio20/special-features/payments-for-ecosystem-services/en/>
6. ***Payments or Rewards? Farmers benefit from Environmental Services:*** This feature article was published in the June 2011 edition of *Farming Matters* magazine. The article discusses the role of farmers in providing environmental services previously provided by forests. PES can provide incentives to ensure farmers maintain environmental services from their land. The magazine is published in the Netherlands by the [AgriCultures Network](#).

PRESA research has also featured several times in the **ICRAF in-house newsletter**.

PRESA beyond 2011

A visit was made to IFAD to present the evidence generated so far through PRESA work and the relevance of this evidence in promoting pro-poor RES-based approaches to ensure resilience within multi-functional landscapes. A seminar presentation and a number of discussions culminated in a need to conduct a thorough final evaluation of the program in order to get a clear view of developing future actions that take into considerations emerging concepts within the new CGIAR structures and also on the global research and development arena. The Evaluation process has been initiated and is expected to be completed by December 2011.

In the meantime, PRESA is working closely with key partners in Kenya to build evidence generated in Mt. Kenya site and future research into the TANRMP proposal. PRESA is also approaching other potential support sources including Government of Finland and UNDP.

D. Capacity Building Activities: ICRAF has contributed to or led/organized capacity building initiatives on several topics related to rewards for environmental services. These are summarized as:

Research partnerships

1. Almost completed graduate research

- i) Hosea Mwangi, JKUAT, Kenya
MSc thesis: *Evaluation of the Impact of Conservation Practices on Ecosystem Services in Sasumua Watershed, Kenya*, using SWAT model
- ii) John Kimani Mwangi, JKUAT, Kenya
PhD Thesis: *Trade-off analysis among ecosystem services using the Soil and Water Assessment Tool (SWAT) model in Upper Aberdares*

- iii) Isabel van de Sand, University of Oldenburg
PhD thesis: Integrating natural resource management and adaptation to climate change: The case of payments for ecosystem services"

2. Continuing Graduate student research

Lucie Andeltova, Bonn University Germany

PhD Thesis: *The Role of Risk and Trust in Conservation Auctions for Performance Based Payments for Environmental Services and the Cost Effectiveness Implications: Experiments in Rural Kenya*

Sabbatical Leave contract

John Gathenya Mwangi from 1 August 2010 to May 2011- working on Kapingazi basin

G. PRESA IAC meeting:

The International Advisory Committee meeting held on 29 March 2011, facilitated the process of taking stock, reflecting on how far PRESA had come in achieving its objectives and refining the annual work plan to focus on a strategy for consolidating lessons learned in the various landscapes, key messages to communicate, key research areas that still require more work and ways of linking key findings in the landscapes into ongoing local processes. The planned final evaluation for PRESA is to further analyse achievements in understanding pro-poor Rewards for Environmental Services in multifunctional landscapes, selecting key issues to take forward based on emerging research interests within the Consortium Research Programs and the development arena.

A report of the meeting's discussions can be [downloaded here](#).

H. Contracts: Contracts were given to the following partners:

1. University of Conakry (CERE) from June to 10 December 2011 (Set up a prototype payment mechanism for watershed services in Fouta Djallon). [View contract](#)
2. Ecotrust from 1 June, 2011 to 31 October 2011 (Building payment for environmental services in government processes). [View contract](#)
3. Nature Harness Initiatives (Uganda) NAHI-1st August -30th November 2011 (Cost-Benefit Analysis of Management Interventions for private forests in Wambabya, Nkusi and Waki and further engagement with private sector for Rushebeya-Kanyabaha landscapes for effective delivery of environmental services). [View contract](#)

Conclusion

The PRESA goal is: *hundreds of thousands of smallholder farmers and residents living in the highlands of East and West Africa benefit from fair and effective agreements between stewards and beneficiaries of ecosystem services.*

The following is the objective-by-objective summary of progress made towards realizing the project goal.

Objective 1: Foster the development, implementation and assessment of workable environmental service agreements in three core landscapes and four associate landscapes in the highlands of East and West Africa.

Expected outcome 1: *A set of landscapes in the highlands of East and West Africa have workable environmental service agreements and provides fair rewards to ecosystem stewards.*

So far, PRESA has generated evidence contributing to supporting the implementation of payments for ecosystem services, through:

- a) **Hydrological modelling** (Embu and Sasumua and to some extent Coyah site) linking water flow and water quality services to land use change/interventions in clearly delineated watersheds. The *key message* is that clearly quantifiable changes can be achieved in improving water quality through proper land use interventions. A strong business case for using RES mechanisms to achieve this through the strict (commoditized) PES exists, at least in the case of Sasumua. Land

use change also significantly affects water flows. However the changes are small. A strict PES approach may not be feasible, but a co-investment approach is possible with CIS based on the understanding that appropriate land use practices significantly improve water flows. Partnership at country program level with TANRMP (Tana River Natural Resource management Project) is being explored to respond to the pending research questions.

- b) **Conjoint analyses** have given indication of what farmers are willing to accept (Embu, Ulugurus and Usambaras), what influences WTA, and the potential risk of crowding out of good inclinations to take actions for public good.
- c) **Prototype payment mechanisms** have been implemented only in the Ulugurus and are only being initiated in the subsites of Fouta Djallon in Guinea. Key messages are yet to be generated on farmers' perspectives on conditional contracts and whether RES delivers more effective and efficient performance than other natural resource management approaches.

Objective 2: Catalyze policy support and private-sector participation in environmental service agreements in Kenya, Tanzania, Uganda and Guinea.

Expected outcome 2: *Private companies become increasingly involved in a range of initiatives for ecosystem management in the highlands of Kenya, Tanzania, Uganda and Guinea, including policy dialogue with public agencies and fair contracts for ecosystem management.*

PRESA has directly attempted to facilitate PES implementation in Sasumua and in the process has been able to develop deeper understanding of the institutional and policy challenges involved. Details of conditionality and contract management and fund transfer and benefit sharing need to be better articulated. Institutional mandates in engaging in PES need to be articulated.

Key lessons are expected from the work initiated in partnership with the University of Conakry and the Coyah Water Bottling Company – an already willing buyer of watershed services.

The capacity to use carbon payments (satisfying all carbon methodological demands) to support watershed management could be developed further by using scenarios analysis with the GenRiver model, building on partnership already developed with Ecotrust and NAHI.

Objective 3: Provide proactive and responsive support to the dissemination and application of assessment tools, negotiation methodologies, prototype mechanisms and monitoring tools among a PRESA community of practice, including other IFAD projects, regional and national Katoomba networks, NGOs and national organizations active in the innovation of new approaches to pro-poor rewards for environmental services in the highlands of East and West Africa.

Expected outcome 3: *Improved quality and increased number of environmental service reward mechanisms in place and operational in the highlands of East and West Africa.*

Through, its communication strategy including a website, newsletter and articles published in various journals and also through its partnerships with research and development partners, PRESA work has been widely disseminated. The merging of the regular newsletter with that of Katoomba Group and UNDP has widened the scope of dissemination and interaction of many parties interested in the evidence related to PES implementation.

All in all, the objective have been achieved in as far as generating and disseminating evidence that fosters development and implementation of RES approaches especially for watershed management. What is missing is the successful implementation of evidence-based RES and the assessment of whether RES agreements are fair and effective. Results from work commissioned to partners over this year and also from observations from prototype experiments may contribute to this, but a well designed analysis of RES fairness and effectiveness will need to be built into the next phase of PRESA.