PIMA

Poverty and ecosystem impacts of payment for wildlife conservation initiatives in Africa: Tanzania's Wildlife Management Areas

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Abstract

Community Based Natural Resource Management and Payment for Environmental Service initiatives are being rolled out across the Global South, but there are conflicting views as to how they work, for whom and under what circumstances. This is partly due to the complexity and multidimensionality of the ecosystem services (ES) and poverty alleviation (PA) objectives involved, and the inevitable trade-offs. But it is also due to lack of rigorous impact evaluation approaches that control for confounding factors and ensure that the voices of the most marginalized are heard. PIMA aims to deliver qualitative characterization and quantitative measurement of:

• The impacts of Tanzania's Wildlife Management Areas (WMAs) on long term trends in quantity and quality of Ecosystem Services (ES)
• Impacts on formal and informal structures and processes of governing access to ES in WMAs
• Effects on different social groups and the associated implications for their pathways out of poverty
• How these impacts vary with social, economic and political circumstances of WMAs

This is achieved using a Before-After, Control-Impact (BACI) study design and matching of control and treatment villages outside and inside WMAs. PIMA combines qualitatively sound understandings of WMA governance and of differentiated changes in household and individual wellbeing, with quantitatively and statistically rigorous quasi-experimental techniques.

Protected wildlife areas in Tanzania

- National Parks
- Ngorongoro conservation area
- Game controled areas,
- Wildlife Management Areas
- Matched non-WMA areas.

The WMAs of Tanzania

• 1998: Tanzania's national development strategy (MKUKUTA) promotes Community Based Natural Resource Management (CBNRM).
• 2004-2014: 17 pilot Wildlife Management Areas (WMAs) established covering ~2.5 million ha and impacting >410,000 people.
• 2014: 22 more WMAs planned, affecting another 1.5 million rural people.

WMA impacts remain insufficiently documented.

PIMAs objectives

PIMA aims to carry out a rigorous evaluation of the impacts of Tanzania's WMAs, to enhance understanding of what works, for whom, under what conditions. PIMA thus addresses :

• The nature, quantity and quality of ecosystem service (ES) benefits that WMAs deliver
• Governance, access to and distribution of ES benefits from WMAs
• Resource use histories demonstrating effects of WMAs on livelihoods, poverty and wellbeing

Geographical scope

The remote sensing component of PIMA includes all pilot WMAs in Tanzania (Figure 1).

PIMA field surveys focus on:

The northern rangeland WMAs:
• Enduimet
• Burunge
• Makame

The southern Miombo WMAs:
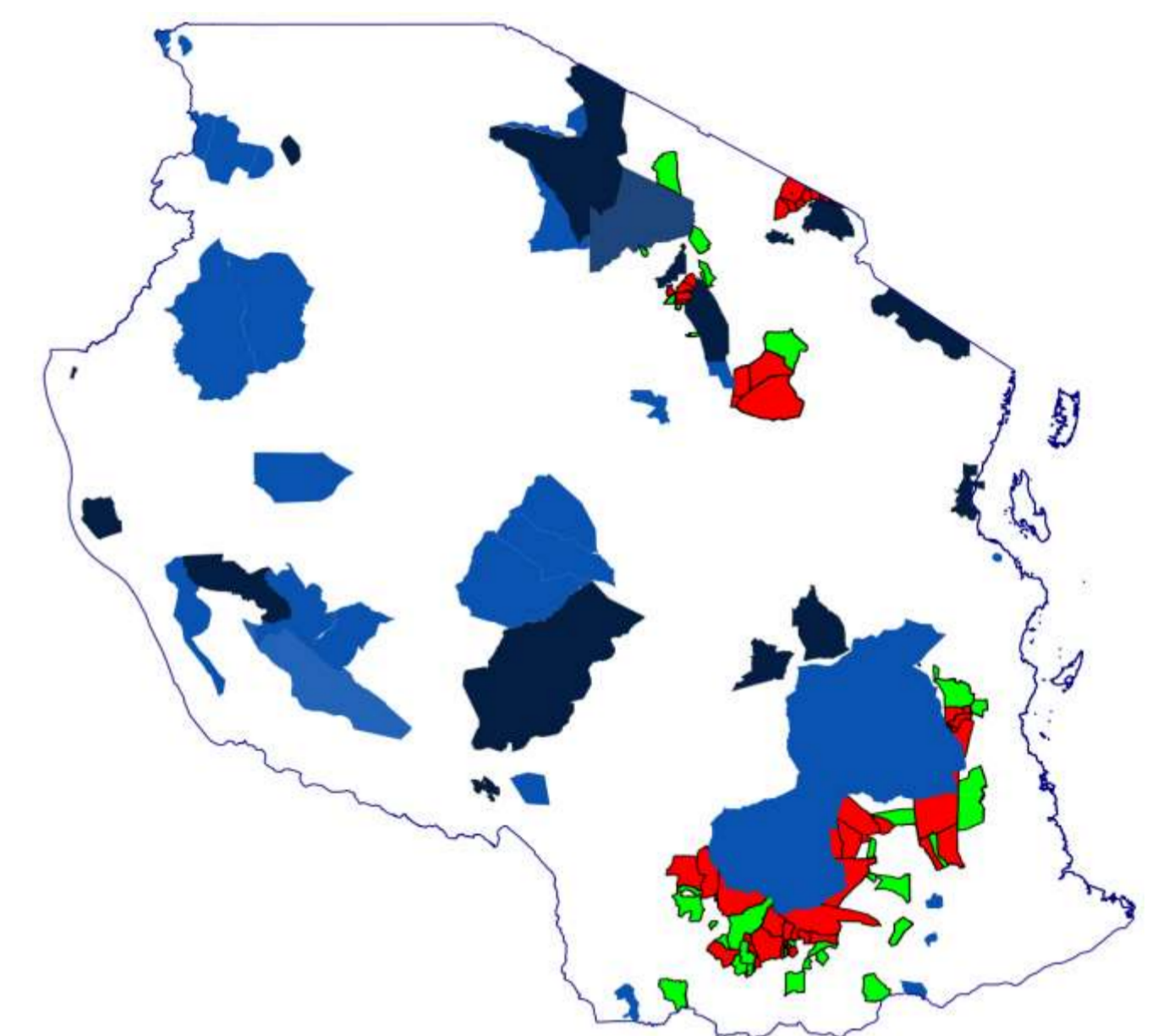• Mbarang'andu
• Tunduru
• Liwale

Four treatment villages are selected for each WMA alongside matching control villages.

BACI analysis

PIMA's impact evaluation uses a comparison of Before-After and Control-Impact (i.e. inside-outside) of selected WMAs, villages and households, making it possible to control for general changes in resource use patterns, economy, and environmental conditions coinciding with, but not caused by implementation of the WMAs.

Governance

PIMA uses a political ecology approach through key informant interviews with local government, WMA representatives and individual users to:

• Trace dimensions of participation in representation, rule-making, enforcement, and access to benefits and processes of upward, downward and horizontal accountability
• Identify key points or processes where marginalized groups are excluded or elites capture benefits intended for wider access

Livelihoods

PIMA assesses livelihoods, poverty and wellbeing outcomes of WMAs through focus groups and a stratified random interview survey with 40 household heads and 20 female members of these households in each village, documenting:

• Multidimensional concepts of poverty and wellbeing
• Resource use histories
• Individual pathways in and out of poverty

Questionnaire Survey

PIMA employs local language researchers to ensure data quality. The year 2007 was selected as the baseline year prior to establishment of the WMAs and events recollected by the household occurring in 2007 are used as a point of reference. Recall data is collected to compare present to pre-WMA establishment livelihoods in terms of:

• Selected assets owned
• Income portfolio
• Crop damage
• Access to natural resources
• Consumption of selected natural resources
• Wellbeing
• Shocks experienced,
• Household composition
• Education
• Migrant / resident status

Survey interviews are entered in the field using tablets uploading directly to a cloud database enabling instant access to data for analysis.

Project partners

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Conflict resolution
Pastoralism is a major livelihood issue in WMA areas and conflicts often arise over access to grazing areas for livestock.

Arial surveys
TAWIRI conducts aerial wildlife counts in Tanzania's protected areas using small fixed wing Cessna airplanes.

Questionnaire interview
PIMA also evaluate specifically how WMAs affect s women's livelihoods and participation in natural resource management

Wildlife in community land
A considerable proportion of Tanzanias wildlife lives outside protected areas and annual migration routes takes additional wildlife through community lands where they may be subject to harvesting.

Difference in difference

PIMA's statistically rigorous quasi-experimental design establishes a counterfactual through matching of treatment villages inside and control villages outside the WMAs on the criteria measured prior to establishment of the WMAs:

• Total annual precipitation
• Elevation
• Slope
• Population density
• Overlaps with elephant and lion distribution
• Percentage village area covered by most common land cover types (Global Land Cover 2000 maps)

and on distances to:
• Nearest major town and road
• Nearest wildlife corridor
• Edge of national park or game reserve

Ecosystem services

PIMA focuses on a range of key ecosystem goods important to local people. These encompass provisioning, regulating, supporting and cultural services such as:

• Water as a key limiting resource in arid and semi-arid rangeland WMAs
• 1^0 production incl. crops, pasture, forest products
• 2^0 production incl. livestock and wildlife
• Cultural services
• Access to social networks
• Tourism based on wildlife viewing and hunting

Analysis will be based on:

• Remotely sensed data - i.e. MODIS and NDVI – revealing changes in surface water, vegetation, settlement, cultivation, fire and infrastructure
• GIS referenced overflight data (incl. 3 new aerial counts) recording livestock and wildlife densities
• Village government and individual interview reports of cultural services, social networks, tourism activities

Household sampling strategy

The household sampling strategy aims to enable evaluation of differentiated effects by:

• Constructing a list of all HH's in the community
• Participatory wealth ranking all HH's
• Selecting randomly from the list 10 HH's plus 5 backup HH's from each of these group:
   - Members of the AA [or village council, village environmental/natural resource committee]
   - Very poor
• Selecting randomly from the list 20 HHs plus 10 backup HHs that are:
• Other
• Selecting randomly from the sampled HHs 20 women plus 10 backup women - excluding any female HH heads

Wealth ranking is conducted by focus groups establishing local definitions of wealth based on assets and socio-cultural indicators and assign all village households to four wealth groups.

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