

**MBARANG'ANDU WMA**

Mbarang'andu WMA is located in Ruvuma region, bordering Selous Game Reserve in the north, and is one of five WMAs in the Selous-Niassa Corridor. It was registered in 2006, received user rights in 2010, and generated hunting-related revenues under government oversight up to 2013. In 2013 the AA assumed co-ownership of the hunting block under the WMA regulations and was then able to retain a larger share of hunting revenues that had previously been captured by central government. Its seven member villages (Kitanda, Nambecha, Likuyu Sekamaganga, Mchomoro, Kilimasera, Songambebe and Mtelawamwahi) are home to about 16,500 people of the Ndendeuli and Yao tribes. Most residents are farmers and some practice shifting cultivation, though the WMA restricts access to new land for cultivation. Currently, there is one hunting investor but there are no game viewing safari operators.

**The PIMA project dissemination note**

The Poverty and ecosystem service Impacts of Tanzania's Wildlife Management Areas (PIMA) project is an international research collaboration involving University College London, the University of Copenhagen, Imperial College London, Edinburgh University, the Tanzania Wildlife Research Institute, the UNEP World Conservation Monitoring Centre, and the Tanzania Natural Resources Forum. PIMA collected household-level information on wealth and livelihoods through surveys and wealth ranking exercises, supplemented with WMA- and village-level information on WMA governance, including revenue distribution. This information was gathered in 42 villages, both inside and outside six WMA areas, in north and south Tanzania. Wealth ranking covered over 13,500 households. Wealth, assets, and livelihood strategies from both before and after the WMA were surveyed for men and women in nearly 2,000 households (status in 2014-15 at the time of the PIMA surveys; and in 2007, based on recall). Comparing changes over time in WMA villages with similar non-WMA villages allows us to know whether changes are caused by the WMA or not (Fig 2).

**Revenues in Mbarang'andu WMA**

- The revenues from different types of fees are meant to be distributed according to the Wildlife Regulations 2008 and 2012 (Fig 3)
- A share of tourism revenues goes to central (*black*) and district (*white*) government
- The rest is returned to the WMA, which can keep half (*hatched*) and distributes the rest among the member villages (*light grey*)
- WWF (2014) reports annual WMA revenues ranging from USD 2,800 to 22,700 between 2008 and 2012. These revenues are shares from government-run hunting blocks. Donor contributions to WMA villages from a hunting outfitter and a mining company amounted to USD 28,000 in 2012 and USD 33,000 in 2015. Mbarang'andu villages received around USD 1,000 annually from the AA in the last three years

**Map of Mbarang'andu WMA**



Fig. 1: Map of Mbarang'andu WMA (white). Based on GIS shapefiles from WWF. Compiled by J. Bluwstein.

**Fact box: Mbarang'andu WMA**

District	Rufiji
Member villages	7
Population	16,451
Area	2,900 km <sup>2</sup>
Year registered	2006
Authorised Association (AA)	Mbarang'andu

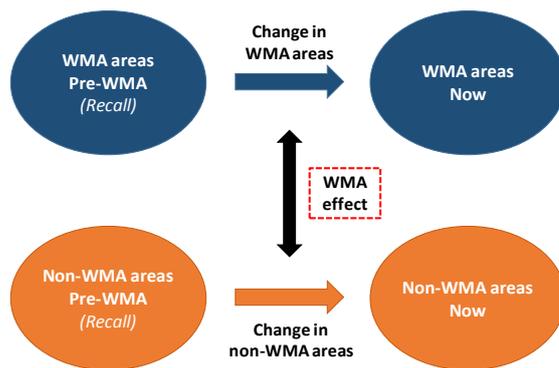


Fig. 2: How PIMA can tell what changes WMAs caused

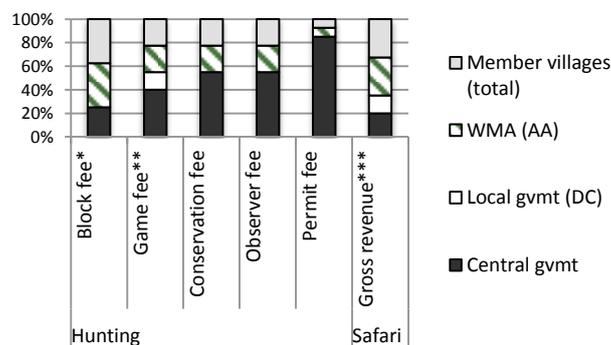


Fig. 3: allocation of total income from hunting and photographic tourism fees according to Wildlife Utilization Regulations 2008 and Wildlife Regulations 2012

\* The WMA can negotiate higher block fees, of which it can keep 100% of the premium they negotiate. \*\*The highest game fees are for elephant trophies: between US\$10,000 - US\$25,000, depending on the size. \*\*\* collected by central government, then distributed to WMA after taxation. Fees include concession fees, bed fees, wildlife activity fees, vehicle entry fees, etc

## Livelihood changes in Mbarang'andu WMA

### Wealth

- Based on local perceptions, Mbarang'andu households were ranked as 'very poor', 'poor', 'normal' and 'rich' for 2014 and (by recall) for 2007
  - On average, Mbarang'andu households have increased their wealth between 2007 and 2014
  - This improvement was three times larger in WMA than in non-WMA villages
  - In non-WMA villages, the majority of households remained with the same wealth
- However, it is not due to WMA revenues as these have been limited or non-existent. Noe (2013) documents philanthropic contributions to 'Friends of Mbarang'andu' by conservation NGOs and by the uranium miners operating in the WMA; villages have been able to apply for support for specific projects

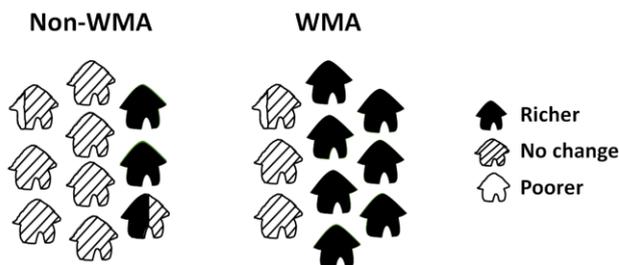


Fig. 4: Changes in wealth between 2007 and 2014. For every 10 households, approximately 2.5 have become richer and 0.3 poorer in non-WMA areas. In WMA areas approximately 7 in 10 households have become richer and 0.2 poorer.

### Access to NRs and environmental income

- Access to natural resources (NRs) means the extent to which rules and regulations constrain or help households' use of firewood, poles, honey, wild foods etc for consumption or sale. 'Environmental income' means income from collection and/or sale of NRs
- Reliance on firewood and wild vegetables and fruits increased in WMA and non-WMA villages), while income from construction material, timber, wild fish and honey etc decreased between 2007 and 2014, relative to other environmental incomes (Fig 5)
- Income from wild fish, honey, timber and charcoal represents a small contribution to rural livelihoods in WMA ( $\leq 6\%$ ) and non-WMA villages ( $\leq 3\%$ )
- Access to many environmental goods has become more difficult in WMA villages, but only a few respondents believe this is WMA-related

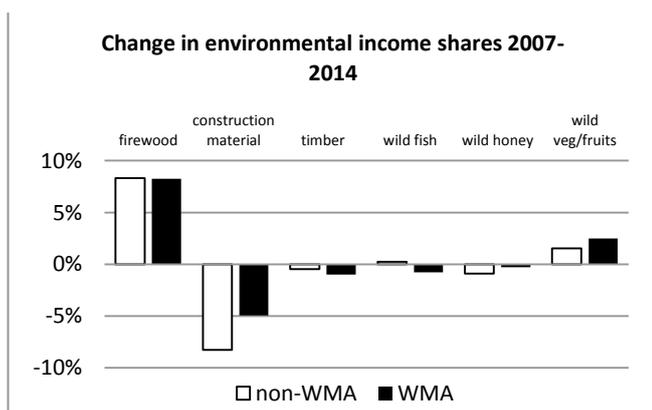


Fig. 5: Change in livelihood portfolio contributions from 2007 to 2014 in WMA and non-WMA villages

### Livelihoods

- NR-based activities (agriculture, livestock keeping, wild products) contributed 83% total income of Mbarang'andu households and corresponding non-WMA households in 2014 (Fig 6). Wild products include firewood, construction materials, timber, wild fish and honey, etc.
- The contribution of NR-based activities, and of wages, decreased in Mbarang'andu households and non-WMA households from 2007 to 2014 (Fig 7)
- The reliance on remittances increased in WMA and non-WMA villages from 2007 to 2014 (Fig 7)

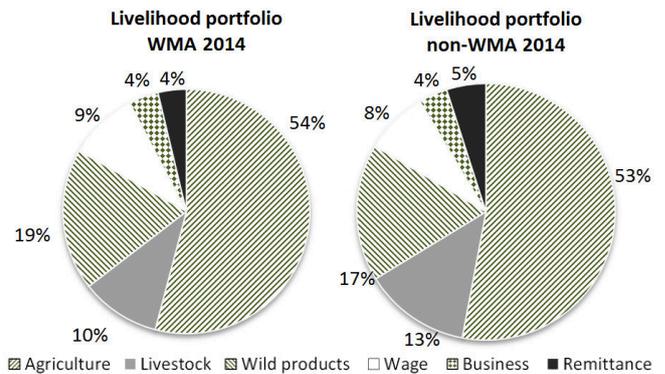


Fig. 6: Shares (%) of total income (full circle) earned from different activities in Mbarang'andu WMA (left) and non-WMA (right) villages in 2014

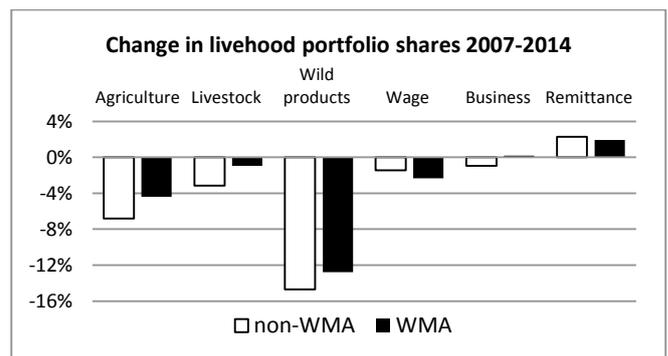


Fig 7: Change in livelihood portfolio contributions from 2007 to 2014 in WMA and non-WMA villages

### Farmland

- Agricultural land is measured relative to household size and composition, and reported in terms of area per 'adult equivalent' (AE)<sup>1</sup>
- People in WMA on average have more farmland in 2014 per adult-equivalent than in non-WMA villages (WMA: 1.24 acres/AE, non-WMA: 0.95 acres/AE)
- In both WMA and non-WMA villages there has been little change since 2007 in the average amount of farmland per adult-equivalent

### Grazing land

- Half of the respondents in Mbarang'andu villages think that access to grazing land has not changed, and half think that it has become worse, however not because of the WMA
- The results are similar in non-WMA villages

## Livestock

- The term 'Livestock' includes all domestic animals but poultry. To make it easier to compare holdings made up of different types and sizes of livestock (e.g. goats, calves, cows) PIMA converts them to the equivalent number of 'livestock units' (LUs)<sup>2</sup>
- Between 2007 and 2014 the number of livestock per household decreased in Kitanda village by 0.8 livestock units on average, and has not changed or increased very little in the other villages, both WMA and non WMA
- Households which had fewer livestock units in 2014 than 2007 stated cash needs as the main reason for this

## Human - wildlife conflict in Mbarang'andu WMA

- Human-wildlife conflict means human and livestock injury and death because of wildlife, as well as crop raids and property damage. This imposes large costs
- On average, 6.5 out of 10 households in WMA villages experienced crop raiding in the past 12 months compared to 3.5 out of 10 households in non-WMA villages (Fig 8)
- There are large differences between Mbarang'andu WMA villages in the share of households that have experienced crop raiding in the past 12 months (Fig. 8)
- On average, respondents in WMA and non-WMA villages reported that the level of crop damage has stayed the same since 2007
- The average value of crops lost in the past 12 months is significantly higher in WMA villages than in non-WMA villages (Fig 9)

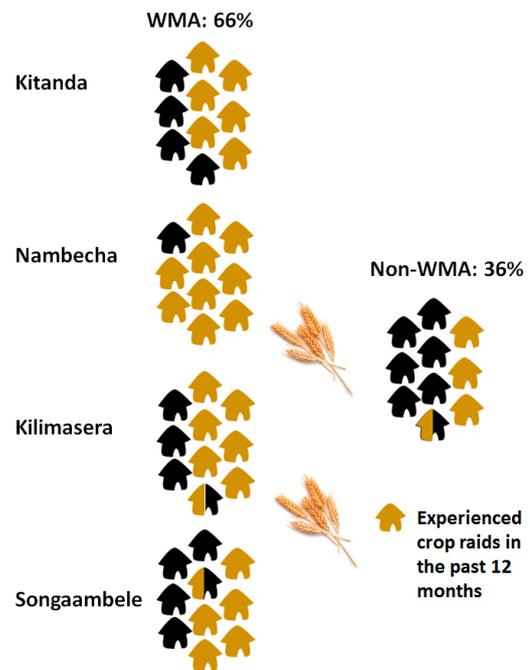


Fig. 8: Averaged proportions of households in WMA (66%) and non-WMA (36%) villages that have experienced crop damage by wildlife in the 12 months prior to survey

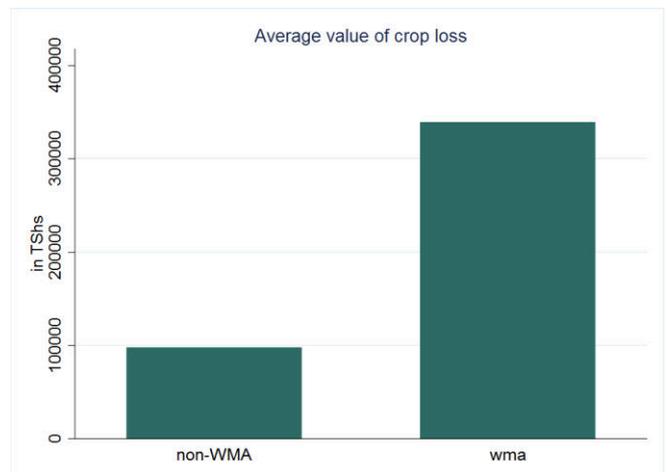


Fig. 9: Average value of crop loss per household in WMA and non-WMA villages. Note: Based on estimated area affected, crop yield, and estimated sales value of the harvest.

## Conclusion

The wealth rank data shows a move positive development in WMA villages compared to non-WMA villages. However we cannot directly attribute this observation to WMA revenues because historically – before WMA implementation - there has been a mix of money flows into Mbarangandu villages due to Selous Conservation Program in the 1990s, the overlap with a government-run hunting block and mining activities in the area. The central government shared parts of hunting revenues with the communities while the hunters, miners, and conservation NGOs donated money from time to time to ensure a good relationship with local people (Noe 2013). Only towards the end of PIMA's research period did the WMA start to generate its own – albeit small - revenues. The WMA itself does not appear to have contributed to changes in household's average size of cultivation land. Access to construction materials and timber became worse, while access to firewood improved in WMA and non-WMA villages. Crop damage is a bigger problem for WMA villages, likely because they are closer to Selous GR compared to non-WMA villages. Since local guns were taken away from people during Operation Tokomeza at the end of 2013, people have not been able to protect themselves from crop-raiding elephants as they did before, by shooting in the air. Proximity to the Selous makes special protection necessary for farmer's crops, but the WMA cannot provide this unless they prioritise crop protection by WMA village game scouts and the WMA generates substantial revenues to compensate people for their crop losses. We have major doubts that Mbarang'andu WMA and the other WMAs in the Selous-Niassa Corridor can attract sufficient hunting or game viewing tourism to generate the kind of revenues that would be needed to at least offset the present costs that WMA communities experience from crop raiding and costs to be expected in the future from limited access to resources and to



Fig. 10: Kilimasera village. Picture J. Bluwstein

land for cultivation. Another main concern of Liwale WMA communities is a legal access to bushmeat. This was promised as a benefit of being part of a WMA, however no resident hunting quota have been issued by the Wildlife Division since 2012, which does not promote a positive attitude towards the WMA

## Notes

<sup>1</sup>In these findings, farm land is related to household size and composition, because men, women, and children of different ages need different amounts of food, and so the same area of land means very different levels of food provision for different households. Using a standardised system, we add up household members to a total in terms of 'adult equivalents', which makes it easier to compare household farmland relative to consumption needs.

<sup>2</sup>Just as PIMA uses a standard 'adult equivalent', we use 'livestock units' to make it easier to compare herds made up of different numbers and sizes of different kinds of livestock, and their food energy needs. One livestock unit is equal to a mature cow of 250kg. A goat or sheep, for example, is calculated as equivalent to around one-tenth of a cow.

## Acknowledgements

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Fig. 11: Mbarangandu. Picture J. Bluwstein



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