

### MAKAME WMA

Stretching over 3,719 km<sup>2</sup> of open woodland, shrubland and thicket southeast of Tarangire National Park, Makame WMA was registered in 2009, but was not fully established until 2012 when it received its user rights. The five villages Irkiushoibor, Makame, Katikati, Ndedo and Ngabolo are home to ca. 10,000 people, predominantly Maasai pastoralists. Government-run hunting blocks have existed in this area for decades. In 2014, Makame WMA entered into its own contracts with two hunting operators, and the first WMA revenues started to come in towards the end of PIMA's research.

### 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 Makame WMA

- WMA 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*)
- First revenues for Makame WMA came in at the end of 2013 and amounted to 15,000 USD
- No information is available at the time of preparing this report as to how these monies have been distributed.

### Map of Makame WMA

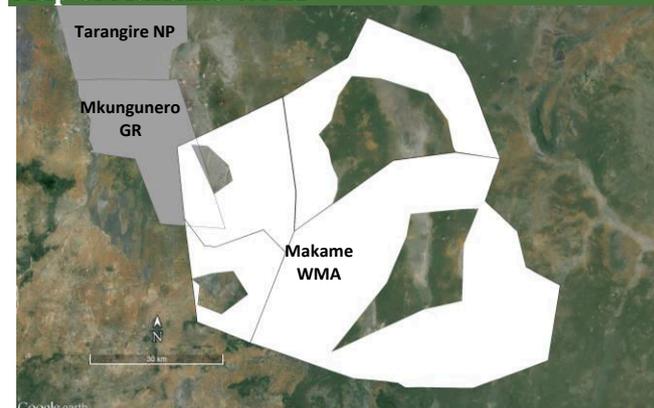


Fig. 1: Map of Makame WMA (white). Compiled by J. Bluwstein.

### Fact box: Makame WMA

District	Kiteto
Member villages	5
Population	9,751
Area	3,719 km <sup>2</sup>
Year registered	2009
Authorised Association (AA)	Indema

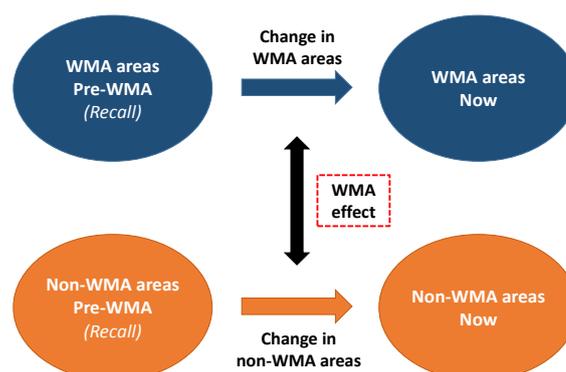


Fig. 2: How PIMA can tell what changes WMAs caused

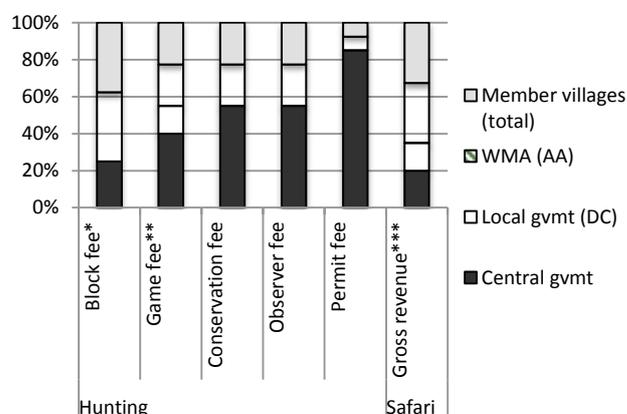


Fig. 3: allocation of total income from hunting and photographic tourism fees according to Wildlife Utilization Regulations 2008 and Wildlife Regulations 2012

\* 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 Makame WMA

### Wealth

- Based on local perceptions, Makame households were classed into 'very poor', 'poor', 'normal' and 'rich' wealth ranks for 2014 and (by recall) for 2007
- Most of the households that were 'rich' in 2007 are still 'rich' in 2014 (both WMA and non-WMA)
- On average, significantly fewer households in WMA villages increased their wealth 2007-2014 than in non-WMA villages (Fig 4)
- Fewer households in WMA than in non-WMA villages had become poorer 2007-2014, and more households that were 'very poor' in 2007 had improved their wealth rank by 2014 than in non-WMA villages (Fig 4)
- However, these changes, and the differences from non-WMA villages, are unlikely to be due to the WMA, because of the recent timeline of WMA revenue

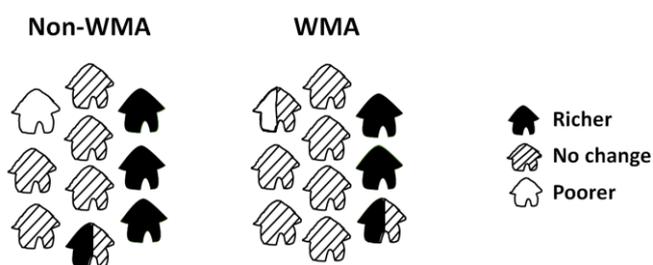


Fig. 4: Changes in wealth between 2007 and 2014. For every 10 households, approximately 3.5 have become richer and 1 poorer in non-WMA areas. In WMA areas approximately 2.5 in 10 households have become richer, and 0.5 poorer.

### 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
- In WMA and non-WMA villages income from firewood has increased compared to other environmental goods (Fig 5), while income from construction materials and wild honey decreased
- No use of timber and charcoal was reported, so these are not presented in Fig. 5
- Access to most environmental goods has not changed in Makame WMA, though some feel that access to honey has become worse

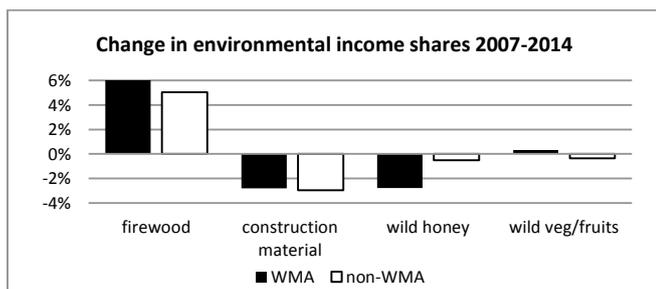


Fig. 5: Environmental income in WMA and non-WMA villages, in 2007 and 2014.

### Livelihoods

- NR-based activities (agriculture, livestock keeping, wild products) made up 72% of total income of Makame households in 2014 and 77% in non-WMA households (Fig. 6). Wild products include firewood, construction materials, timber, wild fish, honey, etc.
- The contribution to income from agriculture, livestock and wild products decreased from 2007 to 2014 in both WMA and non-WMA villages (Fig 7)
- WMA villages increased their reliance on wages, businesses and remittances from 2007 to 2014, while business income dropped in non-WMA villages (Fig 7)

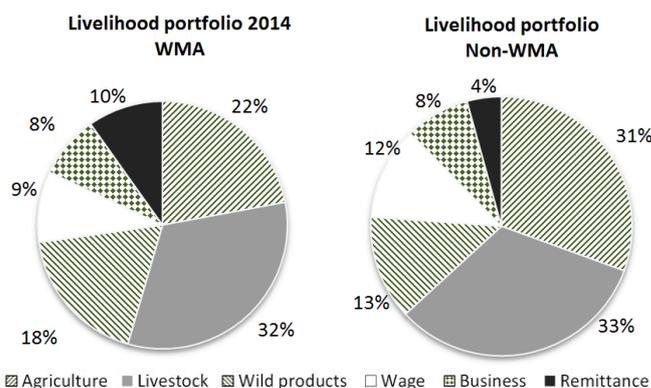


Fig. 6: Shares (%) of total income (full circle) earned from different activities in Makame WMA villages in 2014

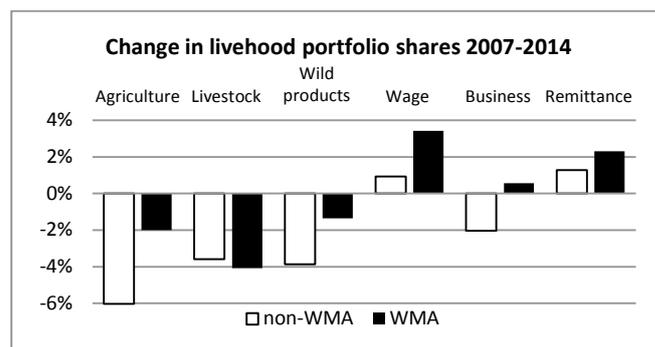


Fig. 7: Change in livelihood portfolio contributions from 2007 to 2014 in WMA and non-WMA villages

### 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 villages have less farmland per adult-equivalent than people in non-WMA villages (WMA: 1 acre/AE, non-WMA: 1.5 acres/AE)
- Most people have less land for cultivation in 2014 than they did in 2007 and the decrease is larger in non-WMA villages
- Over the last 10 years people from other villages and districts moved in to the area that is Makame WMA and established farms, as the WMA was not enforced or otherwise visible. It is likely that most of these farms did not receive official approval and were not formalised.
- Most Maasai residents reject the conversion of their grazing lands into agricultural areas by these in-migrants. They see the WMA as a potential means to remove the in-migrant farmers and secure key grazing from conversion to crops.

## Grazing land

- Most Makame residents are pastoralists, so grazing land plays an important role in their livelihoods
- Grazing on Makame WMA land is currently allowed in all seasons, and access to grazing land has not changed since 2007 in Makame villages

## Livestock

- The term 'Livestock' includes all domestic animals, but 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'<sup>2</sup>
- WMA households in 2014 held *fewer* livestock than in 2007 (Fig 8), while non-WMA households held *more* livestock in 2014 compared to 2007
- In Makame, the most mentioned reasons for having fewer livestock were disease losses and cash needs

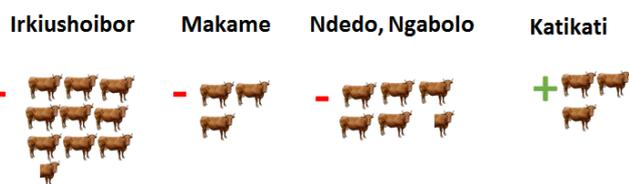


Fig. 8: Changes between 2007 and 2014 in the numbers of livestock units (here expressed as cattle) owned per household in Makame WMA villages

## Human – wildlife conflict in Makame 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
- 7 out of 10 households in WMA villages experienced crop raids in the past 12 months compared to 5 out of 10 households in non-WMA villages (Fig 9)
- Both WMA and non-WMA households reported unchanged levels of crop raids between 2007 and 2014
- In Makame WMA, Irkiushoibor reported the highest levels of crop damage, with 9 out of 10 households there experiencing crop raids

## Conclusion

Our results do not indicate clear impacts on livelihood changes in Makame WMA and non-WMA villages. Changes over time in wealth, livelihood activities, ownership of land and livestock are the same across the two groups of villages, and differences in wildlife-related damages do not show a clear pattern. However, WMA boundaries have only recently started to be enforced (2015) and WMA revenues have only recently begun to accrue (2014). Current lack of differences between WMA and non WMA households is therefore not surprising, and could change in coming years. Makame WMA represents the only WMA that PIMA studied where residents seem largely to lend their support to the idea of setting aside parts of village land for community-based conservation. The mainly agro-pastoralist communities believe the WMA may protect their grazing lands against extension of Mkungunero Game Reserve into their village lands (affecting the villages Irkiushoibor and Katikati), and against in-migrant farmers. This may also impact Makame residents who wish to extend their farming activities. Natural resources-based activities (agriculture, livestock keeping, wild products) made up 72% total income of Makame households in 2014. Thus, continued access to land for agriculture, livestock grazing and other environmental goods, such as firewood and construction materials, remains key for Makame residents.

Non-WMA: 50%

WMA: 70%

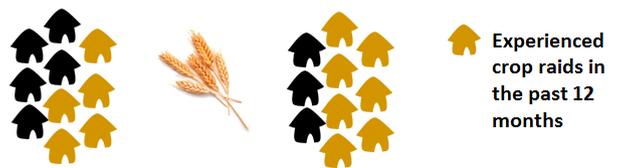


Fig. 9: Averaged proportions of households in WMA (70%) and non-WMA (50%) villages that have experienced crop damage by wildlife in the 12 months prior to survey

- Though a higher proportion of WMA households suffer crop damage on average (Fig. 9), the cost to households is higher in non-WMA villages (Fig. 10)
- Predators attacking livestock is a problem in Makame WMA
- Levels of livestock lost to predators in WMA and non WMA villages are similar
- In Makame WMA, most livestock lost to predators was reported in Ndedo and Ngabolo villages
- In WMA and non-WMA villages predator attacks cost households on average one livestock unit on the most recent occasion



Fig. 10: 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



Fig. 11: Picture by J. Bluwstein

There may be other impacts beyond those documented by PIMA research. The struggle over grazing vs. farming land use inside Makame WMA territories led the district to threaten farmers with eviction, causing them to move voluntarily. Further, the WMA became operational towards the end of our research and so no WMA 'revenue' effect can be seen in PIMA's findings.

## 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' (AE), which makes it easier to compare household farmland relative to consumption needs.

<sup>2</sup>Just as PIMA uses a standard 'adult equivalent' (AE), 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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This note was prepared by S. Funk on the basis of analysis of data collected under PIMA. A. Keane, M. Reinhardt Nielsen, J. Friis Lund, J. Bluwstein and K. Homewood jointly developed PIMA's socioeconomic research design, analyses and interpretation. J. Olila managed the field team. M. Msuha and N. Burgess managed the wildlife data.

## References

WWF (2014): Tanzania's Wildlife Management Areas, 2012 Status Report.



Fig. 12: Picture by J. Friis Lund



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