

## BURUNGE WMA

Burunge was registered in 2006 and received user rights in 2007. Its nine<sup>1</sup> member villages are: Kakoi, Olasiti, Magara, Maweni, Manyara, Sangaiwe, Mwada, Ngolei, Vilima Vitatu. They are home to ca. 34,000 people of the Mbugwe, Barbaig, Iraqw, Maasai and Warusha ethnicities have set aside 280 km<sup>2</sup> for wildlife conservation purposes, facilitated by African Wildlife Foundation and Babati District. Located between Tarangire National Park, Manyara Ranch and Lake Manyara National Park in Babati district, Manyara region, the WMA features a large tourism potential. Currently the WMA has agreements with four tourism investors operating across 6 lodge sites and one hunting block.

## 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 Burunge 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*)
- Fig. 4 shows the actual sums that Burunge AA received and shared with member villages each year, as well as how much any one village receives. Annual revenue for each village increased from ~USD1660 in 2007 to ~USD19100 in 2015. Revenues not shared with the villages were spent by the AA on administration and conservation activities.
- Revenues have increased over time as more tourism investments were established and started paying fees, and as more tourists were attracted.

## Map of Burunge WMA

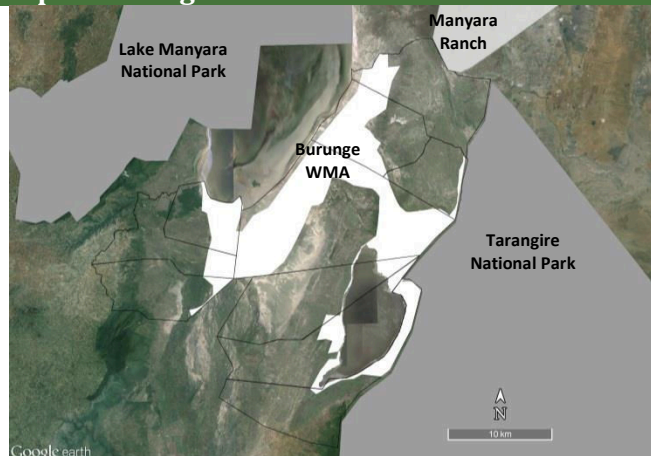


Fig. 1: Map of Burunge WMA (white). Village borders (black) are estimates, based on georeferenced village maps, fieldwork, GIS shapefiles from NBS, WWF, TANAPA. Compiled by J. Bluwstein.

## Fact box: Burunge WMA

Region	Manyara
Member villages	9
Population (PHC 2012)	34,000
Area	280 km <sup>2</sup>
Year registered	2006
Authorised Association (AA)	Juhibu
WMA Income 2014/2015 (USD)	381,835

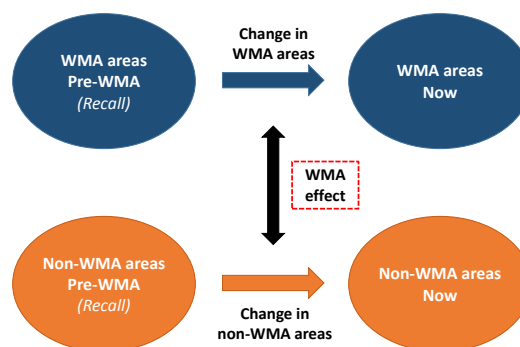


Fig. 2: How PIMA can tell what changes WMAs caused

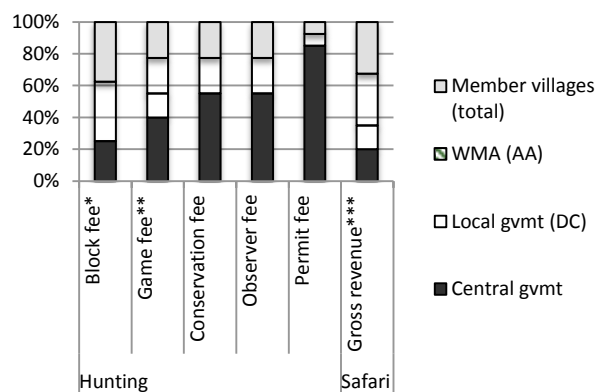


Fig. 3: allocation of total income from hunting and photographic tourism fees according to Wildlife Utilization Regulations 2008 and Wildlife Regulations 2012

\* 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

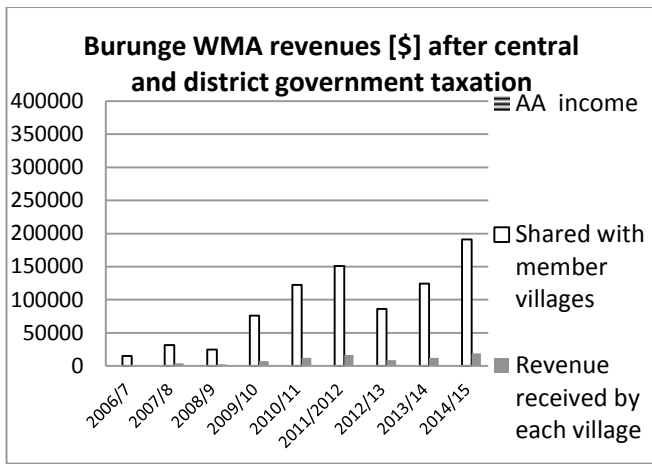


Fig. 4: Total revenues returned to Burunge WMA (after the government takes its share) and their distribution to member villages since 2006. Source: Juhibu (2014). Currency exchange rate adjusted at end of each fiscal year

## Livelihood changes in Burunge WMA

### Wealth

- Based on local perceptions, Burunge households were ranked as 'very poor', 'poor', 'normal' and 'rich' for 2014 and (by recall) for 2007
- Most of the households that were 'rich' in 2007 are still 'rich' in 2014 (in both WMA and non-WMA villages)
- In WMA villages fewer households increased their wealth than in non-WMA villages

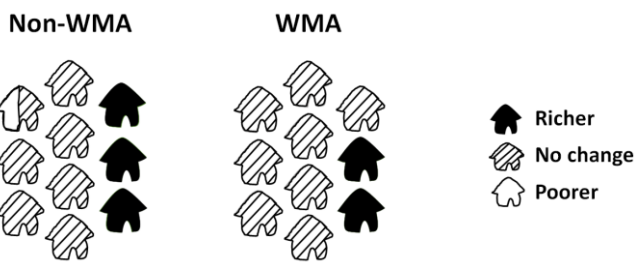


Fig. 5: Changes in wealth between 2007 and 2014. For every 10 households, approximately 3 have become richer and 0.5 poorer in non-WMA areas. In WMA areas approximately 2 in 10 households have become richer.

### 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 these wild products
- Income from firewood, construction material and wild fish decreased in WMA villages between 2007 and 2014, relative to other environmental goods (Fig 6)
- Access to fish, firewood, and construction material declined more in WMA villages than in non-WMA villages, and around 2 in 10 people see the WMA as the main reason for this

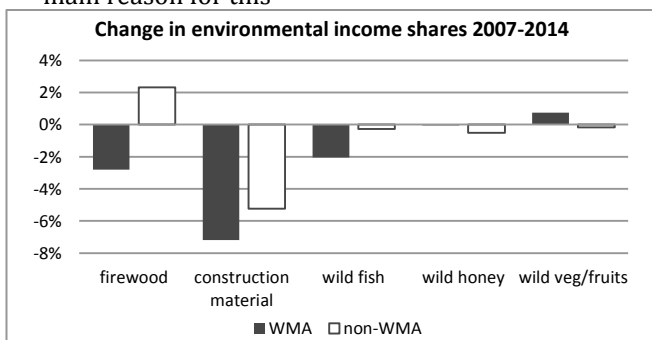


Fig. 6: Change in environmental income in 2014 compared to 2007, in WMA and non-WMA villages

## Livelihoods

- NR-based activities (agriculture, livestock keeping, wild products) made up 75% total income of Burunge WMA and non-WMA households in 2014
- WMA villages rely more on agriculture, while non-WMA villages rely more on livestock (Fig 7)
- Both WMA and non-WMA households experienced similar changes in their livelihood portfolios from 2007 to 2014 (Fig 8). The contribution of agriculture, wild products, wages, livestock and businesses decreased while remittances increased. The decrease in contributions from agriculture, livestock, wild products and wages was more pronounced in WMA villages

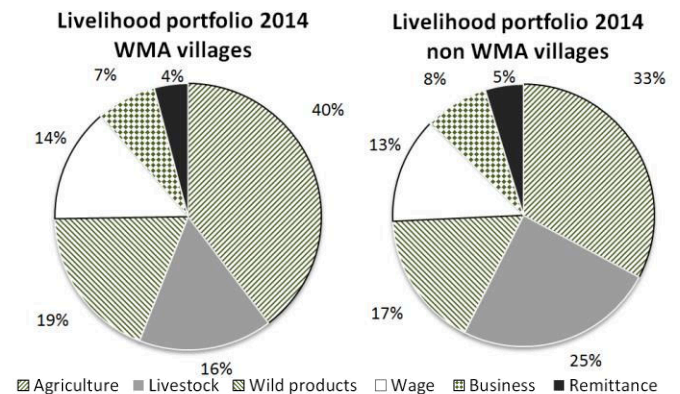


Fig. 7: Shares (%) of total income (full circle) earned from different activities in Burunge and non-WMA villages in 2014

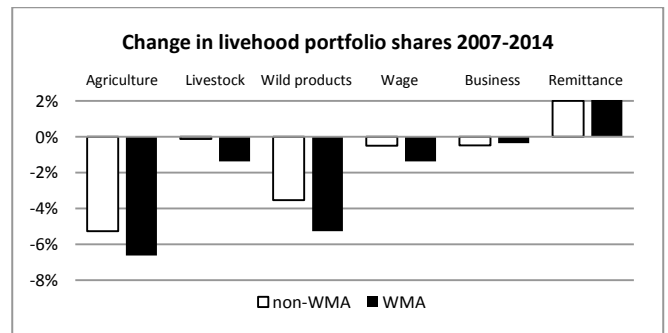


Fig. 8: Change in livelihood portfolio contributions from 2007 to 2014 in WMA and non-WMA villages

## Farmland

- Agricultural land is measured relative to household size and composition, and reported in terms of area per 'adult equivalent'<sup>2</sup>.
- People in WMA and non-WMA villages have about the same amount of farmland per adult-equivalent (WMA: 1.4 acres/AE, non-WMA: 1.5 acres/AE)
- Most people have as much land for cultivation in 2014 as they did in 2007

## Grazing land

- All Burunge WMA and non-WMA villages except Namalulu have worse access to grazing land today compared to 2007
- In WMA villages access to grazing land has deteriorated more than in non-WMA villages
- 17% of respondents in WMA villages think that decreased access to grazing land is due to the WMA
- For some villages grazing land, especially in the dry season, is a particularly big problem (Kakoi)

## 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>3</sup>)

- On average non-WMA households have more livestock, but between 2007 and 2014 livestock holdings per household decreased in both WMA and non-WMA villages (Fig 9)

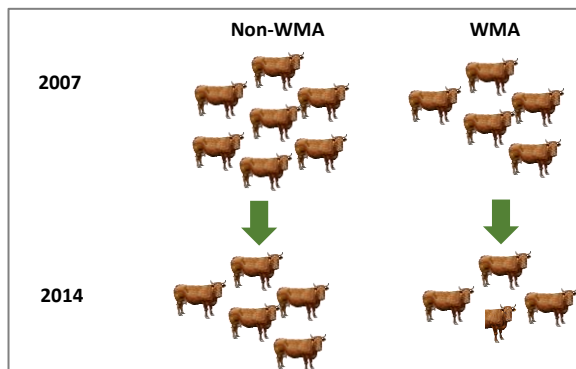


Fig. 9: Changes between 2007 and 2014 in the numbers of livestock units owned per household comparing WMA and non-WMA villages

- The main reasons given for lower livestock holdings are drought, disease and cash needs
- In some Burunge villages average LUs per household has decreased, in others it has increased (Fig 10)
- Disease as a reason for losing livestock was mentioned in WMA and non-WMA villages (Kakoi, Namalulu, Gidemar)

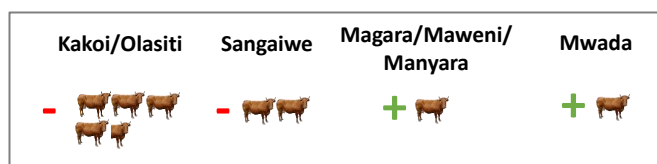


Fig. 10: Changes between 2007 and 2014 in the numbers of livestock units (here expressed as cattle) owned per household in Burunge villages

### Human - wildlife conflict in Burunge WMA

- Human-wildlife conflict means human and livestock injury and death because of wildlife, as well as crop raids and property damage.
- 6 out of 10 households in WMA villages experienced crop raids in the past 12 months compared to 3 out of 10 households in non-WMA villages (Fig 11)
- There are large differences between Burunge WMA villages in the share of households that have experienced crop raids in the past 12 months: Households in Kakoi/Olasiti are most affected (Fig 11)
- More WMA than non-WMA households reported increasing severity of crop raids between 2007 and 2014
- The cost to households from crops lost to wildlife is significantly higher in WMA villages (Fig 12)
- There are large differences between Burunge WMA villages: In Kakoi the average crop value lost is (at least) three times as large as in the other WMA villages
- The main species mentioned in relation to crop damage are elephant and zebra
- Elephant and human populations in the Burunge area have increased over the past years (Fig 13)
- As human and wildlife populations grow in an area, human-wildlife-conflict becomes more likely
- Other factors, like wildlife getting used to people and ceasing to avoid them, or people planting new crops that wildlife are attracted to, may also increase human-wildlife conflict.

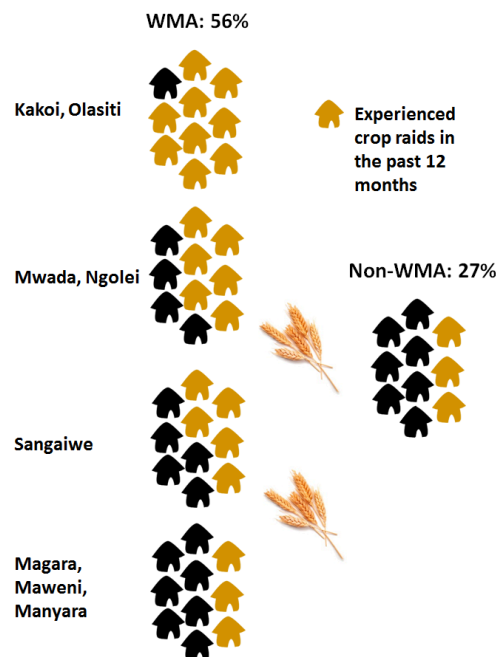


Fig. 11: Averaged proportions of households in WMA (56%) and non-WMA villages (27%) that have experienced crop damage by wildlife in the 12 months prior to survey



Fig. 12: 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

### Human and elephant population increase

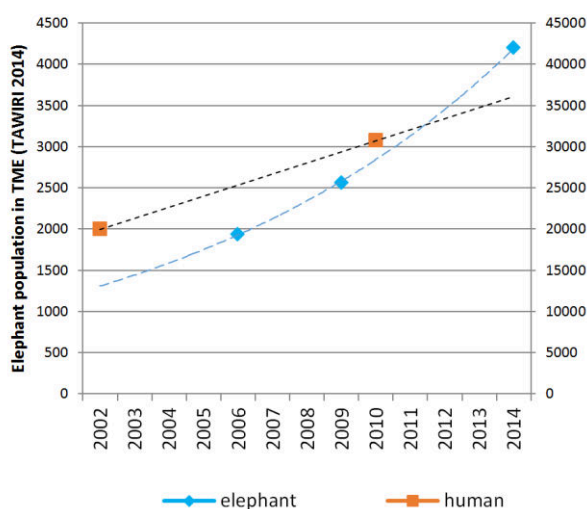


Fig. 13: Growth in human (squares, right axis) and elephant (diamonds, left axis) populations. Sources: TAWIRI (2014), HDIC (2010), WWF (2014).

Human population in Burunge WMA (NBS 2002, HDIC 2010)

## Conclusion

Restrictions in access to land, water, firewood and other resources are affecting Burunge WMA residents. Livestock, farming, and wild products made up three-quarters of WMA and non WMA household income in 2014. Livestock ownership has on average decreased in both WMA and non-WMA households since 2007. Land under cultivation has remained stable since 2007. Access to and use of firewood and construction material has declined more in WMA than in non-WMA villages, and access to grazing land is worse today in WMA villages compared to non-WMA villages. In addition, human-wildlife conflict is intensifying in a region where elephant and human populations are both increasing. WMA villages lose more crops to wildlife than non-WMA villages. Despite their different individual circumstances, WMA villages all receive the same amount of money from the WMA office and there is no compensation for conservation-related losses. The villages' share of WMA tourism is limited by the share of revenues taken by central and district governments and by Burunge AA expenditures on administration and conservation activities. Communities have little influence on how revenues are spent by the AA and distributed amongst the member villages. The AA currently prioritizes anti-poaching measures at the cost of mitigation and compensation of human-wildlife conflicts. One of the WMA investors (Chem Chem Safaris) claims large tracts of village land leaving little to no access to land for local communities. The tensions over inequitable distribution of benefits and costs of conservation continue to fuel local conflicts and violent encounters between the Burunge VGS, Chem Chem private guards and Burunge WMA residents.

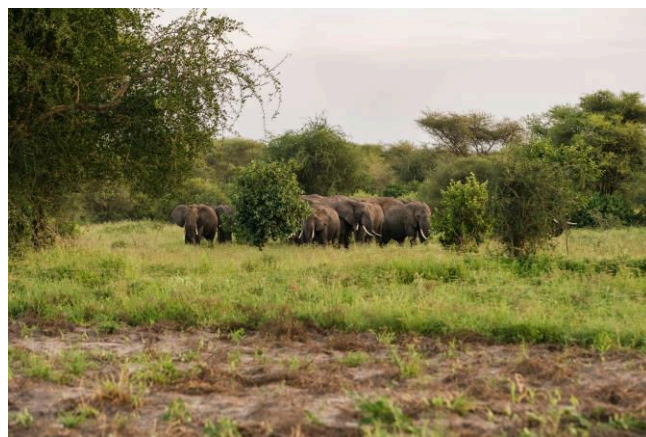


Fig 14: Elephants in Kakoi village, photo by Alex Wunsch

## Notes

<sup>1</sup> Minjingu village is the tenth member village but has never acknowledged its membership and rejects payments from the WMA office. The conflict about Minjingu's membership is currently being pursued in court.

<sup>2</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>3</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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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.

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