

Impacts of beekeeping & agroforestry initiatives Upper Mara River Basin, Kenya

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Background

Traditional forest-based beekeeping has a long history in the Mau forest, an area which despite regeneration, has lost 4,165 km² of natural forest since 1973, mainly converted to farmland. The resulting soil erosion, decreasing water and soil quality and availability of woodfuel have become major issues. As part of the four year Mau Mara Serengeti Sustainable Water Initiative which ended in 2017, training and support for beekeeping and agroforestry sought to contribute to the wider project aims of improving water safety and security, to support structural poverty reduction, sustainable economic growth and conservation of ecosystems in the Mara River Basin.

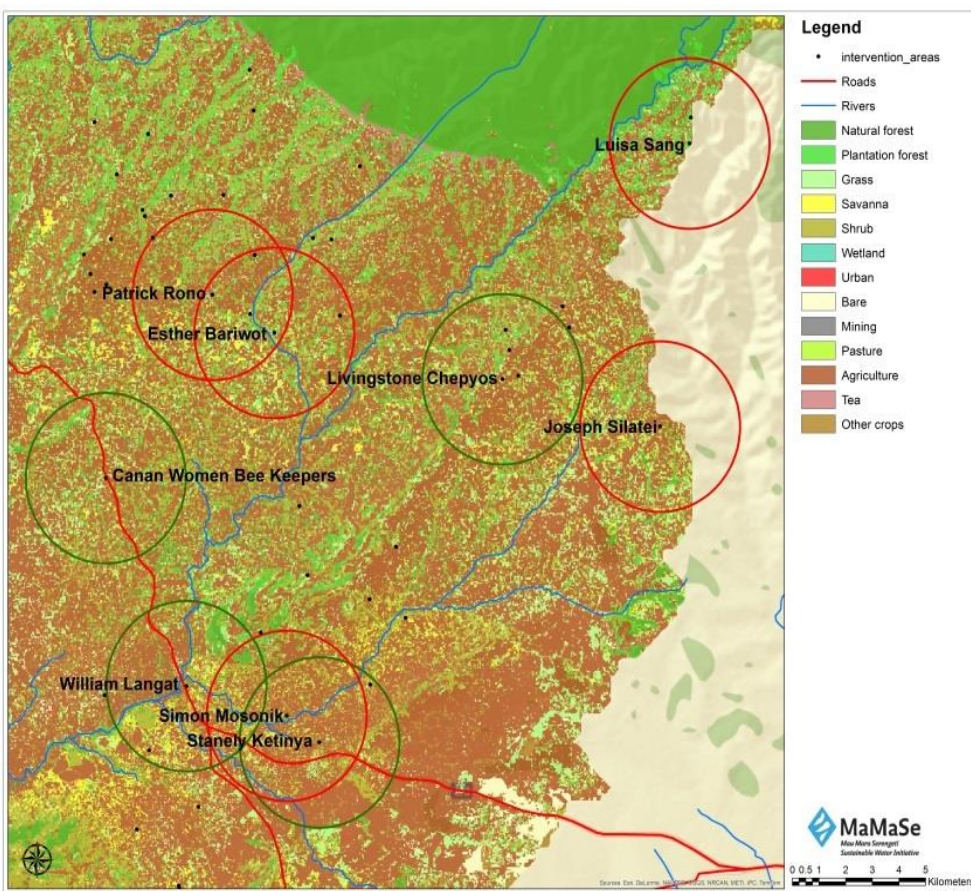


Objective

- Assess how beekeeping affects incomes and reforestation, and how agroforestry contributed to beekeeper's livelihoods

Methods

- Supply of 8 'The Hive' beekeeper starter kits on a repayment and honey buy-back agreement to a "project group" of 5 new and existing beekeeper-farmers in one Community Forest (CFA) and two Water Resource Users Associations (WRUA); accompanied by training and followed by monthly support visits and an advanced beekeeping training after 6 months
- Selection of a comparison group of 5 beekeeper-farmers with 12 traditional and 'modern' hives
- Monitoring the 10 beekeepers every 3 months in 2017 using structured questionnaires and observations of changes in beekeeping practices, production, marketing, livelihoods and environmental variables (land cover, sources of bee forage, afforestation, water availability and quality), analysed quantitatively and qualitatively.
- Plotting beehive locations and observations of land cover on-farm and within a 3km radius around farms, using GIS analysis
- Analysis of bee forage based on land cover classification, a literature review of melliferous species and meetings with beekeepers gathering traditional knowledge of bee forage species, agroforestry uses and seasonal flowering calendar
- Interpretation workshops of monitoring results, bee forage species and agroforestry systems with beekeepers and members of the Associations
- Post-project interviews and farm observations in 2018 with 16 beekeeper-farmers and 17 non-beekeeper farmers, using qualitative analysis to assess motivations, drivers and relations between beekeeping, agroforestry and reforestation.



Land use cover and monitoring locations, Upper Mara River Basin



Mau forest, tea belt and farmland

Results

Beekeeping generates modest incomes

- Honey yields and costs varied significantly between beekeepers with no clear trends between project and comparison beekeepers, or modern and traditional beekeeping practices
- All consumed their honey, total income from honey varied from 20€ to 285€ with no trends between project and comparison beekeepers
- Farming was the main income source for all beekeepers, tree crops growing in importance

	Average honey yield (kg) per hive	Average hive & equipment costs (€)
Project beekeepers	4.7	59
Comparison beekeepers	7.1	14

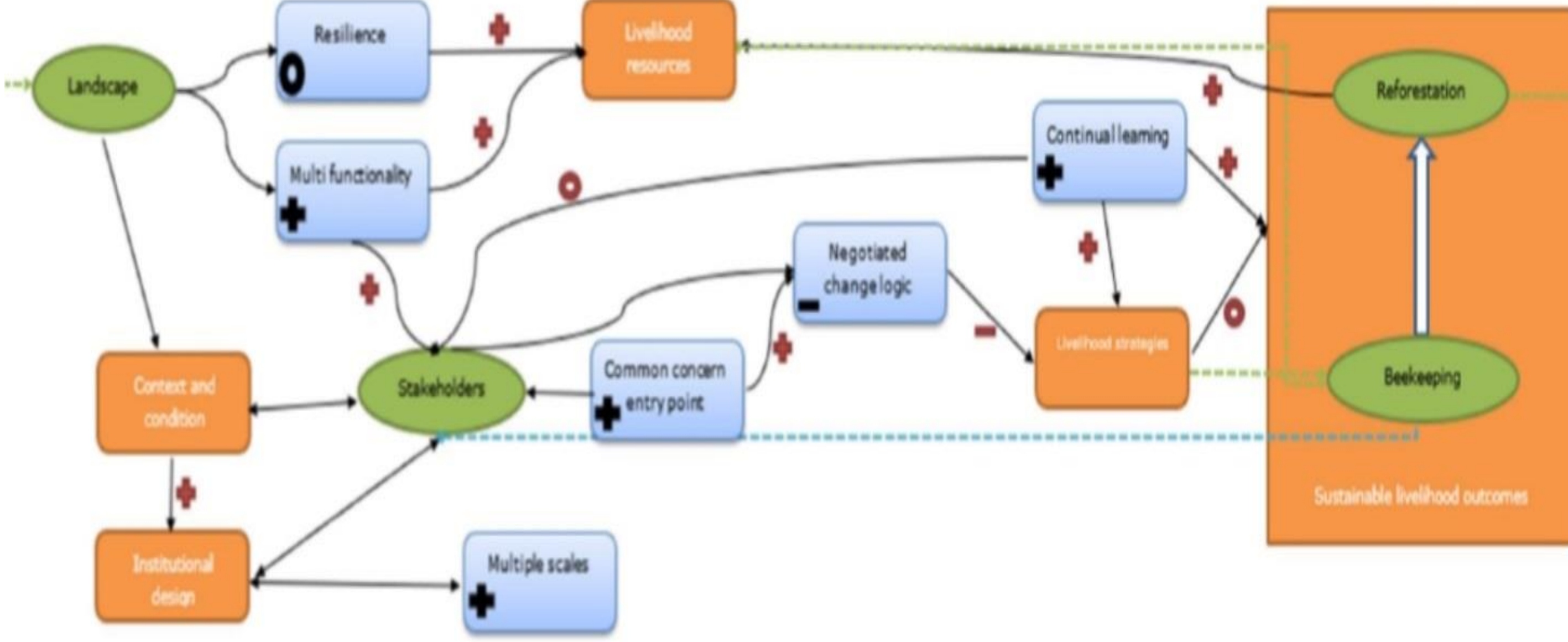
Links between beekeeping & agroforestry

- Apiaries are located in tree covered on-farm areas, bee pollination is recognised
- Beekeepers improved their farm environment, planting forage species, especially multi-purpose trees. All farmers valued trees most for construction and fuelwood
- CFAs and WRUA members were more active conserving off-farm forage in riparian forests zones, planting and raising awareness of bee-tree-forage links with neighbours and on community lands.
- At least 123 bee forage sources identified: mainly native forest trees and bushes, agricultural crops and exotic, agroforestry trees, together providing almost year-round forage, except in the peak dry season
- Agroforestry systems benefitting beekeepers were identified, involving 75 indigenous and exotic species, 36 multi-use tree species, 118 indigenous and 74 exotic tree and crop species

Very good (natural forest, plantation trees, savanna, agricultural crops), 71%	Good (shrubs, tea plantations), 15%	Marginal (wetlands, urban areas), 50%	Low or no (grass, bare lands, pasture),...
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Bee forage rating of land cover in Upper Mara River Basin

Relation	
Dependent relation	→
SLF	→
LA	→
Additional components	→
Specific RQ	→
Main research question	↑
Positive LA step	+
Negative LA step	-
Positive relation	+
Negative relation	-
Neutral relation	0



Associations between motivations and drivers for beekeeping, agroforestry and reforestation in the Upper Mara River Basin

Conclusions

- Beekeeping and associated agroforestry generally contributes modestly to farmer's livelihoods: providing income as well as food, timber, woodfuel and pollinating crops.
- All farmers are concerned about the changing landscape and climate, however drivers to participate in projects to improve the environment were no different for beekeepers than non-beekeepers.
- Beekeepers actively plant trees and protect forests, attributing value to riparian, natural forests that contribute to protect the watershed, only slightly more than non-beekeeper farmers
- Whilst farmers and the associations had planted trees, these are not well integrated into farming systems – but greater potential was seen
- Six economically viable agroforestry options were identified for the three altitudinal zones in the Upper Mara Basin

Acknowledgements

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