Degradation of the succulent fodder tree *Euphorbia stenoclada* in southwest Madagascar and approaches for improved management

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INTRODUCTION

In the dry coastal zone of the rural Mahafaly Plateau region, livestock keeping contributes significantly to food security of local people. However, livestock keeping has become increasingly difficult:

Decreased rainfall and unsustainable harvesting of the wild succulent fodder tree *Euphorbia stenoclada* ("*Samata*", Figure 1) led to its increasing degradation and thus scarcity of this most important dry season fodder resource.

We aim to identify the spatial pattern of the degradation of *Samata,* socio-economic reasons for its mismanagement, and to develop approaches for improved management.

Fig. 1 Harvested wild *Samata* stand

MATERIALS AND METHODS

- Field survey: Measurement of diameter (DBH), biomass, regeneration and mortality on 68 sample plots (30 m*30 m) (Figure 2).
- Field experiments: Analysis of germination rates and shoot rejuvenation under different treatments.
- Interviews (n=111) with livestock keepers in 20 villages.

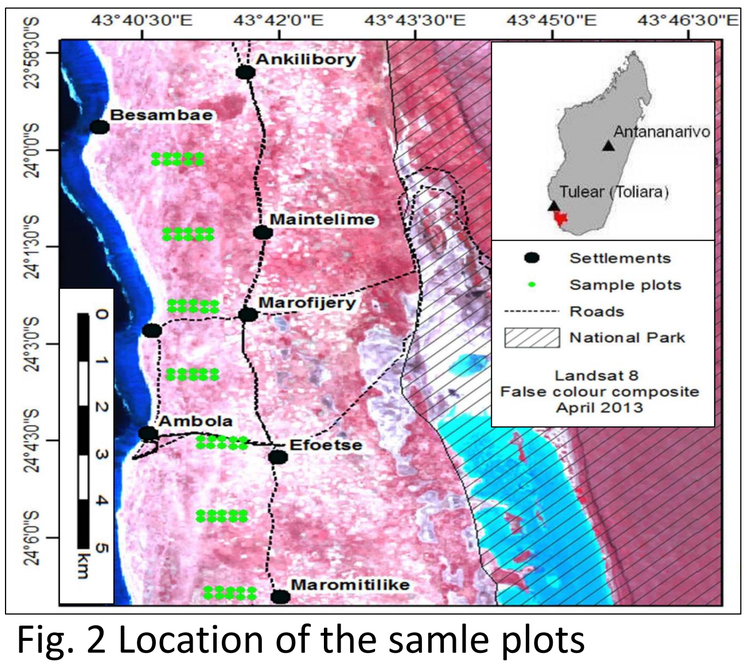

Fig. 2 Location of the samle plots

Fig. 3 *Samata* trees partially cut to death

KEY RESULTS

- Lowest average biomass found for young trees at 1000-1500 m distance from the villages (0.1t/ha) (Figure 4).
- Besides cutting at the branch level, also cuts at the apical meristem and at the trunk are common (Figure 3), resulting in the tree's death.
- Mortality rate of cut trees is up to 22%, 45% revive through shoot regeneration. However, low density of very young trees <5 cm DBH (134/ha) indicates difficulties in regeneration.
- Lack of local knowledge on artificial multiplication of *Samata.*

- Experiments show success with *Samata* germination and multiplication by cuttings, the latter technique being faster and technically easyier. Direct insolation and regular watering are needed.
- Formerly open access to all *Samata* stands, today many privatized by users. Unequal access forces many users to overuse the open access ones and/or buy private resources, at home and further away (new transhumance movements).
- Mainly the many non-local users are blamed for unsustainable *Samata* harvesting. Restricting access for non-local users is not wanted (for socio-cultural & practical reasons).
- Community rules for sustainable harvesting are defined in few villages, but are not enforced.

Distance (m) of from village		<1000	1000-1500	1500-2000	2000-2500
Number of plots		22	21	18	7
Density (individuals/ha)	Young individuals (<10 cm DBH)	386	394	364	352
	Mature individuals (>10 cm DBH)	76	42	46	101
	total	462	436	410	453
Biomass (t/ha)	Young individuals	0.3	0.1	0.2	0.3
	Mature individuals	0.7	0.7	0.7	0.6
Percentage cut individuals (%)	2.5-5 cm DBH	24	17	24	18
	5.1-7.5 cm DBH	73	66	77	81
	7.6-10 cm DBH	95	89	96	87
	>10 cm DBH	95	96	93	96
Mortality rate (%) after cutting		16	22	20	13
Rate of shoot revival (%) after being cut to death		46	42	38	49

Fig. 4 Results from the field survey

CONCLUSIONS

- Results suggest that degradation of wild, open access *Samata* stands will further aggravate.
- The complex socio-economic situation is hampering more sustainable harvesting.
- Local capacity building on *Samata* multiplication by cuttings will mitigate the degradation.

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Financially supported by: Federal Ministry of Education and Research; SUSTAINABLE LAND MANAGEMEN; FONA Sustainable Land Management BMBF