Towards integrated farming and biodiversity protection landscapes for improved livelihoods in a Southern African TFCA: policy and governance considerations

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ABSTRACT

The transfrontier conservation areas (TFCAs) scheme which has gained popularity in Southern Africa offers opportunities for addressing the global challenge to balance food production and biodiversity protection at least in this part of the world. This study evaluates the influence of existing legislation and governance regimes on the utilization and management of wild tree resources by local farmers and the implications for the development of ecoagriculture landscapes that integrate production and protection while promoting livelihoods. The study was conducted in a South African peasant farming community falling within a TFCA and a biodiversity hotspot. Public policy documents were consulted, and primary data were gathered by means of questionnaire surveys, key informant interviews and direct observation. It was found out that the problems associated with lack of indigenous tree resources affecting many communal areas in the region were marginally felt in this area, and the natural vegetative cover was in an almost pristine state. Although sound public environmental policies existed they were loosely enforced due to challenges like lack of capacity to monitor compliance and conflict between leadership structures. We recommend the incorporation of customary rules and full involvement of local community members in the development of biodiversity-agriculture integration policies, and the recognition of traditional leadership structures as the main vehicle for policy implementation.

INTRODUCTION

The world is facing a challenge to balance food production and biodiversity protection. Meanwhile the transfrontier conservation areas (TFCAs) scheme which has gained popularity in southern Africa since the 1990's (Cumming 2011) presents opportunities for addressing this challenge. TFCAs aim to achieve the conservation and sustainable use of biological and cultural resources whilst promoting regional peace, co-operation and socio-economic development (Sandwith et al. 2001, Smith et al. 2008). Land uses in TFCAs are expected to promote landscape level ecosystem management, to enhance ecosystem services and maximize the benefits of biodiversity conservation to local communities.

A broad framework for land use transformations that enhance rural livelihoods and agricultural production systems while conserving or restoring ecosystem services and biodiversity at a landscape scale, known as ecoagriculture, is a potential strategy to achieve the goals of the TFCAs scheme. In ecoagriculture landscapes, biodiversity conservation is an explicit objective of agriculture and rural development (Scherr and McNeely 2007). An effective ecoagriculture system fulfills three interlinked key objectives, i.e., agricultural production, biodiversity conservation and viable local livelihoods, in the same space and at the same time. Ecoagriculture has the potential to improve the natural assets of poor people by protecting wild species important to human health and livelihoods, ensuring the provision of environmental services critical to the peoples' livelihoods, and supplementing incomes with biodiversity payments (McNeely and Scherr 2003).

Policies, laws, and regulations of governments or other organizations provide the framework and context in which people make decisions and take actions that affect biodiversity either positively or negatively (USAID 2005). The term policy implies a commitment or statement of intent and governance is the manner in which access to resources is regulated and monitored in the local communities under focus. In this paper governance refers to the roles of the local authority including traditional leadership and the local municipality, as well as the provincial and national agents, in determining community members' access to natural resources. Of interest is how local customary norms and public laws affecting natural resources relate and are enforced. Policy and governance are crucial considerations to integrated landscape management since they determine the roles that stakeholders can play, the kinds of investments that can possibly be made, and what benefits can be obtained and how they are shared.

This study assesses the influence of existing public policies and customary rules on the utilization and management of indigenous wild tree resources by local farmers and the implications regarding the development of ecoagriculture landscapes which integrate agricultural production and biodiversity protection while promoting local livelihoods. Ecoagriculture concerns itself not only with agricultural systems but with the entire mosaics of land use and is thus an approach for managing multifunctional landscapes (Buck et al. 2006). Indigenous trees that make up forests and woodlands or are scattered in agricultural fields are a major component of ecoagriculture landscapes. It was felt that the consideration of a particular natural resource would allow a more focused assessment of the practical influence of existing

legislation and governance regimes on the management of the resource.

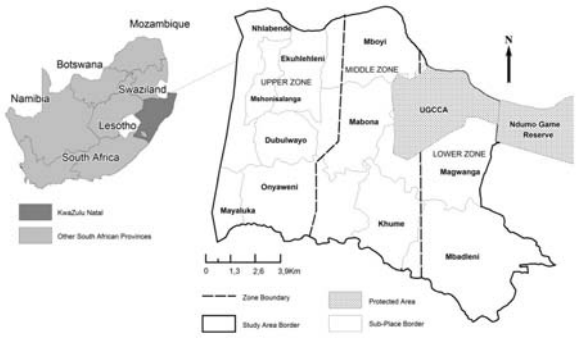

Figure 1: Study area map

The study area is a peasant farming community known as the Mathenjwa Tribal Authority (MTA) in northern KwaZulu-Natal Province of South Africa, stretching from 26°48'S to 26°57'S and 32°00'E to 32°10'E (Figure 1). It is within the subtropical savanna biome which is generally dry and warm to hot throughout the year (Mucina and Rutherford 2006). This area is a globally recognized biodiversity hotspot and a habitat to some of the most endangered vegetation types in South Africa, classified as vulnerable (Van Wyk and Smith 2001). The area is part of the Lubombo TFCA along the borders of South Africa, Mozambique and Swaziland (SADC, 2006). The inhabitants of the MTA are among southern Africa's poorest people who have traditionally depended significantly on harvesting natural resources (Soto et al. 2001). These conditions show that the area require strategies for enhancing local food production and livelihoods at the same time conserving biodiversity.

METHODS

The MTA was divided into three zones: lower zone (low-lying gently sloping coastal plain, around 150m ASL), middle zone (rugged and mountainous area around 350m ASL, transitional between lower and upper zones) and upper zone (dissected plateau, about 550m), in order to capture possible social and biophysical variations across the area. Primary data were collected through questionnaire surveys, key informant interviews, group interviews and direct observation. A total of 170 local farmers' household heads selected at random from all zones answered a structured questionnaire. The availability of firewood, construction timber, indigenous wild fruits and medicinal plants in the study area was assessed. These variables were potential indicators of the status of woody cover. Respondents were asked to indicate whether or not they were experiencing shortage of firewood, timber, wild fruits and medicinal plants. If experienced, the respondent had to show whether the problem was 'minor', 'average' or 'major'. If a shortage was not being experienced the respondent was to indicate 'not faced'. In a separate survey focused on indigenous tree use and preferences, an additional 30 respondents, each representing a household, completed a structured questionnaire. National and provincial policy documents were consulted for legislative tools relating to natural resources governance and environmental management.

RESULTS AND DISCUSSION

Status of Woody Cover

Results show that firewood shortage was not a problem to the greater number of respondents except in the upper zone (Figure 2). Responses regarding the availability of timber (Figure 3) and wild fruits showed a similar pattern (Figure 4). Shortage of firewood, timber and fruits reflected pronounced variations across the landscape, and were generally more common in the lower and upper zones compared to the middle zone. Shortage of medicinal plants reflected slight spatial variations and was generally a minor problem across all zones (Figure 5).

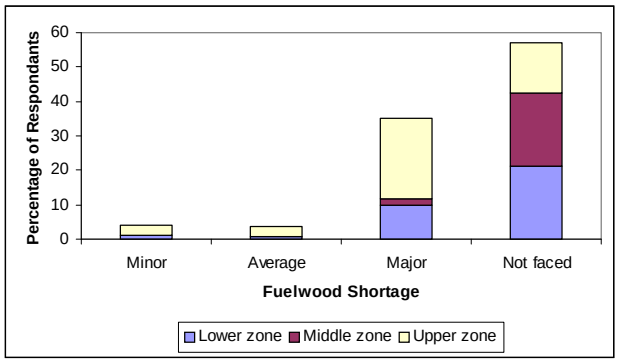

Figure 2: Problem of fuel wood shortage (N=170)

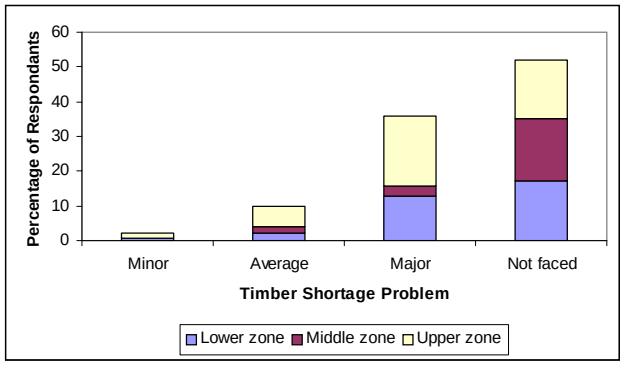

Figure 3: Problem of timber shortage (N=170)

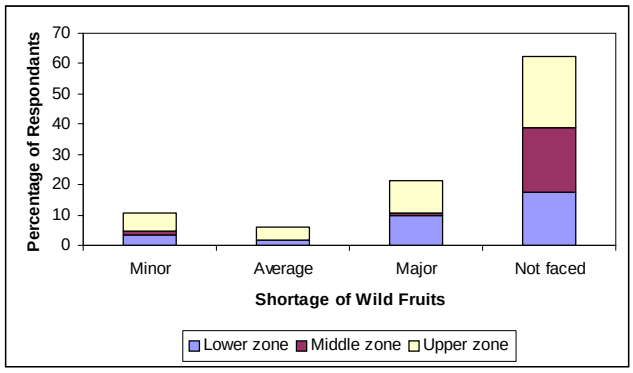

Figure 4: Problem of wild fruits shortage (N=170)

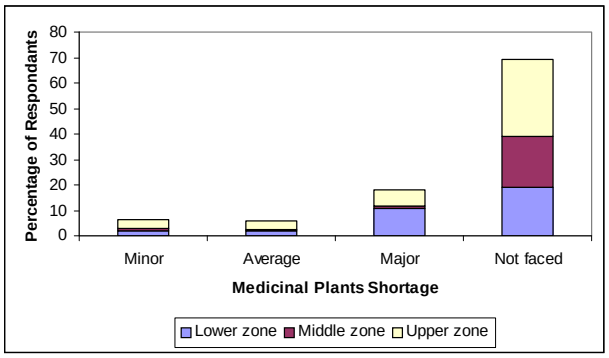

Figure 5: Problem of medicinal plants shortage (N=170)

Overall, the problems associated with lack of indigenous tree resources which are a common feature to many communal areas in Southern Africa (Kwesiga et al. 2003, Chitakira and Torquebiau 2010), were marginally felt in the Mathenjwa area, suggesting that the area's natural vegetative cover was in a near-pristine condition. This confirms an assertion by Van Wyk and Smith (2001) that the vegetation of Maputaland region was generally in a reasonably undisturbed condition. It is necessary to make in the area in the wake of a drying climate and increasing human population.

Perceptions of Tree Cover Changes

The study investigated local farmers' perceptions of natural woody cover dynamics in their localities over the previous decade. The perceptions were assumed to influence attitude towards conservation of indigenous tree resources. The greater number of respondents perceived that there was an increase in natural bush, woodland or forest cover (Figure 5).

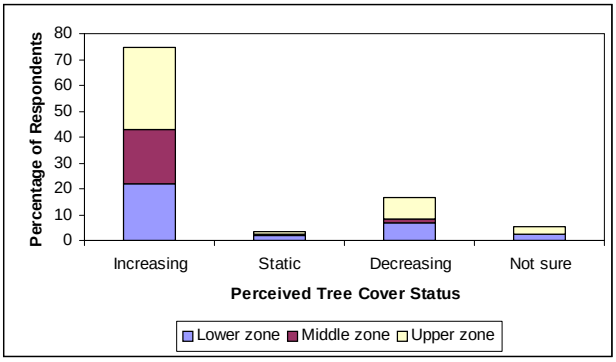

Figure 5: Perception of woody cover changes (N=170)

Comparison with Quantitative Evidence

An analysis of recent SPOT imagery by Fleury (2011) using a geographic information systems (GIS) programme revealed the MTA as characterised by used or cleared land (e.g. built-up, cultivated or roads) blended with inter-connected patches of natural forest, woodland and grassland. Cleared land constituted about a quarter of the land cover while the remaining 75% was under natural vegetation. Another study in the same area by Torquebiau et al. (2010) analysed a series of aerial photographs spanning from 1942 to 2010 revealed an increase in tree cover over this period. What accounts for the increase in woody cover is not certain. Interviews with elderly people in the community pointed towards a decrease in average annual rainfall in the area which possibly implies that the conditions became less favourable for tree regeneration and growth.

Group interviews revealed that due to the increasing dryness of the area crop production became less reliable and more fields were left under fallow or completely abandoned, particularly in the lower zone. Possibly, bush then encroached into formerly cultivated land. Another explanation is that the enactment of the National Veld and Forest Fire Act of 1998 (Government of South Africa 1998) possibly led to significant reduction in the use of fire as an agent for clearing land for cultivation which resulted in increased vegetative cover. With increases in the human population of the local District Municipality, e.g. from 573 341 in 2001 to 614 046 in 2007 (Statistics South Africa 2008) and the associated rise in demand for tree resources and ecosystem services from the area it is important to promote responsible stewardship and conservation efforts in the community to maintain the gain in vegetative cover and prevent possible degradation.

Indigenous Tree Species Preferences

The study was interested in finding out local preferences of tree species for particular uses in the household or community. Each respondent was asked to name three species he/she preferred most for a specified use. Table 1 shows two most cited species per each use. It can be noted that the preferences were based on the ability of a species to produce quality products rather than its availability in the locality. The bush willow family and red ivory trees had multiple uses and were very popular because they made durable construction material or durable charcoal for heating purposes. If the more preferred species were harvested more often than the less preferred ones then the preferences posed a threat to the continued availability of certain species, and the sustainability of ecosystems in the broader landscape. Further investigation is required to establish how preferences relate to sustainability.

Field observation revealed critical issues regarding harvesting methods used. Some individuals could cut down the whole tree to obtain some firewood or construction poles instead of utilising the branches and saving the trunk to allow regeneration. This was because of either ignorance of sustainable harvesting techniques or a lack of concern, reflecting free rider behaviour associated with common property resources (Adhikari 2001).

Table 1: Tree species preferences

Use	Preferred species (Scientific/Family/ English/Zulu)	Preference index (I)
Wood fuel	*Combretum apiculatum* / Combretaceae /Bush willow /*Umbondwe*	8
	Dichrostachys cinerea Mimosaceae / Sickle bush /*Ugagane*)	7
Construction	*Berchemia zeyheri*/ Rhamnaceae/ Red ivory/*Umneyi*	6
	Combretum apiculatum / Combretaceae /Bush willow /*Umbondwe*	4
Wild fruit	*Berchemia zeyheri*/ Rhamnaceae/ Red ivory/*Umneyi*	9
	Vangueria infausta / Rubiaceae/ Wild medlar /*Umviyo*	6
Cultural events	*Ziziphus mucronata* / Rhamnaceae/ Buffalo thorn /*Umlahlankosi*	9
	Sclerocarya birrea / Anacardiaceae/ Marula / *Umganu*	5

Key to preference index:

I=R/N∗10, where I is index, R is number of respondents preferring the species, N is total number of respondents, N=30. Maximum possible index was 10 implying preference by all respondents.

Governance and Access Regimes

Access to indigenous forest or tree resources in the Mathenjwa area was loosely controlled. In terms of customary norms, access was free and open for local residents and there were no restrictions on the amounts an individual or household could harvest, or the harvesting method to be used. On the contrary, public policy enforced by the provincial or municipal conservation authorities put restrictions ranging across harvesting seasons, methods, amounts and species.

Various products like firewood, thatching grass, wild fruits, timber or medicinal plants were being harvested for sale locally or to buyers from outside the community. Samples of those identified during the study are shown in the Appendix. Some form of trade pattern tends to exist. Residents from the upper zone were buying firewood, timber, thatching grass and marula fruit beer from the middle zone or handicrafts and livestock from the lower zone. Residents from the middle and lower zones often obtained grain and domestic fruits from the upper zone.

Some locals were harvesting medicinal plants (the study could not establish quantities) for sale to dealers from large cities like Johannesburg (about 600km away) implying almost unlimited demand. However, unlicensed harvesting of natural medicinal plants for commercial purposes in this biodiversity hotspot posed a threat to the sustainability of the species and ecosystems and was illegal in terms of Section 57(1) of the National Environmental Management: Biodiversity Act of 2004 (Government of South Africa 2004).

The national legislation provided for the protection of specified tree species and many medicinal plants in the area including cycads (*Encephalartos spp, Zamiaceae*) were protected. In terms of section 15(1) of the National Forests Act (NFA) of 1998, no person might cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an applicant and subject to stipulated a period and conditions. This policy reflects sound intentions to promote protection and controlled harvesting of certain endemic species. The enforcement of this and other environmental legislation was however slack. There were no effective monitoring mechanisms and offenders and free riders could get away unnoticed and unpunished. Interviews with the Department of Water Affairs and Forestry responsible for the implementation of the NFA revealed a challenge of insufficient manpower and impracticality of having to monitor every part of the natural forests and woodlands at every moment. The Department was conducting campaigns to improve awareness of the NFA and other environmental policies in the rural communities, with the objective to see more compliance with improved awareness. However, awareness alone without providing alternatives to natural resources for rural communities might not result in the desired behavior change.

It was established during group interviews that the local farmers were more familiar with customary norms (relating to property rights and access to biodiversity resources) compared to the documented national or provincial legislation to which they had virtually no access. The day-to-day life of the Mathenjwa people was governed by local traditional leadership on behalf of the Ingonyama Trust Board, the lawful owner of rural land in KwaZulu-Natal province. The conduct of the local people was determined mainly through customary norms and the local District Council's by-laws or provincial and national legislation had a secondary influence. This scenario is appreciated in terms of the legal pluralism school of thought which says that law is much more than state (or public) law and it is possible for some communities to observe 'other legal orderings' which are totally independent from state law (Dupret 2007).

The enforcement of local municipal or provincial legislation was hampered by conflict existing between strong local traditional structures and the municipal authorities. Traditional leaders were hesitant to adopt rules or technical advice from local municipal officers and conservation agents as they felt this undermined their authority. Some traditional healers and other locals indicated reluctance to comply with legislation that protected medicinal plants or restricted their utilization. They perceived this as

prioritizing conservation at the expense of livelihoods. Without the cooperation from the local community, policy implementation is impossible.

Implications for Ecoagriculture Policy

Most countries in the world including South Africa have no ecoagriculture policy. But as the ecoagriculture approach gains increasing recognition across the world (Ecoagriculture Partners 2008) we are likely to see many countries considering developing national ecoagriculture policies to guide and support agriculture-biodiversity integration landscape management practices. Taking it from the foregoing discussion it can be said that a potential challenge for ecoagriculture policy in the study area and most probably in other rural communities was lack of enforcement. Thus strategies need to be sought to ensure effective implementation of existing policies. Under the given scenario, for ecoagriculture policy to be effective in the communal areas it needs to incorporate customary rules. The locals, both men and women, need to be effectively engaged in the development of the policies as a way of motivating them to comply with the policies as well as empowering them with respect to governance of resources in their locality. Since traditional leadership structures have greater influence on the daily conduct of rural community members, they, in collaboration with other stakeholders like extension workers and non-governmental organizations should be the mechanism for implementing the policy. Greater political will is called for as this is seen as crucial for the laws that harmonize customary and statutory systems to be widely and effectively implemented (Knight 2010).

Conclusion

This study showed that the problems associated with lack of indigenous tree resources were marginally felt in the study area most probably because the natural vegetative cover was in a fairly good state. The study revealed policy and governance challenges for natural resources management in communal areas, including conflicts between customary norms and state laws, or between traditional leadership structures and central government authorities. There was ineffective enforcement of public environmental legislation due to the conflicts or lack of capacity on part of the central government. To secure better chances of implementation in the communal areas, biodiversity-agriculture integration policies may have to incorporate customary rules, fully engage local community members and recognize traditional leadership structures as the main vehicle for implementation.

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APPENDIX

Forest Products Harvested for Sale

Key: (a) - road-side firewood stalk; (b) - tree bark harvested for medicine; (c) - thatching grass; (d) - construction wood.

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