Community visioning in a transfrontier conservation area in southern Africa paves way towards landscapes combining agricultural production and biodiversity conservation

Munyaradzi Chitakira [1*], Emmanuel Torquebiau [2, 3] and Willem Ferguson [2]

[1] *Centre for Environmental Studies, Department of Geography, GIS & Meteorology, University of Pretoria, Pretoria 0002, South Africa*

[2] *Centre for Environmental Studies, University of Pretoria, Pretoria 0002, South Africa / CIRAD, UR105, F-34398 Montpellier, France.*

[3] *Centre for Environmental Studies, Department of Zoology and Entomology, University of Pretoria, Pretoria 0002, South Africa.*

[*]Corresponding author, Email: mchitakira@zoology.up.ac.za

Declaration statement:

This manuscript is original work which has not been published elsewhere and has not been simultaneously submitted elsewhere for publication.

This study employed participatory approaches to establish ways of engaging local communities within a transfrontier conservation area, towards achieving the goals of integrated agricultural production and biodiversity conservation at a landscape level, known as ecoagriculture. We facilitated farmers' meetings to create charts of local environmental and livelihood concerns and of their vision of the future. Water scarcity, bad road condition, unemployment, and low harvests emerged among the most prevalent concerns. Through a visioning process, participants arrived at a desired future that was largely inclined towards improved livelihoods with comparatively little attention on biodiversity enhancement. We conclude that stakeholder-driven ecoagriculture could be a sustainable strategy to simultaneously achieve the community's vision and the goals of transfrontier conservation areas, provided biodiversity management strategies are linked to infrastructure improvement and income generating activities. We recommend community visioning process as an effective approach to encourage collective action and to support local ownership of development programmes.

1. Introduction

Biodiversity conservation approaches across the globe have changed dramatically, shifting emphasis from exclusionary protected areas (PAs) where human use of land and resources was prohibited, to more inclusive strategies where utilisation is considered an integral aspect of conservation (Lele et al. 2010, Büscher and Dressler 2010). In Southern Africa, one major development of the 1990's was the emergence of transfrontier conservation areas (TFCAs). TFCAs are large areas that cross political boundaries between two or more countries, and include one or more protected areas as

well as multiple resource use areas (SADC 1999). The main purpose of TFCAs is 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). The TFCAs vision explores the possibility that changing land-use practices from subsistence farming on marginal land to community participation in ecotourism-based or other enterprises may have sustainable economic and ecological benefits for all (Bengis 2005). TFCAs are expected to provide jobs and revenue generating opportunities for people living within and around them. It is anticipated that by demonstrating the economic and social advantages that can be achieved through natural resources conservation and by improving the lives of rural communities, biodiversity conservation will be fostered (Department of Environmental Affairs and Tourism 2010).

The continued degradation of natural biodiversity on a global scale (Convention on Biological Diversity 2008, Williams et al. 2001, Bishop et al. 2008) is a cause for concern and there is need to reverse this trend. Efforts to rehabilitate biodiversity could focus on promoting mosaic landscapes that optimise the environmental and production functions by managing different landscape units in a complementary way (Sayer and Campbell 2004). Local patch-based management ignores the spatial context of biota, water and nutrients as well as interactions among elements of a mosaic. A single patch may be subjected to a state-of-the-art conservation, but that management can fail if the surrounding landscape continues to degrade, impacting adversely on the patch (Lindenmayer et al. 2008). Perfecto et al. (2009) emphasise the need for landscape scale biodiversity-friendly agricultural methods that encourage high quality-matrices enabling conservation of biodiversity and food sovereignty.

TFCAs present a window of opportunity for communities to collaborate in localised conservation and tourism projects through some form of "Community Based Natural Resources Management" (CBNRM). The CBNRM concept represents a paradigm shift from the traditional management of natural resources where local communities are excluded from decision-making processes and equitable sharing of benefits towards one where local communities actively participate in the planning, management and utilisation of resources in recognition of opportunity costs incurred by those that live in or adjacent to conservation areas (Kessler 2007). However, several case studies revealed gross limitations of the CBNRM concept and some scholars and some practitioners consider the CBNRM strategy to be in crisis, while others see a future for this approach (The World Bank 2002, Rodary 2009, Dressler et al. 2010).
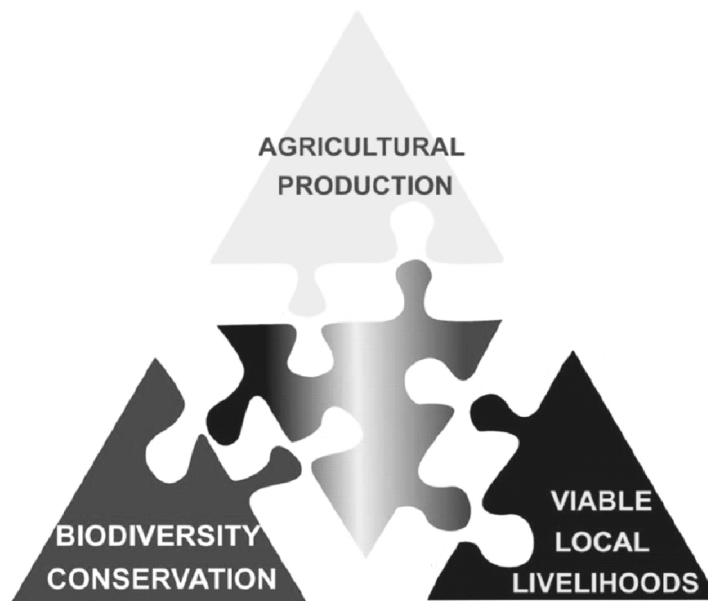

Figure 1: The ecoagriculture concept (*after Scherr and Buck, 2007)*

Ecoagriculture is a strategy that involves local communities and that could promote the Millennium Development Goals regarding poverty, food security, water, sanitation and environmental sustainability at relatively low costs (Scherr and Rhodes 2005) and at a landscape scale within TFCAs. Ecoagriculture (Figure 1) is a broad framework that calls for land use transformations that enhance rural livelihoods and agricultural (crops, livestock, fish and forest) production systems and also conserve or restore ecosystem services and biodiversity at a meaningful landscape scale. The ecoagriculture framework promotes the management of farming mosaics that are balanced in terms of food production, environmental protection and improved human livelihoods, through the planned collaboration of different stakeholders. Ecoagriculture is a conservation and rural development strategy which recognizes agricultural producers and communities as key stewards of ecosystems and biodiversity and allows them to play these roles effectively (Ecoagriculture Partners 2008). Ecoagriculture is based on the ecosystem concept which recognises that ecosystems, including biological, physical and socio-economic components, must be managed as a whole (McNeely and Scherr 2003). Agroforestry, vegetation corridors, forest patches and related features play a key role in biodiversity conservation on ecoagriculture landscapes.

The success of biodiversity conservation in TFCAs is dependent on local community empowerment through their active involvement in planning resource utilisation and management. Empowerment is crucial to the sustainability of projects because participation leads locals to do their own analysis, take command, gain confidence and make decisions (Nemarundwe et al. 2003). However, because of little formal education or isolation, poor rural communities rarely get opportunities to contribute to decision-making and development of policies affecting local natural

resources. As a result their concerns remain unaddressed (Evans et al. 2006). Such an anomaly requires policy adjustments for achieving community participation.

A useful technique to ensure local community involvement in development planning is community visioning (CV). This is a process involving a group of people coming together to develop common ideas about what they would like their community ideally to be like and to plan how to achieve it. Visioning builds local collective capacity and competence, encouraging ownership and creating an opportunity for the community and other stakeholdres to collaborate in developing shared priorities and actions (Sanginga and Chitsike 2004, Communities Scotland 2007).

The CV strategy was used in the 1980s in Chattanooga Tennessee City, USA, for city-wide planning to restore air quality becoming a model of sustainability (Sustainable Communities Network Partnership 1996). One of the "best-practice case studies" on how to create community plans for the future was the Maroochy 2025 Community Visioning Project in the South East Queensland Region of Australia (Gould 2005) that capitalised on the inherent capacity of various stakeholders and the community to create alternatives regarding the definition of issues, images or visions, and finding solutions for local problems. Eventually, the outcomes of the Maroochy vision were incorporated into the Council's corporate plan.

The present work is part of a broader study that investigates the feasibility of planning and implementing ecoagriculture in smallholder farming communities, recognising communal farmers as key stakeholders and biodiversity stewards in the TFCAs and seeking to establish the role they could play towards the achievement of TFCA goals. This paper reports on a CV exercise conducted with the aim to establish aspirations and planning capabilities of local communities rather than coming up with a

6

vision for implementation. We present a community vision evaluated against ecoagriculture goals and the TFCA objectives. We also assess the relevance of ecoagriculture as a strategy towards simultaneously achieving both the community's aspirations and the TFCAs goals. The paper is organised into an introduction presenting the background and theoretical framework, a description of the study area, methodology, the findings, discussion and a conclusion.

2. Study area

The study was conducted in the Mathenjwa Tribal Authority (MTA), a communal farming area in northern KwaZulu-Natal Province of South Africa (26°48'S to 26°57'S and 32°00'E to 32°10'E), covering approximately 547 km^2 of which 19% is within the Ndumo Game Reserve managed by a provincial nature conservation authority, Ezemvelo KwaZulu-Natal Wildlife. A further 6.4% is allocated to the Usuthu Gorge Community Conservation Area (CCA), managed by the local community.

The MTA falls into the subtropical savanna biome (Mucina and Rutherford 2006) with an annual rainfall between 500 mm in the eastern lowlands (around 100 m ASL) and 800 mm in the western plateau (about 600 m ASL), mostly in summer (November - March) but with occasional light rains during winter. The mean annual temperature is around 21°C with summer maximum reaching 40°C. The area is generally dry and warm to hot throughout the year.

The MTA lies in Maputaland Centre of endemism, an ecological region characterised by high endemicity and a globally recognised biodiversity hotspot (Van Wyk and Smith 2001). It includes some of the most endangered vegetation types in South Africa, classified as vulnerable (Mucina and Rutherford 2006). The MTA became

part of the Lubombo TFCA (Figure 1) after South Africa, Mozambique and Swaziland signed a trilateral protocol in 2000 (SADC, 2006).

The inhabitants of Maputaland are among southern Africa's poorest people who have traditionally depended significantly on harvesting natural resources (Soto et al. 2001). The MTA is one of the many rural areas of South Africa that lack access to basic services and infrastructure essential for economic growth and development (Herselman 2003, Jozini Local Municipality 2009). Unemployment and poverty levels in the area are high. The poor community members put biodiversity under threat as they strive to make a living. In order to achieve the aims of the TFCA there is therefore a need to foster conservation strategies in the area but without compromising local livelihoods.
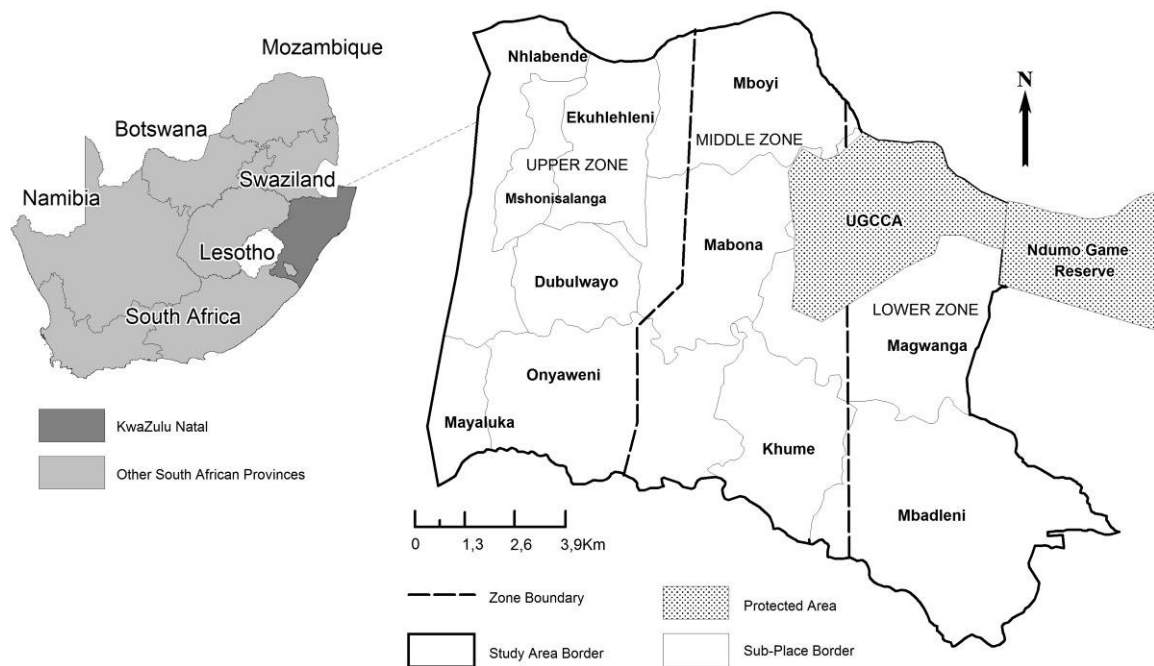

Figure 2: Study area location

3. Methodology

Figure 3: Participants in a community visioning process

In order to capture social and biophysical variability, the study area 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). We facilitated farmers' meetings during which the participants assessed the community's environmental and livelihood concerns and conducted a CV process to define a desired future community. In each zone we facilitated one group meeting, organised into three smaller working groups of three to six participants based on gender, age and home area, i.e. a total of nine sub-groups for the entire study. Each sub-group created a chart of

local environmental and livelihood concerns and a map of its desired future local landscape. Figure 3 shows the organisation of the CV process. The concerns and visions were presented in form of annotated diagrams and statements which we analyse and categorise to produce tables and figures in this paper.

The CV involved interaction (verbal and body language) of participants at two levels: 1) within each group and 2) among members across the groups via a facilitator. A high degree of imagination and mapping were involved in the visioning process. Participants could discuss opinions of individual members and agree on a common idea. The facilitation process was conducted in a way not to influence participants' responses (Groot 2002). Care was taken to explain the exercise in the local language to ensure effective participation of illiterate community members. Participants were given time to think, discuss, express or revise their opinions before making a final decision (Figure 3).

4. Results

4.1 Socio-environmental concerns

As a background to the CV process, participants made an inventory of the local community's environmental and livelihood concerns. Major concerns about the existing socio-economic and biophysical situation were identified and presented in the form of diagrams such as Figures 4a, 4b and 4c. From all the zones, a total of 33 major concerns were raised, categorised based on their nature into 'biodiversity conservation', 'livelihoods' (i.e. services and socio-economic conditions that support the means of making a living as well as access to material and social resources), 'agricultural
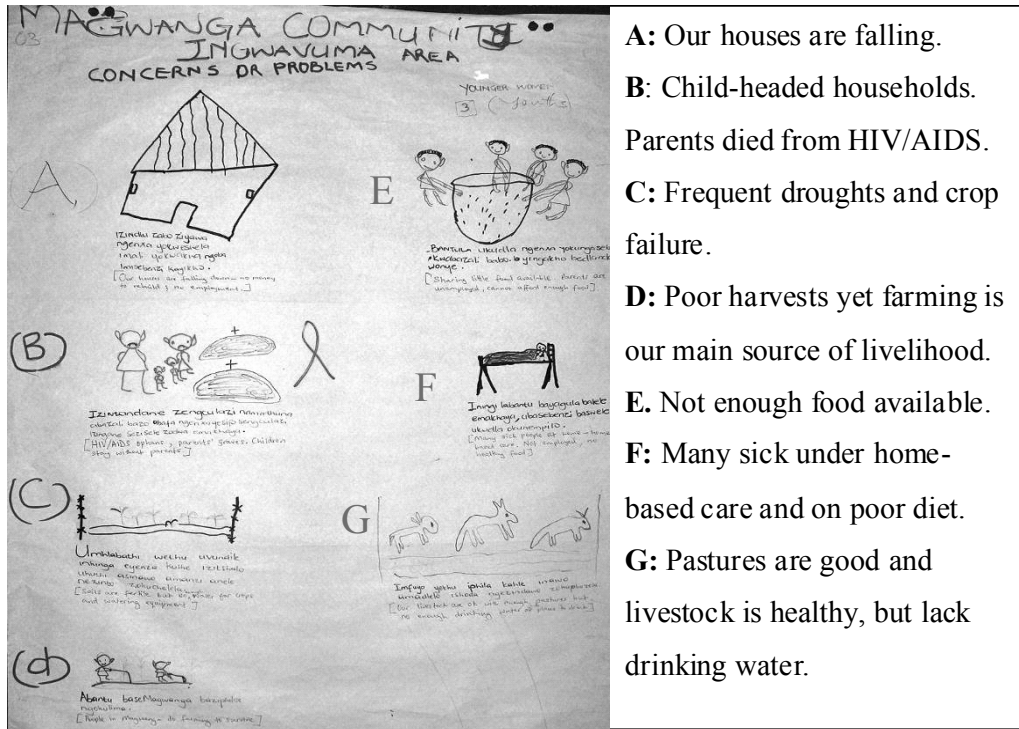
A: Our houses are falling.

B: Child-headed households. Parents died from HIV/AIDS.

C: Frequent droughts and crop failure.

D: Poor harvests yet farming is our main source of livelihood.

E. Not enough food available.

F: Many sick under home-based care and on poor diet.

G: Pastures are good and livestock is healthy, but lack drinking water.

Figure 4(a): Concerns raised by women from the lower zone

1. Boreholes not yielding water - they are dry

2. Bad road condition

3. Poor houses

4. No access to electricity

5. Orphan households

6. No skills training colleges

7. Alien plants colonised pastures

8. No fences around fields; animals destroy crops
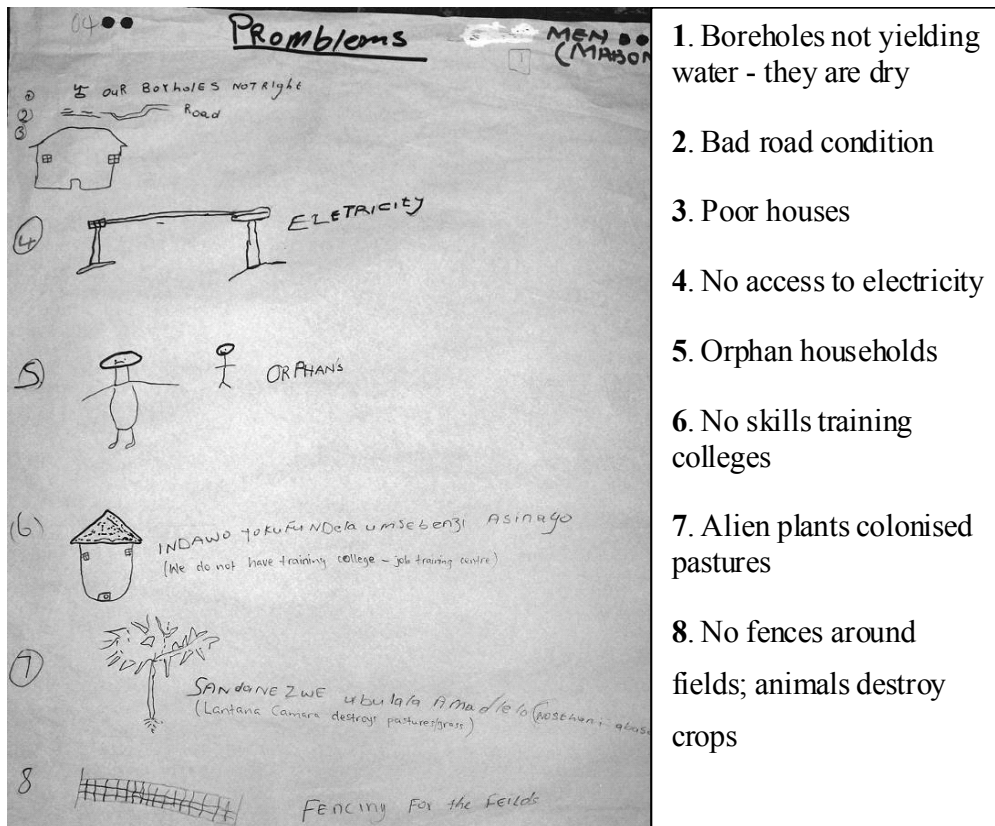
Figure 4(b): Concerns raised by men from the middle zone

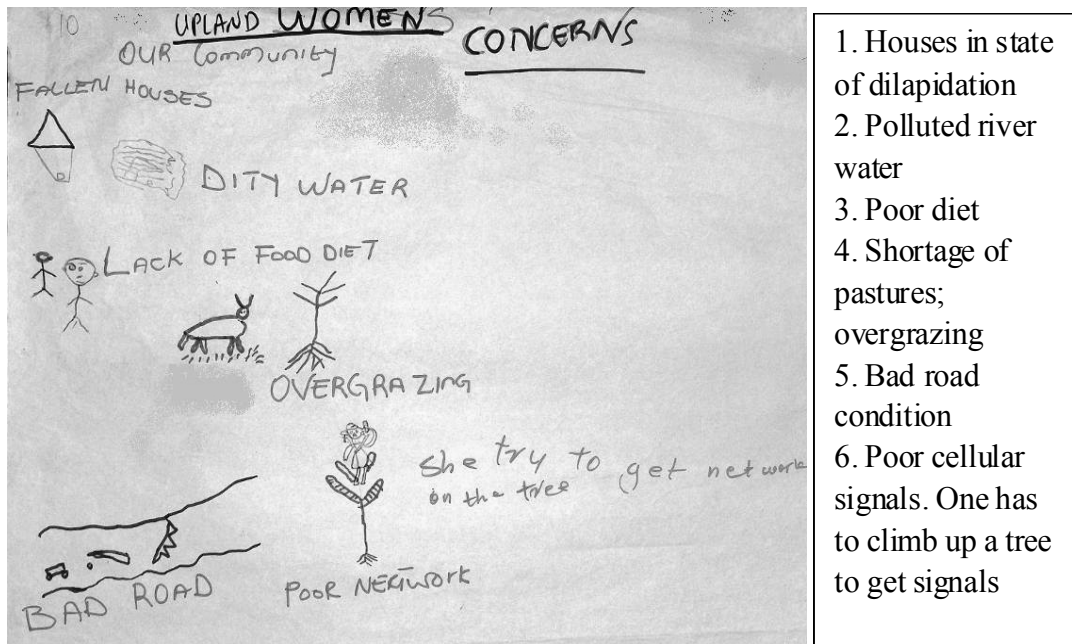| | 1. Houses in state of dilapidation |
	2. Polluted river water
	3. Poor diet
	4. Shortage of pastures; overgrazing
	5. Bad road condition
	6. Poor cellular signals. One has to climb up a tree to get signals

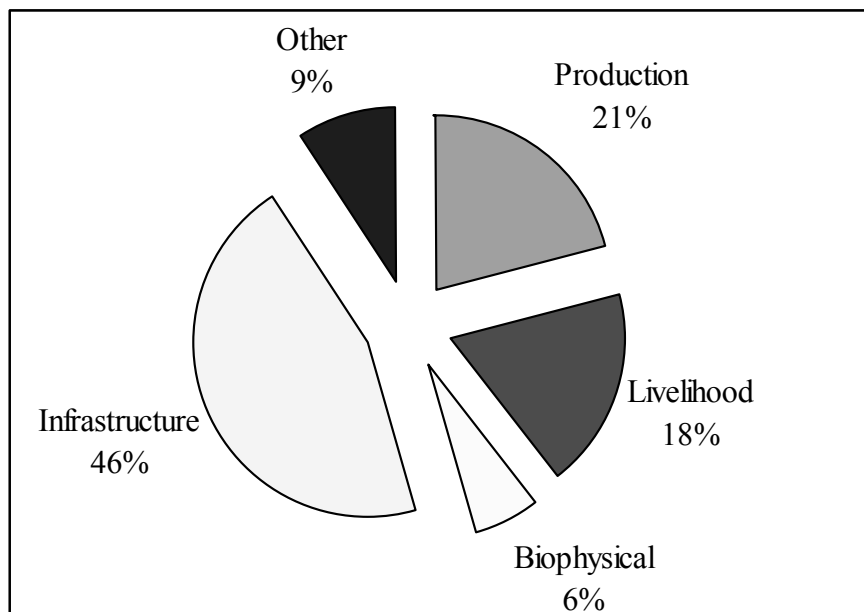Figure 4(c): Concerns raised by women from the upper zone

Figure 5: Analysis of the Mathenjwa community's concerns

production', 'basic infrastructure' and 'others' (Figure 5). Details of the concerns under each category are available in Appendix A.

Table 1: Concerns showing zonal prevalence

Concern	Where Prevalent	Possible Explanation
Poor housing conditions	Lower and middle zone	Higher poverty levels compared to upper zone. The people expect the national Government to build them houses under the Reconstruction and Development Programme (RDP).
Bad roads	Middle zone	Rough mountainous terrain
Invasive alien plants	Middle zone	Less effort made to remove the plants compared to other zones
Sicknesses, HIV/AIDs	Middle zone	Healthcare was poorest in this zone with neither local clinic nor efficient transport to the nearest health centre.
Poor harvest	Lower zone	Driest of the three zones
Inadequate pastures	Upper zone	Most densely populated of the three zones; Much land cultivated or built-up

The concerns were unevenly distributed across the categories with most relating to basic infrastructure, particularly roads, electricity, schools and sport facilities. A lack of access to basic infrastructure can hinder the undertaking and viability of possible livelihoods-improving and biodiversity-caring projects in the community. Agricultural production concerns (21%) were less prevalent than expected of a predominantly farming community.

There were no concerns unique to a particular zone or social group. Based on the number of times mentioned and on the outcome of ranking exercises by the participants,

the prevalence of the concerns shows slight variation across the zones (Table 1). The most common concerns in all three zones included water scarcity, bad roads, poor communication systems, unemployment, and low harvests.

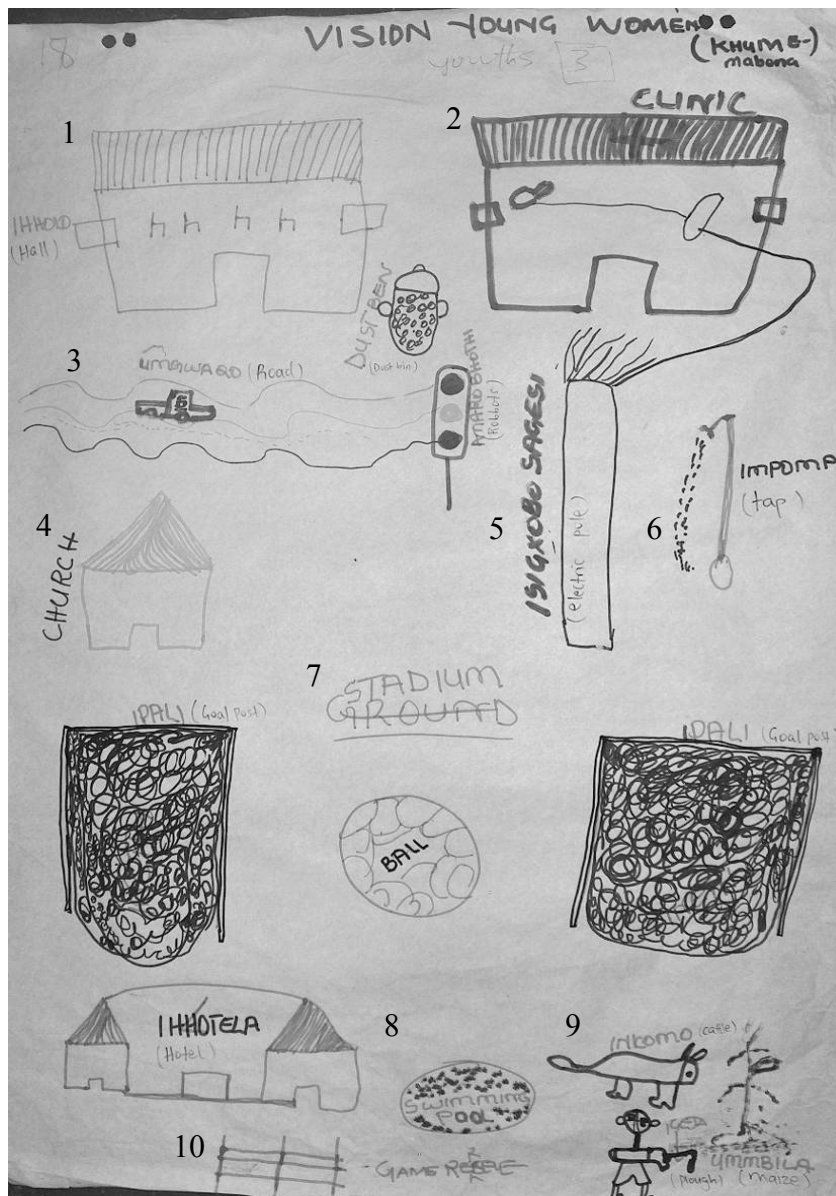Table 2 Community-suggested coping measures

Prioritised Concerns	Community-Suggested Measures
Water shortage	Municipality to draw water from Jozini Dam or Usuthu River
Drought and crop failure	Construct dams and do irrigation
Lack of job opportunities	Public or private organisations to help create jobs in the locality or nearby cities
HIV/AIDS impacts	Government to provide antiretroviral drugs.
Biodiversity and water conservation skills	Department of Environmental Affairs to educate/train community members
Poor housing conditions	Government Reconstruction and Development Programme housing scheme
Security against robbers	Establish sub-Police stations and neighbourhood watch programme
Invasive alien plants	Public or private organisations to fund removal of these species thereby creating jobs for locals
Farming inputs	Government to provide tractors, seed and fertiliser
Poor soils	Government to assist with fertilisers; Farmers to utilise organic waste and litter

During the CV process, participants could suggest mechanisms to deal with the problems identified (Table 2), some of which were unfortunately not technically feasible. For instance, the use of tractors was not possible in much of the middle zone given the predominantly steep terrain. Some of the suggestions provide useful hints to policy makers and intervention agents.

4.2 Shared vision of the desired future

Participants first decided on a period over which the vision would be achieved. In each of the zones, the agreed time frame was five years. Although some participants preferred longer time frames, these were less popular, possibly reflecting the urgent need to achieve the desired status. A period of five years is too short for the development of major projects proposed in the vision such as irrigation schemes or tourism facilities and much longer time frames ought to be considered.

The participants presented their vision by means of annotated diagrams (e.g. Figure 6a, 6b and 6c). A full list of components compiled from the visions of all participating groups is given in Appendix B. The visions from all three zones had much in common, allowing a vision of the Mathenjwa community as a whole to be drawn. This overall community vision, extracted from the diagrams and presented as a statement, would be formulated as 'to achieve better living standards supported by improved farming and non-farming activities based on locally available natural resources which enable diversified livelihoods.'

In an attempt to establish the relevance of ecoagriculture as a strategy towards achieving the community's vision, we analyse the vision from an ecoagriculture perspective. The full range of the elements reflected in the vision of each participating

Figure 6(a): Lower zone men's vision

1. Large community hall

2. Electrified local clinic

3. Tarred road, robot controlled

4. Beautiful local church

5. Electricity supply

6. Piped water supply

7. Sports stadium

8. Hotel and swimming pool

9. Thriving farming

10. Game reserve

Figure 6(b): Middle zone young women's vision

group from all the zones are categorised according to ecoagriculture goals to produce Figure 7. The community vision was largely inclined towards improving livelihoods with comparatively little attention on biodiversity enhancement. Below, we discuss the reasons for this, as well as the corresponding planning implications.
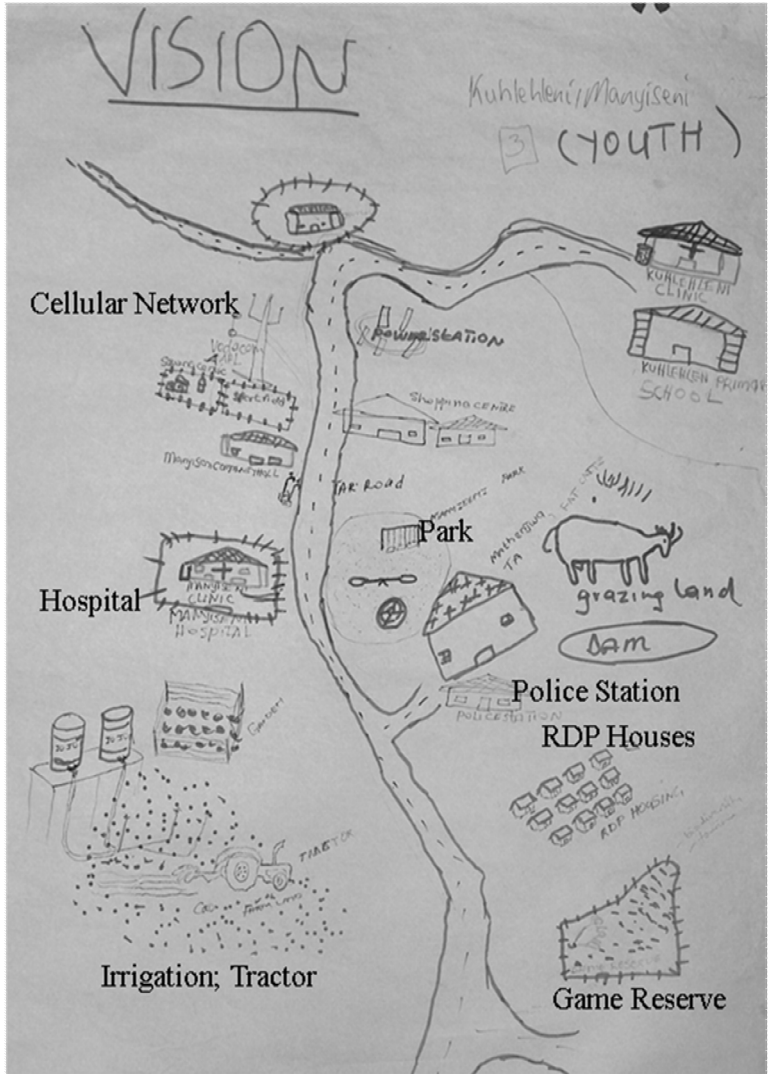
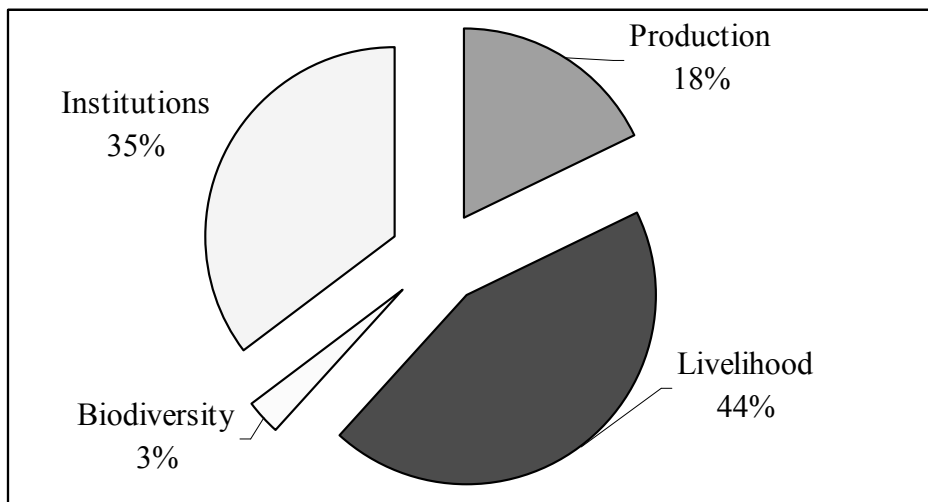Figure 6(c): Upper zone youths' vision

Figure 7: Mathenjwa community vision related to ecoagriculture goals

5. Discussion

5.1 Communal problems identified and solutions towards these.

Our results confirm an observation by Hemson et al. (2004) that the rural poor of South Africa do not see agriculture as an answer to their plight since it generates only 4% of their income. The MTA had a low agricultural potential particularly due to inadequate rainfall and a high mean annual potential evaporation of 1800 to 1900 mm (Jozini Local Municipality 2009, Mucina and Rutherford 2006). It is probable that the local farmers realised the need for alternative non-farm sources of livelihood and thus emphasised less on farming. Earlier research revealed that agricultural activities in the MTA barely satisfied basic needs and the farmers relied heavily on government social welfare grants and natural resources utilisation (Chitakira and Torquebiau 2010, Torquebiau et al. 2010).

The community-suggested remedies reflect a bias on assistance expected from the government, perhaps due to an awareness of the constitution of the Republic of South Africa declaring that the provision of basic infrastructure and social services is a fundamental responsibility of the government at national, provincial and local levels (Republic of South Africa 2009, Josie 2008). For the provision of such services to be sustainable, consumers need to pay taxes or fees (Hemson et al. 2004). But without an increase in rural livelihoods and income generating activities the residents might not afford this. There is therefore a strong need to promote self-reliance among the local community members and CV facilitators should prompt participants to think about what they could do for themselves using the available resources and thus get rid of the dependency syndrome.

5.2 Effective engagement of local communities

Development workers from various parts of the world realised that active stakeholder involvement creates a sense of ownership and greater local commitment to project goals (Nemarundwe et al. 2003). Jones (2006) observes that a number of community nature-based tourism projects existed in Maputaland Region, but these did not achieve long-term sustainability. Goodman et al. (2002) attribute this failure to the indigenous socio-cultural and economic organisation, resentment prompted by historical discrimination, and lack of trust by local people perceiving that the government was concerned more with biodiversity protection than their livelihoods. The needs and perceptions of remote communities remain hidden to outsiders unless special efforts are made to uncover them (Sheil et al. 2003). The probable reason for resentment by local communities is failure to effectively engage them particularly at the project planning phases.

Our study recognises local communal farmers as key stakeholders and biodiversity stewards in the TFCAs scheme and acknowledges that their role is critical to the achievement of TFCAs goals. The challenge is how to make community-managed projects sustainable, considering the problems that have emerged in the implementation of CBNRM schemes (Dressler et al. 2010, Rodary 2009). Perhaps the solution lies in refocusing on the original aims of ensuring social justice, material wellbeing and environmental integrity (Dressler et al. 2010). A "second generation" CBNRM programmes which emphasise on good governance, business-driven processes and integrated resources management are emerging in southern Africa (Rodary, 2009).

The use of CV strategies to facilitate the development of community-managed projects could significantly enhance the revitalisation and sustainability of CBNRM initiatives because it allows a greater understanding of local communities' virtues and

priority goals and accords the consideration of aspirations and input from locals in decision making and policy formulation. This requirement is crucial to the success of rural development projects. Apart from motivating local conservation efforts, CV potentially raises conservation awareness in communal areas and encourages locals to assume ownership of conservation programmes. In this way, CV can be a strategy to avoid conflicts between conservation agents and local community members commonly reported around protected areas in southern Africa and other parts of the world (Hill et al. 2002, Ferraro 2002, Hayes 2006, Andrew-Essien and Bisong 2009).
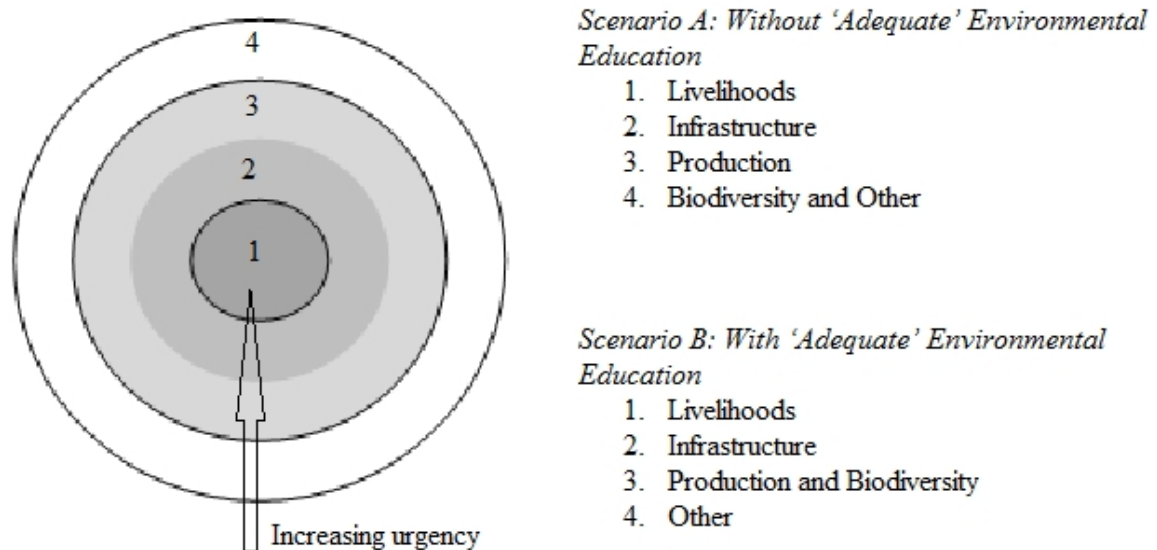
5.3 Hierarchy of concerns

Figure 8: Hierarchy of concerns

Concerns in the MTA community largely determined the community's vision. To help relate the vision to the concerns we develop a model related to Clayton Alderfer's ERG (existence, relatedness and growth) theory of human motivation (Figure 8). Alderfer

(1972) who developed Abraham Maslow's theory of needs hierarchy argued that satisfied lower-order needs lead to the desire to satisfy higher-order needs and that several needs can be operating simultaneously as motivators. However if people are frustrated in meeting their higher order needs they may regress to lower order needs even though these are already satisfied (Simons et al. 1987, Huitt 2007).

The hierarchy in Figure 8 is based on the urgency to get a concern addressed. Livelihood matters require the most urgent attention and occupy the inner ring. Infrastructure appears in the next ring due to its pivotal role in supporting the means of survival (e.g. food and water procurement, shelter or health). The content of the third ring is likely to vary depending on the level of environmental awareness. When the farmers have a high level of awareness, they are likely to realise the interdependency between agricultural production and the wellness of the biophysical environment, and thus the two would appear at the same level. In the absence of such awareness production concerns occupy a higher priority than conservation matters. The more urgent a concern is the closer its position to the centre of the ring. In the light of this observation, the relatively small proportion of biodiversity component in the community's vision (Figure 7) therefore does not imply lack of concern for biodiversity. A complementary study of the communal farmers in the MTA established that 95% of questionnaire respondents were willing to conserve biodiversity due to perceived benefits (Chitakira et al. in press). Thus the small biodiversity component in the vision was a matter of prioritisation of existing concerns, but it also shows that the farmers cared about conservation even though the more prioritised needs were not fully met.

5.4 The community vision and ecoagriculture

South Africa needs initiatives that bring the rural poor into modern services, through new forms of non-farm activities and a revival of agriculture (Hemson et al. 2004). Ecoagriculture embodies diverse livelihood-improving opportunities and, as such, is a competitive means to poverty reduction in rural communities. If rural communities become aware that ecoagriculture places local livelihood concerns at the centre of its conservation strategies (McNeely and Scherr 2003) such awareness could motivate them to plan and manage locally adapted ecoagriculture innovations eventually leading to a realisation of their vision. Ecoagriculture practices possible in the MTA landscape include planning and managing protected areas together with local farming; linking uncultivated areas, wetlands, and forest patches within agricultural landscapes to create habitat networks and green corridors that support wildlife; integrating trees, shrubs, and grasses into farming systems to improve ecosystem services; avoiding the use of fire to clear land or control weeds and pests; and practising conservation tillage, improved fallowing, inter-cropping, and livestock diversification.

The MTA has been identified as a low agriculture and high tourism potential area (Jozini Local Municipality 2009). The integration of ecoagriculture and enterprises that generate employment and bring off-farm income to the locals can be highly advantageous. Examples include the eco-labelling of local agricultural produce and adding value before marketing of natural resources that are abundant in the area such as marula (*Sclerocarya birrea*) fruit, mountain aloe (*Aloe marlothii)*, common thatching grass (*Hyparrhenia hirta)* and medicinal plants.

Rural tourism management by the local community is a potential source of employment and increased income to the MTA. A unique cultural mix at the borders of three countries and the scenic attractions of the area (cliffs, gorges, rivers, wildlife, etc.)

could support sustainable eco-tourism. Although rural tourism can generate benefits to local communities, in reality the development of rural tourism is littered with obstacles (McAreavey and McDonagh 2011, Briedenhann and Wickens 2004). Challenges likely to be encountered by communal tourism enterprises in the MTA include funding, ensuring quality standards, competition from established operators, marketing, business management skills, and accountability. To avoid dependence on the erratic international tourist market it would be essential to expand domestic tourism, for example, by attracting middle and low income urban dwellers who normally do not travel for pleasure.

Another strategy towards poverty alleviation while promoting environmental conservation is 'payments for environmental services' whereby local farmers are paid for managing their land to provide ecological services such as watershed protection and carbon sinks (Engel et al. 2008). As the hierarchy of concerns (Figure 8) suggests, after livelihood needs have been satisfied, more of the community's attention is expected to flow towards caring for biodiversity.

5.5 The community vision and TFCAs objectives

In assessing the Mathenjwa community vision the following questions arise: "Does the vision reflect local consciousness of TFCAs objectives and did the locals see the TFCAs being part of their future?" The TFCA concept is regarded by its proponents as a strategic spatial development programme aimed at consolidating biodiversity and natural resources, integrating management procedures and thereby expanding opportunities for both conservation and rural development in communities around borders (Munthali 2007). The Mathenjwa community vision shows evidence of

simultaneous utilisation and conservation of biodiversity and water resources. The vision also includes the development of off-farm sources of income like rural tourism and aloe processing, in line with TFCAs' economic development and poverty alleviation objective. This reflects that the community is aware of its future in the TFCA. This awareness is an important foundation for programmes that aim to promote the management of integrated production-and-conservation landscapes in communal areas.
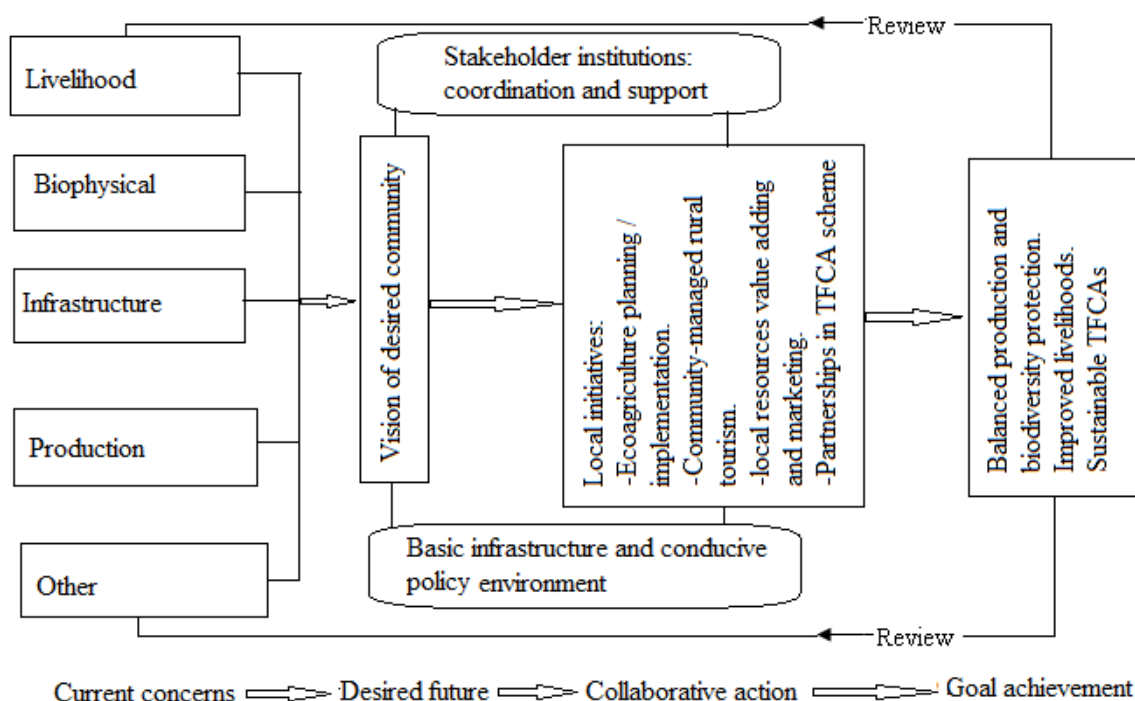

Figure 9: Framework for effective community involvement in TFCAs

Another question is: "How can the contribution of local farmers to the achievement of TFCAs purpose be enhanced?" Figure 9 is a proposed framework for the achievement of TFCAs' goals through effective engagement of local communities in the planning and management of TFCAs. Four basic steps are involved in the process, to be facilitated by an extension worker or rural development agent:

i. *Participatory diagnosis.* Meetings of stakeholder groups are organised to identify main socio-environmental concerns prevailing in the community. The facilitator is expected to stimulate self and collective awareness of development approaches among the local community members (Sanginga and Chitsike 2005, Evans et al. 2006).

ii. *Developing a vision of the desired future.* Participants imagine, discuss, and outline what developments or changes they want to see in their community in an agreed time period, e.g. 20 years, and consider strategies of achieving these. It is important not to be constrained by either political or economic realities when developing a community vision (Okubo (2000).

iii. *Collective action.* All key stakeholder groups need to be involved in planning and implementing agreed strategies. The framework (Figure 9) suggests that ecoagriculture projects, rural tourism and initial processing of local resources to add value can be managed by local communities in collaboration with other players including private entrepreneurs and public institutions responsible for managing infrastructure, water, wetlands, wildlife, forests, and related resources. The goal to achieve food security, watershed restoration, biodiversity conservation, and market development requires more than the effort of an individual farmer (Buck and Scherr 2011). Collective action requires a supportive policy environment, sound basic infrastructure, coordination, and material and technical support from key stakeholders.

iv. *Goal achievement.* Local farmers are actively engaged in the management of landscapes balanced in terms of agricultural production and biodiversity protection and capable of supporting better livelihoods. At this stage improved

livelihoods is an incentive for the prioritisation of biodiversity protection by local communities. Through this way, the TFCAs concept becomes sustainable. Periodic audits of the whole process are required to ensure consideration of new concerns, refining of strategies as may be appropriate and evaluation of progress to check the achievement of desired goals.

5.6 Limitations of community visioning

Defining a common vision implies reaching a consensus among people with different interests and views and this is a challenge. There is a possibility that a supposed community vision actually represents the views and interests of the more powerful social groups in the community or the more vocal and influential individuals. A well-balanced team of participants including representatives from all sectors of the community is a key ingredient in the success of visioning programs (Walzer, et al. 1995). A failure to include some sectors of the community may result in a limited perspective of the team and may imply the preclusion of interesting and productive views.

6. Conclusion

The CV process facilitated during the current study presented a forum for farmers to think and talk about a landscape in which it is desirable to conserve biodiversity, deliver ecosystem services, sustain agricultural production and enhance livelihoods. We recommend CV for extension and development personnel as a strategy that does not only promote effective involvement of locals in proposed development projects but also stimulates local cooperation, enthusiasm and a sense of ownership of the projects. To

planners and policy makers, CV is a tool that provides useful insights into the wishes and expectations of communities, and a way of incorporating their views in policy and decision making processes.

This study indicates the possibility of simultaneously and sustainably achieving biodiversity and livelihood goals in TFCAs. Ecoagriculture presents the much needed opportunities for effective community involvement in the management of TFCAs and the achievement of livelihood and biodiversity goals. However, public policies that support local governance of natural resources towards reconciling conservation and livelihood goals are required (Torquebiau and Taylor 2009). Further research should focus on the policy gaps that need to be addressed to empower local community members towards the attainment of integrated production and conservation landscapes.

References

Alderfer, C., 1972. *Existence, relatedness and growth*. New York: Free Press.

Andrew-Essien, E. and Bisong, F., 2009. Conflicts, conservation and natural resource use in protected area systems: an analysis of recurrent issues. *European journal of scientific research*, 25 (1), 118-129.

Bengis, R. G., 2005. Transfrontier conservation area initiatives in Sub-Saharan Africa: some animal health challenges. *In:* S. A. Osofsky, ed. *Conservation and development interventions at the wildlife/livestock interface: implications for wildlife, livestock and human health.* Gland: IUCN and Cambridge, 15 - 19.

Bishop, J., et al., 2008. *Building biodiversity business.* London and Gland: Shell International Limited and the IUCN.

Briedenhann, J. and Wickens, E., 2004. Rural tourism - meeting the challenges of the new South Africa. *The international journal of tourism research*, 6(3), 189- 203.

Buck, L. E. and Scherr, S. J., 2011. Moving ecoagriculture into the mainstream. *In* Worldwatch Institute. *State of the World 2011: Innovations that Nourish the Planet.* Washington DC.: Worldwatch Institute.

Büscher, B. and Dressler, W., 2010. Commodity conservation. The restructuring of community conservation in South Africa and the Philippines. *Geoforum*, doi:10.1016/j.geoforum.2010.06.010.

Chitakira, M. and Torquebiau, E., 2010. Towards balancing production and protection: participatory landscape performance assessment in KwaZulu-Natal, South Africa. *In:* E. Coudel, H. Devautour, C. Soulard and B. Hubert, eds. *Proceedings of the symposium innovation and sustainable development in agriculture and food - ISDA 2010.* Montpellier, June 28-July 1. Montpellier: Cirad, Inra, SupAgro.

Chitakira, M., Torquebiau, E. & Ferguson, W., in press. Unique combinations of stakeholders in a transfrontier conservation area promote biodiversity-agriculture integration. *Journal of sustainable agriculture.* Accepted in July 2011

Communities Scotland, 2007. *Community engagement: how to guide techniques.* [online]. Communities Scotland. Available from: http://www.communitiesscotland.gov.uk/stellent/groups/public/documents/webpag es/scrcs_006712.hcsp [Accessed 3 February 2011].

Convention on Biological Diversity, 2008. *Biodiversity and Agriculture: Safeguarding Biodiversity and Securing Food for the World.* Montreal: Secretariat of the CBD.

Department of Environmental Affairs and Tourism, 2010. *Transfrontier conservation areas.* [online]. DEAT. Available from: http://www.environment.gov.za/ProjProg/TFCAs/TFCA_contents.htm [Accessed: 10 September 2010].

Dressler, W. et al., 2010. From hope to crisis and back again? A critical history of the global CBNRM narrative. *Environmental Conservation,* 37 (1), 5–15.

Ecoagriculture Partners, 2008. *What is ecoagriculture?* [online]. Ecoagriculture Partners. Available from: http://www.ecoagriculture.org/page.php?id=47 [Accessed 23 August 2010].

Evans, K. et al., 2006. *Field guide to the future: four ways for communities to think ahead.* Nairobi: CIFOR, ASB, World Agroforestry Centre.

Ferraro, P. J., 2002. The local costs of establishing protected areas in low-income nations: Ranomafana National Park, Madagascar. *Ecological Economics*, 43, 261-275.

Goodman, P. S., James, B. and Carlisle, L. 2002. Wildlife Utilization: its role in fostering biodiversity in KwaZulu-Natal. *In*: S. M. Pierce et al., eds. *Mainstremaning biodiversity in development: case studies from South Africa.* Washington D.C.: The World Bank, 21-32.

Gould, S., 2005. *Maroochy 2025 community visioning and action - a case study of anticipatory action learning practices in use within Maroochy Shire, Queensland, Australia.* [online] Steve Gould. Available from: http://stevegould.com.au/pdf_files/Maroochy_2025_report.pdf [Accessed: 24 September 2011].

Groot A. E., 2002. *Demystifying facilitation of multi-actor learning process.* Thesis (PhD). Wageningen University.

Hayes T. M., 2006. Parks, people, and forest protection: an institutional assessment of the effectiveness of protected areas. *World Development,* 34(12), 2064–2075.

Hemson, D., Meyer, M. and Maphunye. K., 2004. *Rural development: the provision of basic infrastructure service. Position paper.* Pretoria: Human Sciences Research Council.

Hill, C., Osborn, F. and Plumptre, A. J., 2002. Human-wildlife conflict: identifying the problem and possible solutions. *Albertine Rift Technical Report Series,* 1. New York: Wildlife Conservation Society.

Huitt, W., 2007. Maslow's hierarchy of needs [online]. Valdosta, Valdosta State University. Available from: http://www.edpsycinteractive.org/topics/regsys/maslow.html [Accessed 27 September 2011].

Jones, J. L., 2006. *Dynamics of conservation and society: the case of Maputaland, South Africa.* Thesis (PhD). University of Pretoria.

Josie, J., 2008. *The intergovernmental context of municipal infrastructure grants in South Africa.* Research and Roundtable conference. University of the Western Cape.

Jozini Local Municipality, 2009. *Integrated Development Plan Review 2008/2009.* Pietermaritzburg: Jozini Local Municipality.

Kessler, C., 2007. *Transfrontier conservation areas (TFCAs) – SADC's choice to promote biodiversity conservation and economic development.* Frankfurt: KfW–Development Bank.

Lele, S. et al., 2010. Beyond exclusion: alternative approaches to biodiversity conservation in the developing tropics. *Current Opinion in environmental sustainability*, 2, 94–100.

Lindenmayer, D. et al., 2008. A checklist for ecological management of landscapes for conservation. *Ecology letters*, 11, 78–91.

McAreavey, R. and McDonagh, J., 2011. Lessons for Sustainable rural tourism: lessons for rural development. *Sociologia ruralis*, 51 (2), 175-194.

McNeely, J.A. and Scherr, S.J., 2003. *Ecoagriculture: strategies to feed the world and save wild biodiversity*. Washington: Island Press.

Mucina, L. and Rutherford, M.C., eds., 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia, 19*. Pretoria: South African National Biodiversity Institute.

Munthali, S. M., 2007. Transfrontier conservation areas: integrating biodiversity and poverty alleviation in Southern Africa. *Natural resources Forum,* 31, 52-58.

Nemarundwe, N. et al., 2003. *Future scenarios as an instrument for forest management: manual for training facilitators of future scenarios*. Jakarta: CIFOR.

Okubo, D., 2000. *The community visioning and strategic planning handbook.* Denver: National Civic League Press.

Perfecto, I., Vandermeer, J. and Wright, A., 2009. *Nature's matrix: linking agriculture, conservation and food sovereignty*. London: Earthscan Publications Limited.

Republic of South Africa, 2009. *Constitution of the Republic of South Africa, Chapter 2 - Bill of Rights.* Pretoria: Government Printers.

Rodary, E., 2009. Mobilizing for nature in southern African community-based conservation policies, or the death of the local. *Biodiversity and Conservation,* 18, 2585-2600.

SADC., 1999. *Protocol on wildlife conservation and law enforcement*. [online]. International Wildlife Law. Gaborone: SADC.

SADC., 2006. *Transfrontier conservation areas*. [online]. Gaborone: Food, Agriculture and Natural Resources Directorate.

Sandwith, T., Shine, C., Hamilton, L. and Sheppard, D., 2001. *Transboundary protected areas for peace and cooperation.* Cambridge: IUCN.

Sanginga, P. C. and Chitsike, C. A., 2004. *The power of visioning: developing community visions of desired future conditions: a handbook for community development facilitators*. [online]. Available from: http://www.researchintouse.com/nrk/RIUinfo/outputs/R7856_FTR_anxH.pdf [Accessed: 24 September 2011].

Sanginga, P. C. and Chitsike, C. A., 2005. *The power of visioning: a handbook for facilitating the development of community action plans.* Kampala: International Centre for Tropical Agriculture.

Sayer, J. and Campbell, B., 2004. *The science of sustainable development: local livelihoods and the global environment.* Cambridge: Cambridge University Press.

Scherr, S. and Buck, L., 2007. *Introduction to ecoagriculture (version 1): an introductory powerpoint presentation* [online]. Ecoagriculture Partners. Available from: http://www.ecoagriculture.org/documents/files/doc_73.pdf [Accessed 27 September 2011].

Scherr, S. J. and Rhodes, C., 2005. *Ecoagriculture: integrating strategies to achieve the millennium development goals.* Washington, DC: Ecoagriculture Partners.

Sheil, D., Liswanti, N., van Heist, M., Basuki, I., et al., 2003. Local priorities and biodiversity in tropical forest landscapes: asking people what really matters. *Tropical forest update,* 13 (1), 16-18.

Simons, J. A., Irwin, D. B. and Drinnien, B. A., 1987. *Psychology - the search for understanding.* New York: West Publishing Company.

Smith, R. J. et al., 2008. Designing a transfrontier conservation landscape for the Maputaland centre of endemism using biodiversity, economic and threat data. *Biological Conservation,* 14, 2127-2138.

Sustainable Communities Network Partnership., 1996. Chattanooga, a city worth watching [online]. Chattanooga, Sustainable Communities Network. Available from: http://www.sustainable.org/casestudies/tennessee/TN_af_chattanooga.html [Accessed 27 September 2011].

The World Bank., 2002. *Building a sustainable future: the African region environment strategy*. Washington, D.C.: The International Bank for Reconstruction and Development.

Torquebiau, E. and Taylor, R. D., 2009. Natural resource management by rural citizens in developing countries: innovations still required. *Biodiversity and conservation,* 18(10), 2537-2550.

Torquebiau, E., Dosso, M., Nakaggwa, F. and Philippon, O., in press. Biodiversity conservation through farming: a landscape assessment in KwaZulu-Natal, South Africa. *Journal of sustainable agriculture*. Accepted in August 2011.

Van Wyk, A. E. and Smith, G. F., 2001. *Regions of floristic endemism in southern Africa: a review with emphasis on succulents*. Pretoria: Umdaus Press.

Walzer, N. et al., 1995. *Community Visioning / Strategic Planning Programs: State of the Art*. Ames: North Central Regional Centre for Rural Development.

Williams, S. E., Gillison, A. and van Noordwijk, M., 2001. *Biodiversity: issues relevant to integrated natural resources management in the humid tropics*. Bogor: International Centre for Research in Agroforestry.

Appendices

Appendix A: Mathenjwa community socio-environmental concerns

Production	Livelihood	Biophysical	Infrastructure	Other
Lack of pastures	Lack of job skills	Invasive alien plants	Bad roads	Orphanage care problems
Frequent crop failure	Lack of employment	Soil erosion	Poor cellular phone network	Poor church buildings
Lack of vegetable gardens	Poor housing		Lack of fencing	Poor sanitation
Lack of draft power	Sicknesses		Few, poor shops	
Lack of agricultural inputs	Food shortage		No banks	
Poor Soils	Water scarcity		No garages	
Livestock diseases			No Post Office	
			Few sport facilities	
			No high school	
			No clinic	
			No community hall	
			Poor transport service	
			No electricity	
			No crèche	
			No market facilities	
Total: 7	*Total: 6*	*Total: 2*	*Total: 15*	*Total: 3*

Appendix B: Components of Mathenjwa community's vision

The maximum possible number of times a vision component could be mentioned was nine (since there were nine participating groups).