FINAL REPORT

Exploring Future Ecosystem Services: A Scenario Planning Approach to Uncertainty in the South East Lowveld of Zimbabwe

by

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Abstract

Problems related to natural resource management are typically complex and require integration of information across several scales and disciplines. This is particularly evident where there are multiple stakeholders with different interests and appealing to different planning horizons. In such cases, scenario analysis has been widely promoted as a useful tool for exploring key uncertainties which shape the future of social-ecological systems often characterised by high unpredictability. Here we discuss our experiences from one year of ethnographic study in a project that was implementing participatory scenario planning methodology in three wards in the South East Lowveld of Zimbabwe. Scenarios were mainly concerned with exploring possible futures for ecosystem services and human well being in the Lowveld. To this end, we investigated the various domains of drivers ranging from technological, environmental/nature, political, human, institutional and economic and extrapolated the impacts of changes in their relationships extending for about 25-30 years into the future. Our main intention was to discuss these drives in the context of the Great Limpopo Transfrontier Conservation Area. Our intention was to develop loosely linked scenarios that can be used to influence stakeholder decisions in formulating robust resource governance regimes. Generating local scenarios with semi-literate communities is time consuming requiring strong commitment from social scientific researchers with strong facilitation stills. Generally, developing scenarios is resource intensive, particularly when the aim is a top-down and bottom-up iterative cycle. Stakeholders should be typically involved in multiple workshops to ensure that the scenarios are credible and impart a sense of ownership. Most importantly, scenario planning allowed communities to transcend the constraints of the hear-and-now mindset which often characterise their livelihood decisions and place renewed emphasis on engagement and communication with decision makers so as to devise strategies that enhance their benefits within the GLTFCA.

Introduction

This report outlines progress made under the project entitled '**Exploring Future Ecosystems Services: A Scenario Planning Approach to Uncertainty in the South East Lowveld of Zimbabwe**' which received funding from WCS-AHEAD Seed Grants Programme. The report summarises research activities carried out between January 2009 and February 2010. The report gives insights derived from empirical observations and data gathered from three wards located the South East Lowveld, Zimbabwe. The focus of experimenting with scenario planning methodology has been to give local populations neighbouring the GLTP an enhanced ability to adapt and change to the challenges and opportunities as the GLTFCA is implemented across the three countries (CASS, 2006). The GLTFCA boundaries are undefined but it encompasses core protected park areas, communal lands and land held under private tenure. It comprises a mosaic of different landuse categories held under different tenure regimes making planning in such environments very complex. This is exacerbated by the fact that there appears to be mismatches between ecological and institutional scales which makes key decisions and policies affecting the TFCAs. This requires innovative approaches that promote key stakeholders to explore their plausible futures in a participatory manner and call for negotiation in the policy arena. In this report, we argue that exploring alternative scenarios for the development of the South East Lowveld is critical for the TFCA evolution itself as success will very likely depend on co-operation amongst stakeholders. Scenario planning offers a promising collaborative approach for building resilience to the future's unpredictability as it provides an opportunity to local farmers to develop a refined understanding of the relationships between ecosystem services and human well being at multiple scales. This report outlines results from field level activities that were conducted over a one year period. In the next sections, we highlight the objectives of the study. This is followed by a brief description of the methodological approach and a characterisation of the key livelihood strategies for most farmers in the area. In the penultimate section, we discuss the key methods and processes of scenario building and the last section focus is on key lessons.

Objectives

This AHEAD-GLTFCA Seed Grant was meant to support on-site field research for PhD studies. The overall aim of the broader study is to develop insights on the dynamics surrounding local level participatory scenario planning and explore how it can enhance self organisation, learning and empowerment of marginalized stakeholders and promote negotiation amongst stakeholders within the GLTFCA. The specific objectives for this current study are stated as follows:

1. To explore key livelihood strategies of Sengwe Communal Area Lands and provide an overview of key TFCA developments likely to affect them
2. To explore and define the key system processes, drivers and interactions for the future of the Lowveld using participatory scenario planning methods
3. Develop community scenarios and relate the community scenarios to higher level scenarios developed for the GLTFCA on concerns such as livestock/veterinary disease control, tourism etc with the aim developing multi-scale scenarios for the GLTFCA in the long term
4. Highlight key lessons and make comparison across wards on the application of the methodology.

Methodology and Study Area

Description of the Study Area

The study was conducted in three wards located in the South East Lowveld of Zimbabwe namely Pahlela/Makanani (ward 13: 64 798 ha), Sengwe (ward 14: 81 279ha) and Malipati (ward 15: 95 312ha). The area lies close to the Gonarezhou National Park and part of Sengwe and Malipati ward provide a corridor link for the GLTP. Generally, the area is commonly known as Sengwe Communal Lands and is important in that it provides the link through the Sengwe Tshipise corridor, which is a very strategic area in terms of the Great Limpopo Transfrontier Park (GLTP). The region is characterized by low rainfall, poor soils of low agricultural potential and high temperatures. Mean annual rainfall ranges between 300 to 600mm and effective rainfall occurs mainly from October to April, but the rainfall is highly variable both between and within years and the variability has increased over the past decades. The area experiences frequent droughts which threaten household food security and negatively impact on crop and livestock production. Vegetation is

predominantly characterised by woodlands comprised of mopane (*Clophomospemum mopane*) which provides useful forage to livestock especially in dry years. Mopane woodlands and mixed species shrubland are also common.

Research approach and methods

Methods used for data collection included key informant interviews, focus group discussions and scenario workshops. In order to understand current livelihood strategies we used a questionnaire and carried out institutional mapping, community historical profiling to explore some of the changes that had impact on local organisation of livelihoods in the area. To achieve this, we recruited and trained six research assistants in basic skills and methods for conducting social science research. We especially wanted them to be creative in mobilising communities during the scenario planning workshops. Key informant interviews were conducted with councillors, headmen, village heads and RDC executives, representatives of development committees (e.g. Malipati Irrigation Scheme, Sengwe Vamanani Crafts Association, Malipati Development Trust). Altogether we conducted 13 key interviews, 5 Focus Group Discussions and facilitated an average of four scenario workshops in each site. Our scenario workshops complemented and built on those facilitated by research assistants and were recorded in notebooks and flip charts and post its. .

Governance and political history

Traditionally, ownership of land in the community is based on kinship, but vested in the Chief, who is the custodian of all land and natural resources in the area. In terms of traditional hierarchy, below Chief Sengwe are headmen (*sadhunhu*) Gezani and Samu and Ngwenyeni. Village heads (*sabhukus*) and councilors play an important role in controlling access to resources like water, land and grazing and forest products. Presently, various types of local land tenure arrangements were exist in the community. These include family land inherited through lineage: family land inherited through paternal lineage, spouse' family land, land rented or leased.

Ethnic diversity in Sengwe is the result of migration. Archival materials and oral interviews with show that the original inhabitants of the area were the Baloyis and Pfumbis. These were subsequently displaced by various Hlengwe (Shangaan) people

(particularly of the Chauke dynasty) who migrated to this area from further south in Mozambique and South Africa in the 1950s. The motivation for these movements appears to have been to escape Mfecane and tribal wars in their former areas. At present, about 75% of the population in the three wards are Shangaan, 15% are Karanga, and Ndebele constitute about 7% while Ndau and Venda each comprise about 3% of the population. Culturally, there are strong linkages across the national borders and people share a common language which is Shangaan. There are an Ndebele minority living especially in Malipati ward, a majority of whom are second or third generation descendants of people who were relocated during the forced displacements in Filabusi around 1954. The enactment of the Land Apportionment Act in the 1930s and subsequent legislation led to movement of people from the hinterland and settled in semi-autonomous villages within the Sengwe Area, predominantly occupied by the Shangaan and Venda speaking people. Apart from the Ndebele being moved into the area by the colonial government, Karanga people also moved in after initially being attracted by the area's potential for cattle production.

Shangaan speaking are the natives and claim to be the "landowners" in the study area. Religious rituals and other traditional practices differ with ethnicity. The Ndebele and Karanga contest the religious, political and cultural authority of the Shangaan. These two minority groups are now calling for more autonomy over their lives and "areas" by openly defying orders to participate in traditional ceremonies that are common among the Shangaan. The inhabitants of Sengwe were heavily affected by the Zimbabwe liberation struggle and the civil war in Mozambique. Repressive and oppressive instruments of colonialism forced villagers into protected villages commonly referred to as "keeps". Protected villages were mainly meant to stop villagers from supporting armed combatants during the liberation struggle. Most Shangaan living in Sengwe have strong family bonds with those in Mozambique and South Africa and these networks have been rekindled in the past decade during the economic challenges with most families benefiting through chain migration. This type of migration occurs when migrants go to destinations where one already has relatives or friends who originated from the same area of origin.

Cultural differences determine the means of production, accumulation, consumption and social networks for different households. These in turn shape the nature of social organization and perception towards various livelihood strategies. It appears conflicts are

multi-layered including those over fertile soils and grazing for livestock as well as political authority and cultural practices such as circumcision. Circumcision ceremonies held by the Shangaan for both men and women are a strong force that influences one's belongingness to the way of life. Conflicts are sometimes over such traditional practices with people from other ethnic groups (such as Karanga, Ndebele and more often Shangaan themselves) defying orders to undergo circumcision. Male circumcision (locally known as *hoko*) ceremonies are held annually. Women attend ceremonies (known as *komba*) were they young women reaching adulthood are trained for womanhood. Women from other ethnic groups are forced to attend such ceremonies only if they marry Shangaan men. Males from non Shangaan ethnic groups (e.g., Karanga and Ndebele) are only asked to attend ceremonies if they marry Shangaan women, especially daughters of Shangaan leaders such as chiefs and headmen. If people from other ethnicities want to assume leadership positions they are often asked to undergo circumcision. For these roles circumcision is eminent-can only be redeemed by receding the post or marriage. Such issues are causing conflicts among the different ethnic groups in the SEL finally leading to calls by the Ndebele especially to establish their own autonomy especially having their own headman.

RESULTS

Livelihood characteristics and strategies in Sengwe Communal Lands

The Sengwe Communal Lands are generally regarded as critical in the development of the TFCA concept in that it espouses the characteristics of a multiple land use zone. Here we discuss the key livelihood strategies for most households in the area. Before discussing main livelihood strategies, we briefly describe the natural resources available in each key land type. There is a high diversity in terms of livelihood portfolios and heterogeneity in terms of household strategies employed by households with key differences existing between wealthy and poor households, male-headed and female headed, based on ethnicity and gender, size and composition of households, among other factors.

Natural Resources and Land Types

The livelihoods of people living in the Sengwe Area are not homogenous but diverse and heterogeneous. The livelihoods of people are shaped by ecological, economic and institutional factors affecting them. These factors shape the relationships of people among themselves, local people and other actors and people and the resource especially those located within the protected area such as the Gonarezhou National Park. Heterogeneity is shaped and characterised by socio-economic differentiation such as origin of households, level of education, farming practices, sources of income (whether on or off-farm) and technologies employed and natural resource access among other factors (cf. Ellis, 1998; Bryceson 2002). There is diversity at spatial and temporal dependence scales with resource extraction in some cases being occasional (only in time of needs such as in drought years), regular for specific seasons of the year and continuous where resources are important to people's livelihoods. Although recognising such diversity, it appears there are various types of natural resources utilised in the area which a key distinction made between resources located in the protected area (Gonarezhou National Park) and those under communal tenure. Another key distinction is made in terms of land types, between valley and upland areas. The valleys comprise the alluvial areas, which occur principally in association with major rivers like the Bubi, Limpopo and Mwenezi and their tributaries. Villagers distinguish three main valley types: *Pfungwe* comprises areas of thick riverine vegetation that occur immediately alongside rivers (but especially along the Limpopo River) and streams. *Bhanyeni* or *Gumbini* is a more open type, which where undisturbed is typically dominated by ilala palms (*Hyphanae petersiana*) with men mostly engaged in tapping palm wine to make an illicit beer (locally known as *njemani*). These plains occur further away from the main rivers and generally comprise older alluvial deposits, comprising soils of relatively high clay content and are highly prized for cultivation. *Liphaleni* comprises patches of saline soils, which support sparse vegetation dominated by salt bushes and interspersed by areas of short grass. This type is restricted to the Mwenezi river system. All valley units are prone to flooding. The ecological conditions prevailing are such that people are increasingly looking for alternative sources of food and income as frequent droughts affects their livelihood options. From participatory mapping exercises conducted in with locals, resources considered to be important for sustenance include rivers, water pans, fish, ilala, reeds, honey, wild animals and mopane worms. Key resources utilised by both humans and livestock show a high degree of seasonal variations. Interestingly, forest resources appear to have a dual role: forest resources are harvested by

households as a coping strategy to overcome shortfalls in periods of stress and as a survival strategy where resources are used for sustenance and informal financial asset used to cover persistent shortages.

Conflicts are also common especially over access to key communal resources such as ilala (*Hyphenae petersiana)* and mopane worms (*Gonimbrasia belina)* and these are more common during drought years. From interviews with village heads and Focus Group Discussions, it appears the Shangaan people monopolise its use by making a local beer called *njemani*. Though in some way destructive to the plants the product is highly valued both culturally and economically. Ndebele women use ilala palm leaves for basketry and other crafts for sale in neighbouring towns and to South Africa. The Shangaan claim that they are indigenous to the area and tend to exclude other ethnic groups from harvesting such resources. Mopane worms are widely harvested and considered a valuable source of protein at a household level but are also sold either locally or neighbouring towns like Chiredzi and Beitbridge. Mopane worms usually occur from December to January and March to April. Besides mopane worms, forested landscapes provide options for multi-enterprise livelihood strategies and a range of provisioning ecosystem services, such as fodder for livestock, firewood, thatch grass and poles for construction.

The Sengwe area is sparsely settled with most villages having a low population density. The variability in rainfall distribution influences human settlements with most preferring to settle close to areas with rich alluvial deposits. Rainfall acts on water resources, grazing, livestock, and wildlife, fields (due to flooding and so stimulating opening of new fields in the uplands) and thus influences availability of wild fruits and ilala which are used especially in drought years. The liberation war impacted strongly in terms of human, livestock and wildlife populations. The availability of grazing influences both livestock and wildlife populations with livestock production more dominant in areas with enough grazing. The forced movements of people to protected villages (known as “keeps”) impacted on production capacities in the colonial era. The post-independence support that the area has received from donors such as World Vision has helped in building of infrastructure such as schools, clinics with humanitarian aid agencies continue to provide food relief in drought years and especially to vulnerable resource poor households and child headed households. Disease control programmes such as the erection of veterinary

fences are an important landmark in people's memory and even influence how they think about future efforts to controlling disease transmission within the GLTFCA.

Livestock production

Land use outside the protected the Gonarezhou National Park is predominantly subsistence agro-pastoralism. Livestock production forms a major component of the livelihoods for most households in the three wards but is concentrated were there is high abundance of desirable grass species such as *Urochloa mosambicensis.* Cattle are used as a symbol of wealth and power. They provide an important income source in periods of adversity when cropping fails and are used to pay for bride wealth. During the dry season leaves from *Colophospermum mopane* provide forage for livestock. Livestock predation is common especially in villages close to Gonarezhou National Park.

In the three wards, there are strong institutional arrangements for livestock management. The Department of Livestock and Veterinary Services offers livestock and veterinary to livestock farmers in the area – their mandate is disease control and management. Livestock data from the Animal Health Centres in the wards show relatively high levels of ownership of cattle. For villages that own cattle, the mean number of beasts is about 15.5 per household. From interviews with cattle owners, it appears in areas especially further from the rivers and Gonarezhou National Park, grazing and watering of livestock are problems that villagers normally confront and in a majority of the cases, rely on well and boreholes for livestock watering. Most grazing is in valley plains and in drought years, the GNP is used for grazing of livestock. During wet season, cattle are kept in grazing zones away from fields and in dry season they graze in crop fields. For villages located close to the Limpopo floodplains, grazing is often in uplands during wet season and in the floodplains during the dry season especially around Sengwe Village[1]. Livestock production is practiced and used as a livelihood strategy both at specialisation and diversification levels. Some households specialise in cattle production without cropping and these use livestock as a source of income for food security. Other households practice livestock production as

[1] The Limpopo floodplains are used by a majority of villages for grazing and fishing. At interviews and FGDs held in Lisenga, Hodela and Mpandle, the villagers were worried about the effects of fencing of the Limpopo strip on their access to traditional grazing areas and water in the Limpopo river.

a way of diversifying risks associated with droughts and do cropping of drought resistant crops such as sorghum and millet.

Cattle tick-borne diseases are mainly controlled by dipping which is performed regularly during the rainy season. With, support from CIRAD Lowveld Livestock, the veterinary department resuscitated dip tanks in the area and has various research initiatives to understand the dynamics of disease transmission at the human/livestock/wildlife interactions. Dipping committees exist at each of the Animal Health Centres and these promote dipping for livestock and this has contributed to healthy cattle populations as the frequency and efficacy of dipping has reduced the incidence of tick-borne diseases. Generally, there is an increasing awareness of threat of diseases at the wildlife/livestock interface, given the increased movement of wildlife (especially around Malipati and Pahlela/Makani wards) into the Gonarezhou National Park during the dry season. Livestock diseases commonly mentioned from focus group discussions include Foot and Mouth Disease (FMD), heart water and trypanosomiasis and Newcastle for chickens. Further investigations are needed to clearly characterize their occurrence and treatment as some farmers relied on ethnomedicines. A majority of farmers receive information from extensive campaigns that are carried out by the Veterinary Department and CIRAD. Watering for livestock is at major rivers and streams during the wet season while wells and boreholes are used during the dry season. Future movements of cattle in the GLTFCA in general will be influenced by the fencing regimes. At the GLTFCA will comprise of multiple land use, disease control and transmission one of the key threats to livestock production for a majority of the households in the study area. Other important threats were drought, losses to predators, theft and losses to landmines especially for villages living close to the section with landmines (e.g. Mpandle, Maguvisa and Dumisa) Mozambique is seen as an important market for cattle due to significantly higher prices than those obtainable in Zimbabwe. Cattle rustling activities are reportedly carried out by Zimbabweans who connive with Mozambicans.

Crop production

Outside protected areas, landuse can easily be linked to the moisture gradient with the intensity of cultivation increasing especially with increasing distance from the GNP and the safari hunting areas. Small-scale irrigation schemes are operating below capacity due to lack of equipment and poor institutional arrangements for managing water. In terms of

cropping patterns, maize dominates in the fertile lowland and wet areas while sorghum, groundnuts, roundnuts and cowpea (*Vigna unguilata*) are generally grown in upland areas. Watermelons and sweet sorghum are planted in every field but with greater emphasis in upland fields. Cropping patterns and preferences vary with ethnicity of households with Karanga specializing more in maize and Shangaan and Ndebele oriented towards sorghum and millet. However, sorghum and millet tend not to be severely affected by periodic moisture stresses which characterize the area. Small scale irrigation schemes like the Malipati and Magogogwe are important for household food security. Malipati Irrigation Scheme has about 120 plot holders with an average of 0.1 ha each. Often, plots are fully cropped during the dry season when labour is available. The Malipati irrigation scheme is currently functioning below capacity largely due to high costs of pumping water and maintaining irrigation infrastructure (pumps, canals and pipes) and inputs like fertiliser.

Household Sources of income

From a sample of 120 households, 75 % of the household income is from sale of livestock especially cattle and small livestock like goats, guinea fowl and chicken. Although most households consider crop farming and livestock keeping being their main income sources, a range of non-farm income sources including petty trade, remittances and temporal labour migration also contribute income. Remittances are common - with an average of 80% of interviewed households have family members – mostly sons – working in South Africa and these send money and goods. Migrants invest mainly in cattle and house construction. Cross-border trade is common especially amongst women. Cross border migration determines the socio-economic welfare of households in the long term and has an impact on household composition in terms of headship and remittances which are often used to buy cattle and food especially in drought years. Migrants are often young men and women aged between 17-35 years and this affects household labour availability during the cropping periods. Cross border migration is common among the Shangaan who view it as a maturity ritual. Ironically, recent data shows that cross border migration is costly: requires money for transport, food and sometimes bribes along the way for a majority of the migrants who do not have requisite travel documents. Migration of young men has resulted in a preponderance of female-headed households and widens the gap between rich households relying on remittances and poorer households (without remittances) who remain more dependent on cropping and often poorly-paid wage labour.

Household decisions on broader livelihood strategies are influenced by herd composition for those with livestock, seasonal cropping patterns, access to fertile land and agricultural inputs (e.g. seed and labour) and also social arrangements. Household economies rely on a close integration of a wide range of resource management and production systems. Generally, there is great heterogeneity between livelihoods of households in the area and this is shown at a range of scales: between and within villages, land use types and between households depending on households relative access or location to key livelihood resources such as forests, grazing, park etc and between households in villages. This heterogeneity is shaped by a range of forces that change over time and household's capabilities to either cope or respond to shocks to their livelihoods also vary.

Exploring key drivers of change and building community scenarios

The scenario planning process

Our key objective of carrying out scenario planning exercises in Sengwe was to develop four alternative scenarios for the area, describing in qualitative terms based on agro-ecological conditions, livelihood sources and lifestyles around the 2030. Our main proposition was that to fully take advantage of the opportunities of the GLTFCA, locals need to first understand the uncertainty of its policy environment and the complexity of factors influencing their livelihoods through scenario planning. In this section, we describe the processes that we used. For diagnostic purposes, the study area was divided into five "sites", with each site having on average 4-5 villages neighboring each other to allow for relatively small groups that can hold meetings possible to decide on common interests. These sites are generally accessible by an all-weather gravel road. We also considered distance from the core park area (the Great Limpopo Transfrontier Park commonly referred to as the "corridor" by most locals) and ethnic composition of selected villages. We wanted to experiment with the scenario planning methodology in different circumstances and explore how the drivers and subsequent scenarios would vary depending on location, ethnicity and resource endowments.

At first we conducted several community level meetings with assistance of field assistants to familiarize the villagers with the aspects of scenario planning methodology and situate its use in the context of the GLTFCA. These workshops started from mid morning and ended around lunch time and in all cases observed the cultures and traditions of the

participants such as prayers before and at the close of meetings. From February through March, our focus was to introduce the tenets behind our approach. We held meetings with traditional leaders (such as the Chief, headmen and village heads) and councilors for the three wards. During introductory meetings, the common remark by communities in the three wards has been the slow pace of implementation of the GLTFCA in general and the increased realization of the importance of eco-tourism which was expressed also by the members of the Malipati Development Trust[2]. The intention of these diagnostic exercises was to generate as much useful information from the villages and then integrate the activities from each through bigger workshops were such exercises would continue. Later, attention of workshops shifted to identifying drivers of change which would be useful in coming up with generic community scenarios in each of the three wards. In all cases, introductory meetings and scenario workshops were facilitated by the CASS research team. Research assistants were mainly tasked to work on institutional mapping, historical profiles and identifying key resources for each area. An average of 16 community meetings were held in each ward and the CASS team researchers facilitated at least 4 of these per ward, mainly those involving the whole ward (see Table 1 below).

[2] A number of scenic sites are being considered by the Malipati Development Trust for tourism lodges. These include Mashawu Hotsprings. Tourism seems to be dominating most debates on opportunities for the area, this is in part due to the relative attention this had received in the policy arena since the inception of the GLTP.

447 **Table 1** Number of workshops held in each ward
448

Ward	Villages	Workshops held	Total per ward
Pahlela (ward 13)	Bekani	2	18
	Jimson	1	
	Makapakapa	2	
	Masiya	4	
	Maunze	3	
	Mtombo	5	
Malipati (ward 15)	Mapolisa	2	19
	Matanasa	1	
	Chishinya	2	
	Samu	3	
	Mugibiza	1	
	Maose	3	
	Hadama	1	
	Mafunjwa	2	
	Ngwenyeni	2	
	Hadama	1	
	Muhlekwani	2	
Sengwe (ward 14)	Lisenga	4	15
	Hodela	2	
	Kotsvi	6	
	Mupandle	2	
	Sengwe	1	

449

450 In order to keep track of all discussions we recorded into notebooks and selected
451 representatives of key stakeholders groups and formed five scenario working groups
452 comprising of about 20-25 people per site.

453

454 In “the driver identification phase” of our research process, we asked workshop
455 participants to discuss and list factors that they thought would be important drivers of
456 change in the area in the coming 25 – 30 years. In total we identified about 34 drivers
457 which we classified into groups based on their relationships and impact scales. When
458 coming up with drivers of change for the South East Lowveld in general, there was
459 increasing the level of awareness and understanding of the complexity of the wider socio-
460 ecological system in some wards whilst some could not easily relate to driving forces

located outside their arena and in the future. An appreciation of key drivers affecting helped in creating of visions "*muvono*" by the participants during groups. Drivers were identified with the locals and the level of impact of the drivers varied from local, national to regional. Political and macroeconomic drivers affected people in the sites in numerous ways especially over the past 20 years. In one instance, experiences of the theatrical and visual representations that were performed by Resource Africa proved a useful tool to both develop and communicate drivers and issues affecting the locals[3]. We are exploring the options of using theatre at as communication tool to promote the methodology amongst stakeholders and promoting awareness of the complexity of the GLTFCA, both in terms of politics of its evolution and the drivers that will influence livelihoods in the future.

In post independent Zimbabwe, the political instability of neighboring Mozambique and South Africa during the apartheid era dented peoples' livelihoods. Political uncertainty and severe economic crisis over the past decade pose constraints to internal and trans-boundary resource arrangements especially in terms of implementation of initiatives. The poor financial performance of CAMPFIRE over the past five years has tended to make locals view the state and especially RDCs with suspicion in delivering services[4]. The weakness of state institutions and general collapse of the economy has pushed locals to migrating to South Africa and Mozambique in search of better opportunities to improve livelihoods[5]. The influence of external drivers on the system were least understood as the tendency by most participants in the scenario exercises was to focus on drivers that are more immediate. Capturing explicitly major areas of uncontrollable uncertainty, which means unpredictable external drivers (e.g. climatic patterns, national economic growth etc) is also difficult when developing scenarios with people whose education and literacy levels are low.

[3] Meeting held at Headman Gezani Court, 01 July 2009. At this meeting after the performance by Resource Africa theatre group, participants could freely identify the issues affecting them and engage in debate on diseases, illegal crossings to South Africa and Mozambique, HIV and AIDS, climate change among other issues. They hailed the performance and wished this could be repeated in all wards in Sengwe Communal Area.

[4] Interview with Headman Samu 19/08/09 (and during various workshops wherein villagers argued they had not received benefits from the programme since 2003). This is understandable due to the macro-economic collapse characterised by hyperinflation, making payments worthless.

[5] Focus Group Discussion held at Samu School 19/08/09

Table 2 Ranking of driving forces. Most participants ranked access to agricultural innovations as the most important driving force, followed by followed by access to better education and access to better infrastructure. The percentages show the number of participants accepting the rank of the clustered drivers in the three wards. Follow up discussions in groups revealed that in all three wards, irrigation opportunities are critical for improved food security for most households.

Rank	Driving forces	Malipati (*N = 67*)	Pahlela (*N= 140*)	Sengwe (*N= 93*)
1	Access to agricultural technologies (e.g. irrigation, inputs, extension support etc)	100	100	100
2	Access to better education (secondary schools, vocational training centres)	85	90	100
3	Access to infrastructure (transport, communication, energy, livestock and crop markets)	56	100	95
4	Employment opportunities (esp. in tourism and support services)	100	90	100
5	Migration	70	75	95
6	National political outlook	70	80	70
7	Health facilities (HIV and AIDS etc, access to malaria drugs etc)	60	55	90
8	Wealth distribution (income from eco-tourism, wildlife revenue)	100	90	100
9	Climate change (rainfall patterns and variability)	80	65	70
10	Access to micro-credits and donor support services	100	85	60

The Sengwe area in which the study falls is generally fragile ecologically and receives less rainfall. This negatively affects cropping activities and presents persistent water problems for livestock. Changes in the national policy context - government-led and/or development interventions in the management of resources within the area and changes in the external

economic environment all have effect on the opportunities for locals who live in a transient mode: migrating to areas with opportunities now and again.

Building of scenarios with communities

Structure and sequencing of processes

The primary purpose of building scenarios with communities in our case was for exploratory purposes and also as a decision support tool in the evolution of the TFCA. The adaptation of the methodology from the earlier projects and especially building on the successes and failures of past programmes as CAMPFIRE involved a long process of explanation, elaboration, and discussion with the local farmers and especially traditional leadership. Our proposition was that if stakeholders understand alternative development trajectories and the interrelationships amongst various drivers of change, we could influence their decisions in numerous ways. When building local scenarios, we used the both the forecasting and backcasting approaches to help locals in appreciating the complexities of their environments. Forecasting is exploratory and backcasting in more anticipatory in nature. Exploratory scenarios begin in the present and explore trends into the future while anticipatory scenarios start with a prescribed vision of the future and then work backwards in time to visualise how this future could emerge. Our intention was to experiment with different sets of driver configurations to create futures from which participants can then develop narrative storylines that are understood by all participants. We used simple diagrams to show impact of drivers and asked participants to comment on them. In the backcasting approach local people selected desirable end points based on current appreciation of the key drivers of change which we helped to group when forming driver matrices. This is because the long-term objective of the CASS project is to generate identified sets of short to medium term plans (strategies) aimed at achieving the desired futures. Backcasting stimulated critical reflection of key drivers focusing on local realities and the impacts of negative drivers on the flow and amount of goods and services for ecosystem health.

Our work to date has resulted in generic scenarios which we apply to the three wards. The four scenarios are “Managing on the Margins”, “Agricultural Advance”, “Tourism Boom” and “Devolution vs Patronage”. Further work will be on exploring and identifying clear

policy proposals and actions for achieving the desired futures. The generic scenarios are described below[6]:

Scenario 1: 'Managing on the Margins'

This is the current scenario - Inaccessibility due to poor roads and no bridge linking the study area to South Africa. Poorly performing wildlife management programme (CAMPFIRE). Devolution of power ends at RDC level. Residents complain that they receive virtually nothing from the CAMPFIRE project. Illegal hunting is rampant and has been 'legalised' in the minds of most villagers. The local community does not value wildlife. They only see bad activities done by wildlife; destruction of crops and killing livestock. Costs of staying with wildlife outweigh benefits. Hence, some locals are hostile to ecotourism and sustainable management initiatives like the GLTFCA. Small-scale irrigation schemes are not fully functional due to economic and political problems. There is a continuous failure of irrigation institutions (e.g. committee) to mobilise resources to fully utilise all land on the scheme. Locals rarely use it due to lack of diesel. Food security remain a key challenge with most villages relying more on imports from South Africa and donor food relief programmes. Bende Mutale across the Limpopo remains a key source of maize meal and other basic needs. Remittances are common – every month *maraichas*[7] delivers groceries and other goods from South Africa. High prevalence of crop destruction and livestock predation prevail. Residents experience huge losses of livestock to diseases and pests. Cattle rustling into Mozambique remain a challenge. Illegal activities like smuggling marijuana from Mozambique are also rampant. Employment is limited and seasonal. A few people are employed during the hunting season to assist safari hunters. There are very few high schools in the area, locals use traditional medicines and prefer not to visit the local clinics which do not have drugs most of the time. Locals especially Shangaan do not value education. Droughts and dry spells are common. Almost every year some parts of Sengwe area experience a certain type of drought. Problem animals such as elephants cause havoc especially in areas close to the Gonarezhou. They destroy people's fields, leaving virtually nothing. Locals also believe that, the valley has fertile alluvial soils which do not require fertilisers. Some experiment with manure on the uplands and get bumper harvests in good rainfall years. Irrigation soils are used to fertilisers hence, they require a lot of fertilisers. In-migration takes place, but at a very slow pace. Residents are

[6] These are descriptions from summaries from each site.

[7] These are small trucks commonly referred to as maraichas used by most migrants in South Africa to send goods to their families back in Zimbabwe.

free to put up houses anywhere and anyhow. Local cultural practices continue to influence mindsets for the youth, the elderly participate more in initiation ceremonies

Scenario 2: "Agricultural advance"

Although there is erratic rainfall, in this scenario, participants felt that advances in constructing irrigation infrastructure would help greatly improve their welfare by 2030. Participants in nearly all villages felt that small-scale irrigation opportunities would increase food security and reduce their reliance on donor food relief programmes. Complete renovation of the irrigation takes place. In this scenario, all villagers realise that dry-land cropping is unsustainable. Dry land farming is heavily reduced. The habitat for wildlife and pastures for livestock increases and improves. Irrigation engines use electricity instead of diesel. All wards have irrigation schemes which are fenced so that crops are not destroyed by wildlife. Parks workers stay in Sengwe area in order for them to respond to problem animals instantly. But this does not augur well with some of the community members who enjoy 'illegal' hunting. Credits for inputs and agricultural equipment are made available by the Government and donors. Locals adopt new farming technologies. Farming in the irrigation is done throughout the year. Farmers are taught good farming methods so that sediment yield is limited. Livestock numbers are controlled since little benefit is coming from livestock production. Fencing regimes in place control diseases transmission. Locals begin to explore cattle markets. Opportunities for beef certification are explored by Cattle Producers Association. Strong disease control programmes in place.

Scenario 3 "Tourism boom"

Locals own lodges in the conservation area especially at prime locations such as Hot Springs. Ecotourism flourishes due to the increased wildlife numbers and marketing by as a block for GLTFCA. There is compatibility between poverty alleviation and tourism growth policies. The local community is empowered with skills such as basket and broom making using the locally available ilala palm. Employment in tourism related jobs soars especially amongst those from vocational training centres. Community reliance on natural resources drops, costs and benefits of conservation direct and immediate. The local community recognizes the significance of wildlife. Illegal hunting decreases. Devolution of tenure rights and power ends at local community level. The locals are now involved in

decision making in issues to do with revenue from ecotourism and safari hunting. The local community manages the portion of the GLTFCA next to them. Parents are educated on the significance of education to their children. In 2030, all children go to primary and secondary schools. The living conditions of the local community improve greatly. Infrastructural development is limited so that the wilderness and habitat for wildlife are maintained and improved. Major developments done are tourism related. However, natural resource-based livelihoods such as crop production and livestock rearing are also upheld though controlled. Measures are put in place so that 'traditional' hunting is also accommodated. Government policies are not deterrent to investors. A small bridge "The Crossing Point" which links Zimbabwe and South Africa is operational. Huge and heavy trucks are not allowed to use that route. This helps to curb the problems of in-migration and the spread of sexually transmitted diseases like HIV\AIDS. Traditional leaders play key role in allocating land and resolving disputes in irrigation schemes. Regulations are set so that kraal heads do not accept in-migrants. Residents now have fixed homesteads with electricity and tape water. In 2025, ecotourism flourishes and residents' reliance on natural resources has been greatly reduced. Look and learn visits to other countries, Cultural exchange programmes with neighbouring countries. The local community now values ecotourism and sustainable management initiatives such as the GLTFCA.

Scenario 4: "Villagisation" also called "Devolution vs Patronage"

Sengwe area received high rainfall – flooding common on the lowlands. Flooding results in destruction of habitat for wildlife and pastures for livestock since people clear more land for dry land farming. Local community especially are convinced that dry land farming is more profitable than utilising the irrigation. Tradition takes its toll and is entrenched. Cultural shock, locals continue to resent tourists. Therefore, more rainfall means more land is cleared for dry land farming. Destruction of the wilderness leads to reduction in wildlife numbers and the scenic nature of the area. This results in less revenue from ecotourism. Strong elite capture, devolution of rights for wildlife and power ends rests with RDC and top government. The little revenue that is obtained from ecotourism is spent at RDC level. Little of the revenue that is generated from ecotourism is used to maintain wildlife or alleviate poverty. The local community becomes unreceptive to ecotourism and sustainable management initiatives such as the GLTFCA. Eventually, the local people resort to "illegal" hunting, arson, cutting of game fences and general disruption of tourism activities

as a way of securing some benefits or protests. Consequently, employment in tourism related jobs plummets. Locals are retrenched first. The majority of the locals are illiterate. Hence, they occupy lowest posts which are affected first. The local community is forced to rely heavily on natural resources. They sell resources such as game meat, firewood and herbs at low prices. Further destruction of the environment ensues. Locals also continue with their illegal activities such as smuggling marijuana from Mozambique and cattle rustling. Prostitution soars. Incidents of sexually transmitted diseases like HIV\AIDS and related infections such as tuberculosis (TB) increase. Prevalence of diseases is exacerbated - buffalos and lions from Kruger National Park are infected by bovine tuberculosis (BTB). These infections might be transmitted to livestock and eventually to humans. Local community spends money on medical bills. They also spend productive time caring for the infected and affected. Further impoverishment of the local community takes place since they sell some of their assets to cover medical bills and funeral costs. Human population increases rapidly as a result of in-migration. The area is now highly accessible. Tarred roads and a bridge increase the accessibility of the area. In-migrants are given pieces of land by kraal heads. Further destruction of the wilderness takes place. The idea of achieving a win-win situation among humans, wildlife and livestock reaches a dead end.

The local community is equipped with skills such as broom and basket making using locally available ilala palm. Tourism growth and poverty alleviation policies are compatible. Local community's reliance on natural resources and farming decreases and devolution of tenure rights and power ends at community level. The community makes decisions on issues that involve management of wildlife and other natural resources found in the area. They manage the portion of the GLTFCA next to them, with minimal assistance from the RDC. Measures on how to rescue wild animals trapped by floods are put in place since reduction in wildlife numbers entails reduction in revenue from ecotourism. Livestock numbers are controlled. Infrastructural development is limited so that the habitat for wildlife is maintained. Secondary schools and hospitals are built. In 2030, every child goes to school and parents know the essence of education. Very few people consider dry land crop production and selling of natural resources as livelihood strategies. Majority of the locals relies on employment in tourism related jobs, revenue from ecotourism and selling of craft products to both local and foreign tourists. Residents are able to rehabilitate their flood destroyed irrigation with little assistance from donors and government.

Despite the area being endowed with natural resources, most residents are poor. The majority of the residents including young people are still illiterate, twenty-nine years after independence. These illiterate and poor people contribute to environmental degradation. Hence, they seem to be seating on a time bomb which can explode any time.

The four scenarios were compiled from workshops with villages in the three wards. Further work will be done on testing on refinishing these scenarios with other stakeholders especially at district level. In the next months focus will be on promoting stakeholder dialogue with these local communities.

Discussion

It is instructive to note that the process of experimenting with the methodology on the CASS project is ongoing. Here we give insights based on a year of ethnographic study with communities in the Lowveld. In the trajectory of experimenting with the local-level participatory scenario approach we realise that such processes take more time and effort than conventional research approaches. In most scenario studies, practitioners often adopt scenario planning methodologies and practices that have not been subject to the type of for example, in-depth case study or ethnographic research that would produce reflective, context-rich, history sensitive descriptions of scenarios-in practice, providing an additional lens with which to view their efficacy. Most studies tend to be unreflective accounts of scenario planning interventions where the academic authors also acted as consultants[8]. Our approach has merits in that we reflect strongly on the experiences of using the methodology, dwelling more on the process as much as the outcome and distilling lessons using a case study approach. In our case, developing participatory scenarios proved to be a useful tool to quickly assess some of the major hopes, fears and thoughts about the future among people in the study area. Such an overview proved important especially given our (CASS department) earlier involvement in projects such as CAMPFIRE. We did not proscribe solutions to local problems but only helped to search for locally robust strategies to overcome some of the inherent challenges posed by living on the edge of protected areas.

[8] A draft paper is in preparation on the experiences and promises of the scenario planning approach in the context of the GLTFCA.

We also note that although noble in formulation, the scenarios that emerge from working with communities reflect in part local realities but need to be linked to other concerns for the entire GLTFCA. This can be achieved by ensuring active representation of community interests in the institutional framework driving GLTFCA implementation. The current three-tier system: the ministerial, joint management board (JMB) and the various sub-committees does not build from local voices. There is no institutional representation at community level on some of the concerns and aspirations of communities living at the edge of the GLTP. Such representation is strategic and would provide a continuously link between key-decision makers, policy and committees. Communication is essential to build trust amongst stakeholders: communication from local to higher levels and vice versa. External facilitators can play an important role in linking the two fronts and promoting knowledge transfer that can inform policy debates on the alternative futures. Scenario planning affords locals to think of issues that they would not have ordinarily thought and this transcends the here-and-now mode of livelihood strategies.

The impact and certainty of drivers vary depending on the scale. Often drivers operating at one scale may be absent at another and scenarios methods should take this into account. Recognizing such cross-linkages was important to avoid the inherent risk of getting very much focused at community-level and neglect the big picture, which for the CASS project is testing the applicability of the scenario planning methodology and trying to link between different levels in planning for its implementation. The focus is on investigating plausible alternative livelihoods (futures/scenarios) for the GLTFCA and various components within it. Although, the focus has been on building scenarios at a local level, the extent to which these scenarios can be linked to across scales has not been explored. This is especially so given the fact that no formal scenario planning initiatives exist in the GLTFCA aimed at influencing stakeholders in the long run. Even through scenarios were to be developed at a higher technical level, they still need to be linked to social and economic realities at a local level. In this study general scenarios developed will be aggregated for the three wards and linked to technical issues emerging for the GLTFCA such as disease and livestock controls and tourism promotion. The intention of the current study is explore how single scale scenarios constructed at a single focal scale (in this case with communities at the local level) can loosely be linked to higher scales. Giller et al (2007) have argued that complex problems around natural resource conflicts frequently cannot be solved at one societal level or sphere, and that especially the local space for manoeuvre is compressed by

realities and dynamics at higher levels. We observed that a major difficulty of involving diverse stakeholders is the difference in epistemologies or knowledge systems across various actors. The same words or concepts are often understood differently at different scales, between scientists and stakeholders, and among stakeholders. Facilitating scenario exercises that seek to promote dialogue between stakeholders at different scales are particularly challenging. In developing scenarios with different sets of stakeholders, it is important to identify and capture differences in values and perceptions. In the study areas, different sets of issues and opportunities came into focus. Often, it results in an increased appreciation of perspectives from other scales and a greater appreciation of cross-scale processes and trade-offs between scales.

CONCLUSION

In this last section, we look more generally at the philosophy of scenario planning and advance some lessons based on different conceptual lens for approaching the methodology. In the approach we use, implicit assumptions exist which List (2004 p24) identifies as a 'fan model' perspective, where multiple potential futures are ontologically acceptable whilst a single shared present and past are presumed. This denies the situatedness and constructive nature of the present and past, which are not fixed and immobile but subject to constant re-interpretation as we understand and reflect more. This re-perceiving of the past and present inevitably influences how we perceive the future which itself is not fixed – there are multiple futures and participants should ideally negotiate the future (cf Murphree, 2004).

In our final words, we return to scholarship: scenarios draw mainly from ethnographic research (Hannabuss, 2001), Chermack and van der Merwe (2003 p.446) see social construction influencing scenario planning in four ways: in the individual construction of knowledge; the social influences on individual constructions; the '*situatedness'* and contextual requirements of knowledge construction, and; the social construction of reality. There is a deep relationship between agency and structure. Our world is socially constructed worlds making the actual building of scenarios an arena in which facilitators and participants simultaneously influence the outcomes of the shared process. Creation of scenarios involves actors – both scenario planners and facilitators - engaging in multiple acts of creation and interpretation of meaning. It is dependant upon the knowledge of those most familiar with their immediate situation, and those concerned about and affected by

761 long and short-term decision making in their region. For legitimacy, workshops should
762 wide groups of participants from different knowledge and institutional backgrounds, as
763 well as having varying degrees of decision-making power.
764
765 Participants welcomed the approach as an a valuable, unique and innovative approach that
766 tackles key issues in planning processes and noted that it is useful as a decision support
767 tool in exploring policy and development options of the GLTFCA. Workshops have
768 resulted in a generic orientation by most villages to "think using the methods of scenario
769 planning"[9]. However, villages still lack the ability to name and critically understand the
770 scale and impact of the identified drivers on plausible futures. This is due to low education
771 levels and complexity of approach. Judging from scenario building workshops, it seems
772 the degree of control that stakeholders (especially local farmers etc) have over driving
773 forces of change is not related to the scale at which we carry out the exercises. We noted
774 that driving forces of change at the local scale are often outside the control of the affected
775 farmers. Impact scales for drivers vary and participants often thought of strategies that
776 enhance their livelihoods in the short to medium term. The solutions to reach the desired
777 end points often rest in another sphere that they do not control. In addition, setting up such
778 initiatives often requires the provincial/district authority to support infrastructural
779 development. What emerged is that these scenario exercises help position local farmers to
780 generally better understand the larger forces affecting their communities and negotiate
781 with stakeholders that can provide key services and functions to pursue the desired futures.
782 The focus of the main Scenario Planning Project is on crafting institutional and
783 organizational capabilities for locals to design resource management regimes that are
784 responsive to the emergence of the GLTFCA - this has not been fully internalized by most
785 communities.
786
787

[9] Numerous occasions when we used the "before and after" technique to evaluate the usefulness of the approach with participants in Focus Groups.

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