AHEAD-GLTFCA WORKING GROUP – 7TH MEETING

Record of the 7th Meeting held on the 8th – 9th March 2007

Clube A Palhota, Pequenos Libombos Dam, Boane District, Mozambique

1. WELCOME

Dr. Bartolomeu Soto, Director of DNAC (National Directorate of Conservation Areas, Mozambique) opened the meeting 09.15 hrs in the well equipped conference room at the Clube A Palhota resort near the Libombos Dam some 30 km south-west of Maputo. On behalf of the Ministry of Agriculture and DNAC Dr. Soto expressed a warm welcome to delegates and said that he was particularly pleased that the Working Group has chosen to hold their 7th full meeting in Mozambique. Jorge Ferrao also sent his greetings and welcome – he was sorry he could not attend the meeting but had just been appointed Rector of the new university in Nampula and had to be there today.

Dr. Soto noted that there was a very full agenda and that the work being undertaken by delegates and the group was very important. One option was to sit back and do nothing about wildlife disease issues but this would not be sensible. The wildlife-livestock-human disease interface was becoming increasingly important and was a particularly important issue in the context of the development of TFCAs.

Dr. Soto again expressed his warm welcome to delegates and his hopes for a successful meeting.

2. INTRODUCTIONS

Piet Theron of SANParks introduced Dr. Nicky Shongwe who was appointed in August 2006 to coordinate AHEAD-TFCA programmes in the TFCAs bordering South Africa and, at this stage, the AHEAD-GLTFCA programme in particular. Her post in SANParks is funded by the South African Department of Environmental Affairs and Tourism (DEAT). Nicky trained and served as a medical practitioner, took a diploma in business management and subsequently taught in an advertising school. At the 6th AHEAD-GLTFCA meeting in March 2006 the question of appointing a full time coordinator to deal with policy development and disease interface issues in TFCAs was discussed and Dr. Hector Magome undertook to seek funding to support two fulltime posts to coordinate and take the AHEAD-TFCA and policy process forward. One post was to be based in Pretoria dealing primarily with policy issues and a second post would be based in Kruger National Park to deal more directly with coordination within the GLTFCA. Funding is still being sought for the second post. Piet noted that this was Nicky's first full Working Group Meeting as coordinator and he wished her well.

Delegates then introduced themselves in turn.

It was noted that this was the largest Working Group meeting thus far with over 50 participants.

PLEASE NOTE THAT PDFS OF MOST OF THE POWERPOINT PRESENTATIONS DELIVERED AT THE MEETING ARE AVAILABLE FOR DOWNLOADING AT http://www.wcs-ahead.org/gltfca_march2007/agenda_march2007.html .

3. BRIEF INTRODUCTION TO *AHEAD* AND BACKGROUND - Nicky Shongwe

The following text from power point slides provided a brief introduction to the *AHEAD*-GLTFCA programme for those who had not been to previous meetings.

Slide 1: The AHEAD-GLTFCA Programme

- 9th Dec 2002, signing of international treaty for GLTP
- World Parks Congress, 2003, AHEAD launch
- Various NGOs - WCS, IUCN's SASUSG, Veterinary Specialist Group etc
- 80 invited participants, Sn Africa, E Africa, Europe and U.S.A.
- Vets, ecologists, economists, wildlife managers etc

Slide 2:

- Aim – address conservation and development challenges at the interface between wildlife, livestock and humans – in relation to health
- Focus – key protected areas, esp TFCAs
- GLTFCA – identified as high priority
- NB -
    - Conservation area
    - Large population in and around park
    - Potential for conflict
    - Political & economic factors etc

Slide 3:

Since 2003:

- Several working group meetings
- Smaller meetings – core group
- Started off as livestock/wildlife/human health interface
- Constant evolution
- Animal/ecosystem/human health interface
- Recognising contribution of ecosystem goods and services and human health
- Conceptual Framework Document

Slide 4:

- Wildlife Conservation Society (WCS) US-based, lead supporting NGO
- Host website: www.wcs-ahead.org
- Also, USAID, Sand County Foundation, et al. - funders
- Current co-ordinator post - SANParks/DEAT

4. OBJECTIVES AND FORMAT OF THE 7TH WORKING GROUP MEETING

Nicky Shongwe

The following text from power point slides formed the basis of an introduction to the objectives of the *AHEAD*-GLTFCA programme and the objectives and format of the 7th Working Group Meeting.

Slide 1: Objectives of the 7th AHEAD – GLTFCA Working Group Meeting

Slide 2: Overall objective of the AHEAD – GLTFCA programme:

"Facilitate development and conservation success through integrated understanding based on innovative, inter-disciplinary applied research, monitoring and surveillance at the interface between wild and domestic animal health, ecosystem goods and services and human livelihoods and wellbeing."

Slide 3: Facilitate:

- Involves many others, many stakeholders in GLTFCA
- Need to get agreement
- Policy NB

Slide 4: Development success?

UNDP guidelines

Conservation success?

TFCA guidelines

Question: Who are the beneficiaries – how genuine are we that we would like to see the benefits going there? What is success for the various stakeholders?

Slide 5: Integrated understanding based on innovative inter-disciplinary…

- Inter-disciplinary work – relatively new concept, requires new attitudes and approaches
- Innovation requires creativity –

Slide 6: Harvard Snowflake Model:

6 traits for creativity

1. Personal aesthetic
2. Problem finding
3. Mental mobility
4. Risk taker
5. Objectivity
6. Inner motivation

Creativity >>>>innovation

Slide 7: Applied (research, monitoring and surveillance):

- Relevant to needs, results - oriented
- Needs to be implemented somewhere

Question: whose needs? (e.g. is community interested in biodiversity)

Slide 8: At the interface:

- Implies relationships between entities
- Linkages
- Own separate excellent research vs. linked, inter-disciplinary brilliant research

Slide 9:

Between wild and domestic animal health, (well represented in AHEAD)
Ecosystem goods and services, (need more here)
and human livelihoods and wellbeing, (and here)

Slide 10: Objectives for this meeting

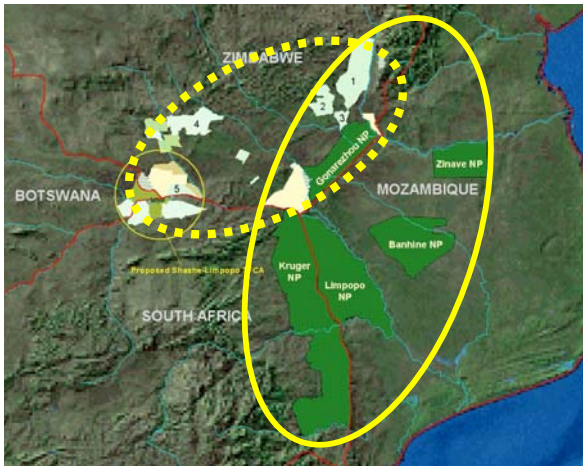
- Gain more knowledge and understanding of other 2 'arms' - ecosystem and human health contribution
- Build and explore linkages
- Gain better understanding of how to be integrated/inter-disciplinary/innovative
- Stimulate action to get results

Slide 11: Question:

"researchers are the people who listen the least because they think they know the solution…"

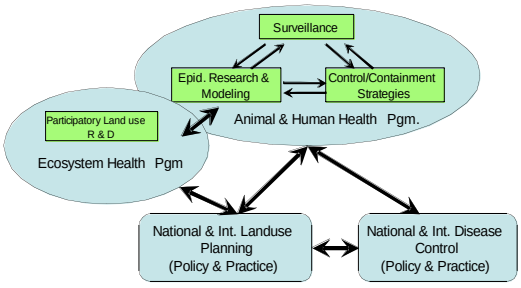
5. THE AHEAD-GLTFCA PROGRAMME: KEY QUESTIONS AND CONCEPTUAL FRAMEWORK REVISITED – David Cumming

The following slides were presented on the revised conceptual framework[1]. Printed copies of the full paper (Cumming et al 2007) were available to all participants [and "**The *AHEAD* (*A*nimal *H*ealth for *E*nvironment *A*nd *D*evelopment) - Great Limpopo Transfrontier Conservation Area (GLTFCA) Programme: Key questions and conceptual framework revisited" is available for downloading at** http://www.wcs-ahead.org/workinggrps_limpopo.html]. The first five slides shown below outlined the evolution of the conceptual framework to its present stage, which is captured in the last five slides. The major shift in the development of the framework has been in placing the triad of wildlife, domestic animal, and human diseases and zoonoses more firmly within a sustainability and livelihoods framework, resulting in greater interdisciplinary cohesion.



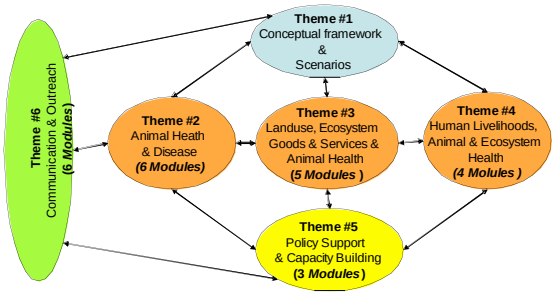
Concepts for an integrated approach (Nov 2003)

Programme Integration?

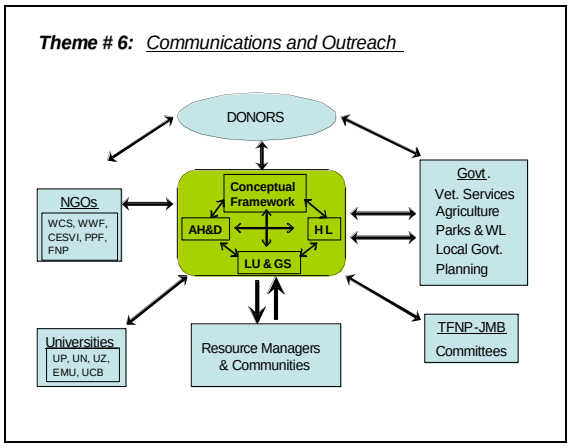


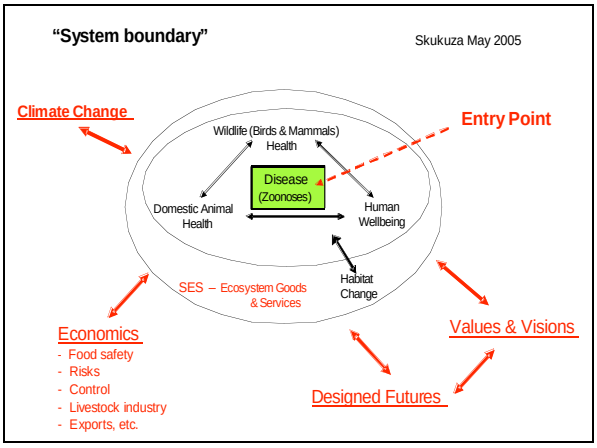
Pretoria – April 2004 : Concept Paper

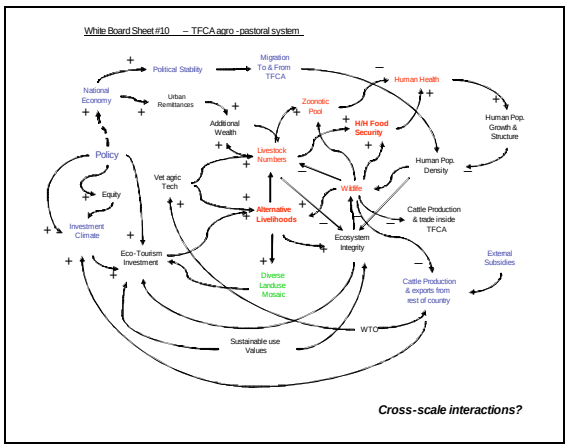
"Sustaining animal health and ecosystem services in large landsc apes"

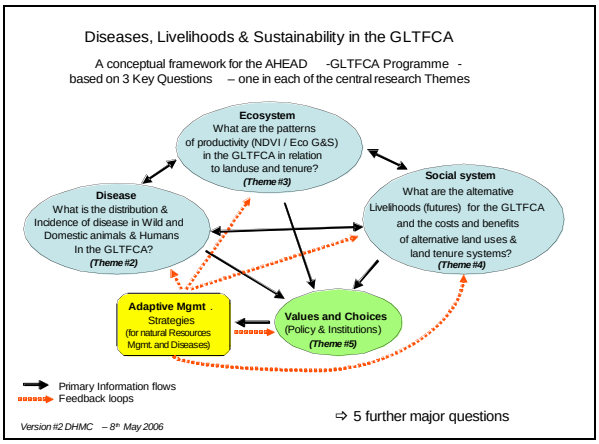


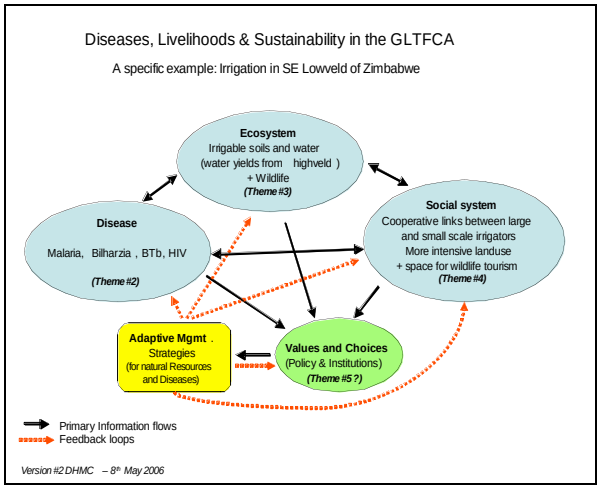
+ 3 countries, 6 provinces, 10+ Districts, etc.











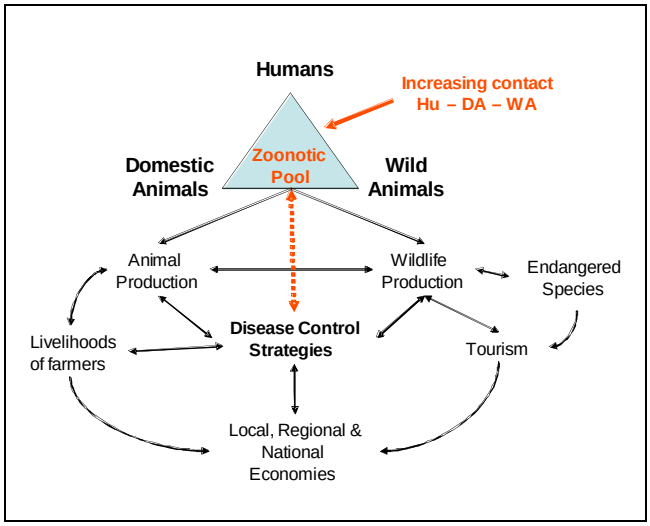
Diseases, Livelihoods & Sustainability in the GLTFCA

A conceptual framework for the AHEAD -GLTFCA Programme -

Five major questions

1. What types and pattern of landuse and tenure will enhance system health *, productivity and resilience (sustainability) of the Social -Ecological System (SES) of the GLTFCA?
2. What is the state and trend of the five capitals (Natural, Human , Social, Financial & Physical) in each landuse/land tenure component of t he TFCA and how might these change, and system influence health , under differing scenarios?
3. How will the biodiversity, environmental, social and economic tr ade offs/opportunity costs of alternative patterns of landuse influe nce adaptability and resilience of the SES?
4. What cross subsidies exist within the system and how vulnerable are they to disturbance and shocks?
5. What is the level of external subsidy to the GLTFCA system and h ow dependent is the system on, or vulnerable to, external subsidies ?

* "***Health***" refers to wild and domestic animal health and human livelihoods – the disease component of the AHEAD programme.



Discussion:

1. *Where are we making progress?* The major shift or area of progress in developing the AHEAD-GLTFCA conceptual framework has probably been in the more explicit inclusion of ideas about complex systems and that we are dealing with linked social-ecological systems. As a result the issues of system sustainability, the "One Health" concept, and human livelihoods are more clearly included, which results in a more coherent inter-disciplinary framework than we had initially. This has served to bring out the overarching key research questions more sharply.

2. *Duplication of effort?* In part the problem of duplication of effort is being tackled by trying to bring about an integrative overview of the whole GLTFCA and its problems and also by developing and maintaining a list of the research and development projects that are taking place within the GLTFCA. This was started at the last meeting (see the last table in the record of the 6th Working Group Meeting, also available at http://www.wcs-ahead.org/workinggrps_limpopo.html) but has not made a great deal of progress. However, it is important to appreciate that some measure of duplication and overlap provides a level of insurance that contributes to system resilience. The AHEAD Programme is sufficiently unique and inter-disciplinary for there to be little danger of duplication with other programmes.

3. *Levels of activity.* It was noted that it would be important to try and maintain a similar level of activity across all three countries engaged in the programme.

4. *Who is the target audience?* The conceptual framework is aimed primarily at research workers who are engaged, or who may wish to engage in the programme. It aims to provide a framework that will help guide and integrate research across disciplines and also set that research more clearly within the wider development and livelihood needs of the GLTFCA. It should also place environmental issues, which tend to be marginalized, in the forefront of the development agenda.

5. *Biodiversity.* Conservation of biological diversity is a central tenet of TFCAs and there is a danger of losing sight of basic principles. SADC included references to the AHEAD programme and the importance of disease / interface issues in their 2006 SADC Regional Biodiversity Strategy (see http://www.wcs-ahead.org/sadc.html).

6. *Feedback*. There is an ongoing need for members of the Working Group to continue to provide feedback, critical or otherwise, on the conceptual framework.

6. GLTFCA DISEASE ISSUES

(see 6.5 for discussion points arising from the following papers on disease issues)

6.1 Addressing animal disease threats and priorities in the GLTFCA – a JMB Conservation and Veterinary Sub-Committee update on progress.

Roy Bengis, Nazare Mangueze, Chris Foggin and Markus Hofmeyr,

The power point presentation by Markus Hofmeyr contained slides with the following text and or photographs:

Slide 1: **The title slide** showed an oblique aerial photograph of cattle crossing the Limpopo River

Slide 2: **GLTFCA JMB Veterinary Subcommittee Mandate includes:**

- The identification of potential animal health issues and challenges related to expansion of the geographic range of wildlife and their pathogens.
- Identification of potential conservation threats related to pathogens cycling in neighbouring livestock (in all 3 countries)
- Identification of the related human health, domestic animal health and zoonotic issues
- Inclusion of these veterinary issues in the development of a Joint Management Plan for the GLTP
- To advise the Joint Management Board (JMB) on the management of animal health challenges, and prioritise appropriate activity areas to address these issues

Slide 3: ***TFCA SUMMARY DOCUMENT FROM THE VETERINARY SUB-COMMITTEE***

PRIORITISATION OF ANIMAL HEALTH CHALLENGES IN THE GLTP

A) INFRASTUCTURAL AND TECHNICAL NEEDS

- Diagnostic capability specifically related to basic disease monitoring
- Centralised data base with GIS capability and data management system

- Communication network
- Technical equipment
- Training and capacity building
- Understanding human/livestock/wildlife interaction around the GLTP
- Development of a Wildlife Veterinary Unit in Mozambique
- Actual implementation of wildlife related disease-monitoring programs
- Planned buffalo translocations to Limpopo National Park
- Sable introduction from Zimbabwe to LNP
- Planned fence on the northern Limpopo River Bank - Zimbabwe

Slides 4 & 5: **B) DISEASE SURVEILLANCE AND MONITORING**

1) Bovine Tuberculosis (BTB) and Brucellosis

- Monitor of BTB and brucella status of cattle in the Sengwe corridor.
- Monitor of BTB and brucella status of cattle in the Limpopo National Park
- Monitor of BTB and brucella status of cattle on the KNP western boundary
- Monitor the TB dynamics of the KNP and Limpopo NP buffalo herds
- Planned survey in Shingwedzi basin (KNP & LNP) – 2007
- Planned survey in Gonarezhou NP and Mateki Hills in Zimbabwe - 2008

2) Tsetse flies and Nagana

- Monitoring of tsetse fly activity and spatial/temporal spread in Gonarezhou National Park.
- Monitor the northern KNP and LNP for tsetse fly incursion.

3) Anthrax and Rabies surveillance and monitoring

- Report acute death situations in herbivores (wild and domestic)
- Collection of blood smears (with field data sheet)
- Reporting of animals with abnormal behaviour (wild and domestic)

4) Topotyping of foot & mouth disease viruses in buffalo in KNP and Limpopo National Park.

- Collect blood and probang samples from a significant number of buffalo in Limpopo National Park and northern KNP

5) Foreign animal disease surveillance in wildlife

e.g. Rinderpest, Canine distemper, High Path Avian Influenza

6) Surveillance for wildlife-related diseases in livestock

e.g. Foot and mouth disease, Theileriosis, African swine fever, Trypanosomiasis and Malignant catarrhal fever

Slide 6: C) PRIMARY ANIMAL HEALTH CARE AT THE INTERFACE

- Vaccination of cattle against FMD and anthrax
- Vaccination of dogs against rabies and canine distemper
- Deworming of dogs (including *Echinococcus*)
- Regular dipping and inspection of cattle

Problematic overall!!

Slide 7: **INDIGENOUS AFRICAN DISEASES THAT ARE "SILENT" IN THEIR TRADITIONAL HOSTS**

- foot & mouth disease in buffalo
- African swine fever in wild porcines
- African horse sickness in zebras
- Theileriosis in buffalo
- malignant catarrhal fever in wildebeest

Slide 8: **INDIGENOUS MULTI- SPECIES DISEASES THAT ARE INHERENTLY FATAL**

- anthrax
- rabies

Slide 9: **FOREIGN ANIMAL DISEASES**

- rinderpest
- bovine tuberculosis
- canine distemper
- avian influenza
- classical swine fever

Slides 10 -12: **The FMD Epidemic Cycle**: Photographs of buffalo, impala and lesions on cow's tongue

Slide 13: **Corridor Disease**: Photographs of ticks on a buffalo, a sick cow and a blood smear

Slides 14: **Trypanosomiasis**: Blood smear showing trypanosomes

Slides 15-16: **Anthrax**: Photographs of a blood smear and a dead kudu.

Slides 17-20: **Bovine Tuberculosis**: Photograph of a buffalo, maps of the GLTFCA, Lion and BTB, proximity of cattle and buffalo near Limpopo River,

- Non-lethal survey conducted in 2006 in the northern zone, focusing on herds in the Limpopo Valley confirmed a low prevalence of TB in this area
- Two herds were tested in Limpopo NP with no positive animals found
- New species: wildebeest, blesbok and bushbuck

Slides 21-23: **Rabies, Swine Fever, Avian Influenza, Lumpy Skin Disease** with photographs

This report was followed by a brief report from Dr. Agostinho de Nazare on wild and domestic animal populations and the epidemiological situation in and around Limpopo National Park. The numbers of livestock indicated in the table below are estimates for 2006, while the wild animals were counted during a survey in October 2006.

Livestock and wildlife numbers in Limpopo National Park

Species	Number	Species	Number	Species	Number
Cattle	21,796	Elephants	630	Sable	62
Goats	11,272	Buffalo	225	Giraffe	23
Sheep	1,623	Wildebeest	358	Zebra	325
Pigs	310	Kudu	273	Impala	496
Dogs	1,052	Nyala	257	Roan	6
		Waterbuck	86		

There were no disease outbreaks in the Limpopo National Park. African swine fever outbreaks occurred in the Massingir District where 300 animals were affected in February 2006 and a further 900 animals were affected in Mabalane village in July, 2006. There was an outbreak of LSD in Chokwe where 1, 000 animals were infected in November 2006. Blackwater fever infected 4,000 cattle in Chokwe, also in November, 2006.

The following vaccinations were effected in the Limpopo National Park during 2006: 16,857 for FMD, 15,484 for anthrax, 5,314 for blackwater and 331 for rabies. Skin tests for bovine tuberculosis were carried out on 3,180 cattle in Mabalane District and 978 in Massingir District.

The major constraints to effective surveillance and disease control were a lack of infrastructure, problems with the delivery of vaccines and a lack of information.

6.2 South Africa/Mozambique collaboration on animal disease surveys: Progress and update.

Peter Buss and Carlos Pereira

The update comprised two presentations, one by Peter Buss and a second by Carlos Pereira, as follows:

6.2.a Results of the bovine tuberculosis (BTB) surveys that were completed during 2005 and 2006. Lin-Mari de Klerk-Lorist and Peter Buss

Prevalence of BTB was sampled in the southern section of KNP, south of the Sabie River, in 2005, and in three areas in the north of the park during 2006. A detection survey was carried out in the south eastern corner of the LNP.

2005 lethal Survey. In the lethal BTB survey conducted south of the Sabie River the locations at which buffalo herds were to be sampled were randomly generated. Animals from the nearest herd to these points were euthanized with a saturated scoline solution and any animals that were not dead on being darted received a brain shot. Carcasses were transported to the abattoir where necropsies were performed. Lymph nodes were removed from all of the carcasses and presented for *M. bovis* culture with a minimum of four samples per buffalo. Samples for affected organs were also collected for histopathology.

A total of 206 buffalo (83 male and 123 female) were sampled from ten different herds south of the Sabie River. Sixty three animals were found to be positive for *Mycobacterium bovis* of which 13 were less than 2 yrs old, and of these 5 were still calves. The current prevalence for the area south of the Sabie River is estimated to be 30.3% with a range of 17.4 - 54%. The distribution of lesions in the buffalo carcasses was as follows: lung – 26%, thoracic lymph nodes – 17%, lung, head and thoracic lymph nodes – 16%, carcass and/or abdominal lymph nodes – 15%, head lymph nodes – 12%, lungs and thoracic lymph nodes – 10%, generalized disease – 4%.

Conclusions from the 2005 survey were that BTB prevalence in different buffalo herds varied between 17 and 55%. Prevalence has not increased since the previous surveys were conducted in 1996-1999 suggesting that the disease may have reached a plateau phase.

2006 non-lethal Survey. The selection of sample locations and herds followed the methods employed in the 2005 survey. Buffalo were immobilised with standard doses of M99 (etorphine) and all were painted with large silver numbers for identification. Radio collars were fitted to some

animals. Blood samples were collected via jugular puncture and interferon-gamma assay was used to determine the BTB status of each individual. Animals that tested positive were euthanized and samples were sent for culture and histopathology.

A total of 133 buffalo (53 male, 78 female) were captured from 12 herds and two animals were found to be positive for BTB. During this survey buffalo were taken along the Limpopo River, as opposed the along the Luvuvu River where they were found during the 2005 survey. Before and after the survey two buffalo were found north of the Luvuvu River with extensive BTB. These results show that bovine tuberculosis has reached the northern boundary of KNP where the prevalence is estimated to be between 1-5%.

Limpopo NP Survey. Known resident herds were targeted to determine their BTB status and methods employed were the same as those used in the 2006 non-lethal survey in KNP. The final results are not yet available.

BTB Monitoring in 2007. Selected herds will be sampled in the Shingwedzi valley and herds believed to be moving between KNP and LNP will also be sampled. Sampling in Zimbabwe could not be undertaken this year but will possibly be carried out in 2008 although there are important logistical constraints such as few roads and the availability of a helicopter.

6.2b Results of a survey to detect bovine tuberculosis (BTB), brucellosis and the status of FMD in buffaloes (*Syncerus cafer*), and tuberculosis in cattle in the Limpopo National Park and adjacent areas.

Carlos Lopes Pereira, Rosa Costa, Agostinho de Nazaré Mangueze, Peter Buss, Roy Bengis, Markus Hofmeyr, Lin-Mari de Klerk, Danny Govender, Louis van Schalkwyk.

Settlement along the Limpopo River and within the LNP provides a direct interface between wildlife and livestock. Bovine tuberculosis has been present in the Gaza Province but at a very low level; 1% or less between 1981 and 2003. A pilot survey of BTB in cattle in the LNP was conducted in 2004 with 1600 cattle (an 8% sample) being tested in Chicualacuala, the northern district of Gaza – three tested positive. In November 2004 the first pilot survey of resident buffalo in the LNP was conducted. Ten animals from a herd of 30 were captured and sampled and none were positive.

In May 2006 a survey was conducted to determine the infection risk of BTB to the Greater Limpopo Transfrontier Conservation Area. Buffalo were immobilized in 2 places, (i) 30 animals from 2 groups close to Madonze river 14 km apart from each other and 10 km from Machamba and Chimangue, (ii) a group 22 animals in the Limpopo Elephant triangle 3 km from the locality of Psitima. A total of 52 animals was sampled from a population of 150 at risk. Cattle were tested in 13 localities of the 17 existing in the interface with LNP. In four localities it was not possible to work because of the lack of

a crush pen. The total number of animals tested was 4158, of which 3180 animals (76.5%) were from adjacent areas along the Limpopo river and 978 (23.5%) from inside the LNP. Fraction tested = 34.8% , Population at risk= 11935.

Results: One buffalo of the 52 captured tested positive to the interferon-gamma assay but histological examination was negative and the culture results are awaited. The animal could have yielded a false positive. No positives to the single tuberculin skin test were found in the 4,158 cattle tested in the interface zone. This was a 35% sample of the 11,935 cattle in the zone.

Samples from 49 Buffalo were tested for brucellosis and for FMD. Only one animal tested positive for brucellosis. The "Blocking ELISA" test for FMD antibodies provided the following results SAT1= 39 animals (79.6%), SAT2 =35 animals (71.4%) SAT 3=38 (77,5%). The PCR and viral isolation (probangs) were negative.

Human-Wildlife Conflict Buffalo in the Limpopo-Elephant triangle are in permanent contact with cattle, and are being poached by members of the communities. They survive in a 6x3 km forest which is being destroyed for producing charcoal and for cultivation. The animals are probably destroying crops and transmitting FMD and Corridor Disease.

Conclusions:

- BTB was not detected in the buffalo of the resident herds in LNP . This is an indication that BTB is either absent or present at undetectable levels (prevalence <1%) .
- Bovine Brucellosis was detected in one animal (2%) n= 49 from Madonze River. No positives were found in the Limpopo-Elephant triangle location.
- BTB was not detected in cattle inside the LNP or in its periphery (interface)
- Buffalo in the Limpopo/Elephants triangle are in a permanent high level of conflict with communities.
- Buffalo in the Limpopo-Elephant triangle are the source of FMD virus and of *Corridor disease for cattle in the region which reappeared in the South of Mozambique in 2004 for the first time since 1960.*

Recommendations:

- Buffalo from the Limpopo-Elephants triangle should be removed as soon as possible.
- Considering the disease status of BTB and Brucellosis (extremely low or free) the buffalo should be translocated to Gorongosa National Park. The likelihood of being infected if

translocated to other parts of the Limpopo is greater than if translocated to GNP which recently acquired BTB and Brucella free buffalo. They will not constitute a risk for cattle (FMD and Corridor) since there are no cattle close to GNP because of tsetse and trypanosomiasis.

6.3. Update on OVI BTB approaches and relevance to the GLTFCA.

Claire Geoghegan (on behalf of Anita Michel)

Ondersterpoort Veterinary Institute is working on improved diagnostic tests for TB and BTB and exploring the development of vaccines against BTB. They have applied for European funding a part of the BTB Study Group which meets 4 times a year at Kruger. In addition OVI has developed a proposal looking the risk of the M. bovis infection of rural communities via milk. They are also looking at the potential for cattle infection with multi-drug resistant human TB. Specific needs of the project include funding and collaboration with social scientists to deal with mapping, house hold interviews etc.

Claire (University of Pretoria, Dept of Zoology and Entomology) is working with communities around Hluhluwe-iMfolozi Park where she is testing wildlife, livestock and human patients with TB and HIV, to assess the risk of BTB exposure and infection for humans. This project is linked with other projects examining animal diseases in the area, run by the University of Pretoria Veterinary Department.

6.4 CIRAD Lowveld Livestock (CLLP) project and other activities[1].

Alex Caron

This study is part of a global approach proposed in the framework of the GLTFCA and relayed at a more specific level by the Conservation and Veterinary Sub-Committee of the TFCA. As mentioned in the previous section the GLTFCA proposition encompasses a matrix of different land-use patterns ranging from National Parks to communal areas. In the latter, where sustainable livestock production is promoted, the interactions between livestock and wildlife have to be harmonised through sound management. The health issue will be a lose-lose or a win-win situation for livestock and wildlife, with no opportunity to tackle the issue by considering only one system. Diseases can spread from wildlife to cattle and the other way round with deep impact on both development and conservation. An ecologically acceptable livestock production system integrated into both the national economy and the conservation objectives of the GLTFCA is also crucial. **Small-scale farmers cannot be left behind during this decision-making process and understanding their strategies, opportunities**

[1] Funded by the French Embassy in Zimbabwe and Coordinated and Implemented by CIRAD

and perceptions for such changes is the goal of this project. The success for conservation objectives as encompassed by the GLTFCA goals is an achievable objective only if a healthy, successful and sustainable livestock production system in the communal areas is reached.

At the study site scale, the improvement of veterinary service delivery will increase the trust of communities in their veterinary authorities and help them to manage their herds' health. Through this modest input, we will try to gather relevant data concerning the status of the cattle population in the area and the structure of the livestock production system(s). Through interviews and questionnaires the perceptions of communities towards the TFCA and wildlife will be elucidated.

Overall objectives

Taking into account the needs in animal production systems highlighted in the feasibility study and other reports, this survey will focus on understanding the socio-economic aspect of cattle production systems in areas where a wildlife / livestock interface is present. It will be integrated into other socio-economical and political work already being undertaken in the sub-region.

Methodology

In order to access the local community and the type of information required, the study will take veterinary services as an entry point, assuming that this service is today ineffective (because of lack of consumables and material; from field observations and interviews) and because of the need to improve the well being of farmers. Through a questionnaire approach (at the individual level initially, but at a group level after 6 months), the survey will try to give an overview of the livestock systems from the point of view of cattle owners.

This starting point will offer the possibility for further investment in exploring production systems in the Lowveld at a wider geographical level or through different points of view (cattle traders for example). Partners could use the results of the study as a starting point for the implementation of more ambitious projects.

Timeline & Logistics

The project started in September 2006 and should run until September 2007 at least. Two final year veterinary students from the University of Harare, and one CASS PhD student, are involved in the project, as well as two local experienced veterinary staff with the collaboration of their organisation. A CIRAD researcher is supervising the project.

6.5 Molecular studies in zoonotic tuberculosis in Mozambique

Custódia Mucavele, Adelina Machado, Mateu Espansa, Elisabete Nunes

Introduction. Human TB is one of the most widespread infectious diseases and a leading cause of death, particularly in developing countries and especially in Africa. Tuberculosis affects animals and humans and is usually a chronic debilitating disease caused by bacteria of the *Mycobacterium tuberculosis* complex (MTC) which includes: *Mycobacterium bovis, M. tuberculosis, M. africanum, M. caprae, M. microti M. canetti* and *M.pinnipedii.* All these species show a very close genetic proximity. *M. tuberculosis* is the most common cause of TB in humans. However, a number of cases in humans are caused by *M. bovis* (Cosivi *et al*.1998). While *M. tuberculosis* is responsible for the disease almost exclusively in humans, *M. bovis* has a wide range of hosts in which it can cause disease, including humans.

Transmission: *Mycobacterium spp*. can be transmitted through contaminated aerosols, milk, faeces, urine, genital fluids, food and water. The typical route from livestock to humans is through agricultural workers inhaling the aerosols coughed up by an animal. Such patients may infect cattle, but evidence for human-to-human transmission of *M. bovis* is limited in immune-competent people (Gutierrez *et al.* 1997; Cosivi 1998).

Epidemiology. 9 million cases of TB were reported in 2004 and of those, around 2 million people died due to the disease (WHO 2006). The situation in Africa has tended to worsen, with HIV playing a key role in increasing number of people infected. More than 80% of TB infected people live in sub-Saharan Africa and in Asia.

Table 1 – Epidemiological situation of Human TB in Mozambique

Population	19 424 000
Incidence	460/100 000 pop
Annual prevalence	635/100 000 pop
Annual mortality	129/100 000 pop
HIV incidence in adult TB patients	48%
MDR – TB	3,3%

Mozambique is one of the 22 countries classified by WHO as "High Burden Countries (HBCs)"

Zoonotic TB in humans. *M. bovis* is responsible for 5-10% of human TB in Latin America, (Haddad *et al*. 2004). These rates are quite similar in Africa (Cosivi *et al.* 1998). Recent studies have reported *M. bovis* as being responsible for 1-6% of human TB in Africa (Cadmus *et al*. 2005 and Kazwala *et al.* 2001). The major risk factors are close physical contact between humans and potentially infected animals (very common in many rural areas in Mozambique), infection by HIV and poor food hygiene practices (contaminated milk).

Distinguishing between TB caused by *M. tuberculosis* and by *M. bovis* is not possible with the use of current routine diagnostic techniques (Amanfu 2006) because the two diseases show similar clinical symptoms and similar bacteriological characteristics in culture media; biochemical techniques also often do not reveal the difference. This makes it necessary to resort to molecular techniques.

Relevance of the Problem. Mozambique is a country where bovine tuberculosis is present in all regions of the country and screenings for bovine tuberculosis in cattle have revealed prevalence rates varying from **less than 1% to over 17%** (DINAP 2005). On other hand, there has been an increase in the incidence of human TB and HIV. The risk factors for zoonotic TB are present in Mozambique, particularly in the rural areas. The impact of *M. bovis* in human TB is unknown. This work has been developed to fill the gap, allowing us to learn the real situation of pulmonary tuberculosis by *M. bovis* in the community in general and in HIV seropositive patients in particular, looking back to the epidemiological role and importance of animals as sources of the disease.

Objectives

- **General Objective** - Identify the involvement of *M. bovis* in human pulmonary TB
- **Specific Objectives**
  - Study the biodiversity of MTC isolates from cases of TB in two rural areas (Buzi and Manhiça) in Central and Southern Mozambique;
  - Identify risk factors important in zoonotic TB in the two rural areas.

Materials and methods. The study is taking place in two districts, Buzi in central Mozambique and Manhica in southern Mozambique. Bovine and human TB occurs in both areas. Human sputum isolates from the samples were used. Both sexes were included, provided they were older than 14 years and were TB patients with BK^+ and agreed to participate in the study. HIV tests (UniGold™ and Determine™) were carried out, again only with the agreement of the patient. Smear microscopy and culture of sputum samples is carried out at the National Reference Laboratory and the Laboratory of Mycobacteriology of the Manhiça Health Research Centre (CISM). DNA extraction and amplification (by PCR) for spolygotyping (Kamerbeek 1997) is carried out at the Centre for Molecular Biology of the University Eduardo Mondlane at the Veterinary Faculty. Spoligotyping is a PCR-based method used to simultaneously detect and type the closely related *Mycobacterium* that was used for typing in this study. The spolygotyping (***spacer oligonucleotide typing***) method is based on the presence or absence of any of the 43 spacing sequences ("spacers") located at the direct repetition (DR) region of CMT Mycobacteria. The method allows quick screening (48H). The results obtained are of easy interpretation and can be easily shared in international databases of genotypes of *Mycobacterium.* The differential characteristic of ***M. bovis*** is **lack of the spacers 39 and 43.**

Results. A dendrogram showing the patterns of hybridization of the different samples was developed.SpoligoType.xls. The spoligotyping results were compared to the World Spoligotyping Database of the Pasteur de Guadeloupe Institute (SPolDB4) http://www.pasteur-guadeloupe. fr/tb/ spoldb4. In Buzi 160 patients were recruited of which 157 had BK results and culture. TB was not confirmed in three cases. TB was confirmed in 93, and molecular typing was carried out on 39 cases. No cases of *M. bovis* were found. *M. tuberculosis* strains were as follows: LAM Family - 19%, MANU Family - 15%, EAI Family - 11%, ST702_Buzi -11%, ST129_Buzi - 7%, S Family - 4%, T Family - 11%. In Manhica 214 patients were recruited of which TB was not confirmed in 18 cases. PT confirmed 130 cases and molecular typing was carried out on 41. Again *M. bovis* was not found. The *M.tuberculosis* strains were as follows: T1 Family - 27%, S Family - 22%, ST70_Manhiça - 12%, LAM 9 Family - 10%, EAI 1 Family - 2%. The genotypes were similar to those found in neighbouring countries.

Contrary to expected results, no *M. bovis* was identified in the 80 isolates submitted for genotyping. In a study by Nunes E.(2004) in Maputo of 232 HIV positive patients with pulmonary TB, no *M. bovis* was detected. Strains isolated from Buzi showed a wide diversity while in Manhiça they were limited. The greater diversity in Buzi is possibly related to greater migratory movements. Low diversity of genotypes is an indication that the sources of infection are the same.

Study constraints: The culture of Mycobacterium under routine techniques - with **glycerol in the culture media** – negatively influenced the growth of *M. bovis*. Culture media enriched with pyruvate (more specific and favouring growth) are recommended for cultivation of *M. bovis*. Practicing the method was a long process. We experienced **several power breaks at our freezing unit,** which negatively affected our study, as several samples were lost. **DNA samples extracted from clinical cases** (sputum) were of poor quality and resulted in deprived hybridization patterns.

Recommendations. Undertake more epidemiological studies in geographical areas where bovine TB is highly prevalent. Specific risk populations should be the main targets in future studies (cattle carers, slaughter house workers and veterinarians). Studies on extra-pulmonary TB (intestinal and ganglionary) which may be related to consumption of contaminated raw milk should be undertaken. Use pyruvate enriched media to boost growth of *M. bovis* in culture media.

6.6. Discussion on veterinary issues (Presentations 6.1 to 6.5)

1. *Fencing along the Limpopo to contain the spread of BTB.* A game fence along the edge of the riparian woodlands on the north bank is envisaged but this still has a long way to go. The primary basis for the proposed fence is to create a wildlife area on both banks of the Limpopo and to reduce wildlife-human conflict in the Sengwe Communal Land. The fence has been requested by villagers but will also have to be accompanied by the provision of water points for cattle outside

the fenced area. The Limpopo Strip (as it is called) would be part of the Sengwe-Tshipise Corridor linking Gonarezhou NP and Kruger NP and would open up opportunities for tourist lodges on the north bank of the Limpopo as well as maintain both banks of the river within a protected area.

2. *Fencing and disease risks*. With both Mozambique and Zimbabwe concerned about the spread of BTB this complicates the risk assessments associated with taking down fences, or, in other areas of erecting them and so defeating the larger objectives of the establishment of transfrontier national parks or conservation areas. As indicated earlier, there are pressures in Zimbabwe to erect a fence but in Mozambique there are pressures to take down the fence and to remove people from the park. There is however no realistic way of eradicating BTB from the buffalo herds in Kruger NP and it will therefore be necessary to separate cattle from buffalo in the short term. The risk of BTB spreading from wildlife to cattle has not yet been examined and the overall risks, either way, have not yet been quantified. In the longer term the risks may be such that fences may not be required. There is also a need to incorporate social and economic issues into the debate – it is not a purely veterinary issue. From a conservation perspective there no indication that BTB is causing a population risk in buffalo but it may do so in other species.

3. *Veterinary database being developed by PPF*. The database is at the end of the first stage of development. It will be run by an IT specialist for a year and then two people will be appointed to run it. It will be an open access database with some levels of security so that access to some data can be restricted if necessary. It is hoped that a variety of organisations will use it.

4. *Origin of BTB in Chicualacuala*. There were three positive skin test cases but these have not been confirmed. No lesions were found.

5. *Conflict situation in the Limpopo-Elephant corner*. This is an endemic FMD area and the movement of buffalo to Chihuto has been documented. The problem is important because it is adjacent to one of the prime livestock production areas of Mozambique. The GLTFCA was one of the first created and its establishment was based on ecological and tourism criteria. Animal and human health issues, socio-economic considerations and conflicts with people and their crops were not taken into account when the political decision was taken to remove the fences. The result is that human wildlife conflict is emerging as a major issue and the lesson emerging is that greater integration of ecological, social, economic and health considerations is necessary in the establishment of TFCAs.

6. *Buffalo populations in the Sengwe-Tshipise Corridor*? Not known – there is only anecdotal information.

7. *Dipping and tick borne diseases*. Dipping before the bush war in the 1970s was very regular and controlled tick borne diseases but this resulted in high mortality once dipping stopped during the

war. However, it later became clear that even with reduced dipping the incidence of diseases remained low and enzootic stability ensued. Later research indicated that it was only necessary to dip in non-arid areas.

8. *FMD topotypes in the GLTFCA.* The extent of mixing of buffalo in the Gonarezhou NP and Kruger NP was such that they had similar topotypes. The translocation of buffalo from the Zambezi valley into GNP introduced a new topotype which raises the question of whether it has now been found in KNP? The introduced topotype has not yet been found in KNP.

9. *Fences and incentives*. The planned fence along the Limpopo will limit the movements of people and cattle, and given the speed with the reconstructed FMD fence in the southern part of GNP has been removed, it will be necessary to provide effective incentives to local people to keep their cattle away from the river and to leave the fence intact.

10. *Links between people tested for BTB and animals (*Mucavele *et al.* presentation). The people tested lived in rural areas but were not necessarily associated with livestock. The questionnaire administered to those tested did not establish whether they were cattle producers. A separate survey 2 years ago on herders who were in direct contact with livestock and who were drinking milk showed a high incidence of brucellosis but no cases of TB. It was noted that in humans where pulmonary TB is present, sputum provides a useful way of testing, but BTB is more likely to develop extra pulmonary lesions which will not be detected in sputum samples. Children less than 14 years were not tested in the Buzi and Manhica study but in similar studies in Tanzania, positives were mostly in children under 12 years old. However in rural areas of Mozambique people do not drink much milk and the route of infection is more likely to be through direct contact.

7. COMMUNITY AND LIVELIHOOD PROJECTS AND ISSUES IN THE GLTFCA

7.1 Community perspectives on interface issues[1]. Obed Baloyi and Sebastiaõ Malulete

The speakers had used disposable cameras to capture a range of images to illustrate aspects of life in their villages in / near the LNP. While these images were being shown, they spoke about matters of concern to them and these are summarised in the following points:

A. Obede Baloyi from Machambe Village.

[1] The participation of rural community members in the meeting was supported by WCS and facilitated by Nicky Shongwe, Madyo Couto, Jessica Milgroom and Rebecca Witter.

1. They sometimes see disease in their animals, e.g. the problem of diarrhoea in cattle and chickens dying without explanation. Humans also sometimes suffer from sweating and confusion.
2. Water is obtained by digging next to dry streams and this can have worms in it.
3. People use a lot of wild foods, e.g. marula.
4. Disease, however, makes them unhappy and they would like vets to visit them and advise them as people sometimes eat animals that have died.

B. Sebastiaõ Malulete from Makandazulu in Chicualacuala.

1. The photographs being shown are the things we see in our daily lives and we have a lot of diseases in out cattle, goats and chickens. We don't know what the diseases are or their origin. Many say they are from wildlife when they are not. In many cases people are using the same water as cattle and even elephants.
2. We face security problems with wildlife and many conflicts occur, particularly in the fields – our main activities are cattle rearing and agriculture.
3. The lack of transport is a major problem and distant villages are likely to be visited only once a year by officials.
4. While it is clear that a lot of research is being done people would like to see the results on the ground and to know what is happening.

Questions and answers

a) *Use of traditional medicines*?. They do have some but mostly for removing ticks. There is also one for gall sickness. However, these are rarely successful.

b) *Diseases from wildlife?* They think that diarrhoea is from wildlife – it wasn't known before.

c) *How do they see the future of their animals and the park?* They believe the park will help but resettlement is slow and uncertain and they need fencing and protection in the meantime. Even outside the park there are problem animals.

d) *Access to health care?* In some villages there are clinics but most have to walk long distances although rudimentary treatment is available in some villages.

e) *How can research make a positive change in their lives?* It is important for research to reach the local level. People want to be able to recognize and understand the diseases they see in their animals. There is a need for researchers to work together with people on the ground.

f) *What benefits are people expecting from the park?* Expect that tourists will bring money and thus improve peoples' livelihoods. Also the wild animals that have disappeared will return.

7.2 Transfrontier conservation: Historical and livelihood considerations within the GLTFCA. Webster Whande

Transfrontier Conservation Areas (TFCAs) have gained high and controversial attention in the Southern Africa region. On the one hand, it is argued that they stand to contribute to biodiversity conservation through ecosystem wide planning and harmonized efforts across geo-political boundaries. It is further argued that TFCAs will contribute to regional peace and security hence the term Peace Parks. Investment in tourism, it is argued, will generate revenues that will also benefit local people who live within these planned TFCAs.

To date TFCAs have been focused on getting the 'politics right', specifically on rallying governments and influential political leaders to support the approach morally, politically and through appropriate policy changes. On the other hand, it has been argued that TFCAs represent yet another imposition of conservation approaches conceptualized by the state and its international partners, without much regard for what happens on the ground. Specifically, TFCAs are criticized for demonstrating land grabbing tendencies through broad mappings of areas where land, resource rights and livelihood strategies are little understood.

Research being conducted in South Africa, within the Great Limpopo Transfrontier Conservation Area (GLTFCA), shows that increased attention on political support might be misplaced. Specifically, the research points to the role of historical experiences in shaping local perceptions of, and hence support for, conservation. Such perceptions, predominantly viewed in terms of local livelihoods, are critical and often hostile to conservation plans. Additionally, due to historical interventions that resulted in forced removals, the post-apartheid efforts at land restitution have opened up competing and conflicting claims to land that is generally regarded as strategic to the success of the GLTFCA, including the core protected area of the Great Limpopo Transfrontier Park (GLTP). Within the GLTFCA, land that has been claimed is increasingly under conflicting land use options as local people contest approaches that will result in the generation of tangible benefits. In this presentation I argue that the success of TFCAs will rely in part on understanding historically shaped perceptions of conservation and local contestations over land and natural resources. Additionally, TFCA proponents need to start looking at local contestations over land and natural resources as political problems that deserve equal attention to that being given at national political levels. The presentation is a conceptual exploration of human and environmental security, highlighting how such an approach can meaningfully address local demands as well as contribute to the objectives of biodiversity conservation.

Discussion:

1. *Cross border dialogue and movement*. The three countries speak to each other at national levels but not at the local level – at least not officially. Transboundary movements of people and livestock (e.g. sale of goats across the border) occurs but it is illegal. Information of conservation and resource management does not seem to be filtering across borders and there is little awareness of what is happening on the other side. Exchange visits (e.g. between Makuleke and Sengwe) do not appear to have rubbed off. On the South African side Zimbabweans are increasingly being seen as a threat. In the Madimba Corridor tourism is not seen as a beneficial option.
2. *Madimba Corridor and Makuleke*. There is a divide between Makuleke who are predominantly Shangaan and the Madimba Corridor people who are Venda, which has historical and ethnic dimensions. The Madimba Corridor leaders (including the chiefs) are cattle farmers and not interested in alternative land use options.
3. The military also play an important role in the governance dynamics of the area. Many residents claim that minerals are more valuable to them than wildlife and tourism.
4. *Community representation at Joint Management Board (JMB) level*? Originally there were six working groups with one at the community level but when the JMB was formed it was decided at ministerial level that communities should operate through their national level committees. Workshops and meetings are currently taking place to re-examine the question of local representation.
5. *Livelihoods in the SEL*. Presently there is a very high reliance on remittances from family members working in South Africa and people are mostly concerned with looking after their cattle which is the primary component of their livelihoods.

7.3. Resettlement and the GLTFCA: Current and pending livelihood strategies in the Limpopo National Park Area. Rebecca Witter, Jessica Milgroom

The power point for this presentation (see http://www.wcs-ahead.org/gltfca_march2007/agenda_march2007.html) consisted primarily of photographs. An abstract summary of the presentation follows below:

According to the vision statement for the Great Limpopo Transfrontier Conservation Area, the initiative promotes "sustainable use of natural resources to improve the quality of life of the peoples of Mozambique, South Africa and Zimbabwe." However, the establishment of the conservation area imposes major changes and challenges for the people living in it, and it is dubious as to what extent it will improve the quality of life of current residents. Focusing on the Limpopo National Park in

Mozambique, we describe local livelihood strategies, and give some examples about how the implementation of the park has begun to limit livelihood options. We suggest that the potential for local residents to adapt to these limitations and to develop alternative strategies is influenced by access to information and a sense of security about the future. These issues are particularly important in the context of resettlement, which has become a key option for people living in the center of the LNP. We conclude by discussing tree use and tree tenure as less considered livelihood strategies in the LNP and illustrate why they need to be taken into account in resettlement planning. We hope to stimulate discussion about the effect that these issues may have on the sustainability of the initiative as a whole.

Discussion:

1. *Resource access rights and ecosystem goods and services*. It may be very useful to try and examine the links between resource access rights and use (e.g. trees) and ecosystem goods and services and so draw out the linkages between the fine scales and landscape scales.
2. *Ownership of trees* depends partly on where they are. Trees in a field are owned by the family but those in the forest are owned communally.
3. *Access to traditional resources following resettlement?* The answer to this lies in the nature of the Mozambique legal framework. All land belongs to the state and the government and no one owns land in the sense of freehold title. However, where people have been living on and using land for more than ten years then government is required to pay compensation if they are moved or resettled. People can retain spiritual rights to features of the land from which they have been moved but, depending on the management plan for the area, do not have use rights, e.g. they can hold a ceremony under a tree but cannot harvest it unless the management plan makes provision for them to do so. In the Kgalagadi TFNP the San people have retained their historic resource access rights.
4. *Is resource use being quantified?* This may be important from the point of view of compensation when people are resettled. At the moment quantification is based on what people say they are using but biological measurements are not presently being used, although potential methods are being examined. Work carried out by the Shackletons in South Africa has shown that the use of natural resources can play a more important role in household livelihoods than employment.

7.4 Contribution of improved village poultry production to food security, income generation, decreased bush meat consumption, HIV/AIDS mitigation and avian influenza preparedness.

Cândido Faiela, Robyn Alders and Brigitte Bagnol

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Abstract

Based on a case study from Mozambique, the paper shows that increased village chicken production has the potential to improve food security, assist in poverty alleviation, HIV/AIDS mitigation, decrease bush meat consumption and promote the early detection of Highly Pathogenic Avian Influenza in rural areas.

The Limpopo National Park (LNP) is located in Gaza Province and this is ranked by the UNDP as one of the poorest provinces in Mozambique. According to the Technical Secretariat for Food Security and Nutrition (SETSAN 2005), the districts of Mabalane and Massingir are characterised by cyclical droughts, chronic vulnerability and food insecurity. At the level of the province, chronic malnutrition was 32% in 2005. Initiatives from government, communities, NGOs and commercial ventures are needed to promote both biodiversity and well-being of communities living within the LNP Support Zone. Agriculture is the mainstay of the rural population in this province as in most of Mozambique, and mixed farming (crop production and livestock raising) is common. One of the few natural capital assets owned by poor households is livestock, which play a crucial role in maintaining household survival in times of crisis. Besides being a natural source of animal protein, livestock are often one of the most important sources of cash income for the poor. Of all the livestock species, chickens are the most common.

According to the Ministry of Health (2003), HIV/AIDS prevalence in Gaza province is 16.4% and impacts on farm households by destruction of available labour through reduction in numbers of able-bodied workers, the time and energy available and the knowledge necessary for production. This loss of labour changes the focus of household activity from agricultural production to food security. Following a HIV/AIDS-related sickness or death, food security is maintained with difficulty in rural areas and this lack of food can further weaken the body's immune system.

The International Rural Poultry Centre (IRPC) is a subsidiary entity within the KYEEMA Foundation, a not-for-profit organisation based in Brisbane, Australia. It groups the specialists involved in village poultry production and the control of Newcastle disease (ND) under village conditions, who offer their services for rural poultry development activities internationally. The IRPC has assisted the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and partners (Food and Agriculture Organisation [FAO], Catholic Relief Services and Bethany) in Zimbabwe, FAO in Manica and Sofala Provinces and Corridor Sands Ltd (CSL) in Chibuto District of Gaza Province to improve village poultry production in collaboration with local communities and Government Services. Results from these and other IRPC activities in Southern Africa will benefit the LNP Community Program in Mozambique through cross-fertilisation of low-cost methodologies for improving village poultry production.

Village chickens provide scarce animal protein in the form of meat and eggs and can be sold or bartered to meet essential family needs such as medicine, clothes and school fees. They are active in pest control, provide manure as a fertilizer, are required for special festivals and are essential for many traditional ceremonies. The productive output of village chickens is lower than that of intensively raised birds but it is obtained with a minimum input in terms of housing, disease control, management and supplementary feeding. They are generally owned and managed by women and children and are often essential elements of female-headed households.

As women are the main carers of sick people, chickens can play an important role in providing them with additional resources to carry out their vital task of supporting people living with HIV/AIDS. In households where there is a lack of able-bodied workers, such as households affected by HIV/AIDS or those that have a disabled family member, village poultry provides a source of high quality nutrition and income without requiring much in the way of labour or financial inputs.

Improving poultry production in a cost-effective manner requires the introduction of appropriate management skills, together with supplementary feed, disease control (emphasizing the sustainable control of Newcastle disease), shelter, improved flock management and development of effective marketing strategies. The implementation of effective village poultry production programs in Asia, Africa and Latin America has resulted in increased poultry numbers, increased household purchasing power, increased home consumption of poultry products and increased decision-making power for women. The rapid and wide geographical spread of HPAI H5N1 has drawn attention to the neglect of village poultry health. Improving village poultry management, including biosecurity practices, will also make an important contribution to the prevention, early detection and control of Highly Pathogenic Avian Influenza (HPAI).

People living in support zones of a National Park or Reserve in Mozambique tend to hunt wild animals for bush meat, even though they recognize that it is prohibited. Improved village poultry production can contribute to reducing poaching of wild animals for bush meat, as the people will eat chicken meat and eggs for animal protein, vitamins and energy and have surplus chickens and eggs for sale.

Discussion:

1. *Advice for improving management*. The most important aspects are controlling diseases, housing and nutrition.
2. *Avian Influenza*. Mozambique has not had any cases but there are plans to introduce rapid tests. There is an ongoing national programme on AI awareness and control.
3. *Wild birds and Newcastle disease*. There is no information on the presence of Newcastle disease in wild birds but surveillance has been problematic. There is also very little information on the

incidence of disease in village chickens. However, in case studies where chickens were vaccinated against Newcastle disease, production increased dramatically. Chickens are also very important for child headed households and there is little doubt that improved chicken production can lead to a reduction in the demand for bushmeat and thus contribute to conservation.

7.5 Community Water Efficiency Programme (COWEP): Lessons learned about Protected Area / Community Relations. Alexis Symonds

Background

Water is a scare resource in South Africa. Many communities remain without an adequate water supply or services. In the effort to ensure that communities have access to clean, safe water and proper sanitation, the Department of Water Affairs and Forestry (DWAF) has identified an urgent need to involve communities in appropriate capacity-building and education initiatives by focusing on water use efficiency.

COWEP was piloted in 2002 in Buffalo City in the Eastern Cape, Mbombela Municipality in Mpumalanga and in a smaller site in Attridgeville Local Municipality in Gauteng. COWEP is implemented in collaboration with District Municipalities.

In 2005/6 SANParks and DWAF piloted a project aimed at encouraging water efficiency in arid areas, through the Community Water Efficiency Programme (COWEP). The project has been initiated in two communities, neighbouring Namaqua National Park namely Kamieskroon and Hondeklipbaai, as well as in the Augrabies community areas near the Augrabies National Park. The project has proved to be a resounding success and DWAF and SANParks will be rolling out the next phase of the project in three additional arid park communities in 2007/8. The project is jointly funded by DWAF and SANParks

The objectives of the project in arid parks are:

- To identify and address water related issues relevant to rural communities in arid environments
- To build partnerships, together with local authorities, for co-operative management of water resources in rural communities adjacent to National Parks

The COWEP utilises Youth Volunteers from each of the communities to drive the project. They are trained by specialised facilitators and work hand-in-hand with the SANParks People and Conservation Practitioners to implement the various phases of the project in the communities. The project is divided into 4 phases, namely, awareness-raising (which includes interventions in schools and in households) implementation, including tap and leak repair in 24 households in each community,

report-back to participants, local authorities and Park Forums and permaculture training and gardening projects in each community.

Highlights and Successes of the Project

- More than 1000 people participated in the two-week awareness raising phase of the COWEP
- A total of 385 households were visited individually and various methods employed to communicate water conservation messages, relevant to their particular situations.
- More than 300 learners participated in water education activities and games over a 5 day period.
- A total of 72 households participated in a tap & leak repair project during the 2-week implementation phase of the project.
- 18 youth volunteers in three different communities volunteered their services to the project and received relevant life skills training as well as the training required to implement the project.
- 7 of these Youth Volunteers qualified for Conservation Learnerships in the Parks.
- Community members enjoyed participating in the activities, also offered their assistance and shared their traditional knowledge about water conservation with the teams. Communities started using grey water for various gardening and other activities.
- 44 community members attended the 5-day permaculture training course. Community Gardens have been started in Augrabies and Kamieskroon, while in Hondeklipbaai 8 household gardens have been successfully started. In all three communities indigenous nurseries have been started to house plants before planting and to provide interested community members with plants.

The success of this project lies in the fact that it emphasizes a partnership approach and allows for meaningful interaction between Parks and local authorities, Parks and communities and involves a broad spectrum of participants from all sectors of the community in education activities as well as practical implementation strategies. Provided resources were developed to address local water issues, this project could be implemented successfully in any number of rural communities.

7.6 Update on "Local level scenario planning, iterative assessment and adaptive management" Jeanette Manjengwa and Chaka Chirozva

The project is essentially a longitudinal methodological experiment in facilitative intervention within the context of the Great Limpopo Transfrontier Conservation Area (GLTFCA). It is a module of the AHEAD-GLTFCA Programme and is targeting selected pilot sites in the three countries involved (Mozambique, South Africa and Zimbabwe). The project is the brainchild of Professor Marshall Murphree and his ideas leading up to the project can be traced in his presentations "Experiments with the future" (Berkeley seminar in 2001), "Negotiating the future" (WWF-SARPO seminar in 2004) and "Local level scenario planning, iterative assessment and adaptive management" (project proposal presented at the 5th AHEAD-GLTFCA meeting in Pretoria, 2005).

The **overall objective** of the project is to enhance the collective ability of rural communities to better manage their natural resources so as to maximize the conservation and livelihood benefits they obtain from those resources and location in the TFCA, through the use of scenario planning and the resulting social learning, self assessment and adaptive management.

The **specific objectives** are: (a) to improve the understanding of the GLTFCA planners of the needs and aspirations of the resident populations in the area, (b) to ensure their consideration in over-all planning and implementation, (c) to refine a research/learning and development methodology that places professional and local civil science into a new relationship, where the professional is less intrusive and local civil science less marginal.

Pilot search and selection. The focus is on the local scale with the community as the fulcrum. Site selection will be through self selection, with initiation and implementation being driven by the local community with peer learning and self assessment. "Light touch" facilitation will be key.

Modalities for **implementation** will involve communities in collectively constructing their preferred visions at 5 sites in Zimbabwe, 2 sites in Mozambique and 1 site in South Africa. Facilitators (Field Assistants) will be appointed and trained in each site.

Milestones. The following inception phase meetings have been held (a) CASS/INR Project Liaison Meeting (INR – SA) and initial concept/project workshop, (b) National Level Stakeholders (Harare, UZ), (c) Local Level Stakeholders (Chiredzi RDC). In-country Stakeholders Meetings have been held in SA and Mozambique and pilot site visits are on-going. A facilitators workshop, a meeting of the Project Management Team, appointment of lead country facilitators and local facilitators are planned for the near future. There will be annual review workshops to refine methodology.

Key sequential components at each local site will be:

- Scenario modeling exercises
- Implementation (on-site experimentation)
- Self assessment
- Adaptation

- Iteration

Discussion

1. *Site selection*. This is not fixed and will depend very much on the situation. In Zimbabwe it will definitely be below Ward level, i.e. at the village level. The project is presently working on criteria for deciding on the size of unit to work with and the variables to use.

7.7 Update on GLTFCA tri-national scenarios planning efforts (Sand County Foundation, USAID-WCS project) and facilitated discussion.

Michael Murphree, Nicky Shongwe, Harry Biggs, Markus Hofmeyr and Peter Buss

The session began with Mike Murphree presenting a background on the development of scenario planning as a discipline for management of the future. He then ran through the methodology followed to date and gave a progress report on the GLTFCA Scenario Planning project financed by the Sand County Foundation. The session ended with the reading of a narrative of one possible scenario for the GLTFCA.

The following is a summary of material presented:

Scenario Planning in the AHEAD GLTFCA – KNP Scenarios

Update Report – March 2007-05-07

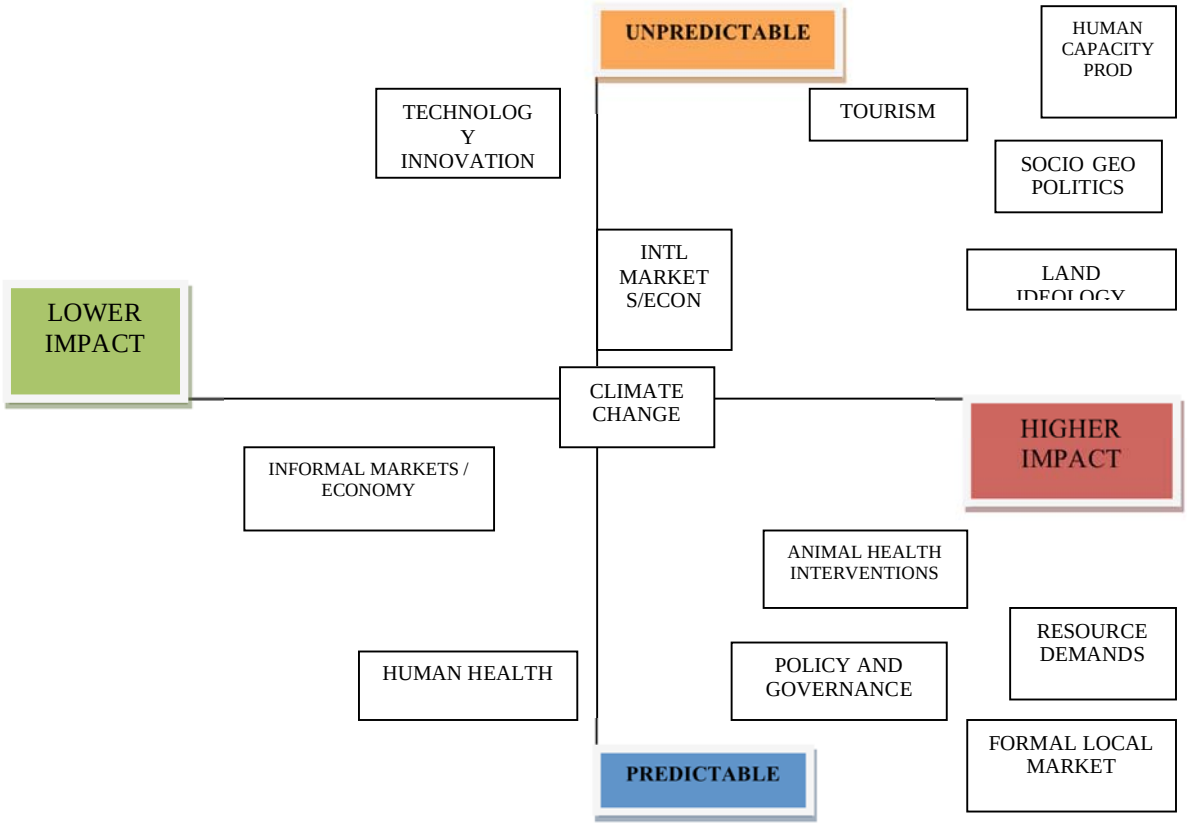
Following on from the scenario planning work undertaken in Kruger in 2006 a further scenarios workshop was undertaken at Skukuza from Feb 8-9 2007. At this meeting the following was achieved:

1. Review of previous scenario process.
2. Reassessment of the system drivers and clusters.
3. Reassessment of the predictability matrix.
4. Development of scenario quadrants.
5. Development of causal relationship diagrams ("horrendograms")
6. Development of first run scenario narratives.

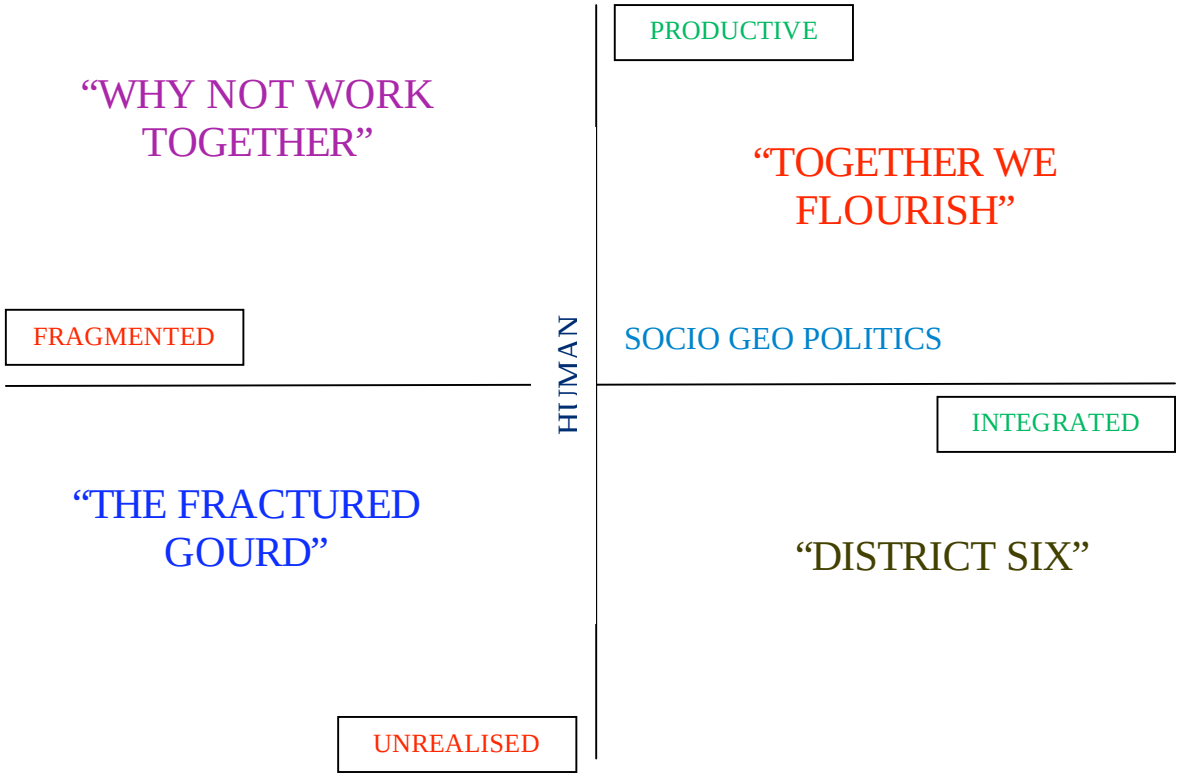
1. It was clear that several aspects of the first scenario planning process were unclear in the minds of the participants. However, some of the products produced in the first exercise like the Rich Picture diagrams were extremely useful. Importantly the Key Question was left unchanged (the key question and time frame provide the parameters of the scenarios – ***" What combination of land use and tenure will enhance system health productivity and resilience (sustainability) of the Socio Ecological system of the GLTFCA."***

2. It was agreed that the system drivers and clusters needed to be reviewed and possibly re - clustered. The results were as follows (cluster headings only):
    - International Markets/Economy
    - Human Health
    - Informal Markets/Economy
    - Animal Health Interventions
    - Policy and Governance
    - Formal Local Market
    - Technological Innovation
    - Climate Change
    - Socio Geo-Politics
    - Land Ideology
    - Tourism
    - Resource Demands
    - Human Capacity/Productivity

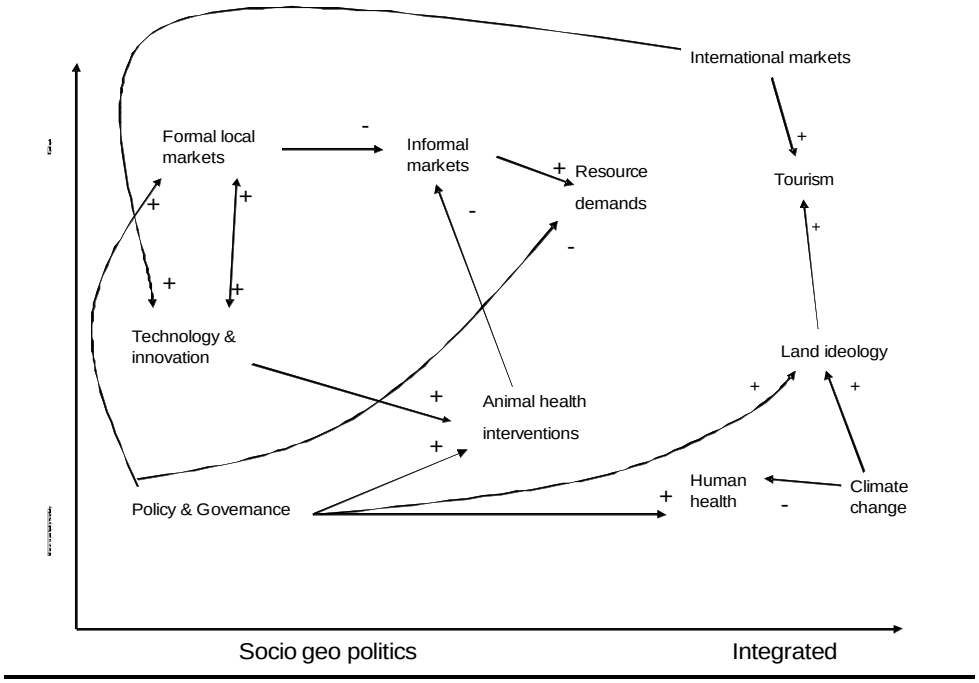
3. The reassessment of the predictability matrix resulted in the following matrix:
   The predictability matrix places the driver clusters on the matrix in a manner that gives an indication of the impact and predictability of the driver clusters. This creates an important picture to understand the forces of change.



4. Based on the above predictability matrix the following scenario matrix was developed:
   The scenario matrix is developed by taking two of the driver clusters that are considered to have a high degree of impact and a high degree of uncertainty. Once these drivers are identified they form the two axes of the matrix with their extreme values identified, each scenario quadrant is given a name that will be used later in the scenario narrative process.



5. The relationship of the driver clusters is then examined in each "scenario quadrant" these are called causal relationship diagrams and they are important in understanding how different drivers will respond to each other.



6. A narrative is then developed for each scenario quadrant to describe how the drivers play out over the specified time period.

Next steps:
The next steps will involve plugging some of the existing planning into the scenarios to see how they perform or more importantly how planning objectives can be achieved in the different scenarios.

Related issues:
A scenario planning exercise has also been undertaken with the Lowveld Wildlife Association in Zimbabwe and in May/June a scenario planning exercise will be undertaken in Limpopo National Park. A full report of the Kruger process will be available in May.

Discussion:

1. *From scenarios to a development process?* It is a question of scale and to move from a regional scenario, such as that still being developed under this project, one would develop a local scale scenario in an adaptive framework.
2. *Scenario planning to community level?* The answer isn't clear yet but the CASS/INR project has been set up to explore the methodology to do just that. CIFOR has also recently published a document providing guidance on developing community scenarios in relation to the management of forest resources.

8. MICRO-FLIGHTS

An informal voluntary discussion session to encourage the airing of new ideas or tentative projects to a group of interested participants was held after day 1 of the main meeting on Thursday evening. The format was a five minute verbal presentation by a proponent followed by an open discussion of the project or idea put forward. The session was attended by 10-15 people and lasted an hour. This was a new component in the Working Group Meeting - a relaxed session, enjoyed by all present.

8.1 The first Micro-flight was by Greg Simpson on the topic of rapid assessment of disease risk and gathering baseline data within the GLTFCA for the purpose of human public health assessment.

8.2 The second Micro-flight was by Michael Schoon on aspects of governance of the two TFCAs (Kgalagadi and Great Limpopo) that he was studying as part of his PhD at Indiana University. Of particular interest were the big shocks or disturbances to the system versus slow change and how

these influence co-operation across countries at different levels (e.g. political versus operational) and how does one measure co-operation and disturbance?

8.3. The third Micro-flight was by Ken Ferguson on the question of fences and boundaries and their influence, beyond containing animals.

9. UPDATES AND PROPOSALS

9.1 Update on Mozambique World Bank TFCA Project, including animal health components. Jorge Ferrao, Madyo Couto and Carlos Lopes Pereira

The *Transfrontier Conservation Area and Tourism Development Project* (TFCATDP) represents the second phase of a 15-year program (the TFCA Program). The long-term objectives of the TFCA Program are to conserve the biodiversity and natural ecosystems within the TFCAs, and to promote economic growth and development based on sustainable use of their natural resources by local communities, with a particular emphasis on ecotourism.

The TFCA program supports the establishment and management of multiple-use conservation areas (including core PAs) on the Mozambique side of three areas with significant transfrontier biodiversity linkages. Environmentally sustainable tourism development links the conservation and development objectives of the TFCAs by providing an economic alternative to unsustainable, destructive use of natural resources, as well as a direct economic incentive to maintain the natural ecosystems and their biodiversity. While the TFCAs span national boundaries, this is a national program supporting the GOM's participation in international agreements and committees aimed at coordinating activities across the national borders, and on-the-ground activities in the portions of the TFCAs within Mozambique. It is complemented by a TFCA program in South Africa and several smaller scale initiatives in Swaziland, Zambia and Zimbabwe.

Phase 1 (completed) - The first phase of the program, supported by the GEF-financed Transfrontier Conservation Areas Pilot and Institutional Strengthening project (1998-2003) (TFCAPISP), was developed in the context of a growing interest in large scale (including transfrontier) spatial development initiatives (SDI) within the southern African region. The TFCAPISP launched the TFCA concept. Its achievements include the establishment of three TFCAs (Limpopo, Chimanimani and Lubombo), policy and institutional development, and modest investments to strengthen the management of the PAs within those three TFCAs. While these achievements provided an enabling context, the TFCAs remain somewhat intangible on the ground, lacking boundaries, legal designation,

and institutional structures and procedures for land use planning and management of natural resources.

Phase 2 (this project) - The TFCATDP will support the second phase of the program, to implement the TFCA concept on the ground in the original 3 TFCAs: Limpopo, Lubombo and Chimanimani. The newer Niassa-Cabo Delgado and Zimoza TFCAs will be developed through funding from separate donor and NGO projects. The main strategic choices for phase 2 of the TFCA program are:

(1) legal designation of TFCAs, including establishment of regulations, criteria, procedures and institutional structures for planning, management and development;

(2) the preparation and implementation of Integrative District Development Plans (IDDPs) in each TFCA, to provide an environmentally sustainable framework for land use planning, natural resource management and development investment within the TFCAs;

(3) the development of environmentally sound and socially inclusive nature tourism (emphasizing community/private sector partnership), and directly related economic activities, in areas with high tourism potential as identified in the IDDPs; and

(4) improving the effectiveness of the PA networks within the TFCAs by:

   a. improving the management capacity of the National Directorate for Conservation Areas (DNAC),

   b. expanding or creating new formal PAs, and rehabilitating/constructing key protected area infrastructure, and

   c. supporting the establishment of community reserves and conservation areas ("informal PAs") in key areas outside the formal PAs (e.g. corridors, dispersal areas, cultural sites, etc.)

Phase 3 - The third phase of the TFCA program is expected to support the replication and scaling up of models tested during the first two phases, and integration with other regional tourism initiatives. By the end of the program, it is expected that environmentally sustainable, socially beneficial tourism will be well established as an economic activity and integrating force within the region, with Mozambique playing an important role and realizing substantial benefits.

The project is composed of five components as follows:

- **Component 1: Strengthening Policy, Legal and Institutional Framework for TFCAs**
  - It will help create the policy, legal and institutional framework for the GOM to implement its strategic choices: i.e. improve regional collaboration for management of transfrontier resources; promote interagency collaboration and vertical linkages between central and local governments; build the capacity of public sector institutions

at all levels and communities to manage biodiversity and natural resources; and to form productive partnerships with the private sector. Community land and natural resource ownership and use rights will also be addressed.

- The TFCATDP will finance consultation, workshops, and study tours, as well as the cost of producing, publishing and disseminating information materials available to all on the project: (1) a national conservation policy; (2) legal framework for TFCA, protected areas and wildlife; (3) guidelines for tendering conservation concessions; (4) the protected area and wildlife institutional reform; (5) the regulation of the new tourism law; (6) guideline for tendering tourism concessions, and (7) four transfrontier agreements.

- **Component 2: Integrated District Development Planning**
  - The establishment and management of TFCAs is centered around participatory land use and economic planning that allow for a balance between tourism, the conservation of biodiversity and the sustainable use of natural resource assets in a defined spatial development context.
  - The success of the TFCAs may depend on the degree to which: (1) these plans are mainstreamed into the GOM's economic development plans; and (2) the commitment and capacity of GOM and its partners at the local and central level to implement these plans. The TFCATDP will pilot in two districts under a proactive approach to integrated planning. The process identified is called *Integrated District Development Planning* (IDDP) and focuses on defining and implementing a series of practical steps to ensure that biodiversity and natural resource based assets are mainstreamed in *District Development Plans* (DDP).
  - Component 2 is divided into two Subcomponents: (2.1.) National capacity building and stock-taking, and (2.2.) IDDP per se. Subcomponent 2.2. will follow these steps: (1) Capacity building and initial consultation at provincial, district and local levels; (2) District diagnostic, including basic data gathering and consolidation with tourism and conservation overlays produced by other component; and (3) Production, adoption and diffusion of the DDPs.

- **Component 3: Community and Private Sector-Led Tourism Development**
  - Component 3 is designed to both develop the capacity of the tourism sector (government, communities and the private sector) to participate in the preparation and implementation of tourism master plans for key tourism districts. This component will support MITUR to establish a comprehensive and clearly defined set of procedures to implement an A-Z process for land concessioning, from land

identification to on the ground investment. It will also support MITUR to implement legislation allowing them to 'recuperate' land allocated for tourism investment where the investment period has expired so that this land can be marketed to appropriate investors.

- Component 3 is divided in two subcomponents: (1) Unlocking opportunities for sustainable tourism investment and growth; (2) Community-led conservation and tourism development. **Subcomponent 3.1.** will support building capacity through MITUR in DINATUR, DPC, FUTUR, ECDA and targeted private sector and community associations to develop and implement; (1) tourism plans in the target TFCAs, (2) business development and financing, (3) the collection of tourism statistics and data, (4) strengthened capacity for licensing, inspection and grading, (5) the implementation of the DTMPs. **Subcomponent 3.2.** will provide support to communities through (1) Land demarcation; (2) a Community Enterprise Fund for organized communities to either proceed with the creation and management of community reserves in interstitial areas or enter into joint venture partnerships with private investors for tourism or conservation related investments such as creation of game ranches, lodges, etc.; (3) the participatory and compensation process to improve natural resource management and land acquisition.

- **Component 4: Protected Areas management**
  - This component will support the identification, monitoring and protection of the most significant and vulnerable biodiversity assets within the three TFCAs, through the establishment/rehabilitation and management of a network of National Parks and Reserves under the direct management of DNAC. This will begin a long-term process of major improvement of the Maputo Special Reserve, including gazetting the Futi corridor and a new marine reserve; support to Bahine National Park and the Chimanimani Special Reserve. Modest support will be provided to Limpopo National Park, to supplement current Peace Park Foundation (PPF), KfW & AFD efforts, and to Zinave National Park.
  - Component 4 is divided in two subcomponents: (4.1) Capacity building and applied research; and (4.2) Biodiversity conservation in formal protected areas. Under Subcomponent 4.1., (a) DNAC's capacity will be reinforced; and (2) survey, inventories, conservation priority setting and applied research will be carried out. For targeted parks or reserves, Subcomponent 4.2. includes: (a) improvement of park design and planning; (b) increasing the area under protection; (c) building or rehabilitating essential infrastructure; (d) procurement of essential equipment required for management; (e) deployment and capacity building of staff; (f)

improvement of communication and information; (g) launching effective law enforcement; (h) carrying out research, monitoring and evaluation, and (i) increasing the PAs' revenue generation capacity.

- **Component 5: Project Management, Communications, and Monitoring and Evaluation**
  - This component will finance the project management costs including project procurement, accounting and monitoring as described by their respective manuals. It will strengthen the capacity of the TFCA Unit to coordinate TFCA program, and will support its related operating costs. This includes recruiting a few additional long-term staff for the Unit, including TFCA Coordinators based in the field in order to support the shifting of planning and implementation to the Provincial and local level.
  - The component includes the implementation of an M&E system to track and assess project implementation and impacts, and a system for adaptive management based on this information; and the development and implementation of an information system and a communications strategy to ensure timely flow of accurate information among the implementing agencies, and to increase awareness and understanding about ecosystem management and TFCAs nationally, regionally and worldwide.

9.2 Research and Development activities in the South East Lowveld of Zimbabwe.

David Cumming

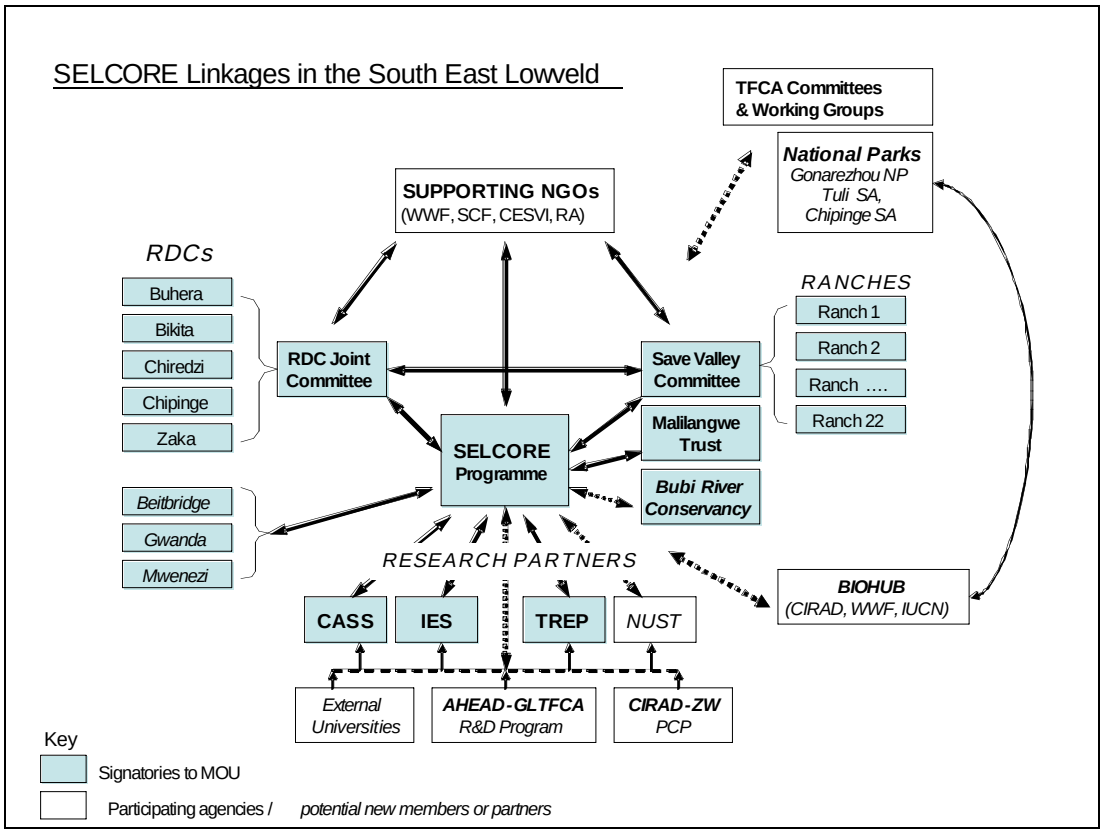
The South East Lowveld (SEL) of Zimbabwe covers an area of ~ 45,000 km^2 lying below the 600m contour. It is characterized by high annual temperatures, low and uncertain rainfall of generally less that 400 mm/yr^{-1}, and recurring droughts. Irrigated agriculture, dependent on rainfall and runoff from the Highveld, has resulted in agro-industrial 'oases' surrounded by extensive cattle ranches, wildlife conservancies, and small-scale, low input dryland agro-pastoralism in overcrowded communal lands. Increasing shocks to the system in the form of severe droughts and floods, resource inequities, poverty and increasing reliance on food aid, have led landholders to examine integrated approaches to land and natural resource management in the region. One result has been a continuing dialogue over the last decade on the research needed to inform landuse and natural resource management and the establishment of the South East Lowveld Collaborative Research (SELCORE) Programme in January 2003.

Land tenure in SE Lowveld in 2000 (~ 45,000 km2)

Land Category	% of Area	People/km^2
Communal Land	35	11-52
Large-scale commercial farms – irrigation	0.01	?

Cattle ranches	16	< 3
Wildlife + cattle	9	< 3
Conservancies	18	< 3
Small-scale Commercial farms	1	< 10
Resettlement land	7	?
Parks and Wildlife Estate	14	> 1

The foundation of the SELCORE Programme is a Memorandum of Understanding between the eight Rural District Councils that cover the SEL, three conservancies, three research Units at the University of Zimbabwe (Centre for Applied Social Sciences [CASS], Institute of Environmental Studies [IES], and the Tropical Resource Ecology Programme [TREP]) and the Department of Forestry and Wildlife Management at the National University of Science and Technology in Bulawayo. These and additional linkages are summarised in the diagram below.



The key objectives of the SELCORE programme (See also attached Objectives Tree – Appendix 2) are to:

- To foster an inter-disciplinary, participatory research and monitoring programme that will enhance landholders understanding of ecological and social systems in the SEL and thereby improve:
    - Adaptive management for the sustainable use of the region's natural resources
    - Policy frameworks for integrated management and conservation of natural resources
    - Resource management capacity, adaptability and resilience of linked social-ecological systems of the SEL,

In order to ultimately enhance the livelihoods and environmental security of people living in the SEL

During its first three years SELCORE was supported by a small grant from the Resilience Alliance which enabled it to hold four consultative workshops involving it members. More recently these have been supported by the Sand County Foundation and WWF.

- Series of workshops exploring, natural resource management problems, needed research
- Examination of research needs in three main sectors (wildlife & tourism, agro-pastoral and large-scale irrigation) and the linkages between sectors
- Options for extension of wildlife based tourism across land tenure regimes through joint ventures & partnerships
- Options for the development of irrigation through linkages between large and small scale irrigators in Runde catchment (Proposal to EU)
- Review of past research on natural resources
- Preliminary analyses of resilience and adaptability in SEL
- Facilitating the initiation of a Lowveld Wildlife Association to help resource managers to build capacity to manage wildlife resources across all sectors in the SEL

CESVI (Cooperazione e Sviluppo) together with the Rural Districts of Beitbridge, Chiredzi and Chipinge, and National Parks & Wildlife Management has been working in the SEL over several years. Its main outputs from the Southern Lowveld Project in Zimbabwe have involved, (a) Developing a GIS data base and associated mapping for the Maramani and Sengwe Communal Lands, (b) Completing biodiversity inventories and vegetation mapping in the three rural districts, (c) Facilitating and assisting in the establishment of the Sengwe Corridor linking Gonarezhou and Kruger NP which has also entailed PRA and questionnaire surveys, an impact assessment of the corridor, and the development of resource management options, (d) Facilitating the examination by stakeholders of landuse options in the Shashe-Limpopo TFCA, (e) A review of the performance of small scale

irrigation schemes, (f) Development of resource management trusts, and (g) A review of past tourism plans and future options for the Zimbabwe component of the GLTFCA.

CESVI, in conjunction with IUCN-ROSA, are expecting, within the next few months, to begin a regional three year project that will be concerned primarily with transfrontier natural resource management by communities within the GLTFCA. The project is being funded by the Italian Ministry of Foreign Affairs and the major part of the project will be in Mozambique.

Other agencies and programmes involved in the South East Lowveld are as follows:

- Veterinary Services – BTB, FMD and Tsetse surveillance
- CASS - Resettlement in Save, Campfire (Mahenye's)
- IES – Institution building for resource management
- SCF – Land holder monitoring and resource management
- WWF – Rhinos and conservancies, landuse options
- CIRAD – support for PPCP, Chitsa, SEL planning and wildlife assessment with WWF & IUCN under *BIOHUB*
- AHEAD-GLTFCA Working Group – program to address animal, human, and ecosystem health in the GLTFCA
- Shashe-Limpopo Predator Research Group
- Malilangwe Trust – elephants and habitats, archaeology, annual game surveys,
- Save Conservancy – elephant management, wild dogs, landscape/vegetation mapping, landowner values in relation to habitat management, rhino monitoring, surveys, bushmeat trade, etc.
- Sugar Research Institute

An interesting new development underway is the formation of the Lowveld Wildlife Association which will include the Rural District Councils, Conservancies and government agencies involved in wildlife management in the South East Lowveld. Associated with this initiative is re-examination of the fencing options relating to FMD zones and control in the SEL.

Discussion:

1. *Progress on the ground*. Little tangible progress is being made because of the major constraints on funding and investment but it is equally important to establish the linkages between sectors and develop and plan a way forward and that is what is happening at present.
2. *Potential for expanding the TFCA.* The SEL is a semi arid area and wildlife production and tourism is the most productive landuse after irrigation which, because of soil and water constraints, is limited to very small areas. Dry land cropping is very risky and surplus cereals

may be produced one year in fifteen. It is therefore important to decouple wealth creation from primary production, and tourism, as a service industry, can partially achieve that. Coupled with this is the need to intensify agricultural production where this is possible. Extensive livestock production will nevertheless remain an important component of livelihood strategies in the communal lands.

3. *Existing Buffalo/FMD fence*. The existing fence line around Gonarezhou National Park has been in a state of disrepair or non-existent for several years. A recent attempt to reconstruct the fence failed because it was taken down by local people as fast as it went up.

4. *Is tourism a sustainable investment strategy?* Photographic (non consumptive) tourism has effectively collapsed in Zimbabwe over the last few years for political reasons. However, safari hunting has continued with little change and has effectively sustained conservancies and CAMPFIRE operations. So some aspects of tourism are very resilient and over the last 30 years in the south east lowveld they have been more resilient and sustainable than commercial cattle ranching, for example. There are great expectations for the TFCA and the key will be to find effective ways of getting the returns to local household levels. In some communities in the Zambezi Valley where there are tsetse flies and they don't have cattle, returns from safari hunting are now being paid directly to the communities and they regard wildlife as their cattle.

5. *Is research integrated into policy?* The research that has been carried out on the economics of game ranching and wildlife-based tourism in Zimbabwe has certainly influenced policy at a national level. At a local level research is currently being done on poaching and bushmeat trade and results indicate that only about 20% of the meat from animals snared ends up in the surrounding community. It therefore makes better sense to develop an open structured system and to crop animals and make the meat available to surrounding communities at competitive prices.

6. *Common policy on resource use in the TFCA.* There does not appear to be one. Within Zimbabwe the Sengwe-Tshipise Corridor will be an integral part of the Great Limpopo Transfrontier National Park, linking KNP and the GNP. The corridor presently has two minefields running through much of its length and there are very limited opportunities for photographic tourism. Under the present investment climate the only option is to continue using the area for safari hunting which can be maintained with very low investment. Sustainable use within the corridor is not precluded under the protocols establishing the transfrontier national park and would certainly remain an option within the wider TFCA. In Mozambique a fully integrated plan on zoning and options for use is being developed.

9.3 "The spatial dynamics of wildlife populations across and along the north-western Kruger National Park boundary fence, South Africa" Ken Ferguson[1]

1. Project Background

A key debate in southern African conservation is the role of boundary and disease control fences in preventing epidemics of transregional emerging diseases, and its corollary, the impact of these fences on wildlife populations. Foot-and Mouth disease (FMD) and Bovine Tuberculosis represent a perennial threat to livestock on commercial and communal range land that adjoin the borders of the Park (and APNR's). Arguably, wildlife fences can be viewed as 'interfaces', 'corridors' or 'barriers'. KNP's western fence was designed in the 1950's to prevent outbreaks of FMD and was largely successful until a combination of factors led to a rapid decrease in its efficiency, post 2000 (floods of 2000; increased human/fence line activity; Bengis 2006). Over R20 million has been spent on electrical fence construction and maintenance since 1998, yet the flow rate of large mammals across the boundary has increased since that time (R. Bengis; DSVS, pers. comm.), in part due to the dramatic increase in elephant numbers within KNP and the human theft of solar panels and wire (D. Keet; DSVS pers. comm.). The result is that large mammals (buffalo, elephant, lion, hippo) are frequently exiting the KNP/APNR's and ranging amongst farmland and even peri-urban areas (Fertiliser Plant, Phalaborwa, pers. obs.).

2. Project Aims

This project concerns the 'how, when, where and why' large mammals cross and move along the fence line. We aim to collate data in order to document the following parameters:

- Delineate and quantify sections of fence that are within High Impact Zones (HIZ), and compare and contrast these with areas that can be classified as Low or No impact zones.
- Quantify large mammals occupance and usage of HIZ's. Analyse the spatio-temporal relationship of key species in relation to each other and HIZ's
- Determine the causation and patterns (seasonal) of why and how HIZ's are targeted (Flood and fire damage; Elephant damage; Anthropogenic damage; Buffalo/lion stampedes; Intrinsic fence weak spots e.g. across water courses; Type of fencing e.g. electrical versus new high tensile impact 'I' beam fencing; Approach and departure habitat corridors/habitat types/topographical conduits such as vleis; Prevalence and distance to water sources).

[1] In the meeting Ken Ferguson did not speak directly to his paper, which had been circulated to participants, but entertained the meeting with a brief scenario and role-play involving two protected areas, surrounding villages, problem elephants and buffalo and a fencing project, transport/communications links between communities on either side of the reserves and an impending election. The major point of the exercise was to emphasize the importance of keeping the message simple if you wished to involve, and gain the support of, a wider audience than scientists.

- Target the movements and habitat use of two selected 'keystone' megaherbivore fence challenging species (elephant and buffalo) as they approach, arrive and depart through the fence line. Quantify the occupance of mesoherbivore fence species, with smaller home ranges than the above, by means of fence line contrast transects and camera traps.
- Determine aspects of the ecotonal properties of the fence interface.
- Make recommendations as to the efficacy of fence lines, in relation to variables such as alignment, type, and maintenance schedules. Further to provide DoA, DSVS and SANParks species specific risk analysis of disease transmission within the overall context of multi-factorial fence variables.

3. Project Methodology

Two separate, methods, which exhibit a high degree of complementarity, are to be used in order to test the above assumptions, both are reliant on a symmetrical contrast (i.e. either side of the fence):

3.a Across Fence Methodology

The development of a satellite tracking 'event field' (up to 20 VHF receivers attached along the fence line at either set intervals/ linear stretches/habitat ecotones, will allow a parallel field to be created up to 10km on either side of the fence, giving a total of 2,000km.sq coverage) whereby five satellite collared elephant and five adult female buffalo herd members (darted outside of the park boundary) will be GPS referenced when they enter the event field. Analyses of their approach and departure 'angles' and the spatial temporal correlation of fence egress between the two species can then be measured in relation to habitat type, season, water points etc.

3.b Along Fence Methodology

Ferguson (2006; see appendices) examines in detail the fence line contrast transect (FLCT) standardised data collection protocol. FLCT's present a symmetrical experiment whereby animal/ objects (spoor, dung, hair, macro-invertebrate bio-indicators) can be quantified within an intensive transect that spans the fence line. Camera traps will flank the FLCT's. We envisage either 20 - 40 such transects. Monthly line count transects, using the distance sampling method will gauge large mammal 'density' along the fence. Helicopter line transects/sample count could be made on an opportunistic basis when DoA/DSVS Senior Staff are working in the area.

4. Project Study Area

We have identified approximately 100km of fence line along KNP's north western boundary that is suitable for the type of analysis that we propose. The area encompasses fence lines between where the Klein Letaba and the Phugwane Rivers exit the park. This site has been chosen due to a high incidence of large mammal egress, and the variety of habitat mosaics along the fence line course (4-5

'ecozones'). Of particular interest is the smaller habitat mosaics embedded within larger matrices (e.g. Pterocarpus/Combretum woodland surrounded by Mopane woodland) and whether high impact zones are more prevalent in one or the other.

5. Project Capacity Building

The following capacity will emanate from our results:

- Seasonal patterns of fence challenges will allow Department of Agriculture (DoA) to more efficiently deploy its 70 strong fence maintenance workforce, and alert them to specific sections and times of the year where a high degree of repair and monitoring will be required.
- Determine the efficacy of the new high tensile fencing ('I' Beam), and whether and/or where future investment along other boundary sections is warranted.
- Alert DSVS as to the most likely sections and months of the year when the helicopter should be deployed to chase buffalo back into the park.
- Train fence workers in basic data form collection; engage these workers, in the process of our research programme.
- Ensure that the above standardised basic data form collection protocol will be retained after the project has ceased.
- Produce recommendations to the stakeholders (DSVS; DoA ;SANParks; APNR's; Communal tenure contractors) in order to allow for future planning, as far as fences are concerned.
- Standardised methodology will be applicable to other fenced conservation areas.
- GPS/GIS map reference the study fence line, to determine the ratio of linearity to curvy-linearity, habitat types, distance to water points etc, and pinpoint HIZ's. Integrate the results with SANParks GIS Facility, Skukuza.

9.4 Public health risks and benefits from interactions of humans and their domestic animals with wildlife and wildlife-related activities – a pilot project proposal

Greg Simpson

1 Introduction

1.1 Background

Interactions between humans, their domesticated animals and wildlife result in transmission of infectious disease {Bengis R.G., Kock R.A., et al. 2002}{Kalema-Zikusoka G. 2005} and prevalence

of non-infectious disease. These interactions pose public health risks and benefits. Identifying and assessing these risks and benefits would be beneficial to health officials and wildlife managers.

This pilot project aims to create and pilot a tool to identify and assess public health risks and benefits from interactions between humans, their domesticated animals and wildlife. This tool would be of benefit to health officials and wildlife managers in this context in initial assessments and further monitoring.

1.2 Goal

To identify, and initially assess, the risks and benefits to public health through the interactions between humans and their domesticated animals with wildlife.

1.3 Objectives

- To create tools to conduct a public health risks and benefits assessment in the context of humans and their domestic animals interacting with wildlife.
- To collect data from communities in this context using the tools created.
- To collate the data collected.
- To produce an assessment of the data collated.
- To evaluate the tools used and decide on the appropriateness of the assessment and adjust the tools as seen necessary.

2 Study design

2.1 Area and Sampling

The areas for study will be those where communities and their domesticated animals are interacting with wildlife.

2.2 Ethical Considerations

Approval to undertake the study will be needed from the relevant government offices, management bodies and community leaders. Interviewees will be informed of their right to withdraw from the interview at any point.

2.3 Methods

- **Key informant interviews**: Qualitative, in-depth and semi-structured interviews with individuals selected for their knowledge of the issues regarding wildlife, livestock and human health in their area.
- **Participatory methods**: Methods for qualitative data collection with local community members; gathering information on animal numbers, livestock practices, interactions with wildlife, disease statistics, health needs and concerns and perceptions about interactions with wildlife.

2.4 Validity and Reliability

Instruments will be pre-tested inside the study area to ensure validity and reliability, and amended accordingly prior to use. Qualitative data is limited in its accuracy, yet it is a valuable tool in combination with quantitative data.

2.5 Data Collection

Table 1. Data collection framework.

Method of assessment	Information collected	Sample	Tool used
Key informants interviews	Public and domestic animal health risks, prevalence, benefits of wildlife, perceptions of wildlife	Researchers, Health officials, Conservation Areas staff, NGO staff, Academics, local leaders, etc.	Semi-structured interview guide
Participatory Methods	Disease incidence, livestock husbandry, interactions with wildlife, perceptions of conservation area	Community groups: male, female and youth.	Discussion guide
Individual interviews	Disease incidence, livestock husbandry, interactions with wildlife, perceptions of conservation area	Individuals	Semi-structured interview guide

2.6 Limitations

The data will be specific to this area and may be limited in its application to other areas. The means to do extensive data collection will be limited.

2.7 Reporting of Data

The data will be reported by means of a document submitted to the relevant stakeholders; NGOs, community leaders (in an appropriate format), AHEAD – Working Group and others.

2.8 Timeframes and Work-plan

The practical data collection be through interviews and focus groups, and will take approximately two weeks full time for two to three people. The compilation and presentation of the research will take approximately one week full time for one person.

Table 2. Timeframes and Workplan

Phase	Objectives	Activities	Time	Expected outcomes
1. Local Data Collection	To gather local information on the topic	Develop data collection tools and analysis framework	4 days	Functional tools for the collection of local data Method for analysis
		Key person interviews	5 day	Information relevant to topic
		Training of assistant	1 day	Materials tested and final adjustments made
		Community Participatory Methods	8 days	Community information on local diseases, wildlife and conservation areas,
		Individual interviews		Local information relevant to topic
2. Compilation and Analysis	Compile, analyse and report creation of information from study	Compilation of information gathered	2 days	Organised collection of data
		Analysis of data	1 day	Analysed data
		First draft of report	3 days	Final draft of report for evaluation and correction
		Final report	1 days	Final draft of report

References

Bengis R.G., Kock R.A., and Fischer J. 2002. Infectious animal diseases: the wildlife/livestock interface. *Scientific and Technical Review*, 21 (1). p 53-65.

Kalema-Zikusoka G. 2005. Protected Areas, Human Livelihoods and Healthy Animals: Ideas for Improvements in Conservation and Development Interventions. In *Conservation and Development Interventions at the Wildlife/Livestock Interface: Implications for Wildlife, Livestock and Human Health*. Eds: Osofsky S.A., Cleaveland S., Karesh W.B., Kock M.D., Nyhus P.J., Starr L., and Yang A. Gland, Switzerland and Cambridge, UK. IUCN.

Discussion:

1. *Holistic approach*. It should be possible to make the survey more inclusive or holistic. It is a pilot project so there is no need to restrict its scope, e.g. what are the risks to wildlife health and conservation, include an agricultural person and look at food security – perhaps in the Massingir area.

2. *Work on the western side of KNP*. There are studies taking place on the western boundary of Kruger NP and clinics which may keep extensive and pertinent records.

3. *Purpose of study*. The main purpose of this proposed work is to develop a useful tool and if any one else from the AHEAD programme is interested they should contact the author.

10. BRIEF INFORMAL PRESENTATIONS / UPDATES BY PROPONENTS OF OTHER CONCEPTS / PROJECTS DEVELOPED SO FAR (WORKING THROUGH THEMES, MODULES AND PROJECTS TABLE) Facilitator: David Cumming

The meeting worked through the summary table of Themes, modules and projects and an updated table is appended (**Appendix 1**). Key new developments and points raised were as follows:

1. A project examining resource governance and use within the TFCA is being funded and coordinated from Wageningen University in the Netherlands. Nine doctoral students are involved, with four working in Mozambique, three in Zimbabwe and two in South Africa. This programme could link in with the AHEAD-GLTFCA programme.

2. The need to develop baseline indicators might be taken up with the Southern Africa Sustainable Use Specialist Group.

3. A survey of the status of animal disease in the Mozambique component of the TFCA is being written up. The survey of the Shingwedzi catchment has, however, still to be completed.

4. The National Zoological Gardens in Pretoria has now been transformed into a research organisation. Emily Lane has been appointed as a pathologist at the Zoo and will now be in a position to follow through on her earlier proposal to a) collect and diagnose diseased tissue samples, b) establish a reference collection, and c) assist in the development of a disease monitoring system. (See proposals from earlier Working Group meetings).

5. Gavin Thomson will be involved in a study of FMD control policy and plans for Mozambique and will make results available to the AHEAD-GLTFCA programme.

6. The Communications theme is important and must not be lost sight of. Louis van Schalkwyk has established an interactive list serve that is now ready for use.

7. List of research projects and contacts. The decision at the last meeting to create and maintain a list of research projects being undertaken in the GLTFCA together with contact

details for project leaders had made little progress. The only people who responded to the request were Fred Potgieter from OVI and Claire Geoghegan. It was important that this list be established and maintained. Since 6th AHEAD-GLTFCA Working Group meeting in March last year the JMB has been developing a research policy and had hoped to appoint a consultant to produce an up to date list of ongoing research, across all disciplines, in the GLTFCA. Unfortunately the expected funding from PPF to carry out the survey is no longer available.

8. In Zimbabwe the recently revised research permit fee of US $2,000 per annum for foreign researchers working in a National Park, plus a park entry fee of US $4,000 per annum, has been withdrawn by the Zimbabwe National Parks and Wildlife Authority. The former permit fee of US$500 per project is still in place, as is the Zimbabwe Research Council fee of US$500 for foreign research workers.

11. CORE AHEAD-GLTFCA STEERING GROUP AND INSTITUTIONAL COMMITMENTS

The number of letters of collaboration that have been signed by participating agencies is now ten, with four from Zimbabwe, three from South Africa , one from Mozambique and two from the USA. These letters can be used in grant proposals to indicate the expressed level of collaboration in the programme by a wide range of actors and disciplines. There was also an expressed need for a communication strategy to enable the AHEAD-GLTFCA programme to reach a wider audience.

The question of establishing a steering committee has been raised at previous meetings and various models of how a more formal framework could be established have been discussed (see minutes of the 4th Working Group Meeting held in Pretoria at http://www.wcs-ahead.org/workinggrps_limpopo.html). There is now a clear need to establish an operational steering committee to support Nicky in her role as coordinator and it was agreed that Nicky Shongwe would take the lead on this over the next few weeks.

12. NEXT STEPS, ACTIONS AND RESPONSIBILITIES

ACTION	Responsibility	By When
1. Write up proceedings of 7th WG Meeting	Nicky Shongwe & David Cumming	31 March 2007

2. Update list of projects and contact persons	Nicky Shongwe	ongoing
3. Information & Data Sharing	All members through Nicky	Ongoing through the year
4. Establish Steering Group that will deal with questions of funding, branding, communications, institutional links etc via a strategic plan	Nicky Shongwe	31 May 2007

Discussion:

1. There is a need to *develop a strategy* for programme development and implementation and the question of who will drive the process needs to be clarified. The key aspects of the strategy would be those relating to the development of funding proposals and the possibility of bringing in new partners. It was agreed that Nicky would make a start on it towards the end of May.
2. *Core funding* is needed to move the programme into a higher level of operation. The appointment of Nicky Shongwe is a major step in that direction but she will need an operational budget for workshops, meetings and communication in particular. WCS is unlikely to be able to continue this core support for much longer.
3. *Core principles*. A simple document spelling out the core principles of the programme needs to be developed and placed on the web site.
4. *Links to Joint Management Board (JMB).* A link to the JMB has been discussed at previous meetings and needs to be taken forward. It may best be linked to the establishment of the Steering Group with some members of the Steering Group drawn from the JMB Conservation and Veterinary Sub-Committee.
5. There is a need to *expose the programme to a wider audience* and the Society for Conservation Biology Meeting to be held in Port Elizabeth in July this year provides an opportunity to do so. Mike Kock suggested producing a poster on the AHEAD-GLTFCA programme to display at the meeting. He will, in any event, be delivering a multi-author paper drawing on AHEAD experiences to date at the SCB meeting and would be happy to develop a poster. (Steve and Mike have co-organized a joint symposium for SCB on Biodiversity and Health, which should help raise AHEAD's profile.) These items came up during the discussion on a communications strategy, which would need to be developed by the Steering Group.

13. COMMODITY-BASED TRADE – Gavin Thomson.

A short DVD explaining commodity based trade in beef and its benefits to rural farmers in Africa (Botswana) was shown by Gavin Thomson, followed by a lively discussion on the topic. The

development and production of the DVD was being supported by the British Department for International Development –DfID.

14. NEXT MEETING

CASS offered to host the next meeting in Zimbabwe. Late August was suggested as a tentative date for a smaller interim meeting but would depend on progress in the programme. The next full Working Group Meeting would be held tentatively next March in the South East Lowveld within the GLTFCA. Hakamela (Malilangwe), or Chilo Lodge, were possible venues.

15. THANKS AND CLOSURE

In closing the meeting Nicky Shongwe extended her gratitude and thanks on behalf of the Working Group to their Mozambique hosts for a very enjoyable and successful meeting. She thanked Dr. Soto in particular for his assistance in setting up the meeting, and for his participation over the last two days. Thanks were extended to: Jorge Ferrao in absentia together with congratulations on his new appointment, Madyo Couto, Steve Osofsky and David Cumming for their contributions to organizing the meeting, Rebecca Witter and Jessica Milgroom for their part in facilitating the participation of the community representatives from the Limpopo National Park, to all of the presenters of papers, and the translators for their excellent service and, last but not least, to Merle Whyte (and the Mozambican event team) for a great job in dealing with the nuts and bolts of bookings, transfers, logistics and a host of other matters.

WCS supported travel and accommodation for some participants and covered the costs of hiring the conference room, the translators and teas, lunches and dinner on Thursday evening.

Meg Cumming and Mary-Lou Penrith are thanked for taking notes of discussions throughout the meeting.

Harry Biggs proposed a round of applause for Nicky Shongwe for her coordination of a very successful meeting and for placing her personal stamp on this, her first meeting as Coordinator.

The meeting closed at *c*.1345 hrs.

APPENDICES:

APPENDIX #1: PROJECTS SUMMARY TABLE + UPDATES - MARCH, 2007

AHEAD-GLTFCA – Programme: Outline of Themes and Modules and summary of concepts being developed or suggested – 9th March 2007

Theme	*Module*	*Potential research proposal/Activity*	*Lead Agency/ person respon.*	*Status*	*Potential Donor*
#1 *Overarching conceptual framework to facilitate integrated and inter-disciplinary approaches*	*a) Coordination*	*1.Coordination and development of the AHEAD-GLTFCA programme*	*SANParks/Shongwe (Coordinator) WCS/ Osofsky*	*Full-time coordinator appointed*	*Supported by SANParks & WCS*
	b) Development of inter-disciplinary frameworks and models	*1. Ongoing development / revision of conceptual models to link the six programme themes and researchers, disciplines, and stakeholders in the GLTFCA*	*WCS/Cumming*	*First stage completed and report submitted to Working Group in Jan07*	*Supported by WCS*
		2. Furthering TFCA scholarship and postgraduate studies in the GLTFCA	*CASS/INR UWC/PLAAS U Georgia U Indiana Wageningen*	*I MSc 1 PhD 1PhD 1PhD 9 PhDs*	
	c) Baseline indicators	*1. Participatory surveys of animal and human diseases, livelihoods and socio-economic baseline data in communal areas of the GLTFCA*	*CIRAD – livelihoods assessment in SEL*	*Project being developed*	*Support by French Embassy*
#2 *Animal health and disease*	***a)*** *Epidemiological studies*	*1. BTb, FMD and Brucellosis in Sengwe Communal Land Zw.*	*Zw Vet Wildl. Unit, Foggin*	*2000 cattle sampled for BTB – none +ve Brucellosis and FMD sampled being processed in Harare*	*Initial support from PPF*
		2. Status of BTb, FMD and Brucellosis in Limpopo National Park Ongoing work in KNP testing vaccines	*DINAP / Pereira / SANParks*	*Completed except for Shingwedzi catchment*	*PPF supported*
		Kruger: Ongoing work on BTb in Buffalo, Kudu, lion, leopard, hyaena and giraffe and testing of vaccines	*Roy Bengis / Markus Hofmeyr*	*Ongoing research and surveillance*	*SANParks*
		3. Serological studies of FMD, etc. in wild and domestic ungulates in the GLTFCA (Links to Theme #4 need to be built in and be explicit + link to a development NGO?)	*OVI - Vosloo et al. Will be revisited*	*Project concept*	
		4. BTb and zoonotic implications	*OVI / Michel*	*Project Concept Needs further development*	
		5. Coordinating pathological data/sample analyses in GIS database in Mz	*Rosa Costa / Mary-Lou Penrith*	*Project Proposal being developed*	*Part of WB TFCA Project?*

Theme	Module	Potential research proposal/Activity	Lead Agency/ person respon.	Status	Potential Donor
#2 Animal health and disease (Continued)		6. Monitoring of tsetse in TFCA and linked to research on tsetse resurgence in Kwazulu-Natal (also development of of SA policy on tsetse control)	OVI Potgieter	?	?EU
		7. BTb data base from MRI work	MRI / Wayne Getz / Claire Geoghagan / Elissa Cameron	Overlaps with work in Hluhlue and concept paper developed	??
		8.Cordinating Pathological data / tissue database and sample analyses	National Zoo Pretoria Emily Lane, Rosa Costa and Samuel Bila	Earlier project proposal being revisited	NRF
	b) Alternative animal health management and disease control strategies	NOTE: No concepts yet Primary health care measures, Cultural practices and indigenous knowledge, links with epidemiological studies, community based strategies	Mike Kock / Carlos Pereira	?	?
	c) Preventative/proactive measures in disease control and management	1. SOPs/Contingency plans/Risk assessments/Scenarios for priority diseases (e.g. Distemper) as a way of helping to define research and management priorities. (?Alien invasions!) – links to National Depts., Joint MB – Vet & Wildl. Committee)	SANParks Roy Bengis & Markus Hofmeyr	Proposal for priority species being developed	
		2. BTb risk assessment in GLTFCA – PhD study proposal developed and submitted via CIRAD for support	Alex Caron- but now focused on AI	Proposal developed Plans for survey in GNP in 2008 with help from SANParks	CIRAD
	d) Theoretical/fundamental studies (Needs further development in terms of key or strategic additional studies/ideas)	1. Examining the relationship between social structure and the spread of diseases in ungulates and viverrids	?	Initial note by Paul Cross – no further development	NSF
		2. Spatial models of disease risk between KNP and Mozambique using village livestock and wildlife densities and also examining the risks of diseases spreading from dogs to wild carnivores	?	No further development	NSF
		3. Study of tick-host-pathogen ecology at several spatial and temporal scales involving wild and domestic ungulates and humans. .	Cumming GS	Initial note-no further development	
#3 Landuse, ecosystem goods and services &	a) Spatial and temporal relationships between ecosystem processes and disease prevalence	NOTE: No concepts yet Requires remote sensing studies linked to epidemiological work in Theme #2 Climate change and cycles in relation to disease spread and prevalence		See revised conceptual framework and key question of the distribution and state of ecosystems goods and services in the TFCA	

Theme	Module	Potential research proposal/Activity	Lead Agency/ person respon.	Status	Potential Donor
animal health	*b) Landscape level resource use and impacts by wild and domestic ungulates on ecosystem goods & services*	*NOTE: No concepts yet* *Requires remote sensing studies and detailed ground survey work at appropriate scales e.g. impacts of elephant damage, overgrazing, trampling on run off, nutrients, water, non timber forest products*		*No developments*	
	c) Effects of landuse scale and pattern on animal health	*NOTE: No concepts yet* *Requires links between 3a & b and 2a.* *What minimum sets of data are needed?*		*No developments*	
	d) Linkages between wildlife, domestic animals and human health	*1. Disease risk assessment of people living in villages in the TFCA*	*Follow up on LNP Survey by Raath and Pereira*		
		2. Spatial dynamics of wildlife in relation to game fences and disease transmission across fences (e.g. northern boundary fence of KNP)	*Ferguson*	*Proposal developed and submitted for funding*	*WWF-SA*
		3. Public health implications of establishing the GLTFCA	*Simpson*	*Proposal developed*	*?*
	e) Understanding animal husbandry practices	*Note: No concepts or proposals developed* *1. Role of livestock in household production, community differentiation, collective management and institutional factors affecting these*			
		2. Survey of livestock management in a selected community in the Malipati area of the Sengwe communal land	*CIRAD – Alex Caron*	*Ongoing*	*CIRAD*
#4 *Human livelihoods, animal health and ecosystem goods & services (Ecosystem health)*	*a) Scenario planning and participatory exploration of land use options*	*1. Scenario planning and modeling at local community and village levels and developing approaches and methodology for "local adaptive scenario planning" – a 5 yr programme at least.*	*CASS + INR Manjengwa / Chirozva / Murphree MJ*	***Funded***	***IDRC***
		2. Issues of larger scale landuse planning, placement/removal of fences etc. (Biosphere Reserve concept for SEL of Zimbabwe?) (Need for spatial info. and remote sensing data/interpretation)	*WWF-SARPO R. du Toit*	*SELCORE and nascent Lowveld Wildlife Association have held workshops relating to this development and explored alternative scenarios in March 2007*	*WWF/ SCF/ WCS (Funding & support for workshops)*
	b) trade offs between alternative landuse enterprises	*NOTE: No concepts yet but could form part 4(a)2 above on biosphere reserve concept (See also "Conceptual framework revisited" – January 2007)*			
	c) Effects of alternative policies on development, adaptability and resilience	*NOTE: No concepts yet (See also "Conceptual framework revisited" – January 2007)*			

Theme	Module	Potential research proposal/Activity	Lead Agency/ person respon.	Status	Potential Donor
#5 Policy support and capacity building	a) Support for policy development on animal health and linkages between animal and human health and ecosystems	Reviews of existing policy, seminars and training workshops in policy analysis	?	?	
	b) Exploring consequences of alternative policies using scenarios	See 5(a)1 above Scenario planning workshops Urgent need in Zw – scenarios and use of scenes from remote sensing	INR Mike Murphree RdT and MM	Three scenario planning meetings held over the last year and workshop on FMD fences in SEL (See 4(a)2 above	
	c) Capacity building in policy analysis	See 5(a)1 above			
#6 Communi-cations and outreach	**a)** Communication between research workers and agencies engaged in the programme	1. Series of workshops and seminars	WCS (See also Theme 1)	Concept and budget developed	Partial support WCS grant
		2. Web portal for communication between researchers and members of Working Group	Louis van Schalkwyk	Being implemented List serve set up	PPF
	b) Information flow between scientists and Govt. and implementing agencies and policy making agencies	Workshops and seminars and meetings Development of website and database for results.	WCS & CASS PPF GIS initiative		
	c) Participation of landowners, communal farmers etc. in the programme & information flow	NOTE: No specific concepts yet			
	d) Production and distribution of research results, syntheses, policy briefs, etc	NOTE: No specific concepts yet			
	e) Community and Village outreach including theatre linked to PRA	Transfer of information and research findings to communities and feedback on their views, perceptions and needs	Kock & Theatre for Africa + INR	No developments	

APPENDIX 2. LIST OF PARTICIPANTS

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APPENDIX 3. AGENDA, 7th *AHEAD*-GLTFCA Working Group Meeting

7th *AHEAD*-GLTFCA Working Group Meeting

8 th – 9th March, 2007

Venue: ARA-SUL "Clube A Palhota" Resort at Pequenos Libombos Dam, Boane District, Mozambique

NOTE: *Listed presenters of technical topics are kindly asked to prepare a one to two page summary ahead of time and circulate these and any additional material before the meeting, or have materials ready to distribute at the start of the meeting. Thank you in advance for your time and contribution.*

Day One: Thursday 8th March

0900 **Welcome** (Bartolomeu Soto)

0905 Introductions- around the room and Nicky Shongwe's role in *AHEAD*-GLTFCA initiative (Piet Theron)

0920 Brief introduction to *AHEAD* and background (**Nicky Shongwe**)

0935 Objectives and format of the 7th full Working Group Meeting and adoption/adjustment of agenda (**Nicky Shongwe**)

0945 "The *AHEAD*-GLTFCA Programme: Key Questions and Conceptual Framework Revisited". Presentation, discussion of revised Framework document (**David Cumming**)

2.8.1.1 1045 *Tea/Coffee break*

1110 "Addressing animal disease threats and priorities in the GLTFCA- a JMB Conservation & Veterinary Sub-Committee Update on Progress"

(part A- **Markus Hofmeyr**)

(part B- **Nazare Mangueze**)

1140 "South Africa / Mozambique collaboration on animal disease surveys: progress update"

(part A- **Peter Buss**)

(part B- **Carlos Lopes Pereira**)

1200 "Update on OVI BTB approaches of relevance to the GLTFCA (Claire Geoghegan on behalf of Anita Michel)

1210 "CIRAD Lowveld Livestock Project (CLLP) and other activities" (**Alexandre Caron**)

1230 "Preliminary assessment of human TB / BTB in rural areas of Mozambique" (**Custódia Mucavele**, Elisabete Nunes, Adelina Machado, Mateu Espansa)

1250 Q & A, group discussion on TB/BTB, other interface diseases and priority actions needed (facilitated by David Cumming)

1300 Lunch

1400 "Community perspectives on interface issues" (Community Representatives- Obede Baloi & Sebastião Maluleque- Massingir area, Limpopo National Park)

1500 "Transfrontier conservation: Historical and livelihood considerations within the Great Limpopo Transfrontier Conservation Area" (**Webster Whande**)

1525 "Resettlement and the GLTFCA: Current and pending livelihood strategies in the Limpopo National Park area" (**Rebecca Witter, Jessica Milgroom**)

1545 Tea/Coffee break

1615 "Contributions of improved village poultry to food security, income generation, decreased bush meat consumption and avian influenza preparedness" (**Candido Faiela**)

1630 "The Community Water Efficiency Programme (COWEP): Lesson Learned about Protected Area / Community Relations" (**Alexis Symonds**)

1645 "CASS community-based scenarios (IDRC) project update" (**Jeanette Manjengwa, Chaka Chirozva**)

1710 "Update on GLTFCA tri-national scenarios planning efforts (Sand County Foundation, USAID project)" and facilitated discussion (Michael Murphree, *et al.*)

1730 Brief review of progress, outline of tomorrow's programme and break for evening (Facilitator: Shongwe) **Adjourn for dinner (dinner provided by WCS)**- ***Please come back for early start on Day 2!***

Day Two: Friday 9th March

0830 "Update on Mozambique World Bank TFCA project, incl. animal health components" (**Madyo Couto**, Carlos Pereira)

0900 "Updates from SELCORE, LWA and CESVI" (**David Cumming**)

0930 "Update on PPF's GIS database and its availability for / applications to GLTFCA work" (Craig Beech) *CANCELLED- presenter unavailable*

0950 Group discussion on GIS / information-sharing (facilitated by David Cumming)

1000 "The spatial dynamics of wildlife populations across and along the north-western Kruger National Park boundary fence, South Africa" (Ken Ferguson)

1015 "Public health risks and benefits from interactions of humans and their domestic animals with wildlife and wildlife-related activities – a pilot project proposal" (**Greg Simpson**)

2.9 1030 Tea/Coffee break

1100 "Brief informal presentations / updates by proponents of other concepts / projects developed so far (working through Themes, Modules and Projects Table)" (Facilitator: Cumming)

1145 "Need for a core *AHEAD* GLTFCA steering group- now's the time!" (presenters: Murphree / Shongwe / Cumming / Kock / Osofsky / others as available) and group discussion (Facilitator: Cumming)

1215 Institutional commitments to the programme: finalising "letters of collaboration," etc. (Facilitator: Cumming)

1230 Next steps, actions and responsibilities (Facilitator: David Cumming)

1245 Next meeting- when, where, and seeking a volunteer host? (Facilitator: Nicky Shongwe)

1300 Thanks and closure (lunch provided)