

AHEAD-GLTFCA Working Group – 11th Meeting

Record of the 11th Meeting held on the 2nd-4th March, 2011

Mopani Rest Camp, Kruger National Park, South Africa

NOTE: PDFs of most of the PowerPoint presentations given at this meeting are available at:
http://www.wcs-ahead.org/gltfca_march2011/agenda_march2011.html

1. OPENING REMARKS AND WELCOME

Dr. Richard Burroughs, Centre for Veterinary Wildlife Studies, Faculty of Veterinary Science University of Pretoria, South Africa welcomed participants to the 11th AHEAD-GLTFCA Working Group Meeting.

1.1 Keynote Address: Wildlife Disease Surveillance and Monitoring. Roy Bengis

Abstract not available, but please see PDF of PowerPoint on the AHEAD website, as per the above URL.

Introductions: Following the Keynote Address, delegates introduced themselves. Approximately 111 delegates were in attendance.

2. HUMAN HEALTH, LIVELIHOODS, AND THEIR LINKS TO ANIMAL AND ECOSYSTEM HEALTH IN THE GLTFCA (Session Chair: Lucille Blumberg)

Note: abstracts throughout this Record of the 11th AHEAD-GLTFCA Working Group Meeting appear largely as they were provided by presenters, and have not been copy-edited.

2.1 Outbreaks of Zoonotic Diseases in South Africa in 2010: The Human Health Perspective. Lucille Blumberg

National Institute for Communicable Diseases, National Health Laboratory Service South Africa

A number of outbreaks of zoonotic diseases were reported in South Africa in the past year highlighting occupational risks at the human and animal interface, the need for close communication between animal and human health directorates and sharing of surveillance data for early warning, and combining resources for successful outbreak management.

An epizootic of Rift Valley Fever following on heavy rainfall in a number of provinces was associated with 237 laboratory-confirmed human cases and 26 deaths. The majority of those infected worked in occupations where direct contact with animals frequently occurs e.g. farm workers, abattoir workers and animal health workers. A minority of persons likely acquired disease through mosquito transmission or ingestion of unpasteurized milk. While most disease was mild, observed complications included haemorrhagic fever, encephalitis, hepatitis and retinitis. Control measures focused on health promotion to limit unprotected contact with infected animal tissue. Ongoing cases, however, occurred on farms due to difficulties with compliance with preventative measures.

An outbreak of rabies was confirmed in the Johannesburg Metropolitan area due to imported canine rabies from Kwazulu Natal, with 37 laboratory confirmed animal cases mainly in unvaccinated domestic dogs. One human case was confirmed in an infant who did not receive post exposure prophylaxis (PEP) following on an exposure to a puppy. A major drive to educate health care workers and communities about management of animal exposures was undertaken by a joint human health and animal health initiative, together with the provision of rabies vaccine and immunoglobulin for PEP, and an intensive dog vaccination programme.

A focal outbreak of brucellosis was confirmed due to *Brucella melitensis* in a goat herd imported into Gauteng Province. Two human cases were diagnosed in farm workers exposed to infected animal tissue; both were successfully managed without complications.

2.2 As Anthrax Moves Towards the Kruger Boundary: A Perspective on Human Health Risks. John Freatn

National Institute for Communicable Diseases, Johannesburg

Human anthrax case numbers in South Africa are currently very low. Most recent laboratory confirmations at the National Institute for Communicable Diseases have been related to sporadic cases in neighbouring countries. The most common pattern of human exposure to anthrax is in association with death of domestic stock, usually cattle. Informal butchering exposes participants mainly to the risk of cutaneous infection. In poor communities there is often an imperative to reduce the extent of the loss by distributing (sometime selling) the meat, and community members may feel a social obligation to participate. As the guardian of the stock is often not the owner, tangible proof of the death of a cow (as opposed to its theft or unauthorised sale), in the form of horns and/or hide, may be a primary reason for butchery. Education of the community of the potential danger of anthrax to its members and their stock, and of the role of animal health officers in reducing the risk, needs to be sensitive to the cultural environment.

Discussion:

1. Good to hear about anthrax from the human side. Roy Bengis did inform health services and guidelines were drawn up and issued to hospitals and clinics.
2. **Q:** Is transmission related to cuts or scratches, or through normal skin? **A:** Requires a lesion – either pre-existing or due to slaughter process.
3. **Q:** How easy is it to assist communities to identify the signs of anthrax? Can one raise awareness in risk areas where the disease is unknown? **A:** The interface between veterinary and human health is key because there are differential diagnoses. Vets need to inform health services about potential danger to humans.
4. **Q:** What is the situation in KNP with people who handle animals in outbreaks? **A:** Outbreaks statistics - 3 known cases: cut during sampling, prick during bone collection, scrape when scrubbing infected drinking trough.
5. **Q:** Risk to farm workers - what about information to farm workers and farmers on game farms? **A:** Attempted during RVF - limited success and some infections occurred - lack of response due to commercial considerations.

2.3 Introduction to the Mnisi Community Programme and the Latest Findings Regarding Baseline Research on Ecosystem Health, Cattle Production and Health Management at the Wildlife / Livestock Interface within the GLTFCA, South Africa. Jacques van Rooyen

Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, Onderstepoort, South Africa

The Mnisi community is situated at the wildlife/livestock interface just outside Orpen gate on the western boundary of the Kruger National Park (KNP). A large section of the communal land of the Mnisi community (approximately 30 000 hectares of which approximately 75% borders the adjacent conservation areas) has been developed into a long-term research site by the University of Pretoria called the Mnisi Community Programme (MCP). The adjacent provincial reserves - Manyeleti (open ecosystem with KNP) and Andover (closed ecosystem) – are included in the study area. The MCP was developed primarily to study the complex relationship between the health of the environment, the animals (wild and domestic) and the people at the wildlife/livestock/human interface, within the context of the One Health philosophy. Research findings are expected to contribute significantly to the improvement of the livelihoods of the people of Mnisi and surrounding areas, their animals and the overall conservation efforts of the GLTFCA.

The lack of appropriate information of the study area necessitated a broad baseline survey that would describe the status of the environment, the conservation activities, the agricultural activities, animal health and production and that of household socio-economics. Several research projects were initiated and completed over the last two years to generate the relevant information. The main focus of research up to now have been to quantify the ecological capacity and quality of the study area, identifying major constraints and opportunities in the cattle farming sector of the community and establishing a socio-economic profile of cattle-owning households. At least two projects have studied the presence and prevalence of important infectious diseases (especially zoonotic) in animals with the aim of expanding the surveys to wildlife and humans in the study area. Several new projects will contribute to the already growing information-base necessary to understand the interactions between the environment, the animals and people of the study area.

Results from the ecological evaluation of the study area emphasized the importance of biodiversity. The conservation area with the highest biodiversity, Manyeleti, had the most resources available to both grazers and browsers. Even though the communal area had the lowest veld condition score, the botanical composition implied a resilient ecosystem most probably in a less productive equilibrium despite intense over-utilisation. Trade and marketing activity demonstrated the impact of the trade restrictions in the area with only 50% of farmers surveyed having sold any cattle in the preceding 12 months. Home consumption and informal trade of milk and meat indicated potential risk of disease transmission but made an important contribution to household sustenance. The socio-economic profile of cattle-owning households revealed the importance of livestock to their well-being. Low calving rates are of particular concern and thus research into the prevalence of diseases generally responsible for low reproduction rates suggested other factors to be the main reason. New tourism developments in the region highlight the importance of the responsible development of the livestock and wildlife industry within the constraints of the area for conservation, food security and economic sustainability.

Discussion:

1. **Q:** Comparing with Sengwe in Zimbabwe with a different interface, the broad picture is the same; same situation of lack of market access. To what extent is the situation related to the fact that Mnisi is in an FMD control area? **A:** Only one abattoir can source animals from the area; people believe they are last on the list, take it or leave it situation. There are possibilities to develop and increase local consumption due to tourism initiatives in the area - develop proper facilities and products to feed the tourist initiatives. Should also consider commodity based trading from the area.
2. **Q:** Lack of investment in animal health care - reasons? How can changes be monitored? **A:** Longitudinal animal health surveillance, life studies on animals – reproduction parameters, herd health

status, calf survival, parallel to mentorship system and training of handlers and owners in primary animal health care. Need incentives to invest in animal health care – starts there, because must address problem of low offtake, or make the situation worse.

3. Lack of interest and investment may be due to historical lack of access to animal health services and also application of human health knowledge to animals.

2.4 The Mnisi Zoonosis Study. Greg Simpson, Lucille Blumberg, Oupa Rikhotso, Darryn Knobel, Jacktone Okupe

The Mnisi community lives in the area to the west of Manyeleti Nature Reserve in Mpumalanga. The community is comprised of 40 000 people. The predominant sources of cash are migrant labour, government grants and local employment and other livelihoods are agriculture and natural resource use. There are four primary care clinics that have 1000-2000 visits per month each.

The vegetation is bushveld savanna with a small proportion under cultivation and the rest for grazing. There are 12000 cattle, 3000 goats and 400 pigs present. There are also an unknown number of dogs, chickens and cats present.

There were eleven positive cases of rabies in animals last year. One human clinic sees 275 cases per year with symptoms similar to malaria of which only 1.4% were found to be positive for malaria and the rest unknown. Little is known about zoonotic diseases in this area. Medical personnel do not see them as a priority. They are overwhelmed by the high prevalence of human immunodeficiency virus, tuberculosis and diarrhoeal diseases.

This area should be predisposed to zoonotic infections due to the close association of people and their animals and the historic absence of veterinary services. The surrounding of the community on three sides by wildlife reserves should increase the interest in epidemiology of zoonoses in the area. The Mnisi Zoonoses project aims to study the epidemiology of various zoonoses in the area.

Discussion:

1. **Q:** Did the survey for dog numbers include numbers of stray animals? **A:** No, considered how to do it but identification of the animals was a problem. Ownership is also a problem as dogs change from one household to another.
2. **Q:** What other zoonoses might be an issue in humans? **A:** There has been a case of Q fever (Nick Kriek), rickettsioses, and bovine tuberculosis.
3. **Q:** Nutritional status of community? **A:** Don't have statistics: diet may be lacking in terms of vegetables and micro-nutrients; see obesity and hypertension as result of high starch, and malnutrition in children.
4. **Q:** Within the GLTFCA context - reduction of government support, communities that can't or won't invest in animal health. How do you see a way forward to better animal health management? **A:** Unwillingness is due to lack of interest; education results in people doing things other than farming. More serious farmers (often older) are keen to invest in their animals - they may increase size of farms and herds and their willingness will increase over time.

2.5 Zoonoses in the Manyeleti Area. Jacktone Okuthe

A large proportion of human pathogens are zoonotic, the vast majority of which are not prioritized due to lack of information and awareness of the extent of the problem. There is need for reliable data to demonstrate the neglected status of these diseases. Manyeleti area has an existing human, livestock and wildlife interface,

therefore a potential for outbreaks of zoonotic diseases. This study looks at the presence and extent of zoonotic diseases in the area in order to provide data for planning prevention and control programmes.

Notifiable disease records and hospital morbidity data from the area hospital and local clinics were reviewed. Data from the sub-district communicable diseases office were also included. All human cases of zoonotic disease recorded since the year 2005 were documented and animal cases obtained for comparison. No case of human rabies was documented from the Manyeleti area between 2005 and July 2010, while three cases were documented from the entire Bushbuck Ridge sub-district in the same period. However, there were 121 confirmed cases of rabies in animals with a total of 37 human contacts. The low number of human cases suggests there may be cases not being reported.

Discussion:

1. 5-10 zoonoses have been detected in Mpumalanga; interface is a hot spot. Need to strengthen the surveillance systems. Study shows weakness that we have.
2. **Q:** What is the socio-ecology of the low prevalence of zoonoses if it is genuine? We may have more important issues – keep looking but find out why it is relatively low, if that is the case. **A:** Low prevalence may be due to diagnostic limitations – e.g. rabies may just be diagnosed as encephalitis. Diagnosis confirmation not always encouraged.
3. **Q:** Over how many years were the diagnostic cases in dogs obtained? Are there figures on dog numbers, dog/human ratio, rabies vaccinations, and acceptance of vaccination by dog owners? **A:** Obtained over 5-year period; details of dog vaccination not examined, but from neighbouring area vaccination rate was about 36%.

2.6 Investigating Zoonotic Diseases at the Wildlife-Livestock Interface of Two Protected Areas of Botswana: the Okavango Delta and Chobe National Park. Jori, F.^{1,2}; Munstermann, S.³, Mokopasetso, M.³, Etter, E.¹, Mhongovoyo, J.⁴, Nkgowe, C.⁵, Michel, A.⁶ and Newmann, S.⁷

¹UPR AGIRs, CIRAD, Montpellier France; ²Mammal Research Institute (MRI), Department of Zoology, University of Pretoria, South Africa, ³FAO ECTAD, Gaborone, Botswana, ⁴Department of Wildlife and National Parks, Botswana, ⁵National Veterinary Services, Ministry of Agriculture, Botswana, ⁶Department of Veterinary Tropical Diseases, University of Pretoria, South Africa, ⁷EMPRES Wildlife Unit, ECTAD, FAO, Rome, Italy.

The transfer of pathogens at the wildlife-livestock interface is a topical issue in the development of Transfrontier Conservation Areas (TFCA). In this context, we performed a survey for 3 zoonotic diseases in the Botswana component of the Kavango-Zambezi (KAZA) TFCA: a total of 85 buffalo and 500 cattle were sampled along the western boundary of the Delta. In addition, another sample of 85 buffalo was collected from the northern side of Chobe National Park. All samples were screened for the presence of antibodies against brucellosis, bovine tuberculosis (BTB) and Rift Valley fever (RVF) between April and December 2010. In addition, 100 questionnaires were applied among randomly selected cattle owners. The prevalence of BTB and brucellosis in our cattle sample was nil. However, we detected short- (IgM) and long- (IgG) lived antibodies to RVF in 2% and 16% of the cattle, respectively despite the absence of apparent clinical symptoms. Based on these findings, a longitudinal study to monitor RVF virus dynamics over a one-year period in cattle and mosquito vectors has been started in this area. The results of the buffalo survey, once available, will allow us to determine the presence or absence of these diseases within the wildlife population. Multifactorial analysis of questionnaire responses among cattle owners was carried out and results indicate a possible association between cattle-buffalo contact with respect to disease transmission. Combined results from cattle owner interviews, cattle and buffalo surveys will provide baseline data for further comprehensive disease studies at the wildlife-livestock-human interface within the KAZA TFCA.

Discussion:

1. **Q:** Establishment of serum bank for reference material? **A:** Material is conserved in South Africa and Botswana for further surveys.
2. Contribution of zoonotic diseases to acute febrile illness studies in northern Tanzania: 870 hospitalised febrile patients, 9% leptospirosis, 5% Q fever, 8% rickettsioses – almost 25% had zoonoses; 700 febrile outpatients, Kenya, 7.2% positive for rickettsias. This was an animal orientated study, preliminary, but will encourage health authorities to undertake similar studies in humans in the area.

2.7 Activities of the Research Platform Production and Conservation in Partnership (RP-PCP) at the Wildlife-Livestock Interface in Zimbabwe: Outputs After 3 Years. de Garine-Wichatitsky M¹, Murwira A², Caron A^{1,3}, Pfukenyi D⁴, Mundy P⁵, Fritz H⁶, Mukamuri B⁷, Manjengwa J⁷, Mwenje E⁵

¹CIRAD, UR AGIRs, Harare, Zimbabwe; ²Department of Geography and Environmental Science, University of Zimbabwe, Harare, Zimbabwe; ³Mammal Research Institute, University of Pretoria, Pretoria, South Africa; ⁴Faculty of Veterinary Science, University of Zimbabwe, Harare, Zimbabwe; ⁵National University of Science and Technology, Bulawayo, Zimbabwe; ⁶CNRS, UMR LBEE, Villeurbanne, France; ⁷CASS, University of Zimbabwe, Harare, Zimbabwe

The research platform RP-PCP, “Production and Conservation in Partnership” has been created three years ago. It includes four institutions: CIRAD, UZ, NUST and CNRS. Its main research question is to explore the drivers of human/animal interactions in the periphery of protected areas in order to mitigate the conflicts and promote the positive relationship. Four main topics have been identified by the research platform: Animal Health and Environment, Ecology, Governance and Conservation & Agriculture. Three study sites in Zimbabwe are investigated: the South East Lowveld in the GLTFCA, Hwange National Park and its periphery (in KAZA), and the Mid-Zambezi Valley.

In this presentation, outputs after this 3 year phase are presented: 28 postgraduate students have been/still are supervised under the RP-PCP including 20 Zimbabweans and 8 Europeans. Ten Zimbabwean Master students should graduate before the end of 2011. Nine articles in peer-reviewed journals have been published, 8 have been submitted and 26 manuscripts are in preparation. RP-PCP scientists and students have participated in a special issue of Biodiversity and Conservation and are currently involved in 5 chapters on a book focusing on livelihoods in TFCAs. We conclude by presenting the way forward for the RP-PCP including its regional approach through an expansion of its collaboration and study sites. The AHEAD-GLTFCA Conceptual Framework has been a valuable tool for the RP-PCP.

2.8 Assessment of Air- and Water-Related Human Health Effects Among At-Risk Communities Residing in the Upper Olifants Water Management Area. C Wright, MA Oosthuizen, J John, P Albers, W le Roux, M Steyn, B Genthe, P Oberholster

CSIR Natural Resources and the Environment, Pretoria, South Africa

In December 2009, the CSIR initiated a research project to understand the possible risks to human health in the Upper Olifants River Catchment / Highveld Priority Area, following the death of wildlife and alarming results of water samples in the Upper Olifants Catchment. A project team was brought together and ethics approval for the project was obtained from the CSIR Research Ethics Board in July 2010. The NOVA Institute was subcontracted to carry out the fieldworker training and administering of the household survey. The questionnaire asked each household about demographics, possible exposure to water and air pollutants, use of the local stream, sanitation, solid waste removal, nutrition, energy use, health and healthcare, personal hygiene and socio-economic factors. A total of 16 fieldworkers carried out the household survey from 11 - 26 October 2010. Random household sampling was used to select households from the three key areas: Kwa-Guqa Extension 4-5, Vosman and Empumelweni. The final workable dataset was 1003 households. Simultaneous

to the household survey, air quality (AQ) monitoring was done for 1 month at the Reverend's house to monitor ambient PM₁₀, SO₂, and mercury concentrations. Manganese and lead were tested for from the PM₁₀ filters. Two water sampling campaigns were carried out to determine water quality of the local stream (the Brugspruit, tributary of the Olifants River), tap water (house taps and stand pipes) and storage container water. For each campaign, the number of samples included: 3 from the local stream; 7 from taps in-house; 7 from standpipes; and 14 from in-house storage containers. For the stream water samples, tests for presence of protozoan parasites, enteric viruses, bacteria pathogens, faecal indicators and somatic coliphages were done. For the in-house taps, standpipes and storage containers, faecal indicators and somatic coliphages (indicator for viruses) were tested for. Data quality control and cleaning is underway and descriptive results will be presented.

Discussion:

1. **Q:** Very little *Cryptosporidium* - was this expected? **A:** No, results are being worked on and written up.
2. Possible under-representation of disease: look at people who say they are healthy – people may only seek assistance when it impacts on their lives.
3. **Q:** How long has the river been polluted? Any plans for a longitudinal survey? **A:** CSIR sampling in collaboration with others, including mines - data for 2 years. No plans on their part. Would like to start with local factors e.g. filling in of clinic forms.

2.9 The Kavango-Zambezi TFCA: Policy and Process Observations from a One-Health Perspective.
Mark Atkinson

Wildlife Conservation Society, AHEAD Program, Botswana

AHEAD (Animal & Human Health for the Environment And Development) aims to address problems facing biodiversity conservation and development in large, transboundary landscapes, focusing on the critically important linkages among wildlife health, domestic animal health, and human health and livelihoods. Our current area of focus is one of southern Africa's major transfrontier conservation areas, the Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA), at the verge of becoming perhaps the world's largest conservation-oriented landscape. The development of TFCAs to further the conservation of biodiversity and sustainable development through the harmonization of transboundary natural resource management is a priority for SADC (the Southern African Development Community) and the five countries that encompass the KAZA TFCA: Angola, Botswana, Namibia, Zambia and Zimbabwe.

The importance of this TFCA to the region was evidenced when the five nations signed an international MoU to establish the KAZA TFCA in 2006, agreeing to create a transfrontier area spanning approximately 400,000 km² and encompassing more than 70 protected areas including national parks, game and forest reserves, community conservancies, hunting blocks, and game management areas. A key economic driver behind TFCAs like KAZA is nature-based tourism, which now contributes about as much to the economy of southern Africa as agriculture, forestry, and fisheries combined. However, the management of wildlife and livestock diseases (including zoonoses) within the envisaged larger transboundary landscape remains unresolved and is an emerging policy issue of major concern to livestock production, associated access to export markets, public health, and other sectors in the region.

This presentation will describe specific health-related cross-sectoral issues in the context of KAZA, identify areas of conflict that threaten conservation and development success and discuss potential opportunities for making progress towards achieving compatibility between the TFCA concept and management of transboundary animal diseases in the region.

Discussion:

1. **Q:** Nice to see similar approaches to same problems. Not yet enough proof for policy makers that “One Health” approach works (mentioned by senior policy maker at a recent conference). Is there a need to get things right at one place through cross-sectoral approach instead of many places? **A:** In KAZA, countries tend to follow the lead of one pro-active member e.g. Namibia commodity based trade initiative. Need to find ways for wildlife and livestock to be compatible.
2. **Q:** Buy-in by communities under TFCAs – must start development of policy at community level. What do you have in mind? **A:** CJ GCF programme is trying to promote something between top down and bottom up approach – push idea that communities must be part of the planning process. They are promised many things e.g. tourism will put an end to poverty but not clear how. There are progressive communities in KAZA that are making things work themselves. Decision-making bodies must meet them half way.

2.10 How Relevant is Climate Change to SADC Transfrontier Conservation Areas? Anton Seimon

Wildlife Conservation Society, Global Conservation Program, New York, USA

Climate change confronts the Southern African Development Community with a variety of building stresses that have the potential to reverse past successes in conservation and development throughout the region. In the 10th AHEAD meeting in February 2010 it was noted that climate change as a concern in planning for human livelihoods and animal health was largely not being taken into account in the GLTFCA. This talk will follow up by discussing the relevance of climate change in SADC regional contexts, and report on some subsequent findings from a literature review performed for the Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA). The presentation contains three components. First, drawing largely from recent work by the International Livestock Research Institute (ILRI) it examines impacts of climate change upon agriculture in Sub-Saharan Africa under high-magnitude climate change scenarios for the 21st century. This reveals the potential for profound changes in food security for the SADC region and its TFCAs, with implications for land use, cultivars, and the viability of cultivation and pastoralism across the landscapes. Second, the WCS Albertine Rift Climate Assessment focused in equatorial Africa is briefly outlined as a demonstration of how applied climate research and modeling for conservation is being utilized through stakeholder consultation to facilitate the incorporation of climate change threats and opportunities into long-term conservation planning. Finally, results from the KAZA literature review on climate change are presented. Among other things, these identify an apparent disconnect between scientific understanding and conservation policy related to the development of the TFCA, and a deficit of understanding on animal disease epidemiology under predicted changes in climatic conditions. Taken together, these studies suggest that the TFCA development would benefit from greater inclusion of climate change-related considerations.

3. ANIMAL DISEASE CONTROL MEASURES: HOW DO THESE AFFECT LIVELIHOODS? (Session Chair: Roy Bengis)

3.1 Challenges Managing Foot and Mouth Disease at Wildlife / Livestock Interface Level on Mongolia's Eastern Steppe. Enkee Shiilegdamba, S Bolortsetseg, A Fine, and D Joly

Wildlife Conservation Society

Foot and Mouth Disease (FMD) and other pathogens such as anthrax, tuberculosis, brucellosis and pasteurilla are endemic in livestock in Mongolia. Close interaction between domestic livestock and wildlife increases likelihood of disease transmission amongst livestock, wildlife and humans. Disease outbreaks such as FMD have caused severe disruptions to Mongolia's pastoral economy, and threatened long-term persistence of wildlife such as Mongolian gazelle (*Procapra gutturosa*). Mongolian gazelles share pasture with domestic

livestock (sheep, goats, Bactrian camels and cattle) and there is fear and perception amongst veterinary and animal husbandry community that specifically, gazelles spread FMD and other pathogens to livestock. A clear example of this perception was documented during FMD outbreaks in livestock in 2010. FMD outbreak was detected in cattle in April of 2010. This outbreak continued to spread from cattle to sheep, goats and camels in Dornod and Sukhbaatar provinces. In August of 2010 FMD outbreak spread further from Dornod and Sukhbaatar provinces to neighboring provinces such as Khentii, Dundgobi, Tuv and Gobisumber. During this timeframe gazelle were observed with FMD-like clinical symptoms such as lameness fallen hoof, weak body conditions and were confirmed to be exposed to FMD virus by laboratory analyses. The National Emergency Committee (NEC) and all corresponding national agencies started to blame gazelles as the source of FMD transmission. Therefore, there was a Government decree to cull all lame and ill looking gazelles in September and another decree in November to alter and prohibit further migration of gazelles to non FMD areas. Government officials suspected FMD outbreaks occurred from Dornod to Sukhbaatar and in Tuv and Gobisumber provinces due to gazelle migration.

WCS completed an initial serosurvey of Mongolian gazelle in 1998-99 and found no evidence of FMD exposure. However, in a 2001 study following 2 years of outbreaks of FMD in livestock, antibodies to type O FMD virus (FMDV-O) were detected in the majority of gazelles sampled (67% of 33 animals). In the follow-up study (2005-07) we collected sera from 57 wild Mongolian gazelle calves and 555 adult domestic animals of four species sympatric with the Mongolian gazelle, including sheep, goats, Bactrian camels, and cattle. Overall, 1.9% (95% CI 1.1 - 3.5%, n =555) of the 4 livestock species were seropositive for non-structural proteins of Foot and Mouth Disease virus (FMDV-NS), while 23.2% (95% CI 20.3 - 26.5%, n = 555) had antibodies for structural proteins (i.e., possibly vaccination-derived antibodies). Seven of 57 free-ranging gazelle calves (10.9%, 95% CI 5.4 – 20.9%) were FMDV-NS positive (had maternal antibodies). Additionally, 36 adult gazelles were sampled in 2008 and none of them were seropositive for exposure to FMD virus, indicating a significant decline ($\chi^2=18.99$; $p < 0.001$; $df=1$) in seroprevalence among gazelles from the same area compared to a livestock outbreak timeframe. The episodic nature of FMD outbreaks on the Eastern Steppe shows that FMD is not endemic in Mongolia as most primary outbreaks occur 50-100 km radius from border with China and Russia. Also our limited seroprevalence studies in gazelles show that FMD virus exposure in gazelles occur only during or following concurrent outbreaks in livestock. This suggests that FMD may spill over into the gazelle population during livestock outbreaks, and that successful control of FMD on the Eastern Steppe requires a focus on control in livestock populations through consistent vaccination program. During a livestock/wildlife interface disease outbreaks control policies are often formed without adequate information about the risk of disease on wildlife conservation issues and environmental impacts. WCS therefore set out some studies to identify pathogens that are present in wildlife (such as Mongolian Gazelle/*Procapra gutturosa* and Saiga Antelopes/*Siga tatarica mongolica*) in comparison to local livestock to inform decision makers and disease control policies to properly address the disease control and mitigation activities without involving or negatively impacting wildlife and the environment. Results of our findings show wildlife exposure to a range of livestock diseases. Results of our wildlife/livestock interface disease study will be vital to help in the design and implementation of a disease management program addressing conflicts at livestock/wildlife interface.

Discussion:

1. **Q:** Are there conservation areas on borders with Russia and China? **A:** Conservation areas exist on the borders with Russia and China; there are attempts to extend Mongolian gazelle migration areas. No fences on Russian side but Chinese border fenced.
2. **Q:** Is there any supporting information from China on strains and trends? **A:** Very difficult for a small country to initiate cooperation with large neighbours – FMD is endemic in China but information is not shared, ban on samples being shared. Russia does share information with Mongolia.

3.2 Linking Livestock Disease and Human Behaviour to Improve Rural Public Health: A Case Study of *Mycobacterium bovis* and Milk in South Africa. Claire Geoghegan, Tiny Hlokwe, Keneilwe Raseleka, Tanguy Marcotty, Wayne Getz and Anita Michel

Community and animal health are intrinsically linked in rural farming areas, where households rely heavily on livestock for agricultural practices, transport, food and financial security. This close contact between humans and animals provides frequent opportunities for the transmission of disease among species, especially in areas where poor medical and veterinary resources limit effective disease surveillance and control. Combating the spread of these zoonoses is essential to prevent declining community and livestock health from increasing the use of natural resources to supplement food, income and medicinal products. Public health campaigns are often a cost-effective and popular method to communicate preventative strategies and prophylactic measures to remote communities. However, without adaptation, the recommendations are often locally impractical or culturally insensitive, which hinders compliance and disease control.

Here, we present the results of a study to address the risk of zoonotic bovine tuberculosis (BTB) in rural farming communities neighbouring Hluhluwe-iMfolozi Park, in KwaZulu-Natal, South Africa. We discuss the use of clinical disease surveillance and human behaviour research to assess disease risks based on local lifestyle and livelihood practices; with particular reference to dairy and meat use by household members. The relevance of current public health recommendations for dairy products are further addressed through the quantification of bacterial longevity in locally obtained, experimentally infected, milk and soured milk products under various traditional collection and storage conditions. Finally, a combination of the clinical, behavioural and molecular results are used to develop locally-relevant public health recommendations, with a view to promoting enhanced compliance and more effective disease control in rural KwaZulu-Natal.

4. DISEASE TRANSMISSION AT THE INTERFACE (Session Chair: Peter Buss)

4.1 Prevalence of Diseases at Different Wildlife / Livestock Interfaces in the Great Limpopo Transfrontier Conservation Area. Caron, A, Miguel, E, Jori, F, Hofmeyr, M, Pfukeyni, D, Foggin, C, de Garine-Wichatitsky, M

The creation of Transfrontier Conservation Areas (TFCAs) in southern Africa is increasing wildlife, livestock and human movements across international boundaries. The increased mobility of these potential hosts is an opportunity for their pathogens to spill over to new species and spread to naive areas. The perception is that this negative outcome of TFCAs could compromise their success as it could influence human, livestock and wildlife health. The extent of the pathogen threat on TFCAs will depend on the type of multi-host system (wild and domestic) present, on the type of interface between wild and domestic populations and as a consequence of contacts between wildlife and domestic populations that will lead to disease transmission. We explored the prevalence of important pathogens for livestock (mainly cattle) and wildlife (mainly African buffalo) at three different wildlife/livestock interfaces (no interface, no fence or fenced interface) in the South East Lowveld of Zimbabwe and adjacent international protected areas in the Great Limpopo Transfrontier Conservation Area. Our main assumption was that different interface will lead to different pathogen transmission at the wildlife/livestock interface. Results on bovine tuberculosis, foot-and-mouth disease, brucellosis, Rift Valley fever and tick-borne diseases suggest that wildlife/livestock transmission do occur across all types of interface but not with the same intensity and not uniformly across hosts and pathogens. We conclude that the ecology of disease transmission in complex multi-host epidemiological systems necessitate a community-level analysis and the subsequent development of new multidisciplinary approaches.

4.2 Contacts Between Domestic Cattle and African Buffalo in the Great Limpopo Transfrontier Conservation Area: Potential for Disease Spread. de Garine-Wichatitsky, M, Miguel, E, Cornélis, D, Grosbois, V, Foggin, C, Jori, F, Hofmeyr, M, Caron, A

There is evidence that wildlife plays a major role in the epidemiology of several (re)emerging or endemic diseases in livestock and human populations living at the periphery of conservation areas. In southern Africa the African buffalo (*Syncerus cafer*) is known to play a role in the maintenance and spread of important diseases, such as bovine tuberculosis, foot-and-mouth disease and brucellosis. Management has mainly concentrated on the confinement of free-ranging buffaloes inside protected areas, associated with surveillance and/or vaccination of livestock populations at the periphery. Despite these measures, buffaloes and other wildlife species have reportedly repeatedly spread pathogens across boundaries of conservation areas during the past decade. Very few studies, however, have documented contacts between wildlife and livestock at these locations.

We used data from sympatric radio collared buffaloes (n=24) and cattle (n=17) to estimate the frequency and intensity of inter-specific contacts for both direct (co-occurrence at the same site at the same time) and indirect (same site but with a delay in time) contacts. Animals were monitored between July 2008 and December 2010 in two sites from the Great Limpopo TransFrontier Conservation Area, inside and at the periphery of Gonarezhou National Park (Zimbabwe) and Kruger National (South Africa). Using social network analysis, we analyse the structure of contact networks. The main results indicate that: 1) contacts between cattle and buffaloes occur both inside and outside protected areas, although direct contacts are rare; 2) there are significant variations between individuals in the frequency of interspecific contacts. The epidemiological implications of these results are discussed.

4.3 Disease Dynamics of Bovine Tuberculosis and Rift Valley Fever: A Possible Role for Immune Mediated Interactions in Coinfected African Buffalo (*Syncerus cafer*). B Beechler¹, V Ezenwa³, A Jolles²

¹Department of Environmental Sciences, Oregon State University, Corvallis; ²College of Veterinary Medicine, Oregon State University, Corvallis; ³School of Ecology, University of Georgia, Athens

Studies in wildlife disease ecology typically investigate a single host-pathogen system, however natural populations are exposed to multiple pathogens simultaneously. Different parasites present in a population may affect each other's incidence through their effects on host immune responses. We are investigating interactions between the invasive disease bovine tuberculosis (BTB) and the native viral disease Rift Valley fever (RVF) in a competent reservoir host, African buffalo, at Kruger National Park (KNP), South Africa. Here we present cross-sectional data on 200 female African buffalo suggesting that RVF seroprevalence is elevated in buffalo with chronic BTB compared to animals uninfected with BTB. However, this pattern does not hold for those buffalo recently (and acutely) infected with BTB. Further, we show that buffalo with chronic BTB, but not acute BTB, have impaired immune responsiveness to novel antigen challenge. In combination, these results suggest that chronic BTB may result in immunosuppression in buffalo, which may make them more susceptible to viral infections such as RVF. Invasion of a non-native infection such as BTB may thus secondarily alter the dynamics of native infectious diseases in free-ranging wildlife populations.

Discussion:

1. Need to be careful about interpretation of data: positive serology does not necessarily indicate a disease or a problem. RVF as an example: we don't know enough about exposure of cattle to mosquitoes and whether they became ill. Must be careful about how results are reported in case wrong conclusions are drawn.
2. Many people looking at diseases in different parts of the country; lack of resources cited as a limitation; SADC from trade point of view complains about lack of data to support claims of safety of products. Needs a regional approach – use the same tests, make sure data can be accepted as reliable.
3. Could BTB chronic humoral activation enhance detection of RVF antibodies? – need to look at this.

4. **Q:** If buffalo get BTB, don't they already have a compromised immunity? Maybe part of natural selection – how can you pinpoint the difference? **A:** The data presented are just on prevalence, but 5 years of data will be more informative.
5. **Q:** With gamma interferon, may get false negatives – early and chronic infections not detected. Rather source uninfected animals from uninfected herds? **A:** Changes over time may help to eliminate this but it is a consideration.

4.4 Session Discussion

1. **Q:** Contact studies for FMD do not include method of transmission. Is this known? **A:** Aerosol transmission and also fomites. Contact was not close when large cattle were used in experiments but transmission/integration occurred between similar-sized young animals. **A:** Some misunderstanding – previous answer referred to carrier transmission. Most transmission occurs when young animals in herds are acutely infected and excreting virus – mistake to assume only one way of transmission. **Q:** Extent and rate of contact between cattle and buffalo: effects of herd size and cattle breed on contact? **A:** Sample was random and not stratified at all; point taken, but believes strategy of owner re grazing will be more important than breed.
2. To understand pathogen dynamics need to conduct longitudinal studies in linked host populations. Move away from cross-sectional serological prevalence studies (can build on them); need to standardise methodologies. Learn from human health surveillance.
3. Comment re FMD and longitudinal studies: (i) reason for changing strategy to take season into account, (ii) contact study will be longitudinal.
4. Note on terminology. Must be very careful to distinguish between disease and infection; antibodies reflect host response; look for disease and also links between seroprevalence and disease.
5. Study in Sengwe and study in southern KNP: splinter groups and solitary buffalo on W boundary of KNP seek out cattle – higher risk scenario.
6. SADC committee - interest in changing policy to change peoples' lives. Need to understand scientist/politician interface. Politicians don't understand the information they get. Need to address real problems in a constructive manner, not search for diseases. Lack of sustainability of livestock production in some areas not always due to FMD control - there are other factors. The SADC committee needs to be involved - for instance, the epidemiological subcommittee influences decisions on disease control.

4.5 Video: The Need for Compatibility between Wildlife Conservation and Livestock Development in Southern Africa. Gavin Thomson & Bedelia Basson

5. GOVERNANCE, LAW AND POLICY CHALLENGES FOR THE IMPLEMENTATION OF THE GLTFCA: A MULTI-LAYERED PRESENTATION FROM THE GLTFCA POLICY RESEARCH GROUP

(Session Chair: Clara Bocchino)

Session prepared by North West University with inputs from USAID and University of British Columbia. The following report provides an overview of governance and policy related issues in the GLTFCA, and is provided *in lieu* of abstracts for some presenters.

5.1 Introduction to the Session: Governance, Law and Policy Challenges for the Implementation of the GLTFCA: A Multi-Layered Presentation From the GLTFCA Policy Research Group. Prof. F. Venter, Prof. W. Du Plessis, Prof. C. Rautenbach, Prof. L. Kotze, Prof. A. du Plessis, Prof. S. de la Harpe, Dr. C. Bocchino, Ms. A Terblanche, Mr. Niel Lubbe (Faculty of Law, NWU) and Mr. R. Alberts (Centre for Environmental Management, NWU)

Introduction

This abstract has been created for the 2011 *AHEAD-GLTFCA* Annual Working Group Meeting with the purpose of presenting and discussing issues related to governance and policy for the Great Limpopo Transfrontier Conservation Area (GLTFCA). Although there have been a number of publications touching on these topics, as well as the challenges and opportunities they pose for the implementation of the TFCA (Wolmer, Duffy, Murombedzi, Whande, Bocchino, and Hansen to name a few), the approach of the authors is to produce a consistent set of novel presentations on the topics. The aim of these presentations is to address, firstly, the challenges and constraints that the GLTFCA has faced in its implementation. Following from there, eight presentations will discuss the principles of each identified field of governance, policy and legal studies. Finally, a concluding presentation will identify needs for further research areas and policy development. These will be timed so as to provide an informative base for discussion, without overbearing the agenda of the meeting.

The assumptions from which the presentations originate directly relate to the origins of TFCAs in southern Africa, both as conservation projects and as Peace Parks. Furthermore, the implementation of the GLTFCA has proven very challenging on governance for seemingly three key reasons. Firstly, its geographical positioning and size – across three countries, spanning vast areas of communal land or un-protected areas, has been so far only challenged by the KAZA TFCA, for which the Memorandum of Understanding, only, has been signed. Secondly, and directly related, are a set of issues related to the use and management of natural resources: from access to land and potable water, to human-wildlife conflict, land tenure systems and rights of use and management of existing wild flora. Thirdly, and overarching, is the issue of governance both within each state and between the three states: South Africa, Zimbabwe and Mozambique.

This set of presentations, further discussed below, will reflect the process that has been summarised in Figure 1. The presentations have been devised to identify, from field experience yet with a sound theoretical basis, the key challenges in the implementation of the GLTFCA and, from a legal perspective, they discuss what are the requirements and/or guidelines in the national, regional and international spheres for improving the implementation in a way that benefits both conservation and rural development within the uncertain borders of the GLTFCA.

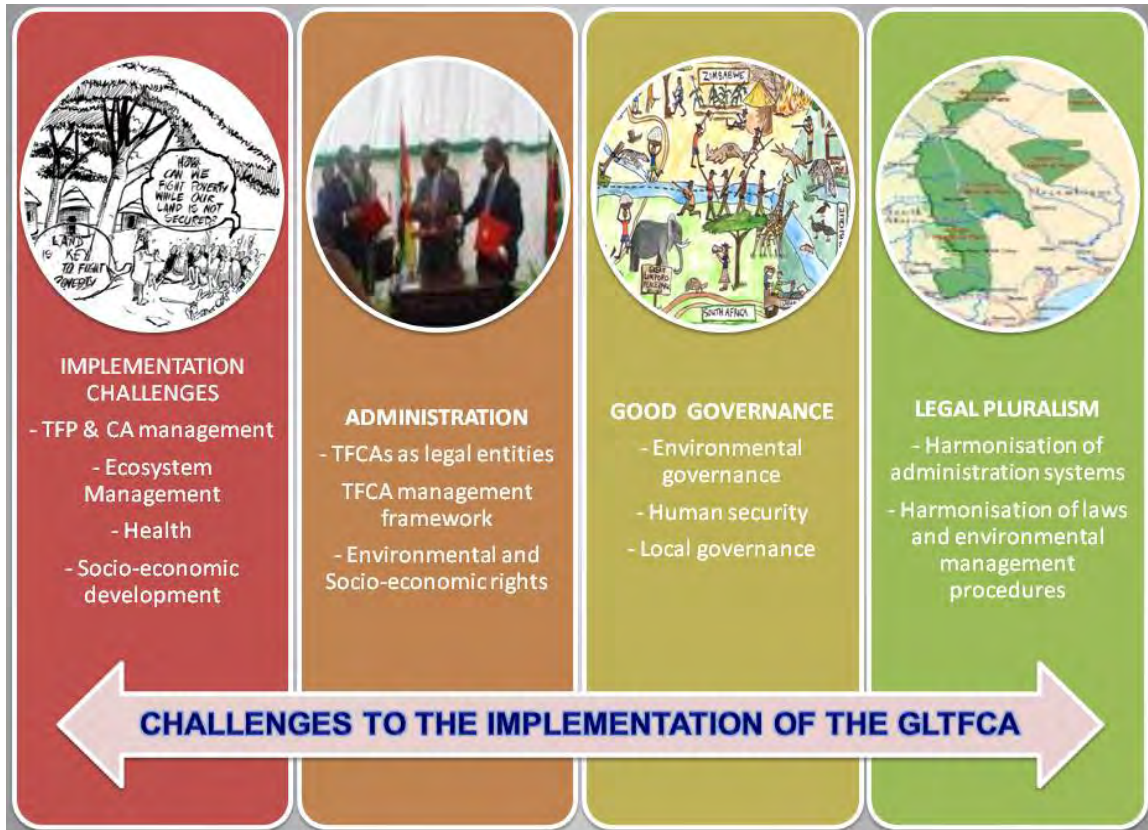


Figure 1: Contents of the presentations

Topic 1: Implementation challenges for the GLTFCA

The establishment of TFCAs in Southern Africa has followed a systematic approach, which aimed on the one hand at fitting in the IUCN categories of protection, although in a transboundary context (Van der Linde et al., 2001), hence the differentiation between a TF Park and a TFCA. On the other hand, it aimed at devising legal mechanisms for the management of areas for protection and/or conservation, without relinquishing sovereignty and political control over the territory in question (see the Treaty for the GLTFCA, 2002). This dualistic approach forms the basis for the establishment of the GLTFCA and its administration at the national spheres of government.

The Treaty for the implementation of the GLTFP, particularly Art. 4, will be used to identify firstly fatal flaws in the issues listed in the first box of Figure 1, and secondly to list and qualify the major constraints to sustainable implementation of the GLTFCA, within the One Health framework, drawn from field experience, stakeholders meetings and informal consultations.

- Presentation: Dr. Clara Bocchino: Implementation challenges for the GLTFCA

Topic 2: Administration

The question of administration for TFCAs is a particularly mordant one, since it is related to principles of national sovereignty and to the existence of a state apparatus for the management of natural resources, as well as all directly and indirectly related issues for Protected Areas and Conservation Areas alike. TFCAs in southern Africa have so far followed an administrative model, as exemplified by the GLTFCA, which has proven constrictive for the management of the TFCA as an ecosystem where state boundaries should not exist.

This section of the joint presentation will contain three presentations that will directly deal with some alternatives in the establishment and administration of a TFCA, as well as with the realisation of environmental and socio-economic rights entrenched in the constitutions of the three countries hosting the GLTFCA.

- *Presentation: Prof. F. Venter: Is there a need for a legal entity for TFCA?*
- *Presentation: Mr. N. Lubbe: Developing a principle-based legally binding management framework for TFCAs*
- *Presentation: Prof. W. du Plessis: The realisation of environmental and socio-economic rights in the GLTFCA*

Topic 3: Good governance

A challenge to development in southern Africa, the achievement of good governance inside and outside TFCAs, if overcome, would undoubtedly contribute to the sustainable realisation of both conservation and poverty-alleviation objectives. Despite the stated objectives of the GLTFCA, however, its implementation status, including its promotion as a Peace Park, has not managed to set standards for the region.

This section of the proposed joint presentation will discuss three key governance issues, which should provide the umbrella for the GLTFCA both as a conservation project and as a Peace project, as well as in consideration of it being embedded in three states, with unique internal government structures e.g. local government structures.

- *Presentation: Prof. L. Kotzé and Mr. R. Alberts: Environmental governance for the implementation of TFCAs*
- *Presentation: Ms. A. Terblanché: The challenges of human security for Peace Parks*
- *Presentation: Prof. A. du Plessis: TFCA management coexists with local governments – principles and reality*

Topic 4: Legal pluralism and conflict resolution

TFCAs must by definition span across the borders of two or more states (IUCN), which provides a very complicated set of boundaries for their management, both within and between states. In general, it brings in challenges of legal pluralism, but in relation to two different legal *milieux*. In the first case, it sets the need to ensure that state law and customary law (especially when officially recognised) work together for conservation, whilst realising more pressing needs for economic development. In the second case, it calls for the harmonisation of different legal systems across borders, and their enforcement. This section will provide insights on these challenges, bearing in mind the objectives of the GLTFCA discussed in section 2.

- *Presentation: Prof. S. de la Harpe: Dispute resolution and dispute management in a TFCA*
- *Presentation: Prof. C. Rautenbach: Taking state law and customary law into account for Conservation Areas*

5.2 Session Keynote Presentation: Whither State Sovereignty in a TFCA? Francois Venter

Discussion:

1. **Q:** Would changing the status of TFCAs to entities that are more independent from states remove some of the difficulties such as claims of landowners around the park? **A:** The State is not a repository of power but it has a responsibility to provide services and security to its citizens. This distinction is founded on the theoretical analysis of democracy, and one should consider the influence of the construct of the nation state. Citizen, in essence, as subject to law not to power: the law, in fact, is what enables them to claim land. In the implementation of TFCAs, therefore any land claim that may be instituted, should be managed by the (new) competent authority in charge of the implementation

and management of the TFCA. This would be part of the natural evolution towards flexible enforcement of sovereignty for joint cooperation.

2. **Q:** [Statement quoted was the foundation of the local conservation movement in Rhodesia (Zimbabwe) in 1971]. Often, conservation areas within the TFCAs are not contiguous and there are other forms of land use, how can this become an opportunity for conservation? **A:** The solution is stated in the purpose of TFCAs. However, it would also require the suspension of sovereign rights over the land, for its achievement and possibly the redrawing of national boundaries. This, in turn, would generate a new problem concerning authority over the TFCA: should it remain internal and based on the model of the JMB? Furthermore, it would advocate for a redefinition of the land use, which follows on from the IUCN definition.
3. **Q:** *Ad hoc* day-to-day field activities in parks are constrained by the bureaucratized management structure, in order to change this very few things would be required in the short term, without going to the extreme of changing the legal status of the area. People could perhaps be issued with a TFCA card that would enable them to carry out their necessary activities without fearing legal implications. **A:** This is true, nonetheless it would require political will from the involved governments.

5.3 Implementation Challenges for the GLTFCA. Clara Bocchino

Discussion:

1. **Q:** In the context of governance, it is also unclear what the role is for neighbouring private land. **A:** This is very important management issue, which is being addressed differently in all three countries, according to their national legislation and experience – or lack thereof. It should, however, be specifically targeted in management plans and handled by the joint management authority.
2. **Q:** Where protected areas in two or more countries have contiguous boundaries the practical and legal aspects of transboundary resource management are minimal. However, in many cases, as in the GLTFCA, protected areas do not always share international boundaries and are separated by interstitial areas of differing or multiple land uses, and in which people live. This factor has both management and legal implications that are, in practice, mostly overlooked. **A:** This is very true, particularly because of the difficulties presented by the various spheres of government involved in each country, and their roles and responsibilities. The question of sovereignty raised in the first presentation is, in fact, not only true for the management of Protected Areas, but specifically in the management of multiple-use interstitial areas and the communities that live in them.
3. **Q:** On the role of donors, the presentation hinted that there was no long-term planning by government? Donors appear to be the main drivers for conservation and states are perceived as declining in capacity to implement. What if TFCAs never happened? What is the difference between TFCAs and conservation per se? **A:** In respect of Mozambique and the Limpopo National Park, one must acknowledge the negative impact of the war that ended in the 1990s only. During that time, the attention of government could not afford to be taken by conservation, and the Gorongosa National Park – for instance – was the headquarter for the RENAMO group. Certainly, it is important that donors were able to initiate conservation efforts and that the government has taken on such a big task. The concern is that as donors fail to devolve managerial and financial responsibilities to the national governments, the donors will keep on driving the process and its projects (whether they fit into national strategies or not) and this will generate a decline in government capacity, as well as confusion amongst citizens (and other local stakeholders) as to who is responsible for the TFCA. Government must begin to responsibly drive conservation and make donor actions fit into their plans.

5.4 Developing Legal Principles for the Management of TFCAs. Niel Lubbe

Discussion:

1. **Q:** What we are trying to understand is the difference between management and extinction. Would a new convention address the problem rather than SADC protocols, which have so far failed? **A:** SADC protocols are conventions at sub-regional level, hence the targeted issues are specific to sub-region. If we were to go one step higher in regulatory instruments, it would entail more countries being involved. In accordance to a general trend in international treaty, therefore, the principles and their implementation would be watered down, in the pursuit of an agreement. Nonetheless, there is a need for such a convention.
2. **Q:** What would the role of climate change be in the high rate of species extinction? **A:** Climate change, like increased population numbers, are just a few of the drivers for species extinction. Key drivers contributing to species extinction should be identified and addressed in management plans. It would be interesting to see if there are structures that can be applied to all areas, considering that some Protected Areas are very well managed.

5.5 The Realization of Environmental and Socio-Economic Rights in the GLTFCA. Willemiem du Plessis

Discussion:

1. **Q:** In having looked at the gap between existing principles and reality, what would be really useful for managers is to see direct linkages through case studies. **A:** There is a direct link between principles and reality, particularly when those principles discussed in TFCAs are, in South Africa (and to a certain extent in Mozambique and Zimbabwe), entrenched in our legislation, specifically the Constitution. When those principles are not enforced, any one can approach court to see to the enforcement of constitutional rights.

5.6 Environmental Governance Perspectives on the Role of the Private Sector in TFCAs. Reece Alberts and Louis Kotze

5.7 TFCA Management Coexists With Local Governments: The Principles. Anel du Plessis

Discussion:

1. **Q:** Lack of capacity of municipalities for biodiversity conservation is recognized. IDPs may help in addressing it but this is not yet sufficient. Also the management of water resources, both nationally and in a transfrontier context, contributes towards conservation. A key grey area, in transfrontier projects, is that communities may (and mostly do) interact across the borders but governments, in effect the gate-keepers, are too bureaucratized to enforce real joint management and may impair the existing level of communication at the ground level. **A:** Such a question refers back to the issue of scale. What is unquestionable is that governments need to 'let go' of some of their sovereignty and powers in order to allow problems to be resolved at the local level, when required by their nature.

5.8 Dispute Resolution and Dispute Management in a TFCA. Stephen de la Harpe

Professor of Law, North West University, Potchefstroom Campus.

Traditionally disputes are resolved by the courts, which are not always the ideal institutions to deal with disputes especially where future cooperation between the different parties is crucial. There are, however, alternative ways in which to resolve disputes, the choice for which depends, amongst others, on: the parties involved, the nature of the dispute, and the surrounding circumstances. The questions in inter-government relations are if and which alternative dispute resolution mechanisms should be utilised. In the GLTFCA it must

be kept in mind that three different sovereign countries, different government institutions, different interests groups (also outside of the area), as well as different legal systems and laws are involved.

The most common dispute resolution methods other than the courts are: negotiation, mediation, adjudication, dispute review boards and expert assessment (referee) and arbitration, or a combination of the above. In this paper the above-mentioned methods will shortly be discussed in order to determine whether they would be appropriate methods, and under which circumstances they could be utilised in the GLTFCA. The management of disputes in order to minimise the negative effects of disputes will also be discussed.

5.9 Taking State Law and Customary Law Into Account for Conservation Areas. Christa Rautenbach

5.10 Possible Adaptations to Community-Based Conservation: Results of a Meta-Study. Suzi Malan

PhD candidate, University of British Columbia, Vancouver, Canada.

This paper presents the results of a meta-study of community-based resource management cases in conservation. It is part of a larger research study on the transfrontier conservation areas of southern Africa, which involves designing improved decision-making processes for the management of these TFCAs. The in-depth analysis requires development of a theoretical framework of which the meta-study forms the foundation. The meta-study provides an interdisciplinary focus on the policies, socioeconomic aspects and ecological impacts of community-based conservation. This study brings together the experiences from Africa, Asia and the Americas over the past thirty years and identifies possible adaptations to the socio-ecological governance of ecosystems.

Discussion:

1. **Q:** How were the case studies chosen? **A:** The projects, or case studies, discussed in the presentation were driven by community-based conservation. This is, however, the beginning of a much longer process.

5.11 Policy, Economic, Legislative and Regulatory Environment for Commercial Export of Beef from TFCAs. Dermot Cassidy – USAID consultant

It is necessary to revisit some of the conventional approaches to resolving the apparent lack of progress in promoting regional trade in SPS (Sanitary-Phytosanitary) sensitive products. The suggestions forwarded in this presentation represent a practical approach derived directly from the principles of Pillar II of the Comprehensive African Agriculture Development Plan (CAADP) and more specifically the 'Framework for the Improvement of Rural Infrastructure and Trade-Related Capacities for Market Access' (FIMA) which consists of the following steps:

- Step 1: Identification of a range of strategic commodities and commercial products (an economic study that can in a transparent and easily understood way incorporate social and ecological dimensions).
- Step 2: Review and align investment and trade policies so as to exploit demand trends (the outcome of the study in Step 1).
- Step 3: Identify the needed regulatory and institutional changes (developed through active engagement with the regional economic communities such as SADC and COMESA and working through Member States).
- Step 4: Identification by all stakeholders of the needed strategic investments and models of public-private partnerships (PPPs).
- Step 5: Stakeholders under the leadership of the REC's, including SADC, specify the necessary efforts and roles to (a) harmonize country strategies (b) link these sectors to transport/communications

corridors (in relevant Member States mediated by the regional economic communities such as SADC and COMESA).

- Step 6: Design rural infrastructure strategies to link the above development domains with national consumption centers and links to foreign export markets. (CAADP is focused in terms of regional transport corridors so this has to be considered).

From these CAADP general principles three specific approaches are advocated in this study;

1. The integration of the private sector into the SPS problem solving process. A regional approach based on the national model that has evolved in South Africa is proposed.
2. A more pro-active stance by relevant governments and SPS implementing ministries to comply with the provisions of the Tripartite SPS Annex of the draft agreement between SADC, the Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC) establishing the Tripartite Free Trade Area (TFTA).
3. A focused effort on selected commodities – in this case helping with the supporting framework for a pilot program of exports of chilled deboned beef from the Kavango Zambezi TFCA as an exercise in regional capacity building and, additionally, in the delivery of tangible outcomes for the international and regional trade agreements while supporting existing efforts in wildlife conservation and eco-tourism.

5.12 Session Discussion

1. It would be useful to gather all the legal papers presented under this session into a publication to be circulated to policy makers involved in TFCAs;
2. This could help in addressing the question of government involvement into the implementation of TFCAs, perhaps the institution of a forum would help (This was attempted under the CESVI Limpopo Transboundary Programme, but failed due to financial resources and initiative);
3. External funding may be steered to integrate existing projects, and to mitigate the competition generated by rural development projects in conservation areas;
4. *A:* Whereas all of the above points are valid, governments and institutional planning are the only two instruments that can manage long-term planning in an effective way, to avoid competition and promote cooperation for both conservation and development. Without political will at the national level, one must bear in mind hardly anything can be accomplished.

6. SUSTAINABLE DEVELOPMENT: HOW DO ECONOMIC ACTIVITIES IN TFCAS AFFECT LIVELIHOODS, PROFIT AND CONSERVATION?

(Session Chair: Anna Spenceley)

6.1 Introduction to the Session. Anna Spenceley

6.2 Is the Public-Private Partnership a Consistent Arrangement for Mozambique's Conservation, or a Periodic Illusion? Bartolomeu Soto

The Government of Mozambique entered into partnerships to manage protected areas, through agreements that allowed the involvement of private sector in management and decision making of the same protected areas. TFCA project is also testing the partnership arrangement in various protected areas namely Maputo Special Reserve, Limpopo National Park and Banhine National Park. The legal framework of the country is not clear about the establishment of partnerships. The features of agreements are different as the negotiations for their establishment were conducted without a guideline. Apart of capacity issues, the Government does not have the

necessary tools for monitoring the partnerships, which forces reactions to events that are being faced. Although the partnerships bring benefits to management of the Parks sustainability remains the question mark once the private partner leaves. The new Policy of conservation tries to set up guidelines for future partnerships in order to improve the implementation, which has to be materialized in terms of law. In this paper the roles and responsibilities of partners, expectation from each other and the results in biodiversity conservation, tourism development and community participation will be analyzed

6.3 Grappling with the Inherent Contradictions and Tensions in the TFCA Model: A Case Study from the Chimanimani TFCA. Andrew Kingman

This paper is drawn from ongoing research by the author into the political ecology of the Chimanimani TFCA, drawing on experience from three years of engagement with communities across the TFCA. The paper and presentation begins by revisiting and summarizing the main critiques (drawing on the work of Duffy, Wolmer, Buscher and others) of the theoretical foundations and assumptions made in the establishment and management of TFCAs. In particular, the author highlights the range of issues relating to what Dressler and Buscher have termed ‘market triumphalism’ in the TFCAs¹. The author then seeks to review these theoretical critiques of the TFCA model in light of experience specifically in the Chimanimani TFCA and more generally through his experience of engaging with the TFCA management and other TFCAs in Mozambique. Particular attention is given to the inherently political nature of ‘development’ in the TFCA including the ‘political’ behaviour of communities, the conflicting agendas of multiple actors (state and non-state) and the resulting dysfunctionality in management and governance, and the gap between the rhetoric of investing in ‘alternative livelihoods’ (balancing conservation and economic development objectives) and the reality of delivery, feasible impact and community response. In the final part of the paper and presentation, the author reflects on his own organization’s attempts to confront these theoretical and practical challenges and presents a progress report along with an outline of developing plans and future challenges.

¹Buscher, B and Dressler, W. Market Triumphalism and the CBNRM ‘crises’ at the South African section of the GLTP, 2007.

Discussion:

1. **Q:** How do you manage expectations in the community and how do you deal with the ratio between people that could benefit versus the large number of people in the rest of the community? **A:** Programmed on what opportunities there are and what the risks and benefits of tourism to the communities might be. Ran the programme in 15 communities to help them understand all the issues and probed their expectations and concerns. Business model was discussed at every stage. More people will benefit from other activities e.g. natural products (coffee, honey, etc.). The community receives money into their own fund and owns 60% of the business.

6.4 The Fine Line Between a Dream Realised and a Dream Shattered. Glynn O’Leary,

THE DREAM

We have a Dream....

A dream that can only be realized through the establishment of Peace Parks
A dream of ancient migration trails trodden deep by an instinct that time has never contained
A dream of a wilderness where the elephant roams and the roar of the lion shatters the night.
Dream, like us, of experiencing Africa wild and free. Where people can reap the benefits of nature and in turn support her.

...This is the dream of the Peace Parks Foundation

Beyond Boundaries the possibilities are unlimited

Open spaces, unlimited beauty, infinite possibilities
Nine Southern African countries united through their passion for nature, culture and community.
Through Boundless, these countries offer tourists so much more in terms of experiencing wildlife and scenic beauty in pristine destinations and afford tourists the opportunity to engage directly with local communities and learn about their culture, history and sustained conservation of the environment and cultural heritage.

... *This is the dream of Boundless Southern Africa*

“I know of no political movement, no philosophy, no ideology which does not agree with the peace parks concept as we see it going into fruition today. It is a concept that can be embraced by all. In a world beset by conflicts and division, peace is one of the cornerstones of the future. Peace Parks are a building block in this process, not only in our region, but potentially in the entire world.”

... *These are the words of Dr Nelson Mandela*

“The Peace Parks concept not only has tremendous benefit for ecosystem protection across international boundaries but also for regional integration of a continent divided at the turn of the 19th century by European powers during a period known as “The Scramble for Africa” that indiscriminately divided the map of Africa.”

... *These are the words of Werner Myburgh, CEO of the Peace Parks Foundation*

Discussion:

1. Although Kruger National Park is less than one hour’s drive from Maputo, it’s not an easy market to access. It is a long drive from Maputo to Massingir. More accessible entry points to the Great Limpopo Transfrontier Park is likely key.

6.5 The Adventure of Covance Community. Vasco Acha

Abstract not available, but please see PDF of PowerPoint on the AHEAD website, as per URL on Page 1.

Discussion:

1. There is a need to consider how conservation is related to tourism. Diversity is needed for sustainability therefore there is a need for a diversity of tourists. Start to aim for Mozambican tourism, and reduce border problems - don’t just aim for the high-end tourist. *A:* This is a possible long-term solution, but in the mean time, Kruger National Park offers major competition for Mozambican tourism - day trips, larger numbers of animals, closer distance to Maputo.

6.6 Communities, Private and Public Sector Partnerships Challenges and Pitfalls in Working as a Private Sector Broker in the Transfrontier Conservation Areas Tourism Development Project TFCATDP. Manuel Mutimucuo

Our objective with this article is to highlight the particular, practical challenges of the current implementation of community/private sector partnerships in the geographical areas of the Banhine and Zinave national parks (Mozambique) in order to contribute to increasing the success of these types of partnerships as development models.

We will briefly describe the setting for this implementation of the TFCATDP, the approach/strategy, its objectives and the actors involved. Within this context we will explain SNV’s vision for success (which is not necessarily shared by all stakeholders), the complex interrelationships between the actors, their motivations, expectations and plans, and what actually is happening in practice.

As this is work in progress, the final outcome is not yet clear so therefore we will concentrate on describing and analyzing the ongoing process and highlighting the lessons learned so far. In short, the following are the main topics to be touched upon; (i) the contracting process of the private sector broker and its consequences, (ii) the differing visions, for this project, and interaction between the main actors, (iii) the actual participation of the communities, (iv) the TFCATDP project framework and rules of the game, (v) the planned outcomes and impacts for the different stakeholders.

We expect that this first formal contribution to sharing SNV's experiences and knowledge within the TFCATDP and beyond about this particular sub-project will be followed by other papers and presentations actually describing and analyzing the final results when they are in.

Discussion:

1. This is the first serious attempt for tourism in the interior, so it was a very important presentation. Noted that Chimanimani also part of inland development.

6.7 Sustainable Economic Activities in TFCAs: An NGO Perspective with a Business Edge. Harry van der Linde

Abstract not available, but please see PDF of PowerPoint on the AHEAD website, as per URL on Page 1.

Discussion:

1. **Q:** How do we know whether these endeavors are successful or not? **A:** Yes it is. Need to go back and measure after establishing a socio-economic baseline; not necessary to do this after each intervention. **Q:** Was thinking more about ecological monitoring, about testing assumptions about conservation impact. **A:** Must look at both.
2. Government has serious economic challenges and if a better alternative comes up they will take the opportunity in a multi-use area if it promises large investment and creation of many jobs. Need to put long-term plans on the table to convince government.
3. **Q:** The graph in your presentation was about where the money is going, not about the benefits. What would you guess the graph would be if it showed benefit? **A:** At least 50% - mainly due to coffee and livestock enterprises. The Starbucks Project in Kenya generates huge amounts of income for communities. Lodges can generate high income as well. Look at the tourism examples and models – income generated from R100 000.00 - R200 000.00 per lodge per year for a community. But, in terms of land use, investors need to be examined carefully. Examples of investors coming in and promising heaven, and delivering nothing. Also need to diversify the product so that livelihoods are sustainable and there are options if, for example, tourism fails.

6.8 Balancing Transboundary Conservation, Economic Activities and Rural Livelihoods in Southern Africa: Breaking New Barriers. Brian T B Jones

Paper prepared for the AHEAD-GLTFCA Working Group Meeting, Kruger National Park, South Africa, 2-4 March, 2011

Abstract: Transfrontier conservation areas have been promoted as win-win-win initiatives that will improve conservation, bring economic growth and improve rural livelihoods. However, their implementation has so far delivered on some conservation objectives, led to limited economic growth and improved the livelihoods of a few. The least success has been in the area of involving local communities and improving their livelihoods. Communities have been excluded largely from decision-making in the development of most TFCAs. The key issue in balancing transboundary conservation, economic activities and rural livelihoods is therefore whether it

is really possible to achieve a win-win-win scenario? Social science critique of the TFCA approach suggests there are major imbalances in power relationships between the key actors that leave communities disadvantaged and disempowered. Further, critique of the neo-liberal conservation principles, which underpin TFCA development, argues that new values for conservation are being created that become available for national and transnational elites to the exclusion of local people. At the same time “Back to the Barrier” conservationists argue that protected areas should not be trying to address poverty issues and that there are fundamental conflicts between the conservation and socio-economic goals of protected areas.

Is there a way of creating a balance and achieving the sought after win-win-win scenario? In order to find a balance we need to divert attention away from technical solutions and seek more equitable outcomes through a major shift in the way we view protected areas and TFCAs. If Parks, the core component of TFCAs, are seen as a form of commons instead of the preserve of the State and the conservation agencies, new thinking about their objectives becomes possible. The goals and objectives of Parks need to be more aligned with societal objectives, instead of being set by a narrow “bio-technical” elite. Civil society needs to help set park goals and objectives within clearly defined ecological thresholds that can increase the legitimacy of the park, and enable it to provide economic as well as ecological outcomes. This opens up the space for carefully crafted co-management regimes between parks and neighbouring land holders in TFCAs that can provide the foundation for the development of TFCAs that balance conservation, economic activity and livelihoods in an equitable manner.

1. The elusive win-win-win scenario

Transfrontier conservation areas (TFCAs) have been promoted as win-win-win initiatives that will improve conservation, bring economic growth and improve rural livelihoods. When TFCAs were conceived in the 1990s they had clear objectives of not only promoting conservation, but also of promoting economic growth through tourism development and of improving local livelihoods. In addition some TFCA initiatives specifically aimed to involve local communities in management of the land and resources. Thus among the broad objectives for the establishment of the Gaza/Kruger/Gonarezhou (GKG) Transfrontier Park (now the Great Limpopo Transfrontier Park or GLTP) were the following (Braack 2000):

- Develop frameworks and strategies whereby local communities can participate in, and tangibly benefit from, the management and sustainable use of natural resources that occur within the Transfrontier Park;
- Facilitate the establishment and maintenance of a sub-regional economic base by way of appropriate development frameworks, strategies and work plans;
- Develop trans-border ecotourism as a means for fostering regional socio-economic development.

More recently Theron (2007:10) stated that TFCAs aim “to establish large conservation and wildlife areas not only through the integration of vast landscapes and re-connecting ecological systems, but also through development of cross-border tourism linkages, ensuring sustainable benefits to local communities through socio-economic upliftment, and the promotion of peace and stability in the region.”

The early rhetoric around TFCAs particularly promoted tourism as providing the driving force for economic development and improved livelihoods. The Peace Parks Foundation (PPF) for example suggested that the GKG TFCA had the potential to become one of Africa’s premier ecotourism destinations (Peace Parks Foundation 2000). The PPF Annual Review of 2001 states that “The basis for the successful establishment of peace parks¹ is that eco-tourism will provide an economically sustainable livelihood to the people living in and adjacent to the parks.”

However, implementation of TFCAs has so far delivered on some conservation objectives, but has led to limited economic growth and has improved the livelihoods of only a few. Analysis and critique of the

¹ i.e. TFCAs

implementation of TFCAS and TFPs strongly suggests that we are not close to achieving the win-win-win situation that planners envisaged. Various authors have raised doubts about the ability of TFCAs to provide adequate economic benefits that would substantially contribute to reducing or alleviating poverty in rural areas.

According to Metcalfe (2005:10): “Besides the rhetoric of increasing employment opportunities for local communities, existing development and management plans do not take an explicit position on how to incorporate or empower local communities, build their assets and their capacity to tangibly tap into the predicted tourism development opportunities in and around the Transfrontier Park. High illiteracy levels preclude most local communities from high profile and well-paid jobs. The majority can only be employed as labourers; that will hardly compensate for the opportunity cost of losing their land and resource access.”

Suich (2008) carried out an analysis of the economic impact of tourism in the Kavango/Zambezi (KAZA) TFCA. The overall vision for KAZA is to “establish a world-class transfrontier conservation area and tourism destination” (KAZA 2006). Among the objectives are the following:

- Develop mechanisms and strategies for local communities to participate meaningfully in, and tangibly benefit from, the TFCA;
- Promote cross-border tourism as a means of fostering regional socio-economic development.

However, the survey by Suich revealed the following:

- In 2004 just 48% of non-wage expenditure was spent locally (i.e. 52% leakage);
- Only 20% of overall profit was generated by local owners reducing the potential income and investments able to be made locally;
- 94% of employees in the tourism industry were locally employed, but few locals were in management or supervisory positions;
- Men made up 61% of the local workforce and women 39%;
- Local wages (more than US\$12.8 million in 2004) made up 73% of the total wage bill in the tourism industry; and
- The total of 5 500 people employed in the tourism industry represented just 0.5% of the total population within KAZA (although this rises to 5% being supported by the industry if we assume each employee supports one household).

With regard to the Great Limpopo Transfrontier Park, according to Whande and Suich (2009:386), “Very little economic impact has been felt at the local level from the developments associated with the GLTP.” Although tourism enterprises in the wider GLTFCA employed around 8 900 people and generated around US\$25 million in wages, most of these enterprises existed before the transfrontier projects were initiated.

These data help to put the existing and potential local impacts of tourism into some perspective. While the local wage bill from tourism in KAZA is substantial the numbers of people benefiting compared to the overall population is small. There is considerable room for improvement in terms of retaining profit locally and increasing expenditure on local goods and services (although part of the problem is a lack of local availability of some goods and services). It is clear that tourism in KAZA will not lift large numbers of people out of poverty. Suich (2008) suggests that since the majority of KAZA residents are reliant on subsistence agriculture, there should also be a focus on improving the productivity, efficiency and sustainability of crop and livestock farming. In the GLTP/TFCA there was no discernible positive impact of transfrontier-linked activities in terms of economic development.

Further, there is a growing body of research which critiques the market-based principles upon which TFCA tourism-led economic development is based. This critique questions the principles of neo-liberal conservation which assert that markets can bring win-win solutions through conservation interventions, in which value is added to nature through eco-tourism and ‘ecosystem services’ and in which for-profit investments can provide incentives for local people to protect nature (Igoe *et al* undated). This critique

suggests that new values for conservation are being created that become available for national and transnational elites to the exclusion of local people. From this perspective, TFCAs help to secure access to communal land for external business interests while restricting community access to land and resources ensuring that communities remain locked into poverty. Unless TFCAs start to provide real benefits for local communities it is hard to counter this critique.

Although some of the early rhetoric suggested that communities should be involved in the management of TFCAs, communities have been excluded largely from decision-making in the development of most TFCAs. Theron (2007) provides an overview of the way in which TFCAs and TFPs have generally been established in southern Africa. Following the signing of an International Agreement or MoU between the governments concerned, institutions were created to facilitate the planning and development process. These institutions generally consisted of the following:

- A Ministerial Committee, which is the top decision making authority.
- A Technical Committee, which advises the Ministerial Committee, and which consists of either high ranking government officials, technical experts, or both;
- Various Working Groups advising the Technical Committee on issues relating to the planning and development of the TFPs / TFCAs, comprised of technical experts of the countries involved.

Once sufficient progress has been made in planning, an international treaty is signed by the countries concerned which formally proclaims the area and provides guidelines for implementation.

Once the treaty has been signed, institutions are established for implementation. In terms of the Treaty, the implementation of the project is the responsibility of the implementing agents which are the conservation agencies of the countries concerned. A Joint Management Board (JMB) is formed by these agencies with the majority of the members belonging to the respective implementing agencies.

Theron points out that most transfrontier initiatives within southern Africa consist of formally proclaimed conservation areas managed by government authorities, and which are generally referred to as Transfrontier Parks. As a result, the various institutions established to manage TFPs consist mainly of government officials and representatives from the implementing conservation agencies.

It is clear that the overall approach has been led by government officials and conservation agencies with no involvement in decision-making of other key stakeholders such as landholders neighbouring the state protected areas.

At the same time “Back to the Barriers” conservationists argue that protected areas should not try to address poverty issues and that there are fundamental conflicts between the conservation and socio-economic goals of protected areas. The “Back to the Barriers” narrative holds that biodiversity can only be conserved in areas free of all human influence (except for science and limited ecotourism activities) and communities should be excluded from decision-making processes about the management of protected areas or the place of protected areas in the wider ecosystem and economy (Hutton *et al* 2005). Again, if TFCAs cannot provide real benefits for local communities and meet their development objectives, then a retreat to the TFP from the TFCA seems logical.

2. The impact of power imbalances

There is clearly an imbalance rather than balance in the mix between conservation objectives, economic activities and improvement of rural livelihoods in TFCA development. Government and conservation agencies control decision making, the private sector controls the economic opportunities and profits, and communities are left disempowered and picking up some of the crumbs of the promised economic growth. This imbalance and lack of progress leads to the question whether it really is possible to achieve the envisaged win-win-win

scenario that TFCAs were supposed to deliver? In order to answer the question we need to consider the causes of the current imbalance.

Social science critique of the TFCA approach suggests these imbalances are largely the result of the major imbalances in power relationships between the key actors that leave communities disadvantaged and disempowered.

Government officials and conservation agencies wield power because, as indicated above, the key institutions and decision making platforms within TFCAs are dominated by government and conservation agencies. Other stakeholders have no say in setting the goals and objectives of TFCAs and a minor role in driving implementation. Government officials have technical knowledge and expertise which is mostly lacking among community participants. The private sector wields power because it has capital and links to markets, and because the tourism industry is not well understood by most communities.

In addition, government and freehold land owners wield power through their ownership of land. For TFCAs to be successful there needs to be some form of joint or co-management between the various stakeholders. However Jones and Murphree (2004: 97) suggest that “co-management arrangements can act as a fig-leaf for state hegemony, particularly if they represent agreements between partners of different legal status”. In order to partially address this imbalance of power, negotiated contractual agreements are required between parties with legal persona, holding rights to veto or withdrawal. In most contexts in southern Africa, communities do not share equality with the state as land holders because communal land is usually owned by the state. One of the only examples of communities appearing at the “top table” in TFCA management in southern Africa is the Joint Management Board of Ai-Ais/Richtersveld TFP. Because the Richtersveld people have title to the land forming the Richtersveld National Park they have managed to secure a place on the JMB for the TFP.

The imbalance of power between the state/private sector nexus and local communities remains a potent threat to TFCA implementation. Katere *et al.* (2001:26) wrote 10 years ago that “Rather than reinforce the colonial legacy of land alienation and inequitable distribution of resources, people are demanding that TBNRM² initiatives become a vehicle for re-distribution of rights. Unless this happens then the current huge income disparities between the rich and the poor can only increase, as will conflicts. TBNRM is currently viewed as being supply driven and consequently not able to address the imbalance of power between the local actors on the one hand and the state and private investors on the other. As long as the powerful and influential dominate the TBNRM process then the very legitimacy of TBNRM initiatives is likely to be contested in the medium and long-term.” Since this was written there has been little change in the balance of power between the key stakeholders.

3. Is win-win-win possible?

Is there a way of creating a balance and achieving the sought after win-win-win scenario? In order to find a balance we need to divert attention away from technical solutions and seek more equitable outcomes through a major shift in the way we view protected areas and TFCAs. Faced with the undeniable complexity of TFCAs, which often involve multiple tenure systems and diverse and divided communities, governments and conservation agencies seem in some cases to have retreated in their vision and scope of implementation to the relative safety and simplicity of TFPs. However the TFCA concept still has some life and vigour in KAZA, which faces numerous challenges in terms of its governance and institutional arrangements. In addition, many organisations still promote the concept of a GLTFCA instead of the more limited GLTFP currently being pursued by governments and conservation agencies.

If the TFCA concept is to remain meaningful, and indeed if the TFP concept is to be successful, technical solutions will not be sufficient. We need to rethink the role of parks and who they belong to in a fundamental policy rethink. If formal protected areas, the core component of TFCAs, are seen as a form of commons

² Transboundary Natural Resource Management embracing TFCAs, TFPs and other transboundary initiatives.

instead of the preserve of the State and the conservation agencies, new thinking about their objectives and roles becomes possible. Murphree (2004: 224) suggests that protected areas should be viewed as a form of commons as they are “sites and bundles of collective entitlement for their constituents which require protection through controls on their use.” In order to determine how protected areas should be managed it is therefore necessary to identify the extent of the commons in question, distinguish between primary and secondary stakeholders, and facilitate the emergence of management regimes that are characterized by consensus on goals and objectives, and provide sufficient incentive for management and the ability to influence outcomes.

Building on these insights, Child (2004) suggests that if parks are a form of commons then their objectives and management regimes need to be more closely aligned with societal objectives. In southern Africa, “park goals have previously been set by a small group of bio-techno-bureaucrats, causing misalignment between their objectives and those of society” (Child 2004: 239). Parks as common property entities should be providing as much value to society as possible, which in developing countries “translates into providing jobs and economic growth without damaging the productivity of natural ecosystems and losing biodiversity” (Child 2004: 239). The means to do this is to ensure that neither ecosystem health nor biological diversity are pushed over thresholds from which it is difficult to recover. These thresholds set the parameters for maximizing economic value. Park managers should therefore aim to “maximize the net benefits that a park provides to society while ensuring that the ecosystem processes or species do not degrade over thresholds using effective, affordable and strategic ecological monitoring” (Child 2004: 240). Counter-intuitively, perhaps, this approach should lead to better conservation because clear biodiversity and ecosystem function goals and thresholds need to be established and monitored.

When balancing economic and ecological outcomes, it is also important to understand the limits to the economic potential of individual protected areas. Each case will need to be evaluated to identify the types of economic benefit that can be provided. But changing our thinking about goals and objectives of protected areas can also lead to increased economic efficiency and a more business-like approach to management, as well as the accountability of park managers to society (Child 2004).

The implications of this thinking for TFCAs are considerable if civil society is involved in setting park goals and objectives within clearly defined ecological thresholds and within the context of transfrontier landscape conservation. This opens up the space for carefully crafted co-management regimes between parks and neighbouring land holders in TFCAs that can lead to achieving a better balance of power between stakeholders and a better balance of conservation, economic activity and livelihoods in an equitable manner.

Within such a scenario parks can now be considered as core conservation areas within the TFCA instead of separate entities managed to meet objectives that do not stretch in scope beyond the borders of the protected areas themselves. The role of parks in the larger landscape conservation approach would be to provide higher levels of protection for wildlife and broader biodiversity which can help to supply community-managed areas on their borders with wildlife for economic use. In addition the parks can provide the key attractions to draw tourists to the region, providing opportunities for other land holders.

Hopkinson *et al.* (2008) express concern that under current legislation in South Africa wildlife leaving a formal protected area is no longer owned by the State and can be appropriated by neighbouring land holders. However, this need not be a problem if neighbouring areas of land are under compatible forms of land use; if wildlife is conserved on the neighbouring land; and if there are agreements between land holders and the protected area authorities regarding use of wildlife that leaves the parks.

Flexible approaches to “ownership” of wildlife need to be adopted if the aim is to facilitate free movement of wildlife over a large landscape comprised of different forms of land tenure and land use (Jones *et al.* 2010). A private safari area adjoining Kruger for example also runs the risk of any purchased or re-introduced wildlife being “lost” to the park where fences have been removed.

But these issues become of less concern if we return to Murphree's common property theme and consider wildlife in a TFCA as a common pool resource shared between various land holders who agree common means and methods of regulated use. This is indeed the *de facto* situation in the KAZA TFCA where parks are unfenced and wildlife moves out of parks on to communal land. Where the state has devolved rights over wildlife and tourism to local communities, who then adopt wildlife and tourism as land uses in areas adjacent to parks, the wildlife is not considered to be threatened when it leaves the park. However, KAZA has not capitalised on this situation in the development of its governance institutions.

4. Scaling up for TFCA management

Within KAZA there is an example of landscape level conservation based on common property resource management principles that could be scaled up to the TFCA level (Jones 2010). The Mudumu North Complex (MNC) in the Caprivi Region of Namibia consists of two national parks (Bwabwata and Mudumu), a State Forest area, four communal area conservancies and three community forests. The state has devolved rights over wildlife and tourism to conservancies and the community forests enjoy rights over the all the forest resources within their boundaries including grazing. Recognising that these legal entities all share common resources, particularly wildlife³, they decided to work together to address a range of common management issues, including wildlife monitoring, joint anti-poaching patrols (even within parks), human-wildlife conflict and fire management. An important catalyst for cooperation was the re-introduction of wildlife from parks onto communal land, which had been made possible by the low poaching and existing wildlife management in the conservancies. A management committee representing the parks, conservancies, community forests and other key stakeholders meets monthly and implementation is achieved through a number of working groups.

In essence, the MNC is an example of common property natural resource management at different scales. The MNC addresses the management of shared resources at the larger landscape scale – who controls decision-making, who decides when and how resources should be used and the level of use. At the local level these issues are addressed through conservancies and community forests where the state has given formal recognition and authority to groups of people to manage common pool wildlife, tourism and forest resources. Common property theory suggests that smaller social units will be more effective in managing resources because of the possibility of continuous interaction between members of the management unit (Murphree 2000). In addition the management of resources is likely to become less efficient and less effective if decision-making is removed from the level at which the resources occur.

However, small-scale social units do not provide the appropriate scale for meeting the challenges of 'fugitive' resources such as wildlife, and particularly species such as elephant, which move from parks into communal land and across international borders. In addition, small-scale management units, even if given authority by the state, do not act in isolation of the state. In the case of conservancies and community forests, the state retains various degrees of control over resources itself, which it has not devolved to the local management units. The conservancies and community forests are also affected by the legislation of other state agencies.

For these reasons while it is important to "scale down" by providing strong user rights and tenure to local management units, it is also important to "scale back up" so that these units cooperate in recognition of the challenges of ecological scale for management and so that they are not in conflict with other entities which also have legal rights and responsibilities over the resources (Murphree 2000). Common property management theory therefore suggests the need for "nested" institutions that are linked and which have clearly defined boundaries of jurisdiction (Ostrom 1990).

The MNC provides a good example of such a nested approach to common property resource management that addresses the problems of management at scale. Relatively autonomous units of management (conservancies, community forests, state protected areas) with their own rights of decision-making and areas of jurisdiction have negotiated the extent to which they give up some of their independence to cooperate. They have then

³ Which moves between unfenced parks and neighbouring communal land

delegated upwards certain decision-making responsibilities and management activities to the MNC as an institution. This does not represent the expropriation of authority by larger jurisdictional units (Murphree 2000), but a negotiated and agreed solution to managing resources at a larger landscape scale – and crucially, the MNC remains accountable downwards to its constituent parts, the protected areas, conservancies and community forests.

An important feature in the MNC is the way in which parks have opened up economic opportunities for local communities inside their boundaries. Two MNC conservancies have campsite concessions inside the Bwabwata National Park and the Ministry of Environment and Tourism is planning to award concessions in the Mudumu National Park to neighbouring conservancies. The current campsite concessions do not generate huge profits for the conservancies but have a much deeper importance to the local people who were removed from the parks. Whereas in the past people wanted to resettle themselves in the parks, now that they gain some benefit from the parks and have a good relationship with park staff through the MNC, they no longer want to resettle in the parks. The concessions provide the people with a stake in the land that was once theirs.

The implementation of the MNC again highlights the importance of the need for appropriate institutional arrangements for large landscape conservation whether within national boundaries or at the transfrontier scale. Instead of institutions dominated by government officials and technical experts consulting downwards to seek approval for preconceived plans and projects, there needs to be delegation of authority upwards from units of management with their own rights of decision-making and areas of jurisdiction. Delegation upwards accompanied by downwards accountability can provide the foundation for functional TFCA management bodies that derive legitimacy from their various constituent parts. This can also provide the foundation for managing common resources across a larger landscape that includes diverse landholders and forms of land tenure.

5. Conclusion

So far TFCAs in southern Africa have not achieved a balance between conservation, economic growth and livelihoods. TFCAs have failed to deliver on the economic growth and livelihood goals set by planners early on. This situation is unlikely to change while major imbalances of power exist which leave communities disempowered.

These imbalances can be resolved if we change the way we think about parks and the role of parks within TFCAs. We need to view parks as common property with objectives aligned with those of broader society and with management of parks accountable to that society. Parks need to maximise economic benefit within biodiversity and ecosystem thresholds. Wildlife in TFCAs needs to be managed as common property with parks as core conservation areas within the larger landscape.

We need to provide surrounding communities with the necessary land and resource rights that enable them to negotiate meaningful co-management arrangements across the larger landscape with governments, park authorities and private companies. Several southern African governments have devolved rights over wildlife outside protected areas to legal community institutions (e.g. conservancies in Namibia), but these rights remain very limited and in some cases (e.g. Botswana) are being withdrawn. South African and Mozambican experiments providing communities with land rights are proving problematic, but should still be pursued. Strong community rights to land and resources are crucial if the TFCAs are to have any legitimacy with local communities.

Institutional arrangements for managing TFCAs need to derive their legitimacy from the constituent parts of the TFCA – landholders, whether state, individual, corporate or community, each with land and resource rights. Management goals and objectives for the TFCA then need to be set by institutions representing these land holders. These goals and objectives are likely to include efforts to improve the sustainability of agriculture and other existing forms of livelihood, not just the development of wildlife and tourism.

Breaking down some of the existing barriers in our thinking about who owns parks and what parks are for can open up new avenues for successful development of TFCAs.

ACKNOWLEDGEMENTS

Many of the ideas suggested in this paper and the conceptual thinking about parks and their relationship to society have been developed with colleagues in IUCN's Southern African Sustainable Use Specialist Group (SASUSG), and as such are not new. I would like to acknowledge the work of SASUSG as a major influence in the development of this paper. I have tried to adapt the SASUSG thinking regarding parks to the challenges of transfrontier conservation, particularly balancing the provision of conservation, economic and livelihood benefits.

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Discussion:

1. **Q:** How well would the model scale up to something the size of a TFCA? **A:** Could probably work in parts and areas of TFCAs. In Kruger National Park and private sector this is happening already; possible in Sengwe corridor where communities are involved through CAMPFIRE.

6.9 Discussion on Sustainable Developments in TFCAs (Facilitator: Anna Spenceley)

1. A common theme between today's and yesterday's presentations is that we have to deal with the fact that it is difficult to live up to promises made to communities in terms of tourism. Need to diversify income opportunities and talk about residents not communities. Brings us back to question of how we can combine livestock with wildlife.
2. **Q:** Do visitors enjoy seeing cattle in Mozambique parks? How would this work as an extra marketing opportunity? **A:** Plan for Limpopo National Park is to resettle the communities. 75% of visitors have little interest in people. International visitors do have an interest but not the South African market. Most of the market is international so there is a cultural possibility. However, regarding the long-term plan there is a shortage of water in the park and the prime game viewing area conflicts with where villages are currently situated. Difficult for the park to exist with both, therefore needs to be either or. Maybe a future possibility of village tours in the south as there will be a barrier fence there (to keep the people out/in?).
3. **Q:** What is wrong here is that promises were made and not delivered – conservation will not survive with current poverty levels and pressure on resource use. May not be the duty of conservationists to deliver on empty promises. For example, there are big discussions around mega projects. Governments are accepting these as they contribute to taxes. In areas like Niassa, there are issues like

conservation vs mining and logging where mining companies will not be forced to create partnerships with communities. Need to put pressure on government to carry out obligations.

4. **A:** Perhaps have taken a wrong course in emphasising poverty reduction linked to conservation and tourism. Need to find some way of legitimizing parks and setting aside land. How do we do this? By saying that the government does this? Or involve our neighbors and people that have lost their land? Looking at larger landscapes with parks as commons may be one way of doing it. Not necessarily appropriate in all circumstances but helps us to think of parks in different ways.
5. Frustration due to emphasis on using conservation to generate economic benefits but the focus has been on marketable places rather than areas that need protection. Look at what we are conserving and the basic principles and how can we use that to generate benefits. Must look at issues of mining, conflicting land use, how do we use the land and what land needs protection, rather than selling conservation as providing benefits. Not easy to generate benefits. Needs a lot of training and capacity building. Need cooperation between ministries, resettlement should not be on parks shoulders, need ministerial cooperation.
6. Need for honesty from conservation world – do we need everything that we have asked for? For example, the KAZA map. Do we need everything on map to make it work? Reality is that mining and power is critical and will be in Africa. Need to engage with other interests. Look at the map and choose places where least impact. Do not have a blanket approach that conservation is only thing that will happen in KAZA, as this will cause problems with government. Rather do risk analysis of different options.
7. Not sure we are pitting the focus on where it would be more important? Must focus on how we are going to make conservation areas more economically viable and conservation land more management efficient. What are the kinds of management models that will make conservation more efficient? Mining should be part of the process – revenues of mining should contribute to conservation. What is the reality and what will work in the long term?
8. On the issue of cattle, we keep separating conservation as a business. No longer a “nice to have.” Will only be able to keep land if it is of economic value. We must recognize that the culture of conservation is the issue, and not biodiversity. People want to see culture and cattle, not just cattle. Culture of cattle, people is a very important part of conservation –should be selling this. We also attach the label of “community” to everyone. Need to look at residents (not communities, but individuals) and talk to them, not to ‘communities,’ which are perceived as poor and in need of charity.

6.10 Wildlife-Ranching on Private Land in Namibia Confers Economic, Social and Conservation Benefits. Peter Lindsey

Mammal Research Institute, University of Pretoria, TRAFFIC southern/East Africa

Legislative changes during the 1960s-1970s granted varying degrees of user rights over wildlife to landowners in southern Africa, resulting in a major shift from livestock farming to wildlife-based land uses (WBLU) in the region. Few comprehensive studies have been conducted on WBLU on private land, and the benefits of wildlife ranching are not widely acknowledged. There is opposition among some politicians towards WBLU due to a belief that they constitute a threat to food security. There is a need for research on WBLU to increase awareness of the associated benefits and guide policy. We conducted a review of wildlife ranching on freehold farms in Namibia. Wildlife ranching is growing in prevalence in Namibia and is now conducted over ~288,000 km² and is the exclusive land use on $\geq 32,000$ km². Income from WBLU and livestock is positively and negatively correlated with employment respectively. While most (87%) meat from livestock is exported, $\geq 95\%$

of venison produced from WBLU remains within the country, contributing to food security. Wildlife populations are increasing with the development of WBLU and freehold farms now contain 21-33 times more wildlife than the protected area network. The economic output of WBLU on freehold land is approaching that of livestock. Due to the popularity of WBLU among younger farmers, increasing tourist arrivals and projected impacts of climate change on livestock production, the output of WBLU will likely exceed that of livestock in future. However, existing policies favour livestock production and prejudice against WBLU by prohibiting the reintroduction of buffalo *Syncerus caffer*, a key species for tourism and hunting. The value of WBLU is also limited by failure of the farming community to reintroduce the most charismatic species necessary for high-end tourism and safari hunting; and failure to develop fully integrated conservancies (co-managed multi-owner land units). There is a need for a shift in state policies to provide more support for WBLU, and to create incentives for the formation of fully integrated conservancies.

Discussion:

1. Would be interesting to compare results with Eastern Cape survey. A word of caution regarding benefits. Ecotourism farms require more labor, but not necessarily the same labour as livestock. Game ranches less labour, venison production least of all. Can encourage weekend farmers - South African, foreigners buy weekend farms and fire all the laborers. Need to be careful about generating expectations.
2. **Q:** Will the big five generate such a significant income? Will buffalo still be better if they come from farms, as opposed to free ranging? Will there still be such a significant contribution, not talking about ecotourism just safari hunting? **A:** Not the whole country is suitable. Where it is suitable, they would generate huge income. Certain income per species depends on diversity of key species. Namibia has less diverse guild than for example, Mozambique.
3. The veterinary control boundary in northern Namibia will move north in the near future but if most of country is a free zone, what about buffalo? This will need to be managed.
4. **Q:** Relies on the export market. Where would exported venison go? **A:** Better to develop ecotourism than venison export industry.

6.11 Payments for Ecosystem Services (PES): Feasibility and Implementation in the Maloti – Drakensberg Transfrontier Project Area. Steve McKean¹ and Myles Mander²

¹*Ezemvelo KZN Wildlife, P O Box 13053, Cascades 3202, South Africa*

²*Eco-Futures, PO Box 2221, Everton 3625, South Africa*

Water is predicted to be the single biggest future development constraint in South Africa. A new water supply augmentation option has been identified which can promote local economic development in rural areas and create hundreds of jobs. Paying people to manage the Maloti Drakensberg transfrontier catchments for enhanced water supply has been shown to be a financially feasible. Recent research in the Drakensberg shows that robust vegetation cover in the upper catchments – through rehabilitating degraded areas, maintaining the recommended cattle carrying capacity and by burning the mountain grasslands in the spring every second year – can enhance water resources by:

- reducing summer stormflows,
- increasing winter baseflows by an additional 13 million m³ in the upper Thukela catchments,
- reducing annual sediment yields by 1.3 million m³ in the upper Thukela rivers, and
- sequestering 134 000 tonnes of carbon per year in the upper Thukela catchments.

In essence, good land use practice in high rainfall mountain areas is good for water security, carbon sequestration and other ecosystem services. The following services have high value, and can be traded:

- additional and more regular water supply for users - improving assurance of supply and adding value to both reticulated and raw water users,
- reduced sedimentation of water infrastructure and river ecosystems which reduces water storage and abstraction costs – thereby making cost savings,
- additional carbon sequestration which is tradable, and which also improves grassland productivity, and - a range of other ecosystem services are also enhanced by this action such as reduced flooding, improved water quality, improved fishing, biodiversity conservation and improved grazing. These are economically beneficial to society but which cannot be traded yet in this location. Importantly the management costs are at the most 20% of the direct value of tradable benefits, making this a financially attractive option. Improved management and rehabilitation will also result in 1800 restoration jobs in the first 7 years, with some 500 permanent jobs, making it socially necessary. Payment for ecosystem services is being implemented worldwide and has now been shown to have new and exciting applications here in South Africa. However, up to 2010, no projects had been implemented.

Implementation of a pilot “payment for ecosystem services” project in the upper uThukela began in 2010. Funding (R3.3 million) was obtained from “Working for Water.” In this first year, approximately 546 people were employed, 15 hectares of degraded land rehabilitated and 15 hectares of alien plants along water courses cleared. Challenges encountered during implementation include:

- various administrative delays with obtaining the funding and administering the project hence only degraded land rehabilitation and alien plant clearing were addressed during this year,
- local political and “vested interest” issues interfering with progress,
- co-ordination of project and implementing monitoring,
- capacity at community level to manage a business relationship, contracts, etc.

Budgeting for 2011/12 has included grazing and fire management and aims to begin to develop the framework necessary to establish a market (beyond payment for labour) for the sale of ecosystem services from these catchments for the benefit of the upper uThukela communities.

Discussion:

1. **Q:** How do you get payment for ecosystem services? **A:** Working for Water makes cash payments for services rendered. **Q:** Downstream beneficiaries don’t pay? **A:** Plans for the future to get them to pay.

6.12 High-End Ecotourism as a Sustainable Land Use Option in Rural Africa: the Role of Employment in Reducing Poverty, Improving Social Welfare and Stimulating Economic Growth. Sue Snyman

The rural African economy is largely characterized by a lack of economic development and a heavy reliance on subsistence agriculture, as well as natural resources, for survival. Natural resources provide essential services to communities: watershed protection, fuel, food, pollination, building materials, and climate regulation. The establishment of conservation areas often results in costs for communities in the area in the form of human-animal conflict costs: loss of crops and livestock; loss of access to natural resources and loss of access to the land for alternative uses. In the past, communities were able to survive through subsistence farming and in some cases, government rations, grants, etc. As population growth has escalated people are finding it harder to survive in this manner and there is a greater need for permanent employment and a steady, reliable income, which reduces the risk faced by rural households. The increasing role of climate change and

its effect on subsistence lifestyles is also resulting in a growing dependence on the market economy and a declining ability of traditional subsistence lifestyles to sustain rural populations.

For ecotourism as a land use to be viable and sustainable it is essential that there are tangible benefits for communities living in and around conservation areas that exceed the costs that they bear in the form of human-animal conflict, restrictions on resource use, etc. The inability of many rural economies to provide adequate employment and income, mostly due to a lack of development and industry in these areas, has resulted in high dependency ratios in most areas of rural Africa. To date there has been no multi-country study that has assessed the direct impact of high-end ecotourism employment on rural households in terms of dependency levels and average household incomes. In this study we look specifically at the role of the private sector, in the form of high-end ecotourism operations, in rural economic development and poverty alleviation. The inclusion of Pafuri Camp in the Makuleke Concession of the Kruger National Park in the analysis highlights the important role of high-end ecotourism in the Great Limpopo Transfrontier Conservation Area.

One-on-one structured questionnaire interviews were used to ascertain the socio-economic status of local communities and the impact that ecotourism operations have on poverty reduction and social welfare in these areas. A total of 1555 surveys were conducted in five countries: 1228 community surveys and 327 lodge staff surveys, covering over 21 rural African villages and more than 19 different ethnic groups. The survey included questions on the following: demographics, education, employment, income and expenditures, health and safety, and attitudes to tourism and conservation. Using the collected data we attempt to assess the role played by employment in high-end ecotourism operations in reducing poverty and improving social welfare in rural communities at study sites in Malawi, Namibia, Botswana, South Africa and Zimbabwe.

Analysis of dependency ratios, average household income and other socio-economic variables indicates that high-end ecotourism operations have an important role to play in poverty reduction and economic development in local economies in southern Africa. Lack of government support in a number of African countries highlights an important role for the private sector in reducing poverty and stimulating economic growth. Comparing the number of staff members' dependents with that of the average community members in the area indicates that rural communities rely heavily on the market economy in the form of ecotourism operations for financial support and from there, social support. Ecotourism alone is not the panacea for rural Africa but it certainly has an important role to play in terms of local economic development and empowerment, biodiversity conservation and poverty reduction.

Discussion:

1. **Q:** Do payments to Makuleke community reach people who were not originally part of the community? **A:** This is a problem with all such initiatives. Difficult to follow where money goes and there are complaints. We can't tell communities what to do with the money but you can make sure you find out what happened. Concerning Makuleke, lots of people do not benefit. An additional factor is the conflict between Venda and Chief Mhinga.
2. **Q:** How did you arrive at negative effects of climate change? **A:** Were not examined – just noted that they do happen.

6.13 Stakeholder Perspectives on the Potential for Community-Based Ecotourism Development and Support for the Kgalagadi Transfrontier Park, Botswana. Naomi Moswete, Brijesh Thapa and Brian Child

Issues surrounding transboundary protected areas and adjacent local communities have surfaced as the most difficult to manage. Protected area resource conservation has also gained momentum as a vehicle for achieving a wide range of goals, including but not limited to improved co-management and benefits to neighboring communities. Currently, there is lack of empirical research that examines stakeholder perspectives about

community-based ecotourism development and support for the conservation of a Transfrontier Park. In order to address this gap, the stakeholder theory was used as a foundation for this mixed methods study. Two stakeholder groups, residents and the public sector were identified. Over 700 surveys were administered to local communities adjacent to KTP, while 13 face-to-face in-depth interviews were conducted among representatives from the public sector (local and national) stakeholder group. The results of this study discovered that the public sector representatives held positive perceptions about ecotourism and also expressed strong support for community-based ecotourism development in the Kgalagadi region. The representatives were knowledgeable about the concept of Transfrontier Parks, especially KTP. They indicated strong support for protection of KTP as a conservation area. However, there were negative perceptions about KTP as a Transfrontier protected area, due to the existing flaws in the Transboundary management system and Park-related development activities. Generally, the results revealed challenges and difficulties associated with land ownership and control, problem animal control, poor communication with Park authorities, lack of transparency with regards to Park activities, lack of local involvement in Park management, and inequality and favoritism with regards to benefits sharing, especially part-time employment. The Park has not played a significant role in assisting adjacent villages with community conservation and development projects or programs. There were no developmental initiatives that involved neighboring communities in the co-management and collaborative activities and planning with respect to KTP as a Transboundary area.

Collectively, the public sector representatives expressed in terms of the need for change in the management approach of KTP to ensure active involvement and full participation of equal benefits for adjacent local communities on both sides of the Park. Policy recommendations have been suggested in this study to reassess the co-management ideals in the general conservation of KTP as a Transfrontier Park and the role of adjacent local communities. It is essential therefore that key stakeholders in transboundary conservation areas understand the needs, aspirations and attitudes of one another as this will help toward planning and co-management of shared resources. Thus, we recommend that clear-cut and comprehensive Park-based community ecotourism and transfrontier management strategies should be formulated and implemented to benefit adjacent communities and shared resources.

Discussion:

1. There are five issued concessions on Botswana side. Not one block has been built because expectations from Botswana government are too high. Want high end lodges, but concessionaires given too short a time period (10 years to invest 20 million). Also problem of servicing - shopping centres are very far away. Problems do need to be addressed.

7. MONITORING OF DISEASE

7.1 Regional Planning for Cheetah and Wild Dog Conservation: Mozambique as a Success Story. Abel Nhabanga, Purchase, G, and Pariela F

Abstract not available, but please see PDF of PowerPoint on the AHEAD website, as per URL on Page 1.

7.2 Achievements of the Epidemiological Network for Monitoring the Dynamics of Foot and Mouth Disease in the GLTFCA (CORUS Project, 2008-2011). Jori, F^{1,2}, Heath, L³, Etter, E^{1,2}, Caron, A^{1,2,6}, Massicame, Z⁴, De Garine-Wichatitsky, M^{1,6} and P Thompson⁵

¹CIRAD UR AGIRs, Montpellier France; ²Mammal Research Institute, University of Pretoria, Pretoria, South Africa; ³ARC-OVI; ⁴Instituto Moçambicano de Investigações Agrárias; ⁵Epidemiology Section, Production Animal Studies, Faculty of Veterinary Science, University of Pretoria; ⁶CIRAD, 37 Arcturus Road, Highlands, Harare, Zimbabwe

The CORUS project “Development of an Epidemiological Network for Monitoring the Dynamics of Foot and Mouth Diseases in the GLTFCA” was launched in 2008 for duration of 3 years with funding from the French Ministry of Foreign Affairs. This project has allowed the development of a network of actors and researchers working in the field of FMD within the different countries encompassing the GLTFCA: Kruger National Park (KNP) in South Africa, Limpopo National Park (LNP) in Mozambique and Gonarezhou National Park (GNP) in Zimbabwe, and has produced several results. One of the major foci has been the development of methods and protocols to evaluate the efficiency of main FMD control methods within the GLTFCA. The application of these methodologies has allowed measuring the efficiency of the veterinary control fence to separate wildlife and livestock in the western boundary of KNP. In addition, the efficiency of current FMD vaccines to protect cattle against circulating viral strains has been assessed in the outskirts of LNP and GNP. Another interesting output has been the development of a risk assessment stochastic model to measure the risk of FMD transmission at the KNP interface. More recently, the project has contributed to a pilot study on the transboundary movements of buffalo and their pathogens across the borders of the 3 countries. Most of these tools and methodologies have the potential to integrate information from other regions in the GLTFCA or could also be replicated in other TFCA areas in southern Africa where FMD transmission occurs as a result of contact between buffalo and cattle.

7.3 Shifting Sands of Conservation: Rapid Veterinary Assessments in 2007 and 2010 in Limpopo National Park. Michael D. Kock, Angostinho de Nazare Manguze, Michael Murphree and Clara Bocchino

Most of the protected areas in Mozambique, including the Limpopo National Park, have within their boundaries a number of human settlements, for which the main land-use is subsistence agro-pastoralism. As a result, there is an inherent tension between conservation and human development objectives within these Protected Areas.

Such a scenario poses a great number of challenges for management, in trying to successfully reconcile human development objectives within the context of biodiversity conservation. An important component of this development dynamic are the issues around wild and domestic animal health, the sustainable delivery of ecosystem goods and services, and associated human health. It is at the interface between wild and domestic animals, and human livelihoods, within and outside these protected areas, that these issues are most acute.

Rapid veterinary assessments, examining the issues highlighted, were conducted in 2007 and 2010. The latter assessment was carried out to see what, if anything, had changed in terms of health related challenges within Limpopo National Park and surrounds. Significant shifts were detected for key drivers with overall increased driver impact: many related to the resettlement process. It was particularly interesting to note the manner in which predictability and impact have changed for certain key drivers. Drivers related to wildlife and livestock shifted into a higher impact but a more predictable scenario, as increasing contact occurred at the interface. In 2010, more was understood about wildlife and livestock issues than in 2007. Health and Disease drivers have become more uncertain as wildlife populations increase and livestock/human health service delivery remains unreliable in a number of areas. Of all of the drivers examined, the governance/policy driver appears to be the most critical in shaping the conditions that are influencing human and animal health, since it is intrinsic to defining and implementing strong and sustainable management for the protected area and its support zone.

Discussion:

1. **Q:** How standardised was the informal interview approach (for comparability)? How can a value be put to the key drivers? **A:** Questions asked were consistent; same people often interviewed on 2nd round. Got a huge amount of information. Drivers surfaced again and again. Picked out from interviews.

2. **Q:** Impact axis in matrices were shifting to the right – is it important? Is it an artifact of the system? **A:** May inform management that things are becoming less stable and there are issues that need to be addressed. **A:** Flags issues for managers.
3. **Q:** Why no improvement in veterinary health service provision from 2007 to 2010 in Mozambique? **A:** Lack of funds – donor funding recently greatly decreased – problems with resettlement funding. The lack of funds dates from 2009.
4. **Q:** In other words the problems may not just be due to politics? **A:** Park has limited revenue from tourism and depends mainly on donor funding – two donors, one waiting for the other – 30% shortfall in operational costs; will be able to employ a vet as soon as funds become available. The resettlement is stopped at a high political level.

7.4 Disease in Free-Ranging Wildlife from the GLTFCA Since 2009. Emily Lane¹, Bengis, R², de Klerk-Lorist L M², Hofmeyr, M³, Buss, P³, Govender, G³, Reininghaus, B⁴, Michel, A⁵

¹National Zoological Gardens of Pretoria; ²Department of Agriculture, Fisheries and Forestry; ³SANParks; ⁴State Vet, Orpen; ⁵Faculty of Veterinary Science, University of Pretoria

Over 110 wildlife pathology cases from the GLTFCA have been examined from January 2009 to 2011. These cases will be reviewed and characterised according to source (State Vet Orpen, DAFF-Skukuza, SANParks, etc.), date/season, and the species, age, sex of animal. While these cases do not represent systematic monitoring of disease in the GLTFCA, they highlight certain diseases and conditions that require further research and provide, in some cases, new information on the presence or distribution of disease in the GLTFCA. A brief discussion of key findings and their relevance to the GLTFCA will be presented.

Discussion:

1. **Q:** Are there any particular samples (e.g. lymph nodes) you would like from rhino? **A:** Would like everything but understand this is not always possible. Because there is very little histological information, we need a range of organs because one single organ might not reflect the cause of disease.
2. **Q:** Are you looking for viruses in the samples? **A:** We cannot do this from formalin preserved tissues – the vets are doing that.

7.5 The Prevalence of *Cryptosporidium* Spp. Oocysts in Wild Mammals in the Kruger National Park, South Africa. Nada Abu Samra¹, Ferran Jori³, Amidou Samie², Peter Thompson¹

¹Epidemiology Section, Department of Production Animal Studies, University of Pretoria, Private Bag X04, Onderstepoort, 0110 South Africa; ²Department of Microbiology, University of Venda, Private Bag X5050 Thohoyandou, South Africa; ³CIRAD, UR AGIRs, Mammal Research Institute, University of Pretoria, 0002 South Africa

This study determined the prevalence of *Cryptosporidium* spp. oocysts in faecal samples from elephant (*Loxodonta africana*), buffalo (*Syncerus caffer*) and impala (*Aepyceros melampus*) in the Kruger National Park (KNP) and an adjacent game reserve in South Africa. Fresh stool samples (n = 445) were collected and tested using an immunofluorescent antibody test (IFA) for *Cryptosporidium parvum*. A total of 278 of these were randomly selected (approximately 90 samples per wildlife species) and tested with the modified Ziehl Neelsen staining technique (ZN) for *Cryptosporidium* spp. The prevalence of *Cryptosporidium* spp. was highest in elephants (25.8% [95% confidence interval: 17.3, 35.9]), compared to buffalo (5.5% [1.8, 12.4]) and impala (4.3% [1.2, 10.5]). *Cryptosporidium parvum* showed similar patterns. 29 samples, including ZN positive and

IFA positive samples, were retested using a real time PCR (rtPCR) technique. Of the 28 ZN-positive samples, 14 (50%) were positive with rtPCR and of the 9 IFA-positive samples 6 (67%) were confirmed positive by rtPCR. The prevalence of *Cryptosporidium* oocysts was significantly higher in both of the two study areas adjacent to the western KNP boundary compared to the area in the centre of the KNP (OR = 3.2 [1.2, 9.0]; P = 0.024). Our study demonstrates for the first time the presence of *Cryptosporidium* spp. in wildlife in South Africa. Simultaneously 800 faecal samples from cattle, grazing adjacent to the fences of the KNP, were collected and are yet to be analyzed. The transmission of this parasite between wildlife, domestic animals and humans is a plausible hypothesis and represents a potential risk for immunodeficient human populations. However, to determine the importance of *Cryptosporidium* spp in human, approximately 200 stool samples will be collected at communal health centres/clinics adjacent to the KNP. Molecular characterization of *Cryptosporidium* strains in cattle and human patients from these communal areas will be done to establish possible transmission links between humans, livestock and wildlife.

Discussion:

1. In NICD survey of infantile diarrhoea, 12% of samples positive for *Cryptosporidium*, source unknown but humans probably important source for other humans.
2. **Q:** No symptoms in wildlife? What about the situation in captive wildlife? **A:** No description of symptoms in wildlife. *Cryptosporidium* known from captive collections but no symptoms described.
3. **Q:** Are humans being categorised by, for example, age or occupation? **A:** No, just asking for samples from hospitals and clinics.
4. **Q:** Did you find Mycobacteria in samples from wildlife? **A:** Will do more analysis to answer the question.

7.6 Progress / Results of the EPISTIS Project: Spatial Risk Model for FMD in the Wildlife-Livestock Interface of the KNP. L van Schalkwyk, E De Clercq, C De Pus, E Dion, S Vanhuysse, G Hendrickx, P Van den Bossche

(remote sensing tools to study the EPIdemiology and Space/Time dynamicS of diseases or EPIdemiological Space-Time Information System)

The wildlife-livestock interface along the Kruger National Park (KNP) boundary is highly heterogeneous, which could impact on the efficacy of disease control measures often not taking this heterogeneity into consideration. African buffaloes are endemic hosts of Foot and Mouth Disease (FMD) and often cause outbreaks of the disease in domestic cattle along the KNP boundary, despite stringent control measures such as vaccination and movement controls. We studied the movement patterns and production parameters of cattle in three study areas along the western boundary of the KNP. A combination of remotely sensed data as well as routine surveillance data were combined with animal tracking data to produce distribution and density maps of cattle in these areas. Similar techniques were used for distribution/density mapping of African buffalo in the KNP. Furthermore, a retrospective study was done to analyze the spatial and temporal patterns of buffalo escaping from the KNP. These data were then combined in a probabilistic framework for predicting FMD transmission (by animal contact) in the presence of environmental constraints. Basic surveillance data as well as risk maps produced through this framework are made accessible through a web interface to users. These products are aimed at enabling decision makers to include wildlife-livestock interface heterogeneity in their disease control endeavours.

Discussion:

1. **Q:** Interpretation of seasonal patterns – found same in Zimbabwe? **A:** May be due to dry rivers, curiosity, searching for food.

2. **Q:** Maps are of buffalo going out. What about cattle going in? **A:** The number of cattle going in was too low to expand the model to include them.
3. **Q:** Age and sex of buffalo going out – differ from state veterinary data? **A:** The data were taken from state veterinary monthly reports. Not all the reports noted age and sex. Little overlap with reports from e.g. Limpopo, Kruger National Park, Mpumalanga.
4. Be cautious about data not recorded in a systematic way. Can use it but be careful of interpretation. **A:** Need to be careful also of perceptions – interviews are often perceptions.

8. TOOLS AND METHODOLOGIES (Session Chair: Michael Kock)

8.1 Using Scenario Planning to Support Stakeholder Engagement on Desired Livelihood Futures for Communities Living in the Great Limpopo Transfrontier Conservation Area. Billy Mukamuri and Chaka Chirozva

Centre for Applied Social Sciences, P.O. Box MP 167 Mt Pleasant Harare Zimbabwe

There is wide recognition that natural resources are in a state of depletion worldwide. In sub-Saharan Africa, natural resources management in communal areas is largely inhibited by insecure tenure and access rights, extractive fiscal policies and imposition of external policies and a general absence of space for local institutional experimentation and innovation. Once these barriers are removed, it creates space for innovation for local communal collectives living in marginal environments to evolve towards self-governing and self-enhancing entities if authority, responsibility and incentives to achieve desired outcomes are clear. For the past five years, the Centre for Applied Social Sciences at the University of Zimbabwe has been advancing the use of scenario planning as an innovative tool through which marginalized communities can turn the recent shifts like creation of the Great Limpopo Transfrontier Conservation Area to their advantage. Once a preserve for business, political and military strategists, scenario planning is now commonly used in futures studies ranging from forests, wildlife, river basin modelling, agriculture and climate change. In a majority of these cases, experts are at the centre of formulating the scenarios with very limited inputs from local communities. In this paper, we present a pro poor scenario planning framework generated from socio-ecological, governance and adaptive management perspectives and discuss how scenario planning was used with semi-literate communities living in Sengwe Communal Lands in Zimbabwe, an area that has been designated as part of GLTFCA. We chronicle the research process “entry to finish” of the project. What do we learn after five years? Scenario planning can support engagement between local communities and district level stakeholders on discussions of desired livelihood futures. This process resulted in formulation of key community proposals centred on tourism; water and irrigation; wildlife management and energy development aimed at enhancing desired livelihood futures for Sengwe residents. We reflect on the role that researchers play in such arenas. Scenario planning is an important boundary spanning object to support stakeholder engagement when locals are faced with a growing number of uncertain parameters in the environment and lack information about the future. Local communities' imaginations of the future (based on needs, visions and aspirations) are inseparable from contemporary politics and clash with higher level planning ideas.

Discussion:

1. **Q:** What will the next step be – business plan, private partner? **A:** The assessment shows that planning for tourism is possible by communities but there have been disappointing results elsewhere; needs gradual, careful planning; not a one-off investment. Market research is necessary before starting. Will present to donors – as a university department the authors' role is facilitation; implementation is not their mandate.

2. **Q:** CBNRM – where is the programme getting it wrong? What are the solutions? **A:** Difficult questions. There are many factors like collapse of economy, lack of good management – solutions will vary.

8.2 Disaster Risk Reduction and its Relevance for TFCAs. Dewald van Niekerk

African Centre for Disaster Studies, North-West University, Potchefstroom Campus, South Africa

Disasters know no borders, and have a profound impact on development gains. History has shown that in times of disaster, development initiatives, especially in the developing world, are the first to suffer. However, the need and will to reduce disasters is not new. Humans have always aimed to mitigate the impacts of disasters on their lives and livelihoods. Yet, a focus on the disaster events has proven to be inadequate, as a result there has been recently a global shift towards considering the root and underlying causes of disasters. Not only does such a focus help us in understanding a dynamic and complex system, it also allows for much more scientific enquiry aimed at preventing disasters from happening in the first place. To this end the assessment and understanding of the risks associated with hazardous events, community vulnerability and ecologically sensitive areas are much more relevant in reducing disasters. Disaster reduction should be seen as an “insurance policy” against hazardous impacts which might lead to a disaster. Disaster reduction is a multi-disciplinary and trans-sectoral issue. For TFCAs the need to have coherent and robust methods in dealing with disaster risk are crucial. The possible impacts of natural hazards on TFCAs could be profound and therefore disaster risk reduction must become an inherent and normal focus within the management and planning process of TFCAs. This paper will address the need for the mainstreaming of disaster risk reduction within the management of TFCAs. It will firstly consider the benefits of investing in disaster risk reduction and secondly how TFCAs can address disaster risk through their normal planning and operational procedures.

Discussion:

1. **Q:** Can you comment on building resilience into systems? **A:** What is needed can be very simple or very complex. Need to understand systems to see how interventions can be made.
2. **Q:** Preventing risk management from stopping people from doing things? Uncontrolled human population growth as a risk? **A:** Can you identify a hazard? How vulnerable are we to the impact of the particular hazard? Idea is not to paint a gloomy picture but to know what we can do about it. Human population growth is an element of vulnerability assessment. We have problems monitoring that in urban areas. Must consider it as element of vulnerability assessment.
3. **Q:** Disaster Risk Reduction (DRR) must be developed to prevent a lot of different disasters but disasters are rare. Is it worth it? **A:** Hazard identification is important – address multiple hazards, DRR not event specific. Valuations have been made comparing the cost of prevention and response.
4. **Q:** BTB is a slow disaster unfolding in the Limpopo area. Work is being done on dynamics but what is being done preparing communities to manage the disease in their domestic livestock? **A:** Major issue and a potential disaster – should be more pro-active in all the countries. Need a management plan.
5. **Q:** What is being done at community level to manage the disease? **A:** Use BTB as foundation to improve basic health care and do monitoring to reduce the risk.
6. This is what DRR is about – we need to understand systems and their complexity, e.g. water as different kinds of hazards (flooding, source of pathogens and poisons, etc). Scenario planning is very useful – have looked at TB.

9. NEXT STEPS FOR THE AHEAD-GLTFCA INITIATIVE (Session Chair: Richard Burroughs)

9.1 Onderstepoort, SANParks and AHEAD-GLTFCA Working Group Coordination

GLTFCA AHEAD coordinator. Dr. Richard Burroughs gave a progress report on appointing a Coordinator. The position will be a university contract post at SANPARKS, but the challenge will be selling the idea to UP Human Resources. It will be a multi-faceted position and advertisement is expected to go out next month. The process has been ongoing since June/July 2010, however, the complexity of the job reflects the complexity of the context – the incumbent will need support from many actors outside the university including other countries. Input from the region will also be necessary or failure is assured. In terms of functionality, will need advisory committee, avoid micro-management, and incumbent must be able to work independently.

Discussion:

1. **Q:** Is it intentional that the job description title doesn't match the programme name? **A:** Not intentional, an oversight, must look at it.
2. **Q:** Review process at GLTFCA – what about the Joint Management Board? Who is the GLTFCA secretariat? **A:** Will address those issues.
3. **Q:** Comment on UP desire to coordinate the position? Long term future? **A:** Impetus – involvement on One Health issues by UP. Long term involvement in *AHEAD*. No particular territorial imperative – desire to facilitate the programme. Will be a 3-year contract post at senior lecturer level but will not be a lecturer. **A:** Dean wants to make posts more collaborative – collaborative research platform.
4. Emphasise that UP is the host not the driver. The incumbent will work for everyone on the ground. **A:** There will be some responsibilities to the university but not faculty-focused.
5. *AHEAD* started in 2003; initiatives were to be locally owned and operated in order to achieve sustainability. Hope to have applicants from all 3 countries. Person is funded for 3 years – must raise funds for own salary.
6. **Q:** Would it be possible to call for nominations from all bodies involved in *AHEAD* – this was done for the cheetah programme coordinators? **A:** University structures do require a formal advertisement process. UP will have a broad selection panel that will include SANPARKS and a range of other stakeholders.

9.2 Workshop Review and Looking Forward

Discussion:

1. Very refreshing to listen to non-veterinary presentations. For example, policy, law - cross-cutting issues; presentations on sustainability very useful.
2. Useful change would be to increase the discussion time. Question is how to synthesise challenges and solutions and take the next step. Put them together. Perhaps a session after the meeting? Would need a 5-day workshop.

3. Interesting to see that results of proposals from several years ago are coming up. Perhaps bring out a collection of papers/report that could be used for funding.
4. Market this workshop as an essential forum. Moving slowly from multi- to transdisciplinary approach.

9.3 Thanks and Closure

Dr. Richard Burroughs thanked the U.S. Fish and Wildlife Service for funding the meeting and the SANParks team, led by Rina Grant, that put the programme together, as well as the staff at Mopani Rest Camp. He thanked Dr. Steve Osofsky for his continued advice and support.

Thanks were also extended to all of the Session Chairs and other members of the Steering Committee who helped invite speakers. Dr. Mary-Lou Penrith was thanked for taking notes throughout the meeting. All of the presenters were thanked for a stimulating Working Group Meeting. Richard thanked Roy Bengis for the keynote address and Harry Biggs and others for taking on responsibility for moving the grant proposal to USFWS forward, as well as those who provided support, including Markus Hofmeyr. He also extended thanks to Merle Whyte for her patience and diplomacy, and for coordinating, facilitating and helping with the programme financials – a phenomenal input, as always.

The group thanked Richard for all of his efforts, and the meeting was concluded.

ANNEX 1: PARTICIPANT LIST

AHEAD PARTICIPANT LIST : 2 - 4 March 2011

ANNEX 1

Title	Surname	Name	Designation	e-mail	Telephone	Affiliation / Institution
1	Abacar	Antonio	Manager	pzinave@yahoo.com.br	+258 843 988522	Zinave National Park, Mozambique
2	Abu Samra	Nada	PhD Student	nada.nada@gmx.de	+27 721417237	University of Pretoria
3	Dr Achá	Sara	Head: Central Vet Laboratory	sjacha@hotmail.com	+258 825 456399	Directorate of Animal Sciences, Mozambique
4	Acha	Vasco	Community Specialist	vascoacha@gmail.com	+258 823232320	Min of Tourism, TFCA & Tourism Development Project
5	Alberts	Reece	Centre for Environmental Management	12991805@nwu.ac.za	+27 18 299 1581	CEM, North-West Univ, Potchefstroom.
6	Alexander	Antony	Project Manager	antonyalexander01@gmail.com	+258 (0)82 022 4328	Limpopo National Park
7	Atkinson	Mark	AHEAD Senior Policy Advisor	matkinson@wcs.org	+267 725 91109	WCS-AHEAD
8	Basson	Bedelia	Multi Media Producer	bedelia@mmpictures.co.za	082 570 6443 012 362 6162	M & M Pictures
9	Beechler	Brianna	PhD Student	breebeechler@gmail.com	079 069 6471	Dept of Environmental Science, Oregon State Univ, Corvallis
10	Dr Bengis	Roy	State Veterinarian	royb@daff.gov.za	+2713735 5641	SA National Dept of Agriculture
11	Betsch	Julie	PhD Student	julie.betsch@umontana.edu		Montana Ecology of Infectious Disease, Univ of Montana, Missoula
12	Dr Biggs	Harry	Programme Integrator	biggs@sanparks.org	082 905 4664	SANParks
13	Bila	Samuel	Vet Lecturer	bilavet@hotmail.com	+258 824 304170	Wildlife Section, Eduardo Mondlane University (Faculdade de Veterinaria-UEM)
14	Blumberg	Lucille	Medical Doctor	lucilleb@nicd.ac.za	+27 828076770	National Institute for Communicable Diseases
15	Dr Bocchino	Clara	Post Doc Researcher	clara.bocchino@gmail.com	+27 (0)76 306 7510	North West University, Potchefstroom
16	Burger	Kent	OSS Advisor	kent@gimsbw.co.bw kent@gimsbotswana.com	+267 71562822	Southern African Regional Environmental Program, Botswana
17	Dr Burroughs	Richard	Director	richard.burroughs@up.ac.za	+27 (0)12 529 8508	Centre for Vet Wildlife Studies, Fac of Vet Science, Univ Pretoria
18	Buss	Peter	Senior Manager: Veterinay Unit, KNP	PeterB@sanparks.org	+27 (0) 82 905 4665	Veterinary Wildlife Services, South African National Parks.
19	Dr Caron	Alexandre	Animal Health Ecologist	alexandre.caron@cirad.fr anorac@hotmail.com	(263-4) 443422 263 913474294	CIRAD
20	Cassidy	Dermot	Regional Sanitary & Phytosanitary Co-ordinator	dermot.cassidy@gmail.com	(263-4) 443422 263 913474294	United States Agency for International Development
21	Chande	Baldeu	Park Warden: Parque Nacional do Limpopo	baldeu55@gmail.com	+258 827 039830	DNAC
22	Mr Chirozva	Chaka	PhD student/researcher	chaka.chirozva@gmail.com	+263 912 817986	CASS, UZ & Wageningen University
23	Chitakira	Munyaradzi	PhD student	mchitakira@zoology.up.ac.za		Environment and Society Centre for Environmental Studies, Univ Pretoria
24	Coertzen	Llwelyn	Ecologist, Wildlife Consultant	llwelyn_c@yahoo.com.au	082 828 7935	Univ of Pretoria, Centre for Wildlife Management
25	Couto	Madyo	Program Director	madyo.couto@gmail.com	+258 82 579 7514	Niassa National Reserve
26	Cuambe	Oraca	Veterinary	oraca5@yahoo.com.br	82 982 1800 / '827874407	Nacinal Director of Conservation Areas
27	Mr Cumbane	Rodolfo	Ecologist	cumbanerodolfo@yahoo.com Rodolfo.cumbane@gmail.com	+258 825990970 / 820017412	Maputo Special Reserve / Min of Tourism
28	Prof Cumming	David		cumming@yoafrica.com	(263-4) 776 497	AHEAD-GLTFCA Consultant, Percy FitzPatrick Inst. UCT. TREP-UZ
29	Dr De Garine-Wichatitsky	Michel	Senior Researcher	degarine@cirad.fr	(263-4) 443422 to 4	CIRAD, UR AGIRS, Harare, Zimbabwe

AHEAD PARTICIPANT LIST : 2 - 4 March 2011

ANNEX 1

	Title	Surname	Name	Designation	e-mail	Telephone	Affiliation / Institution
30		De Klerk	Grietjie	Chief State Veterinarian	GrietjieDK@daff.gov.za	012 319 7412	Dept of Agriculture, Forestry and Fisheries, South Africa
31	Dr	De Klerk-Lorist	Lin-Mari	Chief State Veterinarian	LinmarieDK@daff.gov.za	+27 (0)13 735 5641	DAFF
32	Prof	De la Harpe	Stephen	Associate Professor	stephen.delaharpe@nwu.ac.za	+27 (0)18 299 1941	North West University, Potchefstroom
33	Dr	Deve	Jimis	Veterinarian	jfdeve@yahoo.com.br	+258 825 455050	National Directorate of Veterinary Service, Moz
34	Dr	Dias	Paula	Director	paulatravd51@yahoo.com	+258 21475161 +258 82 841 3670	Directorate of Animal Sciences, Mozambique
35		Dippenaar	Johan	Chief State Veterinarian	JohanD@daff.gov.za	012 319 7635	Dept of Agriculture, Forestry and Fisheries, South Africa
36		Du Plessis	Anel	Associate Prof	Anel.DuPlessis@nwu.ac.za	+27 (0)83 310 1828	Faculty of Law, North-West Univ, Potchefstroom Campus
37	Prof	Du Plessis	Willemien	Professor of Law	willemien.duplessis@nwu.ac.za	+27 (0)18 299 1969	Faculty of Law, North-West University (Potchefstroom Campus), Potchefstroom
38		Etter	Eric	Veterinarian Epidemiologist	etter@cirad.fr	+263(4) 443422 to 4	CIRAD - UR AGIR Harare, Zimbabwe
39		Fosgate	Geoffrey	Epidemiologist	geoffrey.fosgate@up.ac.za	(012) 529 8257	University of Pretoria
40	Prof	Frean	John	Specialist Medical Microbiologist	johnf@nicd.ac.za	(011) 555 0308	National Institute for Communicable Diseases
41	Dr	Gadd	Michelle	Program Officer, Africa Programs	Michelle_Gadd@fws.gov	+1 703 358 2149	US Fish & Wildlife Service, Div of International Cons.
42	Dr	Gagnaux	Phillipe	Medical Doctor, Wildlife Consultant, Mozambique Private Sector	phillipegagnaux@yahoo.com safariparque@yahoo.com	+258 82 304 6990 258 84 304 6990	Safari Parque de Mucapana, Moamba, Maputo Province, Mozambique
43		Geoghegan	Claire	PhD student, Researcher	cgeoghegan@zoology.up.ac.za	084 606 9386	Mammal Res Inst, Univ of Pta & Hluhluwe-iMfolozi Park, KZN
44		Gerstenberg	Cornelia		CorneliaG@nda.agric.za		Dept of Agriculture, Forestry and Fisheries, South Africa
45		Gorsich	Erin	PhD Student	eringorsich@gmail.com	082 661 8023	Oregon State Univ, Dept of Environmental Studies
46	Dr	Grant	Rina	Senior Ecologist	rinag@sanparks.org	079 519 5650	SANParks
47	Dr	Hofmeyr	Markus	Head: Vet Wildlife Services	markush@sanparks.org	084 700 1355	SANParks / GLTP Vet Sub Com Chairperson
48		Jenkins	Akin	Lecturer UP	Akin.Jenkins@up.ac.za	071 869 2312	DVTD, Faculty of Veterinary Science, Univ of Pretoria
49		Jones	Brian	Environment & Development Consultant	bjones@mweb.com.na	+264 61 237 101	Environment and Development Trust
50		Jori	Ferran	CIRAD Researcher at UP	ferran.jori@cirad.fr	079 465 1011 +27 (0)12 420 2016	CIRAD / Mammal Research Inst. Univ of Pretoria / Dept of Zoology
51		Kingman	Andrew	Director of Programmes	andrew@micaia.org	+258 823034285	MICAIA Foundation, Mozambique
52		Knobel	Darryn	Senior Lecturer	darryn.Knobel@up.ac.za	+27 12 529 8049	Dept of Veterinary Tropical Diseases, Univ of Pretoria
53	Dr	Kock	Michael	Senior Field Veterinarian	mdkock@kingsley.co.za	+27 84 6666621	WCS Global Health Program SA
54		Lane	Emily	Vet Pathologist	emily@nzc.ac.za	72 297 6571 +27 12 339 2706	National Zoological Gardens of South Africa
55		Lin	Iming		iming24@gmail.com	072 475 3089	
56	Dr	Lindsey	Peter	Conservation Biologist	palindsey@gmail.com	+27 (0)11 0216727 +27 (0)82 342 7329	Mammal Research Institute, Pretoria
57		Lubbe	Niel	Lecturer	Niel.Lubbe@nwu.ac.za	+ 27-18-299 1032	Faculty of Law, North-West Univ, Potchefstroom Campus
58		Machado	Adelina		adelm1966@hotmail.com	+ 258 82 3001440	Veterinary Faculty, Eduardo Mondlane University, Maputo, Mozambique

AHEAD PARTICIPANT LIST : 2 - 4 March 2011

ANNEX 1

	Title	Surname	Name	Designation	e-mail	Telephone	Affiliation / Institution
59		Makwaebe	Ishmael	Manager: Community-Based Conservation	IshmaelM@sanparks.org		SANParks
60		Malan	Suzi	IISD PhD Student	suzimalan@gmail.com	+27 83 293 0481	AFRICAD program, Faculty of Forestry, Univ of British Columbia, Vancouver, Canada
61	Dr	Mavale	Adolfo	Veterinarian	amavale31@gmail.com	+258 82 329 6930	
62		McKean	Steve	Resource Ecologist (uKhahlamba)	steve@kznwildlife.com	082 722 1193	KZN Wildlife
63		Michel	Anita	Assoc. Prof.	Anita.Michel@up.ac.za	+27 12 529 8426	Univ of Pretoria, Dept of Vet Tropical Diseases, Faculty of Vet Science, Onderstepoort
64	Dr	Mitchell	Stephen		steve.mitchell@bufo.co.za	+27 12 329 4779 +27 82 795 1465	Bufo Technology cc
65	Dr	Monks	Norman	Area Manager Gonarezhou	nmonks2009@yahoo.co.uk		Parks and Wildlife Management Authority Zimbabwe, Gonarezhou National Park
66		Moswete	Naomi	Lecturer: Univ of Botswana	MOATSHEN@mopipi.ub.bw	(267) 72907875	University of Botswana
67	Dr	Mukamuri	Billy		bmukamuri@sociol.uz.ac.zw	+263 772 112 774	CASS, University of Zimbabwe
68	Dr	Mukarati	Norman	Lecturer: Clinical Vet Studies	nmukarati@vet.uz.ac.zw	+263 4 303211 +263 772 950543	Faculty of Vet Science, Univ of Zimbabwe
69	Mr	Murphree	Michael		murphreemj@gmail.com	+27 072 444 2760	Self, Institute of Natural Resources
70	Dr	Murphree	Nyasha	Medical Practitioner	nlmurphree@yahoo.co.uk		Gonarezhou National Park
71		Mutumucuo	Manuel		mmutumucuo@snnworld.org		SNV Tourism Advisor, Mozambique
72	Dr	Nazare	Agostinho	Veterinarian	nazare78@gmail.com	824084940	Veterinary Services
73		Nelson	Alastair	Asst Dir : Africa Program	anelson@wcs.org	+2 718 9647767	Wildlife Conservation Society, New York
74		Nhabanga	Abel	Wildlife Manager	anhabanga@yahoo.com.br	+258 827 228070	Nacional Director of Conservation Areas
75	Dr	Nhamusso	Antonieta	Epidemiologist	anhmusso@gmail.com	+258 82418030	Directorate of Animal Sciences, Mozambique
76	Dr	Okuthe	Jacktone	Medical Doctor	jokuthe@gmail.com	072 116 8392	School of Public Health, Univ of Pretoria
77		O'Leary	Glynn	Chief Executive	glynn@tfpd.co.za	+27 21 701 7860 +27 82 565 6569	Transfrontier Parks Destinations (Pty) Ltd
78	Dr	Osofsky	Steve	Director, Wildlife Health Policy	sosofsky@wcs.org	1-703-716-1029	WCS
79		Parsons	Sven	Post Doc Researcher	sparsons@sun.ac.za	083 417 5877	University of Stellenbosch
80		Penrith	Mary-Lou	Consultant	marylouise@vodamail.co.za.	+27 12 342 1514	Dept Vet Tropical Diseases, Univ of Pretoria / TAD Scientific cc
81	Dr	Pfukenyi	Davies	Chairman: Dept Clinical Vet Studies	dmpfukenyi@vet.uz.ac.zw	+263 4 303211	Faculty of Vet Science, Univ of Zimbabwe
82		Pienaar	Danie		dpienaar@sanparks.org		
83		Purchase	Netty	Coordinator Regional Cheetah & Wilddog Conservation SA	cheetah@mweb.co.zw	+263 773 016295	Wildlife Conservation Society & Zoological Society of London
84		Rautenbach	Christa	Christa.Rautenbach@nwu.ac.za		+27 (0)18 299 1939	Faculty of Law, North-West Univ, Potchefstroom Campus
85		Robinson	Doreen	Regional Biodiversity, NRM & Climate Change Advisor	drobinson@usaid.gov	+27 12 452 2262 +27 83 448 6167	USAID/Southern Africa
86		Rodary	Estienne	Senior Researcher	Estienne.Rodary@ird.fr	+27 117 174 333 +27 786 999 501	IRD (Institut de Recherche pour le Developpement)
87		Rodrigues	Anabela	Executive Director	anarodmoz@hotmail.com	+258 823200950	Sociedade para a Gestao da Reserva do Niassa

AHEAD PARTICIPANT LIST : 2 - 4 March 2011

ANNEX 1

	Title	Surname	Name	Designation	e-mail	Telephone	Affiliation / Institution
88		Schissel	Thomas	APHIS Attaché	Thomas.C.Schissel@aphis.usda.gov	+27 12 431 4711	US Department of Agriculture
89		Shiilegdamba	Enkhtuvshin	Veterinary Epidemiologist	eshiilegdamba@wcs.org	+976 9595-1514	Wildlife Conservation Society, Mongolia Country Program
90		Simpson	Greg	Veterinarian / Public Health Specialist	gigsimpson@gmail.com	073 443 8518	Univ of Pretoria, Faculty of Veterinary Science
91	Dr	Seimon	Anton	Applied Climate Scientist	aseimon@wcs.org	+1-718-220-5276	Wildlife Conservation Society, New York
92		Snyman	Sue	Community Engagement / Environmental Economist	sues@wilderness.co.za	+ 27 11 257 5145	Wilderness Safaris / Univ of Cape Town
93		Soto	Bartolomeu	Head of TFCA Unit, Moz	bsoto@tvcabo.co.mz	+258 823 029300	TFCA Unit, Ministry of Tourism, Mozambique
94	Dr	Spenceley	Anna	Consultant	annaspenceley@gmail.org	+27 72 3115700	STAND (Spenceley Tourism & Development) IUCN WCPA Tourism & Protected Areas Specialist Group
95	Dr	Spierenburg	Marja	Ass Professor, Dept Culture, Organization & Management	m.j.spierenburg@vu.nl	+31 20 598 6801	VU University Amsterdam / Stellenbosch University
96		Suuma	Kristjan		kenshanimoz@gmail.com		
97		Swanepoel	Billy	Wildlife Manager	billswan@telkomsa.net	082 852 1178	Limpopo National Park, Mozambique
98		Swemmer	Louise	Social Science Coordinator	louises@sanparks.org	+27 (0)13 735 3541	Scientific Services, SANParks
99	Dr	Tanner	Manfred		Manfred.Tanner@fli.bund.de	+49 (0) 38351 71239	Friedrich-Loeffler-Institut , Federal Research Institute for Animal Health
100		Thompson	Peter	Veterinary Epidemiologist	Peter.Thompson@up.ac.za	+27(0)12 529 8290	Epidemiology Section, Department of Production Animal Studies, Faculty of Veterinary Science, University of Pretoria
101		Thompson	Sharon	SANParks Logistics Coordinator	sharont@sanparks.org	+27 13 7353545	Scientific Services, SANParks
102		Thomson	Gavin	Animal Health Consultant	gavin@tadscientific.co.za	+27 82 336 6088	TAD Scientific cc
103		Van der Linde	Harry	Senior Director: Programme Design and Knowledge Management	hvanderlinde@awfsa.org	+27 83 27 85 224	African Wildlife Foundation
104		Van der Westhuizen	Hugo	Country Representative / P. Leader	hugo@fzs.org	+263 775002329	Frankfurt Zoological Society, Zimbabwe
105	Dr	Van Hasselt	James	Health Coordinator	Jamesvh@global.co.za	082 330 8489	One World Sustainable Investments (DFID's Regional Climate Change Programme)
106		Van Niekerk	Dewald		Dewald.VanNiekerk@nwu.ac.za		
107		Van Rooyen	Jacques	Research Coordinator, Mnisi Community Programme	jacques.vanrooyen@up.ac.za	083 289 1312 +012 529 8339	Boscia Wildlife Solutions / University of Pretoria
108		Van Schalkwyk	Louis	Manager: Hans Hoheizen Wildlife Research Station	louis.vanschalkwyk@up.ac.za	+083 633 2203	Hans Hoheisen Wildlife Research Station, Univ of Pretoria
109		Venter	Francois		francoisventer@nwu.ac.za		
110		Wessels	Jacoba	SV Epidemiology	jcdongo@telkomsa.net	082 418 1843 (013) 752 7769	Mpumalanga Veterinary Services
111	Dr	Wright	Caradee	Research Group Leader / Senior Researcher	CWright@csir.co.za	+27 12 841 3092	Environmental Health Research Group, CSIR, Pretoria

ANNEX 2: AGENDA

11th AHEAD-GLTFCA Working Group Meeting
2nd - 4th March, 2011

Venue: Mopani Rest Camp, Kruger National Park, South Africa

NOTE: *Listed presenters of technical topics are kindly asked to prepare a one page summary ahead of time and email these to <merle@mpu.co.za> before the meeting, or have materials ready to distribute at the start of the meeting. Thank you in advance for your time and contribution.*

Blue linked items indicate available PDFs of presentations

Day One: Wednesday 2nd March

Opening Session

0830: Opening Remarks and Welcome (Richard Burroughs)

0835: **Keynote Address:** [“Wildlife Disease Surveillance and Monitoring”](#) (Roy Bengis)

0905: Questions and Discussion

0935: Introductions- around the room, quickly!

0945: Tea/Coffee

All presenters are requested to please leave at least 5 minutes of their allotted time for questions and discussion.

2nd Session: Human Health, Livelihoods, and Their Links to Animal and Ecosystem Health in the GLTFCA

1015: [“One Health and Zoonotic Outbreaks in South Africa”](#) (Lucille Blumberg)

1035: [“As Anthrax Moves towards the Kruger Boundary: A Perspective on Human Health Risks”](#) (John Freaan)

1055: [“Introduction to the Mnisi Community Programme and the Latest Findings Regarding Baseline Research on Ecosystem Health, Cattle Production and Health Management at the Wildlife / Livestock Interface within the GLTFCA, South Africa”](#) (Jacques van Rooyen)

1115: [“The Mnisi Project”](#) (Greg Simpson and Lucille / Belinda / Riann Twine)

1135: [“Zoonoses in the Manyeleti Area”](#) (Jacktone Okuthe)

1155: [“Investigating Zoonotic Diseases at the Wildlife / Livestock Interface in Botswana’s Okavango Delta and Chobe National Park”](#) (Ferran Jori; Munstermann, S; Mokopasetso, M; Etter, E; Mhongovoyo, J; Nkgowe, C; Michel, A and Newman, S)

1215: [“Activities of the Research Platform- Production and Conservation in Partnership \(RP-PCP\) on the Wildlife / Livestock Interface in the SE Lowveld of Zimbabwe: Outputs after Three Years”](#) (Michel de Garine-Wichatitsky, Murwira, A; Caron, A; Pfukenyi, D; Mundy, P; Fritz, H; Mukamuri, B; Manjengwa, J and Mwenje, E)

1235: Discussion

1245: Lunch break

1340: [“Assessment of Air- and Water-Related Human Health Effects among At-Risk Communities Residing in the Upper Olifants Water Management Area”](#) (Caradee Wright; Oosthuizen, M A; John, J; Albers, P; le Roux, W; Steyn, M; Genthe, B and Oberholster, P)

1400: [“The Kavango-Zambezi TFCA: Policy and Process Observations from a One-Health Perspective”](#) (Mark Atkinson)

1420: [“How Relevant is Climate Change to SADC Transfrontier Conservation Areas?”](#) (Anton Seimon)

1440: **Tea/Coffee**

3rd Session: Animal Disease Control Measures: How Do These Affect Livelihoods?

1520: [“Challenges Managing Foot and Mouth Disease \(FMD\) at the Wildlife / Livestock Interface Level on Mongolia's Eastern Steppe”](#) (Enkee Shiilegdamba; Bolortsetseg, S; Fine, A and Joly, D)

1540: “Linking Livestock Disease and Human Behaviour to Improve Rural Public Health: A Case Study of *Mycobacterium bovis* and Milk in South Africa” (Claire Geoghegan; Hlokwe, T; Raseleka, K; Marcotty, T; Getz, W and Michel, A)

4th Session: Disease Transmission at the Interface

1600: [“Prevalence of Diseases at Different Wildlife / Livestock Interfaces in the Great Limpopo Transfrontier Conservation Area”](#) (Alexandre Caron; Miguel, E; Jori, F; Hofmeyr, M; Pfukeyni, D; Foggin, C and de Garine-Wichatitsky, M)

1620: [“Contacts between Domestic Cattle and African Buffalo in the Great Limpopo Transfrontier Conservation Area: Potential for Disease Spread”](#) (Michel de Garine-Wichatitsky; Miguel, E; Cornélis, D; Grobois, V; Foggin, C; Jori, F; Hofmeyr, M and Caron A)

1640: [“Disease Dynamics of Bovine Tuberculosis and Rift Valley Fever: A Possible Role for Immune-Mediated Interactions in Coinfected African Buffalo \(*Syncerus caffer*\)”](#) (Brianna Beechler; Ezenwa, V and Jolles, A)

1700: Discussion

1730: Video on The Need for Compatibility between Wildlife Conservation & Livestock Development in Southern Africa (Gavin Thomson and Bedelia Basson)

1900: Dinner

Day Two: Thursday 3rd March

5th Session: Governance, Law and Policy Challenges for the Implementation of the GLTFCA: A Multi-Layered Presentation from the GLTFCA Policy Research Group

0800: **Session Keynote Presentation:** [“Whither State Sovereignty in a TFCA?”](#) (Francois Venter)

- 0820: [“Implementation Challenges for the GLTFCA”](#) (Clara Bocchino)
- 0840: [“Developing Legal Principles for the Management of TFCAs”](#) (Niel Lubbe)
- 0900: [“The Realisation of Environmental and Socio-economic Rights in the GLTFCA”](#) (Willemien du Plessis)
- 0920: [“Environmental Governance Perspectives on the Role of the Private Sector in TFCAs”](#) (Reece Alberts and Louis Kotze)
- 0940: [“TFCAs Management Coexists with Local Governments: The Principles”](#) (Anél du Plessis)
- 1000: Tea/Coffee**
- 1050: [“Harmonising the Law and Its Enforcement Across Borders: A TFCAs Objective”](#) (Stephen de la Harpe)
- 1110: [“Taking State Law and Customary Law into Account for Conservation Areas”](#) (Christa Rautenbach)
- 1130: [“Possible Adaptations to Community-Based Conservation: Results of a Meta-Study”](#) (Suzi Malan)
- 1150: [“The Policy, Economic, Legislative and Regulatory Environment for Commercial Export of Beef from TFCAs”](#) (Dermot Cassidy)
- 1210: Discussion
- 1230: Lunch break**

6th Session: Sustainable Development: How Do Economic Activities in TFCAs Affect Livelihoods, Profit and Conservation?

- 1330: Introduction to the Session: [“Sustainable Development: How do Economic Activities in TFCAs Affect Livelihoods, Profit, and Conservation”](#) (Anna Spenceley)
- 1340: [“Is Public - Private Partnership a Consistent Arrangement for Mozambique’s Conservation, or a Periodic Illusion?”](#) (Bartolomeu Soto)
- 1400: [“Grappling with the Inherent Contradictions and Tensions in the TFCAs Model: A Case-Study from the Chimanimani TFCAs”](#) (Andrew Kingman)
- 1415: [“The Fine Line between a Dream Realised and a Dream Shattered”](#) (Glynn O’Leary)
- 1430: [“The Adventure of Covane Community”](#) (Vasco Acha)
- 1445: [“Communities and Private - Public Sector Partnerships: Challenges and Pitfalls in Working as a Private Sector Broker in the Transfrontier Conservation Areas Tourism Development Project, TFCATDP”](#) (Manuel Mutimucio)
- 1500: [“Sustainable Economic Activities in TFCAs: An NGO Perspective with a Business Edge”](#) (Harry van der Linde)
- 1515: Tea/Coffee**
- 1530: [“Balancing Transboundary Conservation, Economic Activities and Rural Livelihoods in Southern Africa: Breaking New Barriers”](#) (Brian Jones)

- 1550: [“Wildlife Ranching on Private Land in Namibia Confers Economic, Social and Conservation Benefits”](#) (Peter Lindsey)
- 1610: [“Payments for Ecosystem Services \(PES\): Feasibility and Implementation in the Maloti – Drakensberg Transfrontier Project Area”](#) (Steve McKean and Myles Mander)
- 1630: [“High-End Ecotourism as a Sustainable Land-Use Option in Rural Africa: The Role of Employment in Reducing Poverty, Improving Social Welfare and Stimulating Economic Growth”](#) (Sue Snyman)
- 1650: [“Stakeholder Perspectives on the Potential for Community-Based Ecotourism Development and Support for the Kgalagadi Transfrontier Park, Botswana”](#) (Naomi Moswete; Thapa, B and Child, B)
- 1710: Discussion
- 1830: Video Presentation (Nick Ellenbogen)
- 1930: Dinner**

Day Three: Friday 4th March

7th Session: Monitoring of Disease

- 0800 [“Regional Planning for Cheetah and Wild Dog Conservation: Mozambique as a Success Story”](#) (Abel Nhabanga ; Purchase, G and Pariela F)
- 0820 [“Achievements of the Epidemiological Network for Monitoring the Dynamics of Foot and Mouth Disease in the GLTFCA \(CORUS Project, 2008-2011\)”](#) (Ferran Jori; Etter, E; Heath, L; Caron, A; Massicame, Z and Thompson, P)
- 0840: [“Shifting Sands of Conservation: Rapid Veterinary Assessments in 2007 and 2010 in Limpopo National Park”](#) (Michael D Kock; De Nazare Manguzeze, A; Murphree, M and Bocchino, C)
- 0900: [“Disease in Free-Ranging Wildlife from the GLTFCA Since 2009”](#) (Emily Lane, Bengis, R; de Klerk-Lorist, L M; Hofmeyr, M; Buss, P; Govender, G; Reininghaus, B and Michel, A)
- 0920: [“The Prevalence of *Cryptosporidium* spp. Oocysts in Wild Mammals in the Kruger National Park, South Africa”](#) (Nada Abu Samra; Jori, F; Samie, A and Thompson, P)
- 0940: [“Progress / Results of the EPISTIS Project: Spatial Risk Model for FMD at the Wildlife / Livestock Interface of the Kruger National Park”](#) (Louis van Schalkwyk; De Clercq, E; De Pus, C; Dion, E; Vanhuyse, S; Hendrickx, G and Van den Bossche, P)
- 1000: **Tea/Coffee**

8th Session: Tools and Methodologies

- 1040: [“Local-Level Scenario Planning Experiences in Sengwe Communal Lands, Chiredzi, Zimbabwe”](#) (Billy Mukamuri and Chaka Chirozva)
- 1110: [“Disaster Risk Reduction and its Relevance for TFCAs”](#) (Dewald van Niekerk)

9th Session: Next Steps for the AHEAD-GLTFCA Initiative

1130: Onderstepoort, SANParks and AHEAD-GLTFCA Working Group Coordination-
Overview and Discussion (Richard Burroughs)

1230: Concluding Remarks (AHEAD-GLTFCA Steering Group Members). **Lunch on your
own, departures.**