TRANSFRONTIER CONSERVATION INITIATIVES IN SOUTHERN AFRICA: COMPATIBILITY WITH ANIMAL AND HUMAN HEALTH.

Roy G. Bengis & Lin-Mari de Klerk-Lorist
AFRICA’S COLONIAL HERITAGE

• DURING THE COLONIAL ERA, WILDLIFE IN AFRICA WAS DECIMATED BY MEAT HUNTERS, SPORT HUNTERS AND IVORY HUNTERS.

• SOME FAR SIGHTED COLONIAL OFFICIALS AND POLITICIANS RECOGNISED THE NEED FOR SANCTUARIES FOR WILDLIFE IF EXTINCTION OF SPECIES WAS TO BE PREVENTED.

• A NETWORK OF GAME RESERVES AND NATIONAL PARKS WERE PROCLAIMED AND DEVELOPED IN MANY AFRICAN COUNTRIES.
IT WAS NOT BY CHANCE THAT MANY OF THESE PROTECTED AREAS WERE PROCLAIMED IN REGIONS THAT WERE UNSUITABLE FOR AGRICULTURAL DEVELOPMENT, DUE TO MARGINAL SOILS AND LOW RAINFALL - OR THE PRESENCE OF CERTAIN ANIMAL AND OR HUMAN DISEASES AND THEIR VECTORS
AFRICA’S FIRST GAME RANGERS
DEVELOPMENTS IN THE 20TH CENTURY

• DURING THE 20TH CENTURY THERE WAS UNPRECEDED GROWTH OF HUMAN POPULATIONS GLOBALLY, INCLUDING AFRICA.

• MANY OF AFRICA’S PROTECTED AREAS BECAME PRESSURIZED BY EXPANDING HUMAN POPULATIONS ENCROACHING ON THEIR BORDERS

• THE CONCEPT OF TRANSFRONTIER CONSERVATION AREAS THEREFORE CAME AS A “BREATH OF FRESH AIR” FOR BIODIVERSITY CONSERVATION.
DEVELOPMENTS REGARDING TRANSFRONTIER CONSERVATION AREAS / PARKS IN AFRICA

- THE CONCEPT OF TRANSFRONTIER CONSERVATION AREAS HAS BEEN WITH US FOR SOME TIME
- IN THE 1990’S AND INTO THE NEW MILLENIUM, THIS CONCEPT GAINED MOMENTUM
WHAT IS A TRANSFRONTIER CONSERVATION AREA (TFCA) ??

Transfrontier Conservation Areas, also known as “Peace Parks”, involve the integration or linking of conservation-worthy land across international borders.
OBJECTIVES OF TRANSFRONTIER CONSERVATION AREAS

• CONSERVATION OF TRANSBOUNDARY ECOSYSTEMS AND ASSOCIATED BIO-DIVERSITY

• PROMOTION OF SUSTAINABLE USE OF NATURAL RESOURCES

• IMPROVE THE QUALITY OF LIFE OF RURAL PEOPLE

LARGER GEOGRAPHIC AREAS GENERALLY HAVE GREATER RESILIENCE FOR DEALING WITH NATURAL AND MAN-MADE PERTURBATIONS.
PARTICIPATION IN TFCA’S

• TFCA’S FREQUENTLY INCLUDE CORE EXISTING PROTECTED AREAS IN THE PARTICIPATING COUNTRIES.

• TFCA’S MAY ALSO BE EXPANDED BY CONSOLIDATION OF STATE, PRIVATELY OWNED AND COMMUNAL LAND IN JOINT VENTURES WHICH MAY GENERATE ECONOMIC BENEFITS FOR A REGION.
POTENTIAL BENEFITS OF TFCA’S TO LOCAL COMMUNITIES

• THE TFCA VISION AIMS TO AUGMENT SUBSISTENCE AGRICULTURE ON MARGINAL LAND WITH COMMUNITY PARTICIPATION IN ECO / ETHNO – TOURISM BASED ENTERPRISES, WHICH MAY HAVE SUSTAINABLE ECONOMIC AND ECOLOGICAL BENEFITS FOR ALL.
SOUTHERN AFRICAN DEVELOPMENT REGION : THE CURRENT SITUATION

• IN THE SADC REGION, THERE ARE CURRENTLY THIRTEEN TFCA PROJECTS.
• THREE OF THESE PROJECTS HAVE INTERNATIONAL TREATIES SIGNED AND ARE ALREADY PARTIALLY FUNCTIONAL
• SEVEN OF THESE PROJECTS HAVE HAD FORMAL M.O.U’S NEGOTIATED BETWEEN PARTICIPATING COUNTRIES
• FOUR OF THES PROJECTS ARE STILL IN THE CONCEPTUAL PHASE.
Treaty signed
1. Ai-Ais/Richtersveld Transfrontier Park (Namibia/South Africa)
2. Kgalagadi Transfrontier Park (Botswana/South Africa)
3. Great Limpopo Transfrontier Park (Mozambique/South Africa/Zimbabwe)

MoU Signed
3. Limpopo-Shashe TFCA (Botswana/South Africa/Zimbabwe)
4. Lubombo Transfrontier Conservation and Resource Area (Mozambique/South Africa/Zimbabwe)
5. Mopani-Drakensberg Transfrontier Conservation and Development Area (Lesotho/South Africa)
6. Iona - Skeleton Coast TFCA (Angola/Namibia)
8. Malawi - Zambia TFCA (Malawi/Zambia)
9. Chimanimani TFCA (Mozambique/Zimbabwe)
10. Conceptual phase
11. Luwu Plain - Musuuma TFCA (Angola/Zambia)
CONFLICTING INTERESTS

• IN CERTAIN ECOSYSTEMS, THE DEVELOPMENT OF TRANSFRONTIER PARKS MAY HAVE SERIOUS ANIMAL AND HUMAN HEALTH IMPLICATIONS (SEE RISK FACTORS)

• IN CERTAIN ECOSYSTEMS, ENLARGED CONSERVATION AREAS MAY ALSO RESULT IN INCREASED CONFLICT BETWEEN COMMUNITIES AND DAMAGE-CAUSING ANIMALS.
ENVIRONMENTAL RISK FACTORS OF VARIOUS ECOSYSTEMS OR ECOZONES

CLIMATE
- TEMPERATURE RANGES
- RAINFALL
- ALTITUDE

+ 

GEOLOGY AND SOILS

= 

HABITATS AND LANDSCAPES
- ARID
- TEMPERATE
- TROPICAL
- DESERT
- SAVANNAHS
- RAIN FORESTS
- AFRO-MONTANE AREAS
HABITATS AND LANDSCAPES DETERMINE THE ANIMAL SPECIES DIVERSITY AND MIXES
THE ANIMAL SPECIES MIXES AND THEIR ASSOCIATED PATHOGENS AND VECTORS WILL DETERMINE THE ANIMAL AND HUMAN HEALTH RISKS
AFRICAN BUFFALO

**PERSISTENT CARRIERS OF:**
- SAT TYPES OF FMD VIRUSES
- THEILERIOSIS
- TRYPANOSOMIASIS

**MAINTENANCE HOSTS OF:**
- BOVINE TUBERCULOSIS
- BOVINE BRUCELLOSIS

**AMPLIFICATION HOSTS OF:**
- ANTHRAX
- RIFT VALLEY FEVER
TRAGELAPHIDS = SPIRAL HORNED ANTELOPE : INCLUDE KUDUS, BUSHBUCK, NYALA, ELAND, BONGO AND SITATUNGA.

PERSISTENT CARRIERS OF :
• TRYpanosomiasis

AMPLIFICATION HOSTS OF :
• BOvine TUBERCULOSIS
• ANTHRAX

TRANSPORT HOSTS
• SAT TYPES FMD VIRUSES
• RABIES (NAMIBIA)
WILD SUIDS

MAINTENANCE AND AMPLIFICATION HOST OF:
• AFRICAN SWINE FEVER
• TRYPANOSOMIASIS

TRANSPORT HOST:
• SAT TYPES OF FMD
• BOVINE TUBERCULOSIS
WILDEBEEST

PERSISTENT CARRIERS OF:
BOVINE MALIGNANT CATARRHAL FEVER
ZEBRAS

- AMPLIFIER HOST OF AFRICAN HORSESICKNESS VIRUSES
- MAINTAIN CIRCULATION OF THESE VIRUSES
SOCIAL ANTELOPES

?? MAY BE RESPONSIBLE FOR CIRCULATION & MOVEMENT OF:

• SAT TYPE FMD VIRUSES
• BLUE TONGUE VIRUSES
• RIFT VALLEY FEVER VIRUS
• PPR VIRUS
RABIES: SOME WILDLIFE VECTORS IN CERTAIN SOUTHERN AFRICAN ECOSYSTEMS
HABITAT SUITABILITY FOR VECTORS
TSETSE FLY-TRANSMITTED TRYPANOSOMIASIS

Glossina
(by P.W. Pappas and S.M. Wardrop)
ARGASID TAMPANS : ASF VECTORS
IXODID TICKS: VECTORS OFPROTOZOAL AND RICKETTSIAL INFECTIONS
HAEMATOPHAGOUS AND NECROPHILIC FLIES: MECHANICAL VECTORS OF ANTHRAX
MOSQUITOES AND MIDGES : VECTORS OF SEVERAL VIRAL INFECTIONS OF LIVESTOCK
DISEASE RISKS ASSOCIATED WITH DOMESTIC ANIMALS

- RINDERPEST – R.I.P. +
- BOVINE TB
- CANINE DISTEMPER
- RABIES
- BRUCELLOSIS
BOVINE TUBERCULOSIS IN KUDU
BOVINE TUBERCULOSIS IN AFRICAN BUFFALO
BOVINE BRUCELLOSIS
RABIES AND CANINE DISTEMPER IN SOCIAL CARNIVORES
RABIES IN KUDU IN NAMIBIA
TFCA’S: HOW MIGHT THEY INCREASE THE RISK OF TAD’S

• THEY CREATE CONTIGUOUS POPULATIONS
• THEY CREATE BIOLOGICAL BRIDGES
• THEY MAY FACILITATE THE EXPANSION OF THE GEOGRAPHIC RANGE OF A PATHOGEN OR VECTOR
• THEY MAY INCREASE THE EXTENT OR INTENSITY OF THE WILDLIFE / LIVESTOCK INTERFACE
• DISEASE SURVEILLANCE IN WILDLIFE IS DIFFICULT, UNDER-DEVELOPED AND CHALLENGING
EXTENT AND TYPE OF INTERFACE

• FOCAL – WATERPOINTS / SALT LICKS
• LINEAR – BARRIER FENCES
• DIFFUSE – PASTORAL SYSTEMS

• In real life, the interface is frequently a mixture of these possibilities

IMPORTANT FOR THE TRANSMISSION OF DIRECTLY CONTAGIOUS, INDIRECTLY INFECTIOUS AND TICK-BORNE DISEASES
NEGATIVE OUTCOMES OF INTERFACE TRANSMISSION OF ANIMAL DISEASES

- Local losses of livestock to Afro-indigenous diseases originating from wildlife.
- Losses of wildlife from non-native infections originating from livestock.
- The presence and spread of serious Transboundary Animal Diseases may result in trade barriers which may affect local economies.
A POTENTIAL CASE STUDY – THE GREAT LIMPOPO TRANSFRONTIER PARK
RISK FACTORS

• SUB-TROPICAL CLIMATE.
• LOWVELD SAVANNAH ECOSYSTEM
• MOST DISEASE MAINTENANCE HOSTS ARE PRESENT
• EASTERN SIDE IS UNFENCED – DIFFUSE INTERFACE
• WESTERN SIDE IS FENCED – LINEAR INTERFACE
• DISEASE STATUS OF DOMESTIC ANIMALS ON BORDERS – LARGELY UNKNOWN.
BOVINE TUBERCULOSIS – AN EXAMPLE THAT ILLUSTRATES THAT THESE CONCERNS ARE JUSTIFIED
1960’s BTB believed to have entered the Park

1990 First case of BTB diagnosed in a sub-adult male buffalo

1991-1992 Most herds south of the Sabie river were infected

1996 First two infected herds found north of the Olifants river

1999 First infected buffalo cow found along the Shingwedzi river

2002 BTB approximately 12km north of Shingwedzi

2006 BTB just south of the Limpopo river

2009 BTB found in Gonarezhou in Zimbabwe


BTB believed to have entered
the Park

First case of BTB diagnosed in
a sub-adult male buffalo

First two infected herds found
north of the Olifants river

First infected buffalo cow found
along the Shingwedzi river

BTB approximately 12km north
of Shingwedzi

BTB just south of the Limpopo river

BTB found in Gonarezhou in
Zimbabwe

1960’s BTB believed to have entered
the Park

1991-1992 Most herds south of the Sabie river were infected

1996 First two infected herds found north of the Olifants river

1999 First infected buffalo cow found along the Shingwedzi river

2002 BTB approximately 12km north of Shingwedzi

2006 BTB just south of the Limpopo river

2009 BTB found in Gonarezhou in Zimbabwe
THE WAY FORWARD – WHAT CAN WE DO

- LAND USE PLANNING ON A NATIONAL OR REGIONAL SCALE
- ALIGNMENT OR RE-ALIGNMENT OF PERIMETER FENCES AND CONTROL ZONES TO SEPARATE AREAS WITH DIFFERENT LAND USES
- IMMUNE BARRIERS (VACCINATION) FOR CERTAIN DISEASES. IN THE SUB-CONTINENT, THERE IS A DIRE NEED FOR IMPROVED VACCINES.
- IMPROVED DISEASE AND VECTOR SURVEILLANCE AND MONITORING
- COMMODITY BASED TRADE ((FOR CERTAIN DISEASES)
Land use planning on a national and international level

• For the participating countries, it is important to identify the conservation-worthy regions that lend themselves to the TFCA concept.
• It is important that the land-use practices have sustainable ecological and economic benefits for all, - not forgetting the local communities.
• A Joint Management Plan must be developed for each TFCA.
• An executive Joint Management Board, supported by specialised committees must be pro-actively developed and put in place to identify and resolve common issues related to:
  – Biodiversity Conservation and Animal Health
  – Safety and Security
  – Finances, Tourism and Revenue sharing
  – Community Relations and human resources
DEVELOPMENT OF ROBUST SCANNING AND TARGETED SURVEILLANCE ACTIONS

- INVENTORY OF ENDEMIC INFECTIONS PRESENT
- DETECTION OF NEWLY INTRODUCED OR EMERGING INFECTIONS
- FOCUS CONTINGENCY AND RESPONSE PLANNING
BARRIER FENCING – WHERE APPROPRIATE

• SEPARATION OF DIFFERENT LAND USE PRACTICES
• SENSIBLE AND SENSITIVE ALIGNMENT OR RE-ALIGNMENT OF FENCES
DEVELOPMENT AND STRATEGIC DEPLOYMENT OF REGIONALLY APPROPRIATE VACCINES

• EXAMPLE OF SAT TYPES OF FMD VIRUSES – REGIONAL TOPOTYPES.
• THERE IS A DIRE NEED FOR IMPROVED VACCINES AGAINST RVF, ORBIVIRUS INFECTIONS AND ANTHRAX.
• AN EFFECTIVE VACCINE FOR AFRICAN SWINE FEVER STILL ELUDES US.
• CREATION OF BUFFER ZONES THAT ARE EFFECTIVE IMMUNE BARRIERS.
• VACCINES GENERALLY TARGET THE LIVESTOCK – PROTECT AGAINST ENDEMIC WILDLIFE ASSOCIATED INFECTIONS.
• VACCINATION OF DOMESTIC DOGS TO PROTECT WILD CARNIVORES FROM RABIES AND CANINE DISTEMPER
EXPLORING THE POSSIBILITIES OF COMMODITY – BASED TRADE

• THIS COULD BE LINKED TO REGIONAL DISEASE ZONING OR LOCAL COMPARTMENTALISATION OF BIOSECURE UNITS
• PRODUCING OF A SAFE PRODUCT FOR EXPORT
• IS ALREADY BEING PRACTICED WITH REGARDS TO HPAI
• IS FAR ADVANCED FOR TRADE IN DEBONED, DE-GLANDED AND MATURED BEEF.

• PROCESSING PROCEDURES ARE AVAILABLE TO ENSURE THAT EVEN BUFFALO MEAT IS A SAFE PRODUCT – FOR EXAMPLE HOT CANNING, PICKLING AND DRYING OF LEAN MEAT.

• TAD disease management guidelines may also need to be adapted to dissociate the disease status of livestock from the endemic disease status of regional wildlife.
SUMMARY

• TFCA’S ARE POSITIVE INITIATIVES WITH REGARDS TO BIODIVERSITY CONSERVATION AND ECOTOURISM.

• IN THE ARID SAVANNAHS WITH MARGINAL AGRICULTURAL POTENTIAL, WILDLIFE BASED ECO-TOURISM AND ETHNO-TOURISM MAY GO A LONG WAY TO CREATE JOBS AND IMPROVE THE QUALITY OF LIFE FOR RURAL COMMUNITIES

• HOWEVER, TFCA’S INTRODUCE NEW ANIMAL AND HUMAN HEALTH CHALLENGES THAT NEED TO BE ADDRESSED.
THE END