Food and Agriculture Organization of the United Nations

IUCN SSC Human-Wildlife Conflict & Coexistence SPECIALIST GROUP

HUMAN-WILDLIFE CONFLICT & COEXISTENCE
/ CASE STUDIES

SPATIAL PLANNING TO ENSURE FUTURE COEXISTENCE BETWEEN WILDLIFE AND PEOPLE

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INTRODUCTION

In north-western Botswana, the Okavango River flows for approximately 100 km, from the Namibian border, along what's called the "panhandle" before reaching the Okavango Delta. The Okavango Panhandle area is home to around 35 000 people, who share space and resources with approximately 20 000 resident African elephants *Loxodonta africana.*

HERE, THE RIVER FLOWS YEAR-ROUND, PROVIDING A CONSTANT WATER SOURCE FOR PEOPLE AND WILDLIFE, CONCENTRATING POPULATIONS OF BOTH ALONG THIS PERMANENT WETLAND. HOWEVER, AS DEVELOPMENT HAS INCREASED ALONG THE PANHANDLE, AS WITH MANY PERMANENT WATERWAYS IN AFRICA, THE ESSENTIAL VITAL SPACE FOR ELEPHANTS TO ACCESS WATER AND OTHER RESOURCES IS QUICKLY DIMINISHING.

KEY INSIGHTS & LESSONS LEARNT
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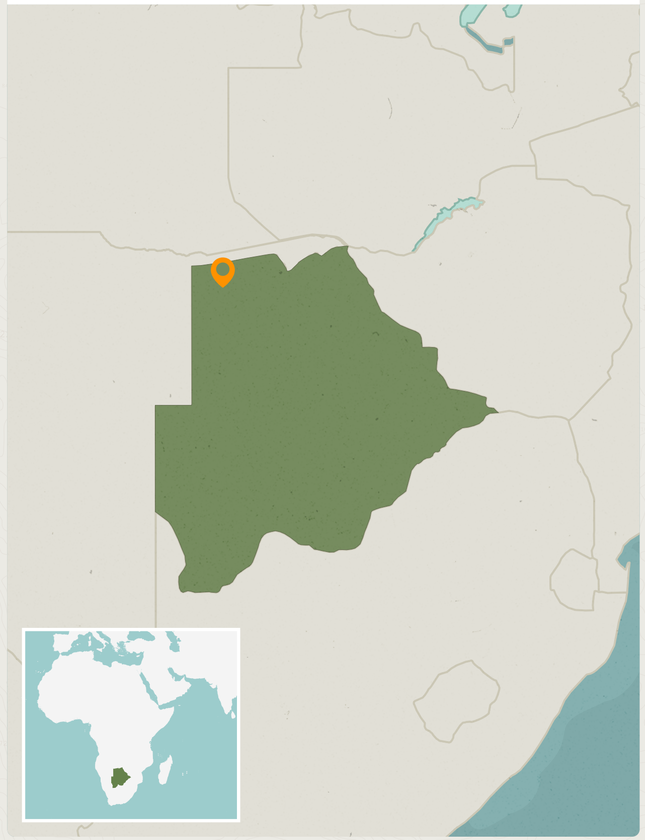
NORTH-WESTERN BOTSWANA

OKAVANGO PANHANDLE, BOTSWANA



Source: Free Vector Maps modified to comply with UN, 2020

Free Vector Maps 2022. World Map [online] [Cited 5 January 2022] https://freevectormaps.com/world-maps/WRLD-EPS-03-0001

As a result, elephants often have to move through communal lands to travel from foraging areas to the river. Within these expanding communal lands, local people live, plant subsistence crops, herd livestock, gather resources, and walk to and from schools. This growing overlap of people and elephants can lead to an ever more frequent competition for natural resources, resulting in negative confrontations and impacts for both parties.

In 2013, the Ecoexist Trust (hereafter 'Ecoexist') was founded by a multidisciplinary team to support the lives and livelihoods of people who share space with elephants, while concomitantly taking into consideration the elephants' needs and habitats. Ecoexist takes a holistic approach to its work: working with communities, government and the private sector to achieve its aims and promote coexistence.

This case study will focus on one of the most crucial aspects of Ecoexist's holistic approach to support land use planning and guarantee that land for agriculture is not allocated to regions which elephants frequently use, ensuring elephants have free movement to access water and the resources they need from the Okavango Delta whilst minimising the ensuing impacts on subsistence farmers.

PROBLEM ANALYSIS

Initial work in the Okavango Panhandle area was conducted as part of a PhD project in 2008 by one of Ecoexist's founders. The purpose of the study was to understand the underlying causal drivers and patterns to this conflict, and to identify possible solutions. The Government of Botswana had identified this geographic area as a hotspot for human-elephant conflict. Three years of ground surveys had been conducted during the PhD project, to identify and map elephant movement pathways, which comprised in the collecting of expert indigenous knowledge. Further analysis was subsequently conducted to explore factors influencing the number of elephants and their movement behaviour, on and around the identified pathways. The project identified 106 elephant pathways crossing a main road to access the Okavango River. One of the most important findings was reached by comparing raided and non-raided fields, to understand why elephants go to some fields and not others, taking into account several social and environmental factors. The main factor identified which influenced the choice of pathway was the relative position of a field to one of the specific elephant pathways. If a field was within 1 km of an elephant pathway, it was 50 percent more likely to be entered by elephants. Unlike other regions where elephants may leave a protected area to enter fields, in the Okavango Panhandle, elephants use pathways to move from foraging areas to the Okavango River, which in turn means moving through human-dominated areas.

WHEN CONDUCTING THE RESEARCH, PEOPLE IN THE COMMUNITY HAD NOTED THAT SPECIFIC FIELDS WERE ON ELEPHANT PATHWAYS AND WERE BLOCKING THE ELEPHANTS' MOVEMENT ROUTES. SOME COMMUNITIES EVEN REQUESTED THAT THEIR FIELDS BE MOVED AWAY.

It was clear that elephants were using certain pathways more frequently than others, with pathways further from larger settlements or regions with cultivated land being used more frequently. Essentially, the elephants chose the *path of least resistance* to access the river, taking a risk-avoidance approach by moving in large numbers. Groups of male elephants, known to adopt a more high-risk foraging and movement strategy, primarily used pathways close to areas of high human activity.

Further research on identifying where humans and elephants overlapped in this human-dominated landscape was also conducted by several students at Ecoexist between 2015 and 2018.

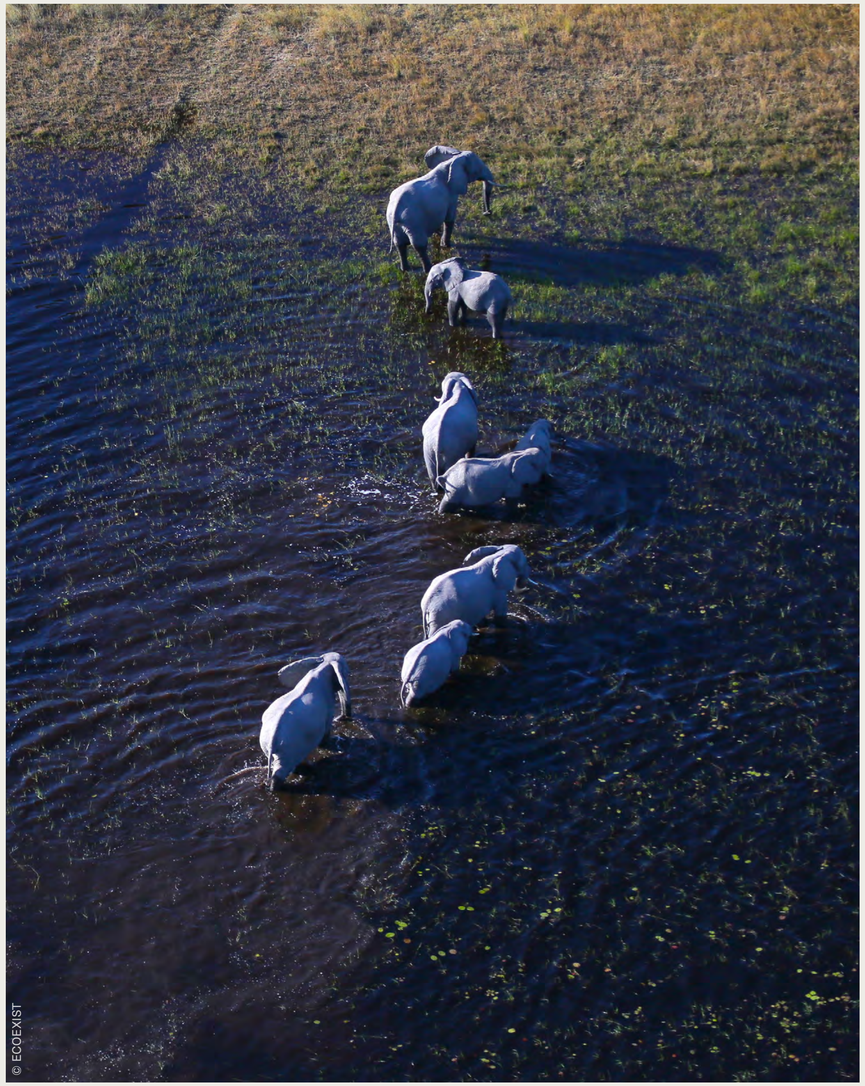
USING GPS COLLAR MOVEMENT DATA FROM 40 ELEPHANTS AND WORKING WITH THE LOCAL COMMUNITIES, THE RESEARCH TEAM IDENTIFIED WHERE DIFFERENT HUMAN ACTIVITIES OVERLAPPED WITH ELEPHANT USE, CAUSING HEIGHTENED COMPETITION FOR RESOURCES.

In Botswana, the land boards, which are the authorities responsible for the administration and management of land allocations, typically are the body that allocate fields. Prior to this project, authorities were not taking into consideration the movement patterns of elephants and how they might move through communal lands. As a result and inadvertently, agricultural land was often allocated along the large elephant corridors, exacerbating negative interactions between elephants and local people. National agriculture subsidies in Botswana also incentivises an increased size of land under cultivation, rather than the amount of crop yield produced, leading to an accelerated conversion of habitat for agriculture.

PROCESS

Ecoexist initially focused on identifying ways to support farmers in protecting their individual fields, while at a landscape level identifying, with the land authority and the community, agriculture zones away from elephant corridors, that could be protected as clusters of fields, using communal fencing. Ecoexist had also worked with farmers to improve their yields by intensifying agriculture in smaller, easier to protect areas, using conservation agriculture techniques that improved soil quality and built resilience to unpredictable rainfall. To reduce fear among communities and negative confrontations with elephants, education and awareness-raising activities were also conducted among the general population to ensure more people were empowered with knowledge on how to be safe around elephants.

HAVING BETTER UNDERSTOOD HOW PEOPLE AND ELEPHANTS USED THE OKAVANGO PANHANDLE AREA, IT WAS APPARENT THAT LAND USE PLANNING AT THE LANDSCAPE LEVEL WAS NECESSARY FOR PEOPLE TO COEXIST WITH ELEPHANTS.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Through ground monitoring, and by tapping into the communities' knowledge on elephant landscape use, in terms of where elephant pathways were located and which pathways were used most frequently, amidst 13 villages in the eastern Okavango Panhandle, Ecoexist was able to use the data to clearly indicate where negative interactions between people and elephants were more likely to occur. This data was used as evidence to highlight the land use conflicts that exacerbated the situation and persuade stakeholders that the situation would only worsen if elephant pathways were blocked by the allocation of more fields.

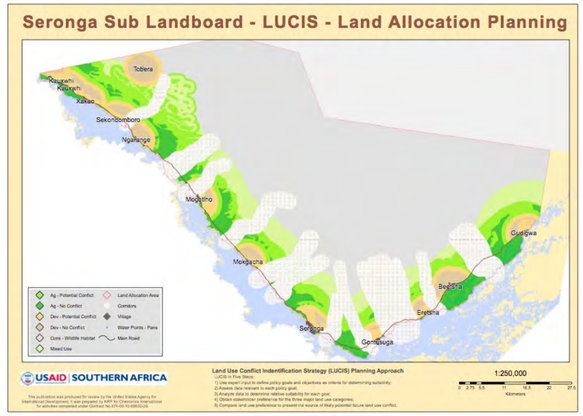
In 2015, Ecoexist partnered with the Tawana Land Board (the land authority for the District that covers the Okavango Delta), the Seronga Sub-Land Board (the sub-district authority for the eastern Okavango Panhandle), and the USAID Southern African Regional Environment Program (SAREP), in the scope of a more extensive programme to develop and implement an ESRI ArcGIS-based model titled Land Use Conflict Information Strategy (LUCIS), in the eastern Okavango Panhandle. The LUCIS model was originally developed for resolving land use conflicts using GIS mapping and transparent stakeholder participation. In this initiative, the land authority stakeholders identified the need for better land allocation processes to avoid general land use conflicts, including between agriculture and wildlife.

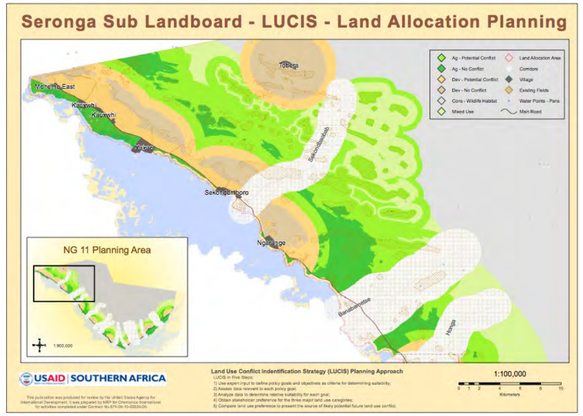
ECOEXIST CONTRIBUTED DATA AND EXPERTISE ON HOW ELEPHANTS UTILIZED THE LANDSCAPE, AND FACILITATED DATA COLLECTION AND MEETINGS WITH STAKEHOLDERS TO IDENTIFY WHERE LAND FOR AGRICULTURE COULD BE ALLOCATED TO REDUCE THE OVERLAP BETWEEN PEOPLE AND ELEPHANTS.

ACTIVITIES

Ecoexist facilitated meetings with the local communities and other stakeholders to identify their preferences for different types of land uses and determine an approach for the allocation of agricultural fields, i.e. what factors they might consider when determining how their settlement might expand and identify where different types of land use could occur in the given landscape, with limited conflict between land use types.

The programme then engaged with the District Land Use Planning Unit (DLUPU), which consisted of government departments, including the Department of Wildlife and National Parks, Department of Crop Production, Department of Animal Production, Department of Water Affairs and relevant land boards. The meetings amassed the inputs from these relevant partners, including national and regional policies for land allocation. Additionally, data was collected on land uses and resources in the eastern Okavango Panhandle, including information on soil quality, infrastructure in place, existing agricultural fields and settlements and locations of boreholes for accessing water. Ecoexist provided data on the main movement pathways used by the elephants, and critical locations in the landscape that were used by wildlife to access the river.





THE LUCIS MODEL ANALYSED ALL THE INFORMATION COLLATED AND PRODUCED LAND USE CONFLICT MAPS TO IDENTIFY WHERE CONFLICTS BETWEEN LAND USES WERE OCCURRING AND WHERE THERE WAS POTENTIAL FOR LAND USE CONFLICT TO OCCUR.

It also identified land areas best suited for arable use, ensuring that it was not in an area where a settlement would expand into, that the soils were fertile, and crop cultivation would not block elephant pathways.

Having identified areas where arable land could be allocated, which would not result in land use conflicts, Ecoexist returned to the communities and presented the maps, highlighting the potential areas for arable land allocation. The communities were then able to contribute further, and subsequently chose the locations with low land use conflict where they would like to have fields allocated.

OUTCOMES

LUCIS is a tool that helps local land boards to reconcile land use policy overlap, zone various sectoral land use types, and allow officers to allocate land more effectively, to avoid land use overlaps and the ensuing conflicts. This ensures areas most suitable for agricultural development are zoned on land with the best fertile soils and away from the main elephant pathways.

MITIGATION EFFORTS TO PROTECT FIELDS ARE NOW MORE EFFECTIVE, BEING PLACED STRATEGICALLY AWAY FROM FREQUENT ELEPHANT MOVEMENT CORRIDORS, MAKING IT EASIER TO KEEP AGRICULTURAL AREAS SAFE FROM ELEPHANTS.

In the Seronga Sub-Land Board jurisdiction (which covers the eastern Panhandle), areas suitable for agricultural field allocation have now been determined. The Tawana Land Board (the main land authority for the District) are currently formalising these areas with community authorities. Now that the system has been piloted, the Tawana Land Board has requested that mapping and benchmarking trips be completed in other sub-land board areas around the Okavango Delta. Ecoexist is now also working with the Shakawe, Nokaneng, Gumare, Sehitwa and Maun Sub-Land Boards to gather data on elephant corridors and engage stakeholders to determine suitable locations for fields in these regions, while ensuring that they do not negatively affect the elephant populations.

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KEY INSIGHTS & LESSONS LEARNT

01 BUILDING TRUST

Trying new methods and bringing new ideas, technology and suggestions to the communities and stakeholders is required to address human-wildlife conflict, but building key relationships and trust was equally essential. Ecoexist has spent a lot of time over ten years doing exactly this: before, during the LUCIS process and afterwards; during the implementation phase. All these efforts have contributed significantly to the success of this initiative.

02 A HOLISTIC VISION

Although negative interactions between people and elephants need to be addressed immediately, in the short term, Ecoexist had a holistic vision to address certain underlying factors that were contributing to these negative interactions. The project comprises many different components that aim to address different drivers of these negative interactions, in order to facilitate coexistence between people and elephants. Ecoexist is, for example, also addressing the lack of benefits coming back to people living with elephants, including providing “Elephant Aware” farmers (farmers that avoid cultivating in corridors and practice methods that allow them to better farm alongside elephants) with better markets to sell products, contributing to an elephant-based economy and establishing a positive reinforcement loop.

03 APPLIED RESEARCH

Alongside its applied work, Ecoexist continues to conduct applied research to understand human-elephant conflict and monitor interventions, recognising the need for expertise in many disciplines, including sociology, politics, agriculture, economics, as well as ecology and conservation biology. Ecoexist is constantly collecting data on elephant-people interactions, assessing the impact of various interventions and informing policy and management-level decisions, as well as conducting new research to fill knowledge gaps, from elephant movement and use of the landscape through GPS satellite tracking collars, to new local-specific agricultural techniques to improve yields, to better elephant deterrent methods that aim at protecting farmers and their crops from elephants.

04 EVIDENCE IS KEY TO POLICY CHANGE

The communities already knew where elephants moved in greatest numbers, most frequently, and combined with data from collared elephants, Ecoexist could better quantify and define these pathways, providing corroborating evidence for land authorities, allowing them to consider this in planning and land allocation processes.

05 A PARTICIPATORY APPROACH

Ecoexist brought together many different stakeholders to gather ideas and suggest solutions that could be co-designed and developed through a participatory process. This was very important for adoption success and the sustainability of the intervention. It also presented a challenge, as it required a lot of coordination of meetings and discussions, which takes a long time, beyond many development programme or donor grant periods.

06 ADAPTATION TO LOCAL CONTEXT WHEN SCALING UP

Ecoexist is currently working with the Tawana Land Board and other communities across other areas of the Okavango Delta to scale up this initiative, and is looking at how these ideas and concepts can be transferred to other areas in Botswana and across the KAZA TFCA countries. This requires adaptation to different situations on the ground, including different social, economic and ecological factors. As farmers are the main stakeholders consistently involved, the process begins by considering the local individual farmers' situation and perspectives.

07 FLUIDITY OF GOVERNMENT STAFF

In Botswana, government staff are often only on placement in a region for a few years, before they get transferred, which can be one of the biggest challenges to momentum and consistency when working with government agencies, to trial, test and implement such an intervention. This initiative focused on ensuring that LUCIS is well integrated into the work processes and policies of the land authority. In practical terms, this requires that rather than individuals being aware of the programme, it is a tool used throughout the whole organisation. Furthermore and importantly, efforts were made to incorporate the tools' products into land allocation plans, policies and guiding documents used by all authority members.

FURTHER INFORMATION

- Ecoexist Trust
- Finding pathways to human-elephant coexistence: a risky business. Oryx. 2016

ACKNOWLEDGEMENTS

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ABOUT THE CASE STUDIES

The **Food and Agriculture Organisation of the United Nations** (FAO) and the **IUCN SSC Human-Wildlife Conflict & Coexistence Specialist Group** (HWCCSG) have jointly developed a set of case studies with the aim of covering the process projects have taken to manage various aspects of a human-wildlife conflict & coexistence situation. This case study is one of many that will be used to illustrate key components of the **IUCN SSC Guidelines on Human-Wildlife Conflict & Coexistence**. The published case studies can be found in the **Human-Wildlife Conflict & Coexistence Library**.

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