

# Cultivating CBNRM Awareness in Namibia Through an Educational Exhibition



## ENVIRONMENTAL EDUCATION IN NAMIBIA

Adrianna Niles, Benjamin Hood, Jesse Beers, Zev Lieberman

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Prof T. Masvawure and Prof A. Manga

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## Authorship



### Authors' Note:

The team members who completed this project (from left to right in the image above) are Benjamin Hood, Jesse Beers, Adrianna Niles, and Zevulun Lieberman. See the bios below for more information. They were led by the team at EduVentures and mentored by WPI Professors Tsitsi Masvawure and Alejandro Manga.

### Authors:

Jesse Beers  
Biomedical & Mechanical Engineering  
[jabeers@wpi.edu](mailto:jabeers@wpi.edu)

Benjamin Hood  
Civil Engineering  
[behood@wpi.edu](mailto:behood@wpi.edu)

Zevulun Lieberman

Adrianna Niles

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## Abstract

Community-Based Natural Resource Management, CBNRM, is an internationally used policy that aims to educate local communities on sustainable practices while promoting their development. Rooted in education, EduVentures looks to extend knowledge to Namibians on programs and policies around sustainability and environmental management. Working alongside EduVentures, we developed an educational exhibition consisting of eight panels and a booklet that addressed key topics of CBNRM. Using a series of qualitative approaches including secondary data review, expert interviews, and conservancy focus groups, we gathered CBNRM data from varying perspectives. The final deliverables for our project included the eight panels and the accompanying booklet.

## Executive Summary

Since the colonial upheaval of traditional land management practices in the 19th and 20th centuries, CBNRM has slowly begun reinstating the management, and land authority possessed by rural communities. Yet the successful implementation of CBNRM in rural Namibia poses many challenges to communities, and organizers. One such organization, EduVentures, focuses on educating Namibians on topics such as the environment and sustainable development. With CBNRM's three goals in mind - economic development, environmental conservation, and community engagement - EduVentures developed material to promote the use and understanding of the policy. Our project's aim was to assist with the implementation of CBNRM in Namibia by creating educational panels and a complementary booklet focused on the history, implementation, progress, challenges, and successes of CBNRM. These will be presented to rural communities, and prospective CBOs. The specific objectives were:

1. Conduct secondary data analysis of existing material on CBNRM and develop content for eight educational panels and a pamphlet for rural conservancy members.
2. Produce visually engaging panels and pamphlets on eight key topics of CBNRM such as history, progress, success stories, and challenges.
3. Work closely with a local review committee made up of stakeholders in CBNRM to identify relevant content, layout, and design.

We have used a series of qualitative approaches which included the following key methodologies: secondary data review, expert interviews, and conservancy focus groups.

Through completing our project, we determined the deeper significance CBNRM holds on Namibians

## Introduction

### History of Namibia

Prior to its independence, Namibia was known as South West Africa; it was there that Germany acted more as an imperialistic conqueror rather than a traditional colonizer (Hutchinson, 2021). Germany arrived in 1884, and by 1888 Germans began confiscating native lands and cattle.



Figure 1: Map of German South-West Africa and tribal lands in the region.

In response to the Rinderpest cattle plague of 1896, Germany created police zones to separate native cattle, and with that the native Africans themselves, from the settler population. The African tribes made several attempts at rebellion, but they ultimately faced genocide by German colonial rule (Hutchinson, 2021).

After Germany was pushed out of the region from World War I, the recently formed League of Nations mandated the administration of South West Africa to South Africa in 1920 (Namibia High Commission). Now under Apartheid, natives continued to be hindered from buying land - that was originally theirs - and were unable to move up in the now more modern economy (Hutchinson, 2021). As a result of these transgressions, the South-West Africa People's Organization (SWAPO) was formed as a liberation movement in 1960. In 1988, the United Nations stopped the decades long guerilla war with SWAPO coming to power over South West Africa in 1989. And on March 21, 1990, Dr. Sam Nujoma became the first president of the Republic of Namibia (Namibia High Commission).

## EduVentures

EduVentures Trust was established in 2003 in a collaboration between the National Museum of Namibia, and the Immanuel Shifidi Secondary School in Katutura. The organization became officially registered as a Non-Governmental Organization (NGO) in 2007. Their stated mission is to “sensitize Namibian school learners to topics related to the environment and sustainable development. The program aims to cultivate an interest among young Namibians in their national heritage (cultural and environmental), and to empower them to get actively involved in environmental issues threatening these” (Eduventures, 2024). The organization hosts multiple educational programs, including the EduMobile, and Enviro Comedy. EduVentures places a large emphasis on providing educational services for disadvantaged communities, which tend to be in rural and remote areas of Namibia. The families in these disadvantaged communities often face a tough choice of either affording essentials like food



and water or sending their kids to school. As a result, this leads to a high dropout rate among boys and girls of primary school age (Shikalepo, 2020). On top of this, there is a low teacher retention rate within these communities, and limited access to SMART teaching devices, which creates an unreliable learning environment. Eduventures programs, like the EduMobile, are hoping to assist these communities in creating a better, secure learning environment.

The EduMobile initiative serves as a traveling classroom for the organization, allowing educators to reach these isolated locations. The program serves to specifically spread information on environmental issues, such as climate change and biodiversity loss, typically to a younger audience (Eduventures, 2024). Additionally, EduVentures sponsors educational projects that promote environmental education across the country. Previous endeavors involve collaborations with WPI project groups, such as the 2023 IQP collaboration to make an educational virtual exhibition (Doyle et al.). The organization additionally incorporates CBNRM concepts into many of its educational programs. Since CBNRM is one of the largest policy tools for rural empowerment and sustainable development in Namibia, EduVentures has a great interest in the success of the concept. Accordingly, the organization often incorporates CBNRM into their educational endeavors, helping to promote sustainable land use and development practices.



*Figure 2: One of EduVentures' many educational programs seeking to promote an understanding of environmental and sustainable concerns.*

## Community-Based Natural Resource Management

### Introduction

Community-Based Natural Resource Management, also referred to as CBNRM, is an internationally used policy concept, which aims to economically empower rural communities through effective resource management, and sustainable practices. CBNRM has been a prominent policy strongly advocated in Namibia, due to the historic lack of community control over natural resources, and increase in environmental concerns. Since its official start in 1998, CBNRM policies and related organizations have primarily focused on Namibians living in communal areas like conservancies, community forests, and water point committees (MET 2013). With the central goal of advancing rural development, CBNRM hopes to empower communities by returning autonomy in natural resource management to rural communities (Welch 2018). The policies and legislation put in place by the Namibian government aim to promote rural areas of Namibia to undertake sustainability; yet, implementation of these policies on CBNRM has been challenging.



*Figure 3: Members of a Namibian conservancy are meeting to discuss sustainable practices.*

<https://www.flickr.com/photos/usaaid-biodiversity-forestry/12210874615>

## Support Organizations

Namibia's constitutional advancement positions the country as one of the emerging leaders in CBNRM. In addition to government assistance, rural Namibians receive support from various non-governmental organizations. Within the CBNRM community of Namibia, organizations such as the Namibian Association of CBNRM Support Organizations, NACSO, aid in developing environmental agendas and creating and mending relationships. In particular, NACSO acts as an umbrella that connects a multitude of organizations working to accomplish the same goal of conservation. Being composed of voluntary NGOs and government sectors, NACSO's role is that of a facilitator, helping each respective association with their own goals while simultaneously supporting and advancing community-based management tactics (NACSO, 2022). By providing necessary technical support, NACSO carries a significant weight in CBNRM advancement. Through the assistance of NACSO, other NGOs have found success in their respective fields.

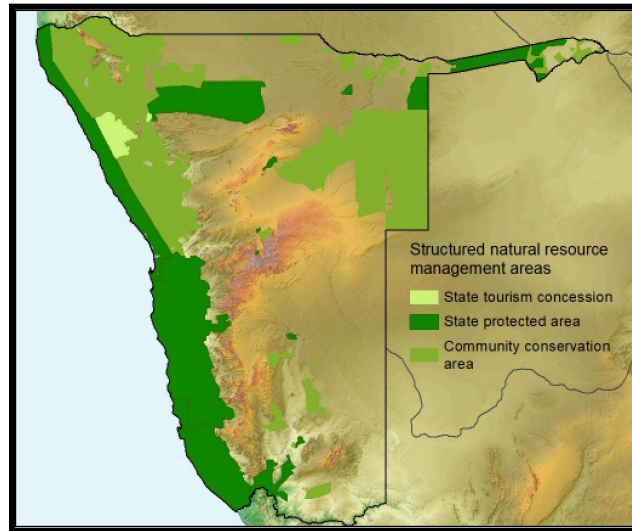


Figure 4: The map above captures the land devoted to conservation management throughout Namibia.

<https://communityconservationnamibia.com/facts-and-figures>

One organization that falls under NACSO’s umbrella is the Ministry of Environment, Forestry, and Tourism, also known as MEFT. Similar to most CBNRM organizations, MEFT’s mission revolves around promoting biodiversity conservation through sustainable natural resource and tourism development for both social and economic benefits to Namibians (MEFT, 2024). MEFT aligns with CBNRM’s goals in terms of empowering communities through conservation. They have found success in piloting programs focusing on governance and allocating community benefits. Recently, to provide financial support MEFT helped to establish the Youth Professional Accountants (YPA) program. Implemented in 2022, YPA provides young accountants to regional clusters to work alongside conservancies in developing a working financial management plan (NACSO, 2022). In addition to financial management support, MEFT presents communities with helpful strategies in managing wildlife. MEFT is responsible for overseeing and administering wildlife quotas to conservancies while ensuring that the biodiversity of Namibia remains intact. Furthermore, a subdivision of MEFT controls permits,

research grants, and the monitoring of wildlife to guarantee only sustainable practices are being followed (MEFT, 2024). While promoting environmentally friendly notions, MEFT cultivates programs in which conservancies can turn to for advice on managing their financials, land and wildlife. Working alongside the government, MEFT looks to bridge gaps between communities and policies while supporting them and promoting conservation.

Another organization that has contributed to CBNRM evolution in Namibia is the Integrated Rural Development and Nature Conservation, IRDNC for short. Working alongside NASCO and MEFT, the IRDNC is cemented in improving the lives of Namibians by expanding the socio-economy in the rural communities through wildlife and natural resources (IRDNC, 2024). The IRDNC incorporates developing world views on inclusion and teamwork strategies. Specifically, their approach encompasses building meaningful relationships with communities, involving women, and promoting accountability along with economic benefits (IRDNC, 2024). Since 2015, the IRDNC has found success in helping the lion, rhino, and elephant populations in Namibia expand while also generating a conservation revenue of around 8 million USD (IRDNC,2024). The IRDNC organization has supported the Namibian government in achieving environmental and sustainability goals.



*Figure 5: The IRDNC approach includes building effective relationships with members of conservancies.*

<https://www.irdnc.org.na/our-mission-philosophy.html>

Continuing, the Namibia Nature Fund, also referred to as NNF, is another organization that seeks to take conservation action throughout the country. NNF mission is one rooted in conserving Namibia's land and wildlife through sustainable development and an ethical use of natural resources to benefit Namibians present and future (NNF, 2024). NNF is responsible for a multitude of programs that assist Namibians in their conservation efforts. In particular, NNF's specialization in financial support and project management gives Namibians an opportunity for consultation and growth (NNF, 2024). NACSO, MEFT, IRDNC, and NNF have provided the Namibian government with assistance in promoting conservation throughout the country.

## Namibia's Challenges

The execution of the CBNRM policies in rural Namibian communities is multifaceted by nature and has presented multiple challenges. Specifically, obtaining the policy's three goals of economic development, environmental conservation, and community engagement, has caused political and power imbalances among local, national, and global branches in Namibia (Heffernan 2022). Though NACSO, MEFT, and IRDNC have left lasting impacts on CBNRM in Namibia, big issues among conservancies remain evolving. Current issues within CBO's include: complicated relationships with wildlife, lack of sustainable practice, lack of funds, droughts and other environmental issues, mining rights threatening wildlife and communities, and restoring tourism industry post-COVID-19 (NACSO, 2022). Navigating emerging CBNRM issues continues to be a balancing act for Namibia.

One of the most pressing challenges for CBO's, is human wildlife conflict (HWC). As people and wildlife continue to occupy the same land, conflict is bound to occur. Throughout Namibia, the issue of Human-Wildlife Conflict is prevalent amongst most communities, in varying degrees and forms. HWC describes instances where wildlife and humans interact in a costly way for one of the parties, usually humans. Many HWC events in Namibia are a loss of livestock from predators like jackals, wild dogs, leopards, and cheetahs. Similarly, infrastructure and crop damage is often caused by larger animals such as elephants. These negative relationships surrounding HWC events worsen community relationships with certain species. In particular, lions and elephants are broadly pegged as the villains of HWC. Due to humans impinging on more remote and untouched habitats, HWC events are typically more common in rural impoverished communities. In Namibia, the communities that suffer the most from HWC have nearly 40% of their population below the poverty lines (NACSO, 2023). Not only does HWC pose a threat to wildlife, it threatens the livelihood of many rural Namibians.

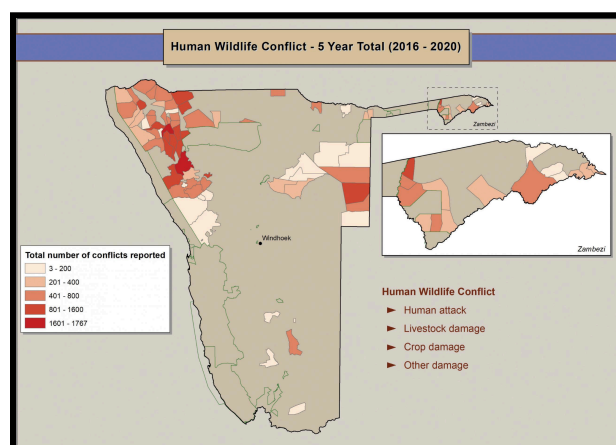


Figure 6: The above map quantifies Human-Wildlife Conflict among conservancies.

<https://communityconservationnamibia.com/the-big-issues/human-wildlife-conflict#:~:text=However%2C%20one%20of%20the%20greatest,of%20human%20life%20or%20injury.>

CBNRM seeks to address Human-Wildlife Conflict within sustainable practices and various training programs. In hopes to minimize conflicts among humans and Namibia's big cats, CBNRM support organizations have established programs such as the Lion Ranger initiative. The Lion Ranger program is responsible for monitoring lion populations and managing HWC involving the species (NACSO, 2022). Various technologies have been developed to assist the rangers in monitoring the movements of the predators. The program and technologies combined fosters a sense of community in looking after their wildlife and provides the necessary management for HWC occurrences.

Through tourism and conservation hunting Namibian conservancies have generated a substantial income; their reliance on the tourism industry was made evident during the COVID-19 Pandemic. After the Pandemic, Namibian conservancies were estimated to have lost at least 90% of their total income (NACSO, 2022). With the reopening of the world and travel, conservancy revenue has almost recovered to pre-pandemic numbers, yet a need for diversifying income sources has never been more prominent.

### CBNRM in Southern Africa

Not only has Namibia made strides and met challenges in CBNRM, much of the Southern African region as a whole has grappled with implementing CBNRM. Zimbabwe, Botswana, and Zambia alike have attempted to solve political imbalances between the government and local communities via CBNRM. Although these policies intend to empower rural communities, challenges commonly arise with implementation. Because failure is more prominent than



success, confidence is lost by countries' governments and financial donors (CHILD 2010). When implementing CBNRM policies, it is evident that successful management techniques vary greatly, depending on location and context. Additionally, successful CBNRM techniques typically require revision, and multiple attempts.

Specifically, Zimbabwe found success in their failures. CBNRM in Zimbabwe began with a “one-size-fits-all” policy which quickly failed, due to the lack of program diversity. The program disregarded the necessities of different species and areas which required attention (CHILD, 2010). Zimbabwe then pivoted to Wildlife Industries New Development For All (WINDFALL), which unfortunately was short-lived due to its failure to include local input, leading to an unfair distribution of program benefits (Shereni et al., 2021). Learning from these past policies, Zimbabwe was able to find success with its Communal Areas Management Program For Indigenous Resources (CAMPFIRE). CAMPFIRE, now an internationally famous program, promotes focus on human-wildlife conflict, learning from the mistakes of previous programs. The original goal of CAMPFIRE was to shift the management responsibility of natural resources, like wildlife, woodlands, water, and grazing back to the communities for direct benefits (Frost, Bond, 2008). However, through the use of Rural District Councils (RDC) to govern CAMPFIRE, the program established a link to the national government and the local committees (Shereni, Saarinen, 2021). CAMPFIRE allowed a beneficial relationship to form between the government and the communities promoting a positive aura about the policy. Zimbabwe’s success with CAMPFIRE resulted in a reduction of human-wildlife conflicts from increased education and awareness on CBNRM (Shereni, Saarinen, 2021). Advancements with CBNRM policies allowed Zimbabwe to become a role model for neighboring countries.



*Figure 7: Zimbabwe's CAMPFIRE sees a reduction in human-wildlife conflicts and promotes community involvement.*

<https://www.go2africa.com/african-travel-blog/our-ultimate-guide-to-a-zimbabwe-safari>

Botswana took a different approach in developing environmental management programs. Botswana used USAID funding to provide funds in the form of 15-year land leases; however, the backing of committees without guidance resulted in a misuse of funds and few community benefits in reality (CHILD 2010). Additionally, Botswana found challenges surrounding the rights over the land leases. Originally, rights to the lease were in the hands of locals who sub-leased to joint venture partnerships (JVP) creating revenue for communities from fees in exchange for photographic or hunting rights (Cassidy, 2021). Rural communities in Botswana had involvement with land rights; however, a new procedure emerged turning away from community involvement. Backed by the Botswana Tourism Organization, establishing the notion of Land Banks undermined communities and disregarded their land rights (Cassidy, 2021). Nevertheless, Botswana was able to find success with the later Botswana Community-Based Organizations Network (BOCOBONET). The BOCOBONET association worked alongside USAID traveling to various CBOs seeking to break the isolation of the villages while giving them a voice in policy (MULALE, FLORA, 2006). While all CBNRM policies hope to educate communities and promote engagement and development, BOCOBONET took a particular

interest in bridging social gaps. Publishing multiple initiatives, like the Botswana CBNRM Services Directory that established a database of contact information to CBOs about provider firms and organizations, the association helped create a network for local communities to share information helpful to future development (MULALE, FLORA, 2006). Although Botswana had its fair share of struggles, the BOCOBONET association prevailed in helping promote CBNRM.

Similar to Botswana, Zambia hasn't found widespread triumphs in CBNRM enactment, as many of their policies are only supported by individual CBNRM advocates, without much aid from the government. However, Zambia has found some recent CBNRM success with the new Forests Act, which helps communities manage forests and collect benefits from their products (Davis et al., 2020). Though Zambia has success in forest management, they continue to have difficulties with CBNRM involvement in wildlife management. Recently, the Wildlife Act lacked the community engagement that the Forest Act harbored; as a result, communities aren't able to reap the same benefits the wildlife industry offers (Davis et al., 2020).

Overall, Southern Africa has proven to have the capability to be a leading figure in CBNRM and environmental management. Although the road to successful community management is far from over, the region is learning from its mistakes, and continuously improving CBNRM policy over time. Each of the region's drawbacks results in strengthening its successes, and Southern Africa continues to empower local communities through CBNRM practices, while promoting sustainable practices. The overall goal of this project is to assist with the implementation of CBNRM in Namibia by creating education panels focused on the history, legal framework, challenges, and successes of CBNRM which will be presented to rural conservancies.

# Methods

## Study Design

Our project utilizes a series of qualitative approaches to gather our data. We derived educational panels and pamphlets through analyzing information from databases, interviews, and focus groups.

## Study Population

### **Population One: CBNRM Experts**

Our first study population was composed of experts across the three main organizational arms of CBNRM implementation in Namibia. These components are the businesses and enterprises which generate income from natural resources, governmental agencies and committees that manage environment and land use policies, and organizations that help manage resources derived from conservancies. These categories include both governmental organizations, as well as private entities and NGOs. Our finalized review committee was made up of six members from these three pillars, with ranging specialities. Table 1 compiles a list of the names, organizations, and positions of this committee. These experts represent the groups

that are the backbone of implementing CBNRM in Namibia; this selected population provided insight into the logistics, importance, and direction of such practices.

*Table 1: Expert Interviewees*

<b>Name</b>	<b>Organization</b>	<b>Position</b>
Expert 1	EduVentures	Project Manager
Expert 2	IRDNC Kunene	Trainee Project Coordinator
Expert 3	MEFT	Forester
Expert 4	NACSO	Director
Expert 5	NACSO	Project Manager
Expert 6	NNF	Project Coordinator

### **Population Two: Conservancy Members**

Our second study population consisted of community members from two Namibian CBOs, the Ozonahi Conservancy and the Otjituuo Conservancy and Community Forest. The Ozonahi Conservancy is roughly 290 kilometers outside of Windhoek. The office in which we conducted the interviews was not directly in the middle of conservancy operations, for it was located in the town Okakarara at the conservancy’s office. Our interviewees from the Ozonahi Conservancy consisted of five conservancy members ranging in occupation and gender. Table 2 compiles a list of the Ozonahi conservancy interviewees, their names, occupations, and gender.

The following positions described are those of the conservancy members we interviewed. The chairperson is a conservancy member that is elected to handle the general

operations and orchestrate the conservancy’s meetings. Alongwith the chairperson, a series of conservancy members are also elected to form committees to support the chairperson in the governance of the conservancy. Continuing, the traditional authority is a group focused on preserving Namibia’s long-practiced customs and indigenous ways.

Though the turnout from Ozonahi was not as large as anticipated, we were able to have in depth conversations with everyone that arrived. We hoped the turnout would have been greater; however, we did not want to impose on conservancy operations and take too much time out of their schedules.

*Table 2: Ozonahi Conservancy Interviewees*

<b>Name</b>	<b>Occupation</b>	<b>Gender</b>
Member 1	Chairperson	Male
Member 2	Unknown	Male
Member 3	Office Administration	Female
Member 4	Traditional Authority	Male
Member 5	Unknown	Female

On the other hand, the Otjituuo Conservancy and Community Forest is approximately 460 kilometers outside of Windhoek. The maximum number of interviewees from Otjituuo was twelve. The occupations of these members ranged greatly compared to those from Ozonahi. Table 3 makes up the interviewees from the Otjituuo their occupations and gender. Our pool of conservancy members from Otjituuo consisted more of farmers and regular members.

Additionally, our interviews took place in the conservancy which provided us with ideal circumstances for our observation portion of the study.

We wanted to understand the community sentiment towards conservation and CBNRM management in Ozonahi and Otjituuo. For this reason, our interactions with the conservancy members are necessary for fine tuning our educational exhibition.

*Table 3: Otjituuo Conservancy & Community Forest Interviewees*

<b>Name</b>	<b>Occupation</b>	<b>Gender</b>
Member 6	O.O.C.F Chairperson	Male
Member 7	Farmer	Male
Member 8	Farmer	Male
Member 9	Farmer	Male
Member 10	Farmer	Male
Member 11	Farmer	Female
Member 12	O.O.C.F Ovaherero Traditional Authority	Male
Member 13	O.O.C.F Manager	Female
Member 14	O.O.C.F Additional member	Male
Member 15	Farmer	Female
Member 16	Student & Marine	Male
Member 17	Farmer	Male

## Recruitment Procedure

### Engaging with Experts

Upon our arrival to Namibia, EduVentures worked to assemble a review committee made up of CBNRM experts for our project. With primary communication coming from our sponsor Corris Kaapehi and environmental educator Maria Johannes, they reached out to several organizations via email and calls to organize a working group for us. When compiling the group of experts, several criteria had to be met including: working for an organization rooted in CBNRM, availability from March to May, a depth of expertise on CBNRM from a business and management perspective, and a desire to participate in promoting CBNRM.

### **Conversing with Conservancy Members**

Similar to our recruitment procedure for the CBNRM experts, EduVentures contacted the chairperson from both Ozonahi and Otjituuu to establish a trip to each conservancy for our interviews. The trip consisted of three days traveling from Windhoek stopping at each respective spot. Ozonahi was first. There we met with chairperson John Uazakuani who facilitated the recruitment of conservancy members for the interviews. The conservancy was overwhelmed with work and daily operations, so few people were available to meet for the time needed to conduct in-depth interviews. Additionally, the office was located in Okakarara which was a town outside of central conservancy operations. As a result, we experienced additional limitations in recruitment due to traveling.

We found greater success with recruitment in Otjituuu. Upon arrival at the conservancy, chairperson Kapehauarue Kafjireri and secretary Elly Tjakaurua gathered members to participate in the interviews. The conservancy office was located directly in the heat of conservancy functions; as result, recruitment flourished. However, we again experienced limitations with time and transportation. Even the chairperson struggled with finding means of



transportation, for we had to pick him up on our way to the conservancy. On top of that, we ran into a language barrier while conducting the interviews which came with its own limitations. When recruiting people from the conservancies it was important that they met the following guidelines: over the age of 18, an active member of the conservancy, and availability during the allotted interview times.

## Measures Assessed

### Expert Individual Meetings

When interviewing the experts individually, we sought to gain an understanding of their involvement and experiences with CBNRM according to the organization and position. Table 4 captures the personalized questions pertaining to each expert. In addition to the customized questions, generalized questions were asked to each expert such as “What would you like to see in our panels?” and “What is your experience with CBNRM?”. The individualized questions enabled us to gather information regarding their expertise and then implement it into the appropriate panel. On the other hand, the generalized questions provided us with a direction to pivot the interview in. Moreover, the consistency of these questions gave us a chance to compare insight from everyone concerning general CBNRM sentiments.

*Table 4: CBNRM Experts Personalized Interview Questions*

Name	Questions
Expert 1	<ul style="list-style-type: none"> <li>• How do you find the balance between rural empowerment and conservation/sustainability goals?</li> <li>• How should we present CBNRM information within the panels?</li> <li>• How does your role within EduVentures relate to CBNRM?</li> </ul>

	<ul style="list-style-type: none"> <li>• What are the benefits and challenges when creating an educational exhibition like this?</li> </ul>
Expert 2	<ul style="list-style-type: none"> <li>• How long have you been with the IRDNC? How long have you been helping EduVentures?</li> <li>• As a project manager, what kind of projects are you working alongside?</li> <li>• What is your experience in CBNRM and how do you specifically contribute to the concept?</li> <li>• How do community forests and fishery reserves fit into CBNRM?</li> </ul>
Expert 3	<ul style="list-style-type: none"> <li>• How does your work uniquely contribute to CBNRM and its initiatives?</li> <li>• What drives you to commit to this field of work?</li> <li>• What role do community forests play in terms of CBNRM and its initiatives?</li> <li>• What is crucial for rural conservancies to know about climate change and how it can impact their lives?</li> <li>• What challenges stop conservancies from benefiting from natural resources such as forests?</li> </ul>
Expert 4	<ul style="list-style-type: none"> <li>• What role does NACSO play in CBNRM, and what should conservancy/community forest members know about the organization?</li> <li>• Can you discuss the role of NACSO in governing CBNRM NGOs and organizations?</li> <li>• How does NACSO envision CBNRM shaping the future of Namibia/Africa?</li> <li>• How does tourism play a role in conservancies, and how should conservancy members view the concept?</li> <li>• How is human-wildlife conflict impacting conservancies? How does this phenomenon tie into conservation?</li> </ul>
Expert 5	<ul style="list-style-type: none"> <li>• How has your experience at NACSO been?</li> <li>• What challenges is NACSO facing with implementing CBNRM?</li> <li>• How does NACSO work with the ministry to make sure conservancies are following compliance requirements?</li> <li>• What are some of the community benefits NACSO offers to conservancies?</li> </ul>
Expert 6	<ul style="list-style-type: none"> <li>• How is human-wildlife conflict shaping the implementation of CBNRM?</li> <li>• What are we learning about effective human-wildlife relationships in conservancies?</li> <li>• What should conservancy members know about human-wildlife conflict?</li> <li>• What are the necessary steps to ensure a conservancy will be self-sustaining?</li> <li>• How do community forests and fishery reserves fit into CBNRM?</li> </ul>

**Expert Group Meetings**

In these meetings, we shared outlines, images, and text we had prepared for the panels. Over the course of each meeting, we guided the review committee through our materials panel by panel. Then the members gave useful critiques oriented around their specialities, along with additional information we should include. Furthermore, they commented on our panel text to ensure the word choice is optimal for understanding. Through our fieldwork, we discovered the importance of addressing the language barrier in our panels. That being said, the review committee’s insight on verbiage was essential in creating the panels.

### **Conservancy Member Focus Groups**

The focus group was semi-structured with a list of questions prepared to gauge the conservancy members’ knowledge and lack thereof on CBNRM. Our questions sought to address conservancy sentiment around the topic and pertain to gaps in our existing knowledge on CBNRM. Though the focus group was led by us, we allowed the answers to our questions to guide the direction of the conversation. In order to capture the dialogue of the focus group, we used the app Otter to record each group to ensure the data we perceive was accurate. Table 5 captures the list of questions we asked and the insight we hoped to learn. The nuances and perspectives we gained through the focus groups enabled us to cater our project to their specific needs.

*Table 5: Conservancy Focus Group Questions*

Questions	What We Want to Learn
How does your conservancy implement CBNRM?	The current knowledge/literacy of CBNRM among conservancy members
How has CBNRM helped the community as a whole? Individually?	Sentiments with respect to community benefits

How has your conservancy handled human wildlife conflict?	Personal experiences regarding human wildlife conflict
How are you looking to diversify the conservancy income?	Looking for specific industry logistics other than tourism

## Data Collection

### Secondary Data Review

Beginning in the United States and continuing in Namibia, we engaged in secondary data review of sources we compiled and were given by EduVentures. The data included sources specific to Namibia and Southern Africa as a whole. We reviewed a total of 88 sources; these included presentations, reports, and literature.

### CBNRM Expert Interviews

The expert interviews consisted of both individual and group meetings. The individual meetings were tailored to each person and their expertise, which lasted roughly an hour long. We had two group members be present at each individual meeting. The meetings were recorded through audio if they were in person or recorded on Zoom if they were digital.

The group meetings we held were specific to attaining feedback regarding the content for our panels. Over the course of two months we met with the review committee three times. The meetings were as short as an hour and were as long as three. Every group member was present for the group meetings and the addition of our sponsor.

### Focus Groups

Accordingly, we conducted in-person focus groups of conservancy members to estimate rural knowledge and interest across the nation. The process occurred in a singular three day trip with EduVentures to the Ozonahi Conservancy and the Otjituuo Conservancy and Community Forest. Between the two conservancies, we held two groups at each site for a total of four focus groups. Each focus group lasted for approximately forty five minutes; the longest lasting an hour. We planned to conduct one on one interviews with the conservancy members; however, due to an unexpected language barrier and a time constraint for the interviews we pivoted to focus groups.

### **Conservancy Observation**

During our research trip, in addition to conservancy member focus groups, we also conducted observations. Guided by EduVentures, we hoped to learn what a typical day looks like in the eyes of a conservancy member. The ability to put ourselves in the conservancy members' shoes proved to be a great help in deciphering what information would be beneficial for them regarding CBNRM. The goal of direct observation is to evaluate an ongoing behavior process, especially when no physical or numerical answers can be obtained (Holmes, 2013). By simply observing the population and taking note of meeting places, daily operations, and attitudes, we collected pictures to commemorate our time spent there. All pictures were taken on personal cameras and captured conservancy life.

## **Data Analysis**

### **Secondary Data Analysis**

After collecting data and information regarding CBNRM that is beneficial to rural Namibian communities, we organized the information into an eight panel display. Our team refined and selected the data that would be included in the panels and pamphlet. The process entailed combing through the provided reports and data, in order to extract the important highlights and presentable information. This process was especially important because the majority of the information our panels present are in the form of graphics and images. Working alongside EduVentures' in-house graphic designer, Hangula Werner, we produced a visually engaging display that targets key topics of CBNRM including: What is CBNRM?, Why CBNRM?, Legal Framework of CBNRM, Impact of CBNRM on the Environment, CBNRM Alongside Wildlife, Socio-Economic Benefits, Challenges Facing CBNRM, and Success Stories.

When designing the series of panels, we used an iterative design methodology in order to maximize efficiency and production. Iterative design is an approach that emphasizes a continuous cycle of making adjustments and tweaks to the project rather than a one-and-done approach; therefore, it allows for additional feedback and an interactive workspace (Engness, 2021). Iterative design enabled us to effortlessly incorporate the review committee into our design process allowing for an open channel of feedback. The consistent communication allowed us to optimize the material included in the educational exhibition tailoring it to meet the needs of the target audience.

Additionally, we worked with Hangula to ensure the panels included both computer-based design and hand-drawn elements. The balance of digital and hand-drawn components allowed us to have creative experimentation in the development of our product. Looking at previous educational exhibitions Hangula and EduVentures produced helped clarify

the aesthetic the panels sought. In order to ensure visual appeal, we took into account color schemes and visuals that support the message we are conveying about CBNRM. The panels must be able to teach our target audience through visual rather than text components as a major portion of the learners struggle with literacy. Literacy and language barriers were important to consider in our development of the panels, for we want people to get the most out of our exhibition on CBNRM.

On the flipside, in order to account for people of higher literacy levels we supplemented the panels with a booklet. The booklet includes a more in depth explanation of the key topics on CBNRM using more words and less visuals to express greater detail. Through the same iterative design methodology we created the booklet which focused on the individuals with greater literacy skills. The booklet is essential in delivering the information to people who are in a place to act on it and pursue the CBNRM policies.

The primary metric we used to gauge the quality of our content and panel design was through the feedback from the review committee of CBNRM experts. Our work with the review committee was a repetitive process. While we developed content, outlines, and drafts for the panels, we simultaneously presented our deliverables to the committee to receive feedback and revise accordingly. Additionally, the review committee deemed some information unimportant in the context of our educational exhibition. On the other hand, the conservancy members presented us with personal stories regarding challenges and successes with CBNRM allowing us to choose material relevant for their circumstances. Using insight from the CBNRM experts and the conservancy members provided us with another layer to ensure the material we were gathering would be beneficial to rural Namibians.

## **Expert Analysis**

Upon completion of the expert interviews, we reviewed and implemented the suggestions they provided. Specifically, their suggestions revolved around the information included in the panels. Using the iterative design methodology, we adjusted our panel outlines accordingly with their recommendations.

## **Conservancy Analysis**

After completing the conservancy member focus groups, we analyzed the recordings we collected. The four focus groups corresponded to four audio recordings and four written transcripts. We interpreted the audio samples to ensure the transcript was transferred over properly. Afterwards we evaluated the context we had gained from the focus groups. This came in the form of quotes from the conservancy members and general group sentiments on CBNRM related topics. From the testimonies we heard, we focused on commonalities within the group and within the two separate conservancies. The observed trends were used to cross-examine the information selected by our team and the review committee.

After compiling the data from our secondary data analysis, the CBNRM expert interviews, and the conservancy member focus groups, we assembled them into a code book. The code book includes primary codes, secondary codes, a definition of code, and the frequency of occurrence. Our code book is a framework for the qualitative data we have collected through our methods. When organizing our codes, we used both deductive and inductive coding. Before beginning our expert interviews and conservancy member focus groups, we had a general idea of themes associated with CBNRM. These themes were broad



such as the history, challenges, and successes of CBNRM. In order to create a more comprehensive codebook, we elaborated on our initial themes to include ones that emerged during our data collection. The code book separates the information into the following primary codes: CBNRM History, Legal Frameworks, CBNRM Challenges, CBNRM Successes, CBNRM Communities, Organizations, and Possible Improvements. The primary codes of our codebook embody the themes we came across during our research and are not limited to our panels' titles. Categorizing our data into these codes allowed us to complete our thematic analysis. Our thematic analysis is further examined in the discussion portion of this report. Additionally, the code book can be found in our appendix.

## Ethics

Our project addresses an important policy that impacts a wide range of stakeholders, as a result it is important to acknowledge the ethical considerations our research has. The ethics will dive into the various formalities we derived and the lasting impact our project will have.

In order to conduct both the CBNRM expert interviews and the conservancy member focus groups we had to obtain IRB approval from WPI. We received ethical approval from the IRB which included our informed consent form for the interviews and focus groups along with a flyer for our conservancy observation. With the interviews and focus groups asking questions that were respectful and knowledgeable was paramount in gathering accurate and useful data. As fully stated in our informed consent form, there was little to no risk to participants in our study. Additionally, it is important to acknowledge participants had the option of remaining anonymous in our data collection and analysis. Confidentiality is crucial in our research, so the

informed consent forms, photos from direct observation, and the audio recordings of participants are kept at the hands of our team and no one else.

Finally, the impact of our project goes as far as directly affecting how rural Namibians perceive CBNRM and live according to CBNRM policies. In order to accurately convey the material, it is important to address the various biases and positionalities of everyone involved in the panel creation process. Primarily, we made a specific effort to circumvent our own biases and potentially eurocentric worldviews, by continuously having our panel/ panel content reviewed by the Namibian expert review committee. Similarly, we orchestrated two visits to CBNRM communities in order to validate our information. This process was employed to not only cover any gaps in our biases/ knowledge, but also those of the Eduventures staff, and expert review committee.

# Results

## Panels

The following 8 panels are the complete primary deliverables, which will be presented in rural communities across Namibia. Each panel serves a distinct purpose in describing the structure, impact, and successful implementation of CBNRM (see Appendix 4 for complete panels).

### Panel 1: What is CBNRM?

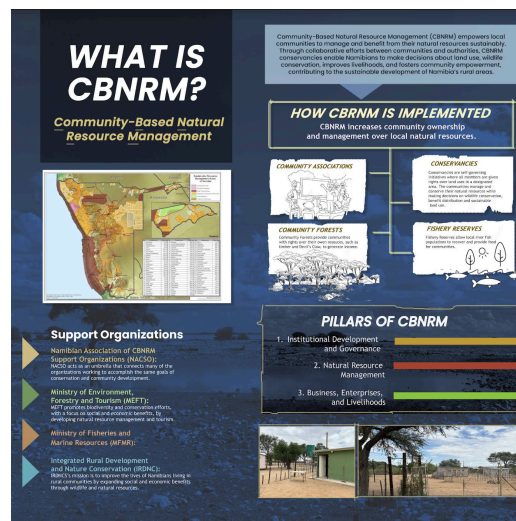


Figure 8: The above image depicts our final product for Panel 1.

**Purpose of the Panel:** The primary purpose of this panel is to describe the broad goals, and functions of CBNRM in practice. Specifically, information was chosen to represent the aspects of CBNRM relevant to rural community members. This includes the various broad benefits which CBNRM aims to provide these communities, such as financial reparations for lost livestock, increased land use control, and benefits from natural resources. Similarly the panel addresses

the conservation aspect of CBNRM, and its goals of protecting native flora and fauna from unsustainable practices. The panel aims to portray these community benefits and CBO goals as two sides of the same coin, emphasizing how correctly implemented conservation can protect natural resources and livelihoods for generations to come. This slide serves as an overall introduction into what the complete presentation will be discussing, aiming to give readers a basic introduction into the ecosystem of CBNRM.

**Data Informing Panel Content:** During initial discussions with EduVentures and expert committee members, it was made clear that economic development and empowerment in rural areas is the primary goal for CBNRM. Although it absolutely represents a conservation effort in Namibia, protecting and monitoring specific flora and fauna, this seems to take a back seat in the scope of CBO benefit. One EduVentures review committee member suggested that of course humans should reach ecological balance with wildlife, but there should not be such an emphasis placed on conservation, except when rural communities are benefiting from those species. Especially, an executive from NACSO stated, when many of these wild species can be extremely harmful and dangerous towards rural communities. Framing this balance between community empowerment and environmental preservation is especially important, when discussing CBNRM with rural communities. Accordingly, panel one describes the primary goal of CBNRM as a step towards developing the economies of rural villages through the implementation of sustainable practices. Additionally, we listed numerous other broad benefits for CBOs, brought about by CBNRM. For example, community control over land practices has always been one of the largest benefits for CBOs. As stated in the 2009 CBNRM in Africa report, “Local rights, authority and tenure over land and resources are central to CBNRM” (Roe D.,

Nelson, F., Sandbrook, C. 2009). We found this importance to be true for both CBOs we visited, where both executive committees mentioned the importance of their increased control over land use, and resource management. For example, Ozonahi community members spoke on how the amount of control they have over managing plants and animals, directly impacted their livelihoods. One member of the traditional authority suggested that because they weren't allowed to chop down some specific bushes, grazing was now more difficult.

From here, the panels delve into each variety of CBO, including conservancies, community forests, fisheries, and community associations. As these organizations are the primary forms of CBNRM implementation, the review committee decided it is crucial to broadly outline each of these CBOs in practice. Specifically, information on the origin, income sources, land use, and general operational practice were included.

The panel additionally describes the basic organizational framework of CBNRM, by outlining the largest relevant NGOs and government agencies. Specifically it focuses on the organizations relevant to the formation and operation of the CBNRM community. Additionally, the review committee member from MEFT emphasized that we should discuss how each organization individually provides community members with increased access to natural resources. Based on this feedback, we included how each CBO adapts land management for community members, through increased access and autonomy.

Lastly, the panels discuss the three broad pillars of CBNRM. These pillars are institutional development and governance, natural resource management, and businesses, enterprises, and livelihoods. These are widely referenced across CBNRM literature, but are primarily sourced from the NASCO strategic plan 2023-2026. We decided to include this content due to its concise

overview of how CBNRM operating organizations perceive the progression, and aim of CBNRM. We included this content from the initial content draft for the panels, but it was further agreed upon by expert committee member six, who stated that it was important to include these organizational focuses in the beginning of the presentation.

**Design Decisions:** In order to convey the message of “What is CBNRM?,” we designed a panel that optimizes information flow with pictures as opposed to words. Working with Hangula, we first started with the background. Throughout our time in Namibia, we took images of differing landscapes to use as background images for our panels. The background chosen for this panel is a watering hole in Etosha with an assortment of blues, greens, and grays; we then chose a blue monotone to apply over the image. The added blue layer dulls down the background image to ensure the text and graphics placed on top are easily seen. Furthermore, the various colors, red, yellow, and green, used throughout the panel are hand picked from the map to add symmetry to the design. Continuing, we used a mix of images and graphic drawings throughout the panel to illustrate key informational components. The graphic drawings seen throughout the panel utilize just black and white to add a hand drawn ambiance to the panel. Additionally, the review committee member from NACSO requested that we include the organizational logos and name, with minimal information on what each organization does. These were included in order to familiarize readers to the organizations they might encounter and benefit from, without including unneeded information.

## Panel 2: Why CBNRM?

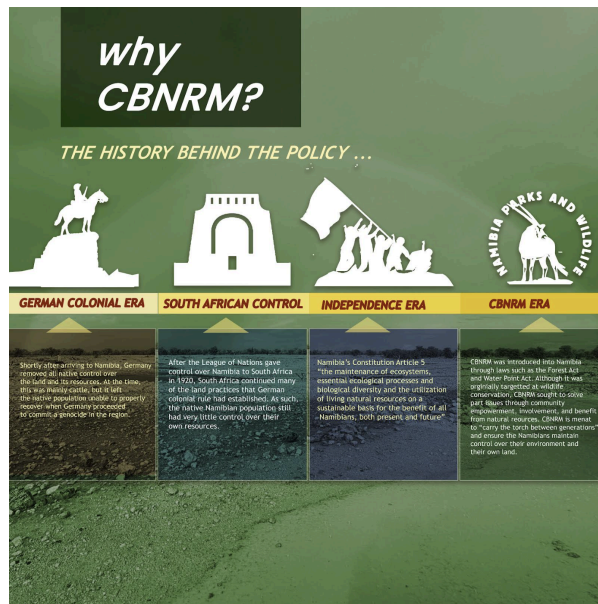


Figure 9: The above image depicts our final product for Panel 2.

**Purpose of the Panel:** The purpose of this panel is to simultaneously provide a brief history of land management techniques in Namibia, and illustrate the contemporary need for CBNRM. To set the scene, a history of indigenous land management practices being overturned by European colonizers is included starting on the left of the timeline. This serves to depict how community land management is not a modern concept, but rather one which was forcibly removed through the colonial increase of national, and private ownership. Similarly, the panel includes information about the origins of the CBNRM movement in the late 20th century, and increasing the autonomy of rural communities. Lastly, it demonstrates how many of the modern issues associated with land use and natural resource exploitation require management techniques such as CBNRM.

**Data Informing Panel Content:** In order to convey the contemporary need for CBNRM, it is necessary to understand the history of land management in Namibia. This history, of course, is extremely rich and complicated, though not very well understood due to the absence and destruction of most regional oral history. However, we decided rural Namibians would already understand traditional land governing practices, and thus to omit all but the most recent pre-independence history impacting land use/ management in Namibia. As a result, the presented history starts with German colonization in the late 19th century, initializing the destruction of traditional land management. This, according to the expert review committee member from EduVentures, would set a key stage for understanding CBNRM, and help explain why community organization is needed to restore the damages of colonial land practices. A large part of this, of course, was the mass genocide committed against the Herero and Nama tribes, and outright theft of land. Although we figured there was no reason to go into detail into these horrific events, they are mentioned in the panels as a huge factor of change. From here, the panel explains how despite the change in colonial control to South Africa, little changed in practice for rural populations. As explained by Austin Hutchinson in his thesis on Apartheid in southern Africa, Namibians at this time had little to no ability to buy/ access their native land, through the institution of private property (Hutchinson, 2021). These content decisions were agreed upon by the expert review committee, who's only suggestion was that we refer to these time periods as 'pre-independence' as opposed to 'German/ South African colonial era'. Although not seen in this draft, this adaptation will be included in the final presentation. This then leads into the independence and CBNRM eras, which are the final historical content in the panels. These discuss the policy origins of CBNRM in Namibia, and how the operational



concepts arose. The progression of these slides is designed to depict how autonomy over land management was destroyed, and now needs to be repaired.

**Design Decisions:** In order to express the why behind CBNRM, we created a panel that touches upon the important historical events that contributed to the policy. The background chosen for this panel was taken in Etosha of a barren field showing a rainbow in the sky after a storm; the image contains a variety of colors including grays, browns, and the colors of the rainbow. On top of the background, we chose a green monotone to simplify the background image. To illustrate the historical significance we displayed the information in the form of a timeline. The timeline contains four Namibian eras. Accompanying each era is a text box explaining the importance, with an image used to emphasize the change that era had on CBNRM. For the German Colonial Era we chose the silhouette of a proud colonial soldier, emphasizing the lack of control Namibians had over their own livelihoods. For the apartheid era under South African rule, we chose an official-looking government building, to illustrate the institutions which oppressed, and controlled the Namibian people. Next, the Independence Era is represented by a group of Namibians raising the country's flag in celebration of their new independence; a true symbol of independence. Lastly, to symbolize the CBNRM era, we chose the Namibian National park logo. This image represents the successful and continued Namibian self governance over land and natural resources, in the modern day.

## Panel 3: Legal Frameworks: Creating a Thriving CBNRM Community.

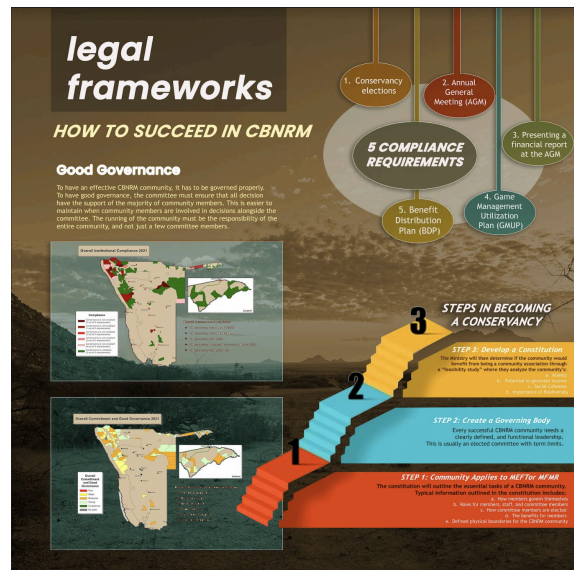


Figure 10: The above image depicts our final product for Panel 3.

**Purpose of the Panel:** The purpose of this panel is to illustrate the basic necessary steps to assemble, and operate a CBNRM community. Most noticeably, the panel assembles the three primary steps to initiating a CBNRM community, such as the primary application and review process. Although the explanation for these steps omit many details, the diagram only aims to capture the core steps. Additionally, this slide outlines some of the essential tenants for running an existing CBNRM community effectively.

**Data Informing Panel Content:** In order to effectively introduce the legal framework of CBNRM, we began by introducing the initial associated policies/ acts. While we initially had some of this content in panel two, the review committee decided that there should be some extra legislation content. Specifically, review committee member six from NNF recommended the The 1996 Nature Conservation Amendment Act, the 2001 Forest Act, and the 2003 Inland Fisheries

Resources Act. All three of these set the foundation for conservancies, fisheries, and community forests alike.

One of the most important goals of this panel was to give communities a general idea of how to establish a CBO. Although the steps included don't cover the complete creation process, this aims to help interested parties start thinking about the application stage, and general CBO requirements. This section begins by explaining how conservancies are created, via an initial screening/ application process. Next, the panel describes some of the more broad components of creating a successful constitution, and governing body. Concepts such as a well designed benefit distribution plan, and committee elections are especially important, due to the universality of a well functioning executive council. As explained in the 2008 report *CBNRM in Africa*, the level of CBO autonomy in orchestrating land management techniques and resource distribution, dictates the level of success that CBO will experience (Roe D., Nelson, F., Sandbrook, C. 2009). Accordingly, we made sure to emphasize how a well designed constitution and system of governance from the get go has clear implications over the lifetime of a conservancy.

In the following section, much of the same informational content, specific to fisheries, is included. In our early drafts, much of our original content for this panel focused specifically on the development and creation of conservancies. Additionally, much of the final content in the beginning of this panel, is primarily specific to conservancies. However, large adaptations were made to this panel by the review committee, in order to include legal information on fisheries, and community forests. As a result, the panel now includes lengthy details on the creation process for both of these CBO categories. Specifically, expert three from MEFT, and an

additional unofficial reviewer from MFMR added lengthy content to this panel, outlining steps to establishing a new fishery.

**Design Decisions:** To effectively communicate the legal frameworks of CBNRM we designed a panel that simplifies the seemingly overwhelming topic of governance and program policies.

The background image we chose was taken at Spitzkoppe during sunset; it contains various rock formations. The coloration of the picture is made up of a series of browns, oranges, and blues.

Following the color scheme of the photo, we chose a brown monotone to mute the background.

To adequately convey the steps in establishing a CBO, we produced a staircase graphic.

Additionally, to capture the five compliances of a conservancy we created a hanging graphic to add another dimension to the panel. The color scheme from Panel 1 was continued in this panel.

## Panel 4: CBNRM and the Environment

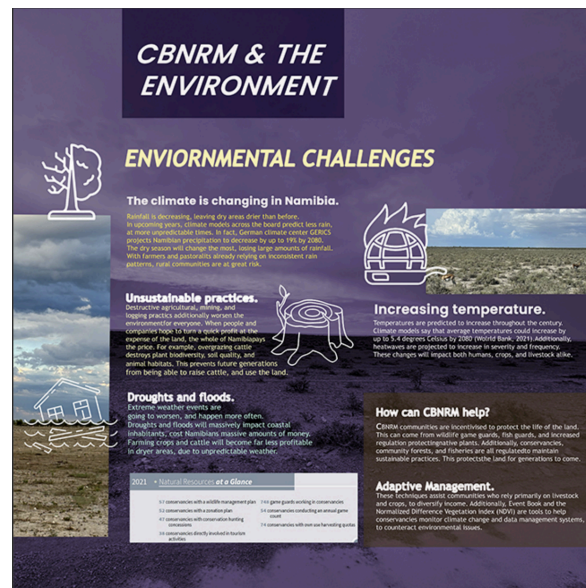


Figure 11: The above image depicts our final product for Panel 4.

**Purpose of the Panel:** The purpose of this panel is to provide an overview of the threats posed on rural Namibians from the climate crisis, as well as some environmental management techniques associated with CBNRM. By outlining specific environmental challenges facing rural communities, and then providing sustainable practices proposed by CBNRM, we hope to illustrate how CBOs can help communities protect their natural resources.

**Data Informing Panel Content:** Much of the initial information such as climate projections and environmental threats are targeted at audiences with lower climate literacy, and for this reason are kept straight forward, without any complicated scientific lingo. Multiple CBNRM experts and EduVentures staff emphasized that reading and scientific comprehension varies widely in rural areas, and to stick to the core takeaways. For this reason, a content emphasis is placed on explaining the practical implications of each climate phenomenon, rather than the specific science behind it. Additionally, this decision helps avoid challenging religious norms. During our conservancy interviews, a member suggested that many community members were aware of climate change, but attributed it to religious causes. Accordingly, we decided to prioritize the practical implications of the climate crisis, and avoid potentially controversial issues such as the actual root of the issue. For example, concepts such as increased irregularity in precipitation may have complicated causes, which might contradict some traditional/ religious interpretations. However, simply explaining the implications of less rainfall is likely far less controversial, while capturing the critical information.

Additionally the panel presents some of the aspects of CBNRM which target environmental concerns. This aims to identify how integrated concepts such as conservation and adaptive management can improve and elongate the longevity of ecosystems, for

community members' benefit in years to come. An emphasis is placed on the community benefit from these concepts, rather than conservation for the sake of conservation. This is because increased levels of flora and fauna is not an inherent benefit in many communities, and can be harmful to crops and livestock. One traditional authority from a conservancy referenced wild animals, stating "...because I'm not benefiting directly [from the animals], I don't know... why should I keep it? Because in the process they will hurt my smaller [live]stock, of which I have to earn some small money." This was a common theme across community members, that increased animal and plant presence due to environmental laws typically brought about some form of inconvenience. However, in the context of sustainable practice, many community members, especially the leaders, believed that sustainable practice and some forms of environmental protection were key to preserving the land for future generations. One community leader stated "It's better to conserve because it is not only for us... we conserve it for our young generation." This suggests that there is some diversity of opinion surrounding conservation within CBO's, although the outright support for conservation is likely limited. Accordingly, we made sure to emphasize the environmental benefits that CBNRM offers rural communities, such as the environmental training, concession fund, and long term economic benefit.

**Design Decisions:** In order to suitably convey the environmental aspect of CBNRM, we designed a panel that incorporated both environment issues and current solutions that are practiced. The background for this panel was taken in Etosha of a barren plain with sparse vegetation. The colors are an array of blues, greens, grays, and browns; we then chose a purple undertone to add a cool element to the panel. Throughout the panel are various illustrations that represent

the environmental challenges that are present in Namibia. The tree captures the repercussions the climate crisis has on the country's vegetation, where the stump symbolizes the unsustainable practices still present in areas. Continuing, the flaming globe in the pan personifies the threat of increasing global temperatures. Lastly, the drowning house represents the infrequent weather Namibia withstands, which includes floods. In addition to the graphics, a series of images of general Namibian landscapes are provided in the panel, along with a chart showing the breakdown of natural resources.

## Panel 5: CBNRM Alongside Wildlife

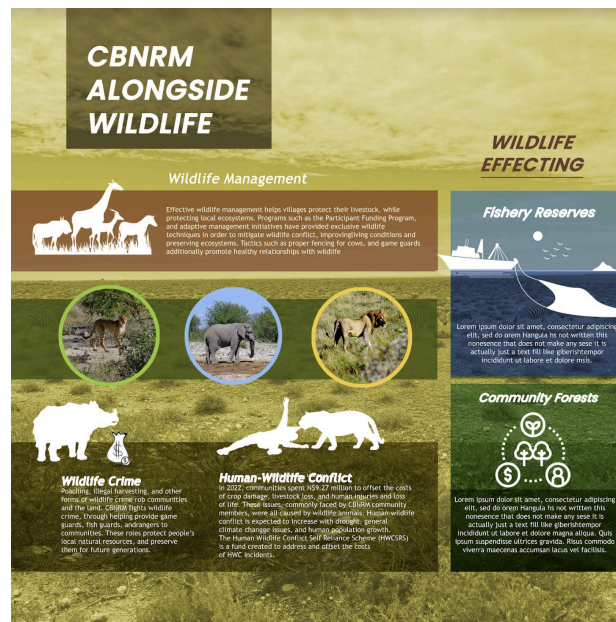


Figure 12: The above image depicts our final product for Panel 5.

**Purpose of the Panel:** The purpose of this panel is to illustrate how CBOs operate in relation to wildlife. This is primarily achieved by providing examples of how various management techniques associated with CBNRM can improve community relations with wildlife. This content

is based on the assumption that the reader already has a good understanding of the human animal conflict faced in their community.

**Data Informing Panel Content:** Human wildlife conflict is one of the largest issues facing rural communities across Namibia. As discussed by community members and leaders alike from both Otjituuo and Ozonahi, predators such as jackals, wild dogs, and leopards greatly impact pastoralists. When interviewing a cow farmer in Otjituuo, we requested information on what losses he typically experienced from jackals and wild dogs. He said nothing, solemnly shook his head, and his friend chirped in, half joking, “don't ask that, you'll make him upset.” The only compensation which that farmer received came via a CBNRM reparations program, which he stated provided him only 3000 N\$ per lost adult cow. Programs like this are widely applicable across HWC scenarios, and are the focus of this panel. Just as levels and variety of human wildlife conflict vary drastically across communities, effective management techniques subsequently follow suit. Accordingly, we had to present management solutions which were broad enough to remain relevant across all scenarios.

Additionally, we included information on how CBNRM helps protect communities against poaching, and other forms of wildlife crime. This has been a large issue in Namibia for some time due to the financial outlets associated with many wild species. CBO's, as explained by expert 4 from NACSO, greatly prevent poachers from stealing valuable species from rural communities. Accordingly, we made sure to emphasize how CBNRM can help protect against this theft. Some of these measures include game guards, rangers, and fish guards.



**Design Decisions:** To adequately portray the wildlife component of CBNRM, we created a panel that highlights both the accomplishments and obstacles facing Namibian fauna. The background image we selected for the panel was taken in Etosha of a green field that captures a herd of zebras walking. The image contains vibrant blues and greens along with the colors of the animals. The crisp skyline adds a sense of order to the panel. Additionally, we added a yellow monotone to the background to mute the image. In the panel are multiple graphics that represent the several different layers of CBNRM and wildlife. To illustrate wildlife management, the following animals, a wildebeest, giraffe, springbok, and zebra are captured walking in the grass. The graphic represents the game CBOs manage within their boundaries. Next, a rhino next to a bag of money symbolizes the lucrative sector of poaching that contributes to wildlife crime. Continuing, a human being attacked by a lion portrays the concept of human-wildlife conflict. Lastly, both fisheries and community forests for an accompanying graphic that represents their associations. In addition to graphics, three images are included in the panel. The images are of some of Namibia's wildlife, a cheetah, elephant, and a lion.

## Panel 6: Socio-Economic Benefits

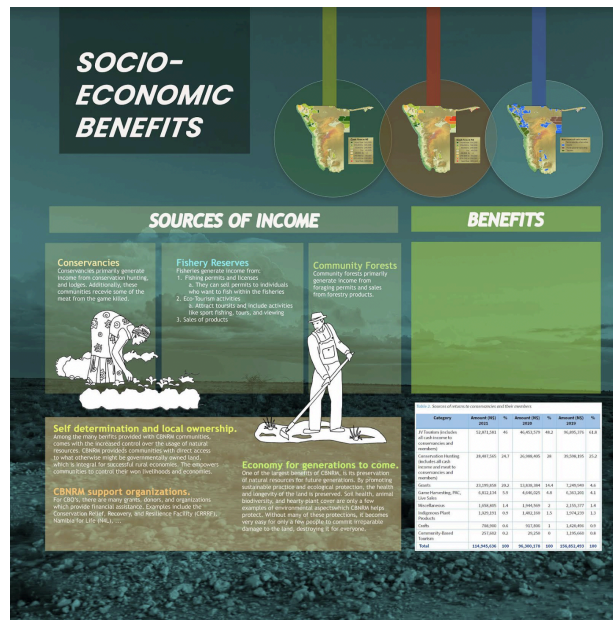


Figure 13: The above image depicts our final product for Panel 6.

**Purpose of the Panel:** The purpose of this panel is to present and explain the potential benefits CBO members receive from CBNRM. We attempted to showcase the impactful benefits CBNRM has to offer CBOs, hoping it will help the audience have a positive outlook on their formation. This helps with the main goal of the panels, assisting with the implementation of CBNRM in Namibia as more people believe CBOs are beneficial. Through many visuals and graphics, we wanted to make sure all audience members, including less literate people, were able to comprehend the content in the panel. We placed a large emphasis on the CBOs Benefit Distribution plan and the local ownership the community has over their resources, as those are two crucial issues implemented in CBNRM.

**Data Informing Panel Content:** When designing this section, the review committee in its entirety stressed that we must break down the benefits by each type of CBO. This was a key development to the panel content, as much of our original draft/ secondary data focused on conservancies. Specifically, the review committee member from MEFT provided in-depth examples of ways CBO members can benefit from community forests, and non-timber resources. Similarly, an additional reference from MFMR provided plenty of information on the benefits of fishery reserves to the members and the wildlife.

Additionally, the testimonies and data from our CBO interviews were incredibly important to this section. During our interviews with the executive committees, we discussed the benefits of CBNRM/ communal ownership over 11 times. This theme was therefore emphasized in the panel layout and the information that made up the panel. When describing the benefits of CBNRM for CBOs, one executive member stated “But now, with the income from selling coal or wood, you can cover your child's school fees and provide for their basic needs, including clothing and food.” Because of multiple quotes like these, we made sure to include plenty of information on CBO incomes, and what they are able to spend it on. Overall with information from the review committee, our data analysis, and new perspectives gained from the conservancy members, we were able to design a comprehensive panel that effectively communicated the Socioeconomic benefits that CBNRM has to offer to CBOs.

**Design Decisions:** In order to effectively depict the socio-economic benefits Namibians receive when participating in CBNRM we created this panel to easily explain the various forms of pros. The background image we chose for the panel is also from Etosha; it highlights the warm tones of sunset with particular focus on the sky. The colors found in the image are an assortment of

purples, oranges, pinks, and blues; a teal layer was also added to the image to quiet down the background. Two graphics of farmers are depicted representing the majority of community member occupations. Additionally, a series of maps conveying the cash flow of the regions are displayed hanging from the top of the panel. Continuing, various shades of green are used throughout the panel for text boxes. The use of green symbolizes the benefits received from the generation of revenue.

## Panel 7: Challenges Facing CBNRM



Figure 14: The above image depicts our final product for Panel 7.

**Purpose of the Panel:** In this panel, we wanted to highlight issues that are preventing CBNRM from being implemented and helping CBOs to their full potential. We did not want to focus on what is wrong with CBNRM or what CBOs have been doing wrong, but rather on how both entities are very resilient when it comes to facing adversity. Many challenges listed are from outside factors such as COVID or troubles with income diversity, and are emphasized through

many graphics. Overall, we wanted the audience to understand that although CBNRM has been very successful in Namibia, there are still challenges facing it which people are working hard to overcome.

**Data Informing Panel Content:** Through our secondary data analysis we came across many factors that are negatively affecting CBNRM. Working with the review committee, we sorted them all into several categories to make them more presentable for the panels. Although the experts who make up the review committee provided great information, they had a very different perspective than the conservancy members we interviewed. In the interviews we heard real examples of challenges CBNRM faces to being successfully integrated which was much more beneficial for us to include in the panels. The conservancy members were struggling a lot with HWC and lack of funding. HWC was our most frequently mentioned theme throughout all of our research, while lack of funding itself has multiple themes within it. A member of the Ozonahi executive committee stated that “The biggest challenge is the lack of funds” which can relate to both government assistance and income diversity, and includes the conservancy’s ability to have effective transportation and communication. Using information from the community members and the review committee we have outlined several of the main challenges in CBNRM with their descriptions, while also communicating them through visuals and graphics so audience members regardless of literacy level would understand the factors stopping CBNRM from achieving its full potential.

**Design Decisions:** To effectively capture the challenges facing CBNRM we developed this panel which showcases the specific areas that Namibia is wrestling with. The background for this panel was taken in Etosha of a watering hole with multiple elephants drinking from it; the image

contains a range of blues, greens, browns, and grays. The background itself embodies a CBNRM challenge, for elephants are a main source of human-wildlife conflict events in Namibia. The background image has a gray film over it to soften the background. The centerpiece of the panel is a globe drawing that symbolizes the global impact CBNRM challenges have. In addition to the Earth, a series of graphics that represent each challenge. This includes: a globe with a person to represent “Global Events,” money distribution graph to show “Income Diversity,” the Earth in the palm of a hand to illustrate “Self-Sustainability,” a hand and paw to symbolize “Human-Wildlife Conflict,” a handshake in front of a government building to represent “Governance,” a sale sign, plot of land, and house to show “Land Tenure,” and lastly a rifle to illustrate “Conservation Hunting.”

## Panel 8: CBNRM Success Stories



Figure 15: The above image depicts our final product for Panel 8.

**Purpose of the Panel:** The purpose of this panel is to provide various success stories among CBNRM varying from personal testimonies and programs that are thriving within the policy. A subsection of the panel includes quotes from conservancy members to stir a positive sentiment about CBNRM and the impacts it has had on their lives. Additionally, the panel highlights the success that programs like game guards and rangers have had in monitoring and rehabilitating species populations of Namibia. The panel's main goal is to generate excitement for participating in CBNRM and to convey the worthwhile possibilities that could emerge when conservation and community engagement are a priority.

**Data Informing Panel Content:** For this panel, we believed the most efficient way to communicate success stories to the audience was to have the main source of information be direct quotes from conservancy members regarding how CBNRM has made a positive impact on their lives. With the transcripts and audio recordings of each conservancy interview, we were able to find specific quotes from all different types of members to use in the panel. The quotes chosen are ones that mention any of the themes from our primary code, CBNRM successes.

The first success story comes from the executive council of Ozonahi. Initially, much of our conversation involved discussing the multiple shortcomings of CBNRM in the community. Specifically, he mentioned that Ozonahi did not receive much attention from CBNRM organizations, since their conservancy didn't host enough exciting wildlife to warrant much tourism. He additionally noted issues related to the accessibility of grants, and the difficulties posed by conservation laws. Eventually, we asked the council member if there were, in reality, any successes in their community from CBNRM. To this he stated that there were in fact multiple benefits to his community from the implementation of a conservancy. Although not

mentioned in the panel quote specifically, he discussed the benefits from funding, increased control, and sustainable practices. We believed this narrative to be very important, that CBOs strengthen communities, despite the apparent lack of direct support from the government.

Similarly, quote three emphasizes the community empowerment created by CBNRM, even in desperate situations. Also from Ozonahi, this community member described how difficult life can be, from finding food, to sending your child to school. He goes as far as to state “we were truly suffering.” However, he states that the implementation of CBNRM has provided new opportunities, and ways to make ends meet. Although the quote doesn’t promise a huge change in living conditions, it displays how CBOs can help make a difference for average community members. We found this concept to be important, and representative of the collective experiences we discovered across our research.

The second quote included is from one of the Ozonahi conservancy members who previously served as a member of the executive board. Due to how CBNRM places a large emphasis on increasing biodiversity, nature in the Ozonahi region seems to be becoming more diverse and people like this member are appreciating that. They also go on to explain how once you become educated, you understand how truly important all nature is and how you can use it to your benefit. Despite the lack of available education in these conservancies, many workshops are offered by organizations like NACSO and NNF which aim to educate CBO members and assist them with becoming more successful. As the wildlife in a CBO is a crucial part of their income and success, a member acknowledging and being appreciative of this shows the good attitude they have towards CBNRM, documenting its success.



**Design Decisions:** In order to sufficiently display the success stories we designed a panel rooted in personal experiences and testimonies from rural Namibians. The background image was also taken in Etosha of a rhino camouflaged in the brush; the coloration includes shades of green, brown, and gray as well as a navy blue film across the image. The panel background itself is a success story of CBNRM, for the rehabilitation of rhino populations in Namibia was largely from CBNRM efforts. To effectively convey the success stories a vertical timeline is the highlight of the panel. In the timeline are a series of quotes and images that tell the story of CBNRM's success. Additionally, to add another dimension to the panel a drawing of an African landscape with diverse wildlife present. With the use of visuals we created ourselves and ones on the internet, we collaborated with EduVentures' in-house designer to ensure that regardless of literacy level, the audience would be able to understand how CBNRM has been able to successfully be implemented in CBO member's lives and leave a positive impact.

## Booklet

As well as the panels, our team generated a booklet that expands upon the information seen in the presentation itself. It was designed to be provided to the audience while the panels are being presented, offering more information to interested parties, while requiring a greater literacy. The booklet enhances the information conveyed in the panels, including a more in-depth description of the various topics found in the panel's titles. In addition to supplemental information, the booklet contains interactive activities, such as quizzes, word searches, and

crossword puzzles to test the learner's freshly acquired knowledge of CBNRM. See Appendix 5 to view the booklet.

## Conservancy Trip

After conducting extensive research on how CBNRM functions, we were able to visit both the Ozonahi and Otjituuo CBO and conduct our interviews. Our first stop was at the Ozonahi CBO where we gathered crucial data for both successes and challenges of CBNRM. Ozonahi does not have large and protected animals present in their boundaries such as Rhinos, Elephants, and Cheetahs. The Ozonahi members are not allowed to benefit on any of the smaller protected animals they encounter in their territory. A conservancy member and traditional authority leader told us in an interview how if a nationally protected animal wandered into the street, someone might kill it just because they are hungry even though it is poaching. The traditional authority leader went on to tell us that many people in the conservancy ask, "If [these animals] do not benefit me, why should I keep [them]?" Due to the lack of profitable wildlife, the Ozonahi CBO does not currently have any source of income, leaving the members helpless at times. However, the members still benefit from the CBOs BDP and are using help from CBNRM companies to eventually receive permits to start generating income. Members from the Otjituuo CBO discussed very different issues they have with implementing CBNRM. Although they do have an income in the form of timber, they still struggle heavily with funding and lack modes of transportation and ways to communicate with members in the far areas of the land. Additionally, both conservancies worked out of a basic shed as their office space.



*Figure 16: The above image is the office of Otjituuo's chairperson.*

The data we gathered from the trip also included our observations which we created a flyer to go along with for members to be aware of. Throughout our time there we all noticed the very different perspective the members had compared to the experts we contacted earlier. All CBO members were very grateful and appreciative of what CBNRM had to offer them, and although they may not be as involved in policy-making, they were able to offer many valuable solutions and additions for CBNRM which were included in the future recommendations.

# Discussion

## Results Summary

Our results can be separated into two categories: the deliverables we created for EduVentures and the intangible themes we derived through our research. This summary will highlight the important outcomes we generated for the project and CBNRM.

The deliverables we developed for our sponsor, EduVentures, included an eight panel exhibition on CBNRM and a booklet which accompanies the display. The eight panels we designed possess the following titles: What is CBNRM?, Why CBNRM?, Legal Frameworks, CBNRM and the Environment, CBNRM Alongside Wildlife, Challenges of CBNRM, and Success Stories. The information displayed on each panel was derived from our secondary data review, feedback from the review committee, and the insight we gained from our CBO focus groups. The panels utilize visuals in the form of graphics, images, and drawings to tell the story of CBNRM. The booklet supplements each of these panels, by elaborating on the information presented. The booklet provides the learner with explanations and in depth discussions on the same CBNRM topics while also expanding upon the material.

## Related Works and Projects

EduVentures Trust has been a long-time partner of WPI through the IQP program. Students have worked with EduVentures in past years to develop similar educational exhibits to be presented across Namibia. For example, last year, students spent a term updating a paneled

climate change exhibit with new information and design decisions. Specific to our project, we took inspiration from the past projects on how to begin designing our panels. The project was set up in a similar way as our own with a review committee process; however, the team did not work as closely with the review committee. The goal of the project was to increase climate change awareness in the Namibian population as the country suffers greatly from its effects. The panels created by WPI students, including this project, are saved in the Namibian library to be used as a resource for EduVentures and other organizations like those involved in CBNRM. With projects like these and our own, WPI students have worked to further the mission of EduVentures in creating a more educated population in Namibia on environmental issues.

## Broader Implications

This project had a clearly defined goal of creating eight educational panels explaining the details and intricacies of CBNRM implementation in Namibia; however, the deeper significance of CBNRM and our respective project was not revealed until midway through the project when we observed the Ozonahi Conservancy and the Otjituuo Conservancy and Community Forest. While there, we spoke to and asked questions of both committee members and conservancy members about CBNRM, how they lived in the community, and challenges they faced. Their answers were incredibly revealing into how CBNRM is impacting people's lives directly and what story our exhibition should tell.

The driving ideal of CBNRM is the return of traditional control over natural resources, as defined in Panel 2: "Why CBNRM?". Members at these conservancies feel empowered by the self-determination they have over their own land and its resources, which was made clear by

our discussions with them. While community members are appreciative of the ideological and tangible benefits of CBNRM implementation, they are faced with a myriad of challenges associated with conservation efforts.

The challenge most in tune with our initial findings from our secondary-data analysis were the reports of human-wildlife conflict across community-based organizations. This is a continuous theme throughout the exhibition, most notably in Panel 5: “CBNRM Alongside Wildlife” and Panel 7: “Challenges Facing CBNRM”. The management committee members explained to us that human-wildlife conflict was rare; however, conservancy members still had personal experiences with dangerous wildlife to tell us about. Predators, most commonly jackals and wild dogs, kill cattle frequently enough for the farmers to display feelings of anger while informing us. What angered the members most was not the act itself, but the under compensation they received from CBNRM support organizations and governmental bodies. A farmer owning a bull worth \$60,000 NA (~\$3,000 USD) received as little as \$3,000 NA (~\$150 USD) in compensation. While the existence of efforts to increase compensation is unknown, our expert interviews revealed to us the steps that CBNRM administrative organizations have taken to mitigate human-wildlife conflict. As shown in the “Wildlife Management” section of Panel 4, experts from IRDNC spoke to us about the implementation of better fencing to prevent and more game guards to respond to incidents of human-wildlife conflict, yet such improvements were not evident at the conservancies we visited.

There is tension between conservation and benefit extraction within these communities. Community members admitted that occasionally conservation is at odds with what people truly need for their livelihoods. As mentioned in the Results, in Ozonahi, the conservancy is focused

on protecting wildlife, but the larger and more protected species are not even present in the region. Only once a year will they see an elephant, and even then it is a nuisance as they will usually trample buildings and homes. As found through our interviews, many conservancy members only want to protect animals that will benefit them. When faced with these complex situations involving livelihoods, it is difficult for conservancy members to feel appreciation for CBNRM.

The challenge that was revealed to be the most comprehensive through our discussions is the lack of funding provided to struggling CBNRM communities. Many CBNRM communities do not actually generate an income, as was the case in the Ozonahi Conservancy. While Ozonahi is designed to conserve wildlife, the more popular species - cheetahs, rhinos, lions, elephants etc - are not present in the region. Therefore, Ozonahi does not receive any profits from conservation hunting and relies on the concession fund to pay their costs. While Otjituuo had an income from its timber sales as a community forest, it still painted a similar picture of hardship. The members of the management committee at Otjituuo stressed to us during our interview how they lacked efficient transportation across the conservancy and community forest. Without a car, the conservancy is unable to properly respond to any incidents, usually forms of human-wildlife conflict, as they are usually miles from the main office. Additionally, many conservancy members lack cell phones and proper methods of communication across the conservancy. For example, while attempting to meet up with the chairperson of Otjituuo, we had to drive to several townships across the conservancy to find him as we had no way of reaching him over the phone.

Even with the many challenges that these two conservancies face, the management committee and members were still incredibly optimistic for the future. This is a sentiment we sought to encapsulate in Panel 8: “Success Stories”. When talking about successes of their struggling conservancy, the chairperson of Ozonahi said, “Look at you when you’re coming here. It’s a success because you knew [to come here]. Gathering the information about us to flourish out. That is a success. Although there is a lack of funding, there’s still success. They said Rome was not built in a day, but there are still successes here.” This is a quote that was included in Panel 8 due to the impact it had. The conservancy members believe in what they are doing, but it is an enormous undertaking and has been ripe with setbacks.

From all this, what story of CBNRM should our exhibition tell? The exhibition is designed to be informative for possibly uninformed CBO members as the challenges and successes of CBNRM and its participants are one-in-the-same. Our exhibit seeks to include both sides and their respective intricacies; the breadth of CBNRM and the depth of its members’ lives. CBNRM has been a noble cause in Namibia, one built into the constitution of a young country hoping to do better than its colonial past. Yet, its nobility has not prevented CBNRM from facing obstacles to its successful implementation. It is the goal of this project to properly educate Namibians on the benefits and contributions of CBNRM in order to gather support and further involvement in the implementation of the program. Even with its challenges, the number of CBOs across Namibia has consistently grown thus demonstrating the inherent support it has and growth it has induced. And that is the story this exhibition should tell: Even though CBNRM has challenges greater than what the panels alone can display, it is an initiative that, with proper



awareness, education, and support, will continue to have a positive impact on the livelihood of rural Namibians both physically and ideologically.

## Lessons Learned

Over the course of our time spent working with EduVentures, we gained valuable work experience while contributing to a project that will hopefully leave a lasting impact on Namibians. Throughout our IQP journey, we learned many workplace lessons including ones rooted in communication, adaptability, and problem solving.

Communication was a common theme we came across while working in Namibia. Whether it was communicating amongst our project group, with our sponsor, or the review committee we encountered both triumphs and setbacks. Communication among group members and with our sponsors was effective and clear. Working side by side, we were able to establish a functioning relationship that provided us with support when challenges arose. The review committee presented us with essential feedback for our project; however, contacting and planning group meetings proved to be difficult. Once we arrived in Namibia, we hoped to organize multiple group meetings to streamline our project. Yet, we soon realized that was not feasible due to the intricate, individualized schedules each review committee member had. Moreover, due to infrequent email responses, we never met with the complete review committee until later into our project's progression. The communication issues we experienced contributed to the following lessons in adaptability and problem solving.

Due to the unforeseen communication issues, our team proved to be extremely adaptable and found success with problem-solving in crunch time. The review committee's role

and approval were essential in producing a final deliverable for EduVentures. Though the committee's feedback was thorough and comprehensive, we received it during the late stages of our project. As a result, we needed to restructure our existing panels to fit their needs, in turn delaying our deadlines and project's progression. Embracing this change was necessary in generating a working educational exhibition for them. Remaining positive amongst the adversity proved to be a useful tool for us. Even though their feedback was delayed, the critiques allowed our project to grow in ways we never could have imagined. From the experiences with communication, adaptability, and problem solving, our project and team flourished in the face of hardship and came out on top.

## Future Recommendations

Upon the completion of our project and time spent in Namibia, we compiled a wide range of recommendations and future work that could occur to optimize our project. Gaps and limitations arose when we conducted our research in the field and when consulting with the review committee. The major gaps in our research were discovered during our conservancy trip. The central limitation conservancy members face is one rooted in access to necessary resources. CBNRM progress within conservancies is impeded by limitations like access to transportation, communication, training, and other resources. Specific to our project, we experienced drawbacks in deliberating with the review committee on feedback regarding the panels content, design, and layout. The central limitation with the review committee also revolved around access; our access to them.

After evaluating the limitations discovered, we expanded on methodological improvements and potential research directions our project could undergo in the future. Our first methodological improvement is the addition of surveys. The survey would target conservancy members seeking to gain a complete understanding of their knowledge of CBNRM and the governmental policies. The addition of a survey would provide quantifiable data to help elevate the project. Our next methodological improvement included gaining additional current resources to supplement our secondary data review. When gathering sources for review, some documents were outdated and last year's reports had yet to be published. As a result, gaps within our secondary data review appeared. The incorporation of up to date sources will elevate the project's accuracy and relevance. Lastly, improving the structure of the review committee would help assist in the efficiency of the team. As discussed in the Lessons Learned section, communication issues halted the progression of our project for a period of time. In order to prevent further issues, providing the review committee with a structured schedule of meetings and interviews Week 1 would ensure their collaboration will be in a timely manner.

Furthermore, potential research directions for the future include conservancy specific projects and additional elements for the educational exhibition. With our field research, we discovered many elements that would aid in promoting CBNRM functioning among conservancy members. Future projects oriented around specific conservancy needs could include developing a conservancy website and promoting training programs, like GPS operating, among conservancy members. On the other hand, developing interactive elements for the educational exhibition would be an added layer to the project. Interactive elements could include a scannable QR code that prompts you to videos and hands-on activities. We are excited to see

the social impact our project will have on communities throughout Namibia. CBNRM is an important policy for Namibians to understand, and generate benefits from. The educational exhibition tour will provide conservancies, organizations, schools, and many more communities with an opportunity to indulge in community-based natural resource management.

## References

*A Brief History of Namibia*. Namibia High Commission. (n.d.).

<https://www.namibiahc.org.uk/history.php>

Alele, F., & Malau-Aduli, B. (2023, February 22). *4.5 data collection methods*. An

Introduction to Research Methods for Undergraduate Health Profession Students.

<https://jcu.pressbooks.pub/intro-res-methods-health/chapter/4-5-data-collection-methods/#:~:text=A%20structured%20interview%20is%20essentially,answers%20that%20require%20further%20clarification.>

Cassidy, L. (2021). Power dynamics and new directions in the recent evolution of CBNRM in Botswana. *Conservation Science and Practice*, 3(1).

<https://doi.org/10.1111/csp2.205>

CHILD, B., & BARNES, G. (2010). The conceptual evolution and practice of community-based natural resource management in southern Africa: past, present and future. *Environmental Conservation*, 37(3), 283–295.

<https://doi.org/10.1017/S0376892910000512>

Cooper, J., Fleming G., Malungani, T., Misselhorn, A. (2004). *ECOSYSTEM SERVICES IN SOUTHERN AFRICA: A REGIONAL ASSESSMENT*. Council for Scientific and Industrial Research, Pretoria, South Africa.

[https://www.millenniumassessment.org/documents\\_sga/SAfMA\\_Regional\\_Report\\_-\\_final.pdf](https://www.millenniumassessment.org/documents_sga/SAfMA_Regional_Report_-_final.pdf)

Davis, A.-L., Blomley, T., Homer, G., Somerville, M., & Nelson, F. (2020, January).

*Community-based Natural Resource Management in Zambia: A Review of Institutional Reforms and lessons learned from the field.* LandLinks.

<https://www.land-links.org/document/community-based-natural-resource-management-in-zambia-a-review-of-institutional-reforms-and-lessons-learned-from-the-field/>

Doyle, R., Fruchtman, B., Griffiths, S., Moy, N. (2023). Advancing Climate Change Knowledge Within Namibia Through a Virtual Exhibition.

<https://drive.google.com/drive/folders/1UgbFPZvnuAJDbGhIzci2RY6DSJcoW4E->

EduVentures Trust. (2024). *Education and Adventures.*

<https://eduventures-africa.org/eduventures/>

Enginess. (2021, October 27). *What is iterative design? (and why you should use it).*

Enginess Industry Insights: Stay Ahead with the Latest Trends and Strategies.

<https://www.enginess.io/insights/what-is-iterative-design>

*Facts and figures.* CommunityConservationNamibia.com. (2021).

<https://communityconservationnamibia.com/facts-and-figures>

Forestry, U. B. &. (2024, February 28). *Marienfluss Conservancy meeting.* Flickr.

<https://www.flickr.com/photos/usaid-biodiversity-forestry/12210874615>

Frost, P. G. H., & Bond, I. (2008). The CAMPFIRE programme in Zimbabwe: Payments for wildlife services. *Ecological Economics*, 65(4), 776–787.

<https://doi.org/10.1016/j.ecolecon.2007.09.018>

Gargallo, E. (2015). Conservation on contested lands: The case of Namibia's communal conservancies. *Journal of Contemporary African Studies*, 33(2), 213–231.

<https://doi.org/10.1080/02589001.2015.1065575>

Go2Africa. (1970, January 14). *The Ultimate Guide to a zimbabwe safari*.

<https://www.go2africa.com/african-travel-blog/our-ultimate-guide-to-a-zimbabwe-safari>

Haingura, I. (2020, November 17). *Update of conservancy game management plans*.

NACSO.

<https://www.nacso.org.na/news/2020/11/update-of-conservancy-game-management-plans>

Heffernan, A. (2022). Development, Conservation, Empowerment: The Trilemma of Community-Based Natural Resource Management in Namibia. *Environmental Management (New York)*, 69(3), 480–491.

<https://doi.org/10.1007/s00267-021-01589-1>

Holmes, A. (2013). Direct Observation. In: Volkmar, F.R. (eds) *Encyclopedia of Autism Spectrum Disorders*. Springer, New York, NY.

[https://doi.org/10.1007/978-1-4419-1698-3\\_1758](https://doi.org/10.1007/978-1-4419-1698-3_1758)

- Hutchinson, A. (2021). *THE EFFECTS OF COLONIZATION AND APARTHEID ON THE DEVELOPMENT OF SOUTH AFRICA: NAMIBIAN INFLUENCE, IMPACTS ON EDUCATION, AND STATE CAPTURE* (thesis). Johns Hopkins University, Baltimore.
- IRDNC. (2024). Integrated Rural Development and Nature Conservation - Our Mission & Philosophy. <https://www.irdnc.org.na/our-mission-philosophy.html>
- Kienetz, A. (1977). The Key Role of the Orlam Migrations in the Early Europeanization of South-West Africa (Namibia). *The International Journal of African Historical Studies*, 10(4), 553–572. <https://doi.org/10.2307/216929>
- MEFT. (2024). Ministry of Environment and Tourism Namibia. <https://meft.gov.na/>
- MET. (2013, March). *National Policy on Community Based Natural Resource Management*. Sustainable Development Advisory Council of Namibia | Sustainable Development Advisory Council of Namibia. <https://sdacnamibia.org/>
- MULALE, K., & FLORA, C. (2006). THE CREATION OF SOCIAL CAPITAL THROUGH NETWORKS IN BOTSWANA’S CBNRM. *South African Geographical Journal*, 88(2), 150–158. <https://doi.org/10.1080/03736245.2006.9713857>
- Namibia*. Namibia | South African History Online. (n.d.). <https://www.sahistory.org.za/place/namibia>
- NASCO. (2022). NACSO. <https://www.nacso.org.na/>



NACSO. (2023, October 6). *Human-wildlife conflict*. CommunityConservationNamibia.com.

<https://communityconservationnamibia.com/the-big-issues/human-wildlife-conflict#:~:text=However%2C%20one%20of%20the%20greatest,of%20human%20life%20or%20injury.>

NASCO, & MEFT. (2024, January 15). *Home: Reporting on community-based Natural Resource Management in Namibia*. Community Conservation Namibia.

<https://communityconservationnamibia.com/>

Nikodemus, A., & Hájek, M. (2022). Implementing Local Climate Change Adaptation Actions: The Role of Various Policy Instruments in Mopane (*Colophospermum mopane*) Woodlands, Northern Namibia. *Forests*, 13(10), 1682-.

<https://doi.org/10.3390/f13101682>

NNF. (2024). Home. Namibia Nature Foundation. <https://www.nnf.org.na/index.php>

Republic of Namibia. (2020). Fourth National Communication to the United Nations Framework Convention on Climate Change.

<https://unfccc.int/sites/default/files/resource/Namibia%20-%20NC4%20-%20Final%20signed.pdf>

Roe D., Nelson, F., Sandbrook, C. (eds.) 2009. Community management

of natural resources in Africa: Impacts, experiences and future directions, Natural

Resource Issues No. 18, International Institute for Environment and Development,

London, UK.

Selormey, E., Zupork, M., Osse, L., & Logan, C. (2019). Change Ahead: Experience and awareness of climate change in Africa. Afrobarometer.

[https://www.afrobarometer.org/wp-content/uploads/migrated/files/publications/Policy%20papers/abr7\\_policypaperno60\\_experience\\_and\\_awareness\\_of\\_climate\\_change\\_in\\_africa.pdf](https://www.afrobarometer.org/wp-content/uploads/migrated/files/publications/Policy%20papers/abr7_policypaperno60_experience_and_awareness_of_climate_change_in_africa.pdf)

Shereni, N. C., & Saarinen, J. (2021). Community perceptions on the benefits and challenges of community-based natural resources management in Zimbabwe. *Development Southern Africa (Sandton, South Africa)*, 38(6), 879–895.

<https://doi.org/10.1080/0376835X.2020.1796599>

Shikalepo, E. (2020). Improving the quality of Education at Rural Schools in Namibia. *International Journal of Research and Innovation in Social Science*, 4(2).

Tripathy J. P. (2013). Secondary Data Analysis: Ethical Issues and Challenges. *Iranian journal of public health*, 42(12), 1478–1479.

Welch, C. (2018). CBNRM in Namibia. In *Land Is Life, Conservancy Is Life* (pp. 86-). Basler Afrika Bibliographien.

World Bank Group. (2021). *Climate Risk Country Profile: Namibia*.

[https://climateknowledgeportal.worldbank.org/sites/default/files/2021-08/15931-WB\\_Namibia%20Country%20Profile-WEB.pdf](https://climateknowledgeportal.worldbank.org/sites/default/files/2021-08/15931-WB_Namibia%20Country%20Profile-WEB.pdf)

## Appendix Glossary

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# Appendix 1: Informed Consent Form

## **Informed Consent for Expert and Conservancy Member Interviews**

**Student Investigators:** Jesse Beers, Adrianna Niles, Zevulun Lieberman, Benjamin Hood.

**Faculty investigators:** Tsitsi Masvawure, Alejandro Manga

**Contact Information:** [jabeers@wpi.edu](mailto:jabeers@wpi.edu), [adniles@wpi.edu](mailto:adniles@wpi.edu), [zmlieberman@wpi.edu](mailto:zmlieberman@wpi.edu), [behood@wpi.edu](mailto:behood@wpi.edu), [tmasvawure@wpi.edu](mailto:tmasvawure@wpi.edu), [amanga@wpi.edu](mailto:amanga@wpi.edu)

**Title of Research Study:**

Community-Based Natural Resource Management (CBNRM) Educational Exhibition

**Sponsor:** EduVentures

**Introduction:** You are being asked to participate in a research study that will allow us to better understand community-based natural resource management. Partnering with EduVentures, we are developing a series of educational panels and a pamphlet that will provide useful information on CBNRM topics to the learner. To maximize the product's potential, we must gather perspective and insight from experts and conservancy members on what should be included in these panels. We are hoping to do so through these interviews. The following form provides information about our study that will allow you to make a fully informed decision about your participation.

**Purpose of the study:** For the WPI IQP team to learn more about CBNRM and the personal challenges, successes, and history of CBNRM through discussing with Experts in CBNRM sub-companies as well as conservancy members. The purpose of this IQP project is to assist with the implementation of CBNRM in Namibia by creating education panels focused on the history, progress, challenges, and successes of CBNRM which will be presented to conservancies in rural areas.

**Procedures to be followed:** You are being asked to participate in an interview that will last for approximately 45-60 minutes conducted by one of the WPI IQP members. In this interview, we will ask a series of open-ended questions regarding your expertise and experience in CBNRM with a particular focus on conservancies. These questions and answers will be written down on a Google document as well as saved as an audio recording. The data gathered in this interview will then be used in the WPI IQP group's final presentation and project report, which can be found on [digital.wpi.edu](http://digital.wpi.edu). You will be given the option to have your name and the data recorded used in the final project report below.

**Risks to study participants:** No risks or discomfort within the study.

**Benefits to research participants and others:** No benefits to study participants

**Record keeping and confidentiality:** The WPI IQP team member conducting the interview will be documenting important statements from the participant's answers. These notes will only be accessible to the WPI team members on a secure device. The notes taken may identify you; however, we will ask you permission to quote you. Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor, or its designee, and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data that identify you by name. If you wish to keep your identification anonymous, any presentation or publication of the data will not identify you unless you have provided express permission to do so.

**Compensation or treatment in the event of injury:** You do not give up any of your legal rights by signing this statement.

**For more information about this research or the rights of research participants, or in case of research-related injury, contact:**

Available contacts: Adrianna Niles, Benjamin Hood, Jesse Beers, Tsitsi Masvawure, Alejandro Manga, Email:( [adniles@wpi.edu](mailto:adniles@wpi.edu), [behood@wpi.edu](mailto:behood@wpi.edu), [jabeers@wpi.edu](mailto:jabeers@wpi.edu), [zmlieberman@wpi.edu](mailto:zmlieberman@wpi.edu), [tmasvawure@wpi.edu](mailto:tmasvawure@wpi.edu), [amanga@wpi.edu](mailto:amanga@wpi.edu))

IRB Manager: Ruth McKeogh, Tel. 508 8316699, Email: ([irb@wpi.edu](mailto:irb@wpi.edu) )

Human Protection Administrator: Gabriel Johnson, Tel. 508-831-4989, Email:([gjohnson@wpi.edu](mailto:gjohnson@wpi.edu)).

**Your participation in this research is voluntary.** Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

I consent to having my name and data associated with and quoted in the final report: Yes / No

**By signing below,** you acknowledge that you have been informed about and consent to be a participant in the study described above. Make sure that your questions are answered to your satisfaction before signing. You are entitled to retain a copy of this consent agreement.

I consent to having my name and data associated with and quoted in the final report:

\_\_\_\_\_

Date: \_\_\_\_\_

Study Participant Signature

\_\_\_\_\_

Study Participant Name (Please print)

\_\_\_\_\_

Date: \_\_\_\_\_

Signature of the Person who explained this study

## Appendix 2: Conservancy Trip Flyer



ENVIRONMENTAL EDUCATION IN NAMIBIA

# CBNRM & Conservancies!

Adrianna Niles, Benjamin Hood, Jesse Beers, & Zev Lieberman

Hello! We are a group of students from an American university (Worcester Polytechnic Institute) that are working on a project with EduVentures. Our project consists of developing an educational exhibition on community-based natural resource management which includes an 8 panel display and a pamphlet. We will be spending time observing your daily operations in hopes to gain insight and perspective on how Namibian conservancies operate. Our observations will allow us to create a thoughtful exhibition that will help promote the benefits CBNRM! If you have any questions please reach out via email to: [adniles@wpi.edu](mailto:adniles@wpi.edu), [jabeers@wpi.edu](mailto:jabeers@wpi.edu), [zmlieberman@wpi.edu](mailto:zmlieberman@wpi.edu), [behood@wpi.edu](mailto:behood@wpi.edu)

## Appendix 3: Code Book

CODE	PRIMARY CODE	SECONDARY CODE	DEFINITION OF CODE	FREQUENCY OF OCCURRENCE
<b>1.0</b>	<b>CBNRM History</b>			
1.1		Southwest Africa	-the success/failures of CBNRM in other South African regions, and how Namibia learned from all of them to have a successful implementation	Otjituuo: Ozonahi: Experts:
1.2		German Relations/Colonial Period	-the initial start of CBNRM only being beneficial to the white landowners and how it has transitioned to the state it is today. - Post-independence German policy	Otjituuo: Ozonahi: Experts:
1.3		South African Apartheid	-How South African Apartheid has shaped policies in Namibia and how it affects CBNRM	Otjituuo: Ozonahi: Experts:
1.4		Independence	-Change and reform during independence which allowed CBNRM to be easily implemented	Otjituuo: Ozonahi: Experts:
<b>2.0</b>	<b>Legal Frameworks</b>			
2.1		Compliance	- conservancy elections, Annual General Meetings, presenting a financial report at AGM Game Management Utilization Plan, Benefit Distribution Plan	Otjituuo: Ozonahi: Experts: - Tessa(SOP)



		<b>CBNRM Pillars</b>	- Institutional Development and Governance, Natural Resource Management, Business, Enterprises, and Livelihoods	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (I)</li> </ul> <p>Ozonahi:</p> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa</li> </ul>
2.3		<b>Governance</b>	- conservancy constitution, forming a conservancy that is in the best interest of everyone, Executive Committee ensures transparency between the committee and the conservancy members and the committee and outside voices	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (II)</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- EC(I)</li> </ul> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa(AGM)</li> </ul>
2.4		<b>Goals</b>	- economic development, environmental conservation, community engagement	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (I) conservation, preserving for younger generations</li> </ul> <p>Ozonahi:</p> <p>Experts:</p> <ul style="list-style-type: none"> <li>- DR(I) conserving for future generation</li> </ul>
<b>3.0</b>	<b>CBNRM Challenges</b>			
3.1		<b>Human-Wildlife Conflict</b>	- loss of livestock and crops, under compensation, structural damage	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (IIII)</li> <li>- CM(I)</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- EC(II) elephants are seasonal</li> <li>- CM (II), the animals that are protected belong to the state so you can't kill them,</li> </ul>

				<p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa(wrote thesis)</li> <li>- Maxi (I)</li> </ul>
3.2		Climate Change	- global trends, Namibian trends: drought, increase in temperature, desertification, lack of information	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (II) Drought in the community “people are crying”</li> <li>- CM (III) climate change is real, but they don't know much about it. They want to fight it.</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- CM(II), rain is a big issue, issue of god, <b>11:26 quote</b></li> </ul> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa(reliance on rainfall)</li> <li>- DR(II) passion to conserve, changing rainfall patterns</li> </ul>
		Funding	- recovering from COVID-2019, competitive grant process, discrepancy in aid between conservancies	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (II) grants</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- EX(I) hard to apply for grants</li> </ul> <p>Experts:</p>
3.4		Communication	- inefficient communication between management and community, lack of policy and policy clarity, lack of support, knowledge, resources, and implementation and mitigation measures, lack of accountability for management committee and conservancy members	<p>Otjituuo:</p> <p>Ozonahi:</p> <p>Experts:</p>
3.5		Transportation	- No modes of transportation, difficulty reaching	Otjituuo:

			outside areas of conservancies, lack of materials	<ul style="list-style-type: none"> <li>- EC (IIIIII)</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- EC(I)Lack of it, needed for patrolling..</li> </ul> <p>Experts:</p>
3.6		Technical Skills/Education	- literacy, inadequate computer skills, lack of training and application understanding	<p>Otjituuo:</p> <p>Ozonahi:</p> <p>Experts:</p> <ul style="list-style-type: none"> <li>- DR(I) lack of understanding</li> </ul>
3.7		Environmental & Wildlife Management	- poaching, illegal harvesting, overgrazing, local and commercial crimes	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (II) illegal harvesting, bush encroachment</li> <li>- CM (I) they want to help protect the environment</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- CM(I), bush encroachment(TA)</li> </ul> <p>Experts:</p>
		Income diversity	-Many conservancies have an over-reliance on tourism and CBNRM wants to expand upon this by adding more diverse forms of income	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (I) gained income from CBNRM, through permits</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- CM(II), very hard to make a profit off wildlife when they are protected(TA), CBNRM policies make it hard to make income sometimes</li> </ul> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa(not dependent on</li> </ul>

				rainfall/tourism)(II) - Maxi (I)
<b>4.0</b>	<b>CBNRM Successes</b>			
4.1		Wildlife Management Tools	- game guards and rangers, SMART, protection for wildlife: fencing and corrals, Participant Funding Program	Otjituuo:  Ozonahi: - EC(I) (poaching) - CM(II) domesticating wild berries, planting plants helps with climate change  Experts
4.2		Wildlife Population	- rehabilitation of the population, the largest black rhino in the world,	Otjituuo:  Ozonahi: - EC  Experts:
4.3		Female Inclusion & Empowerment	- women hold roles on conservancy committees, female rangers	Otjituuo:  Ozonahi:  Experts:
4.4		Benefits	- income generated from conservancy exports are dispersed amongst members, disability aid, CRF funding after COVID	Otjituuo: - EC (III) Provides money to members, and people in need. Payments for killed livestock from HWC - CM (I) payments for killed livestock, are helpful, if small  Ozonahi:

				<ul style="list-style-type: none"> <li>- EC(II)(cattle being killed, compensation)(starting own business)(BDP)(concession fund)</li> <li>- CM(III) funds can pay for small necessities, people get a permit and make money(Lydia) <b>Quote 4:03</b>, able to send kid to school</li> </ul> <p>Experts:</p>
4.5		Communal Ownership	- self-determination of land use, wildlife, and benefits, self-governing entity	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (I) increased control, benefits</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- EC(III) (allows them to manage their own resources)</li> </ul> <p>Experts:</p> <ul style="list-style-type: none"> <li>- DR(I)</li> </ul>
4.6		Increased awareness	-due to CBNRM and the multiple organizations that help with it, communities and their members are able to communicate with areas outside the conservancy and they are better known	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (I)</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- EC(I), they are better known to the public now</li> </ul> <p>Experts:</p>
5.0	<b>CBNRM Communities</b>			

5.1		Conservancies	-communities who have been approved by MEFT to be a registered self-governing conservancy that is able to produce an income from the land and wildlife they own.	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (II)</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- EC(II)(goals of CBNRM and conservancy are aligned)</li> <li>- CM (II)</li> </ul> <p>Experts:</p> <ul style="list-style-type: none"> <li>- DR(I) helps draw up constitutions</li> </ul>
5.2		Community Forests	-a community where all residents are part of the conservancy forest. They aim to conserve and restore the forest and its natural resources to benefit from, must be approved by MEFT	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (II)</li> </ul> <p>Ozonahi:</p> <ul style="list-style-type: none"> <li>- EC(I)</li> <li>- CM (II)</li> </ul> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa</li> <li>- Dr(III),his job is too analyze forests and see how much they have.Forests are center of CBNRM,<b>Integration</b>, Forest fires are big issues</li> </ul>
5.3		Fishery Reserves	-sanctuaries identified by local communities legally recognized by the government which place restrictions to manage their fish resources sustainably	<p>Otjituuo:</p> <p>Ozonahi:</p> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa(I)</li> <li>- DR(I)</li> </ul>
<b>6.0</b>	<b>Organizations</b>			
6.1		NACSO	- umbrella organization, Namibian Association of CBNRM Support organization -Made up of 8 NGOs which all strive to provide quality services to rural communities	<p>Otjituuo:</p> <p>Ozonahi:</p>

				<p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa(umbrella)</li> <li>- Maxi (I)</li> </ul>
6.2		MEFT	-Ministry of Environment, Forestry and Tourism, once just MET until 2020 it combined with the directorate of forestry. The goal is to promote biodiversity through the sustainable use of natural resources	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (I)</li> </ul> <p>Ozonahi:</p> <p>Experts:</p> <ul style="list-style-type: none"> <li>- DR(I) Directorate of Forestry joined MET</li> </ul>
6.3		IRDNC	-Part of NACSO, which provides technical assistance to conservancies such as training	<p>Otjituuo:</p> <p>Ozonahi:</p> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa(Central, NC and S)</li> </ul>
6.4		EduVentures	-educational and data gathering initiative that turned into an NGO that aims to cultivate interest in young Namibians.	<p>Otjituuo:</p> <p>Ozonahi:</p> <p>Experts:</p>
6.5		NNF	-part of NACSO, assist conservancies with grant administration, monitoring, and financial management	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (I)</li> </ul> <p>Ozonahi:</p> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Tessa(ethical assistance)</li> </ul>
7.0	<b>Possible Improvements</b>			
7.1		HWC Solutions	- harmonize conservancy practice, implement mitigation measures, improve information flow	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (I), payments for killed</li> </ul>

				<p>livestock</p> <p>Ozonahi:</p> <p>Experts:</p>
7.2		Education	-increase in education, completion of secondary school, or more workshops provided by companies of NACSO	<p>Otjituuo:</p> <p>Ozonahi:</p> <p>Experts:</p> <ul style="list-style-type: none"> <li>- Dr(I) understand their actions: cutting trees and destroying. Educate about climate change and laws</li> </ul>
7.3		Training	-NACSO and other organizations teaching conservancies how to grow sustainably, how to conserve, how to use equipment, and how to write proposals/grants	<p>Otjituuo:</p> <ul style="list-style-type: none"> <li>- EC (II) Training via government</li> </ul> <p>Ozonahi:</p> <p>Experts:</p>

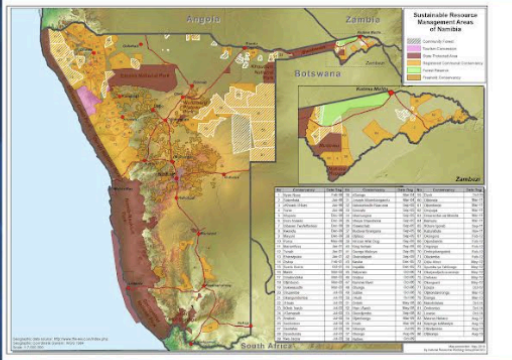


# Appendix 4: Panels

## a. Panel 1: What is CBNRM?

# WHAT IS CBNRM?

## Community-Based Natural Resource Management



**Support Organizations**


- Namibian Association of CBNRM Support Organizations (NACSO):** NACSO acts as an umbrella that connects many of the organizations working to accomplish the same goals of conservation and community development.
- Ministry of Environment, Forestry and Tourism (MEFT):** MEFT promotes biodiversity and conservation efforts, with a focus on social and economic benefits, by developing natural resource management and tourism.
- Ministry of Fisheries and Marine Resources (MFMR):**
- Integrated Rural Development and Nature Conservation (IRDNC):** IRDNC's mission is to improve the lives of Namibians living in rural communities by expanding social and economic benefits through wildlife and natural resources.

Community-Based Natural Resource Management (CBNRM) empowers local communities to manage and benefit from their natural resources sustainably. Through collaborative efforts between communities and authorities, CBNRM conservancies enable Namibians to make decisions about land use, wildlife conservation, improves livelihoods, and fosters community empowerment, contributing to the sustainable development of Namibia's rural areas.

### HOW CBNRM IS IMPLEMENTED

CBNRM increases community ownership and management over local natural resources.

**COMMUNITY ASSOCIATIONS**




**CONSERVANCIES**

Conservancies are self-governing initiatives where all members are given rights over land uses in a designated area. The communities manage and conserve their natural resources while making decisions on wildlife conservation, benefit distribution and sustainable land use.

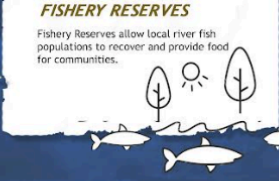
**COMMUNITY FORESTS**

Community Forests provide communities with rights over their own resources, such as timber and Devil's Claw, to generate income.





**FISHERY RESERVES**

Fishery Reserves allow local river fish populations to recover and provide food for communities.



### PILLARS OF CBNRM

1. Institutional Development and Governance
2. Natural Resource Management
3. Business, Enterprises, and Livelihoods

b. Panel 2: Why CBNRM?

# why CBNRM?

## THE HISTORY BEHIND THE POLICY ...

<b>GERMAN COLONIAL ERA</b>	<b>SOUTH AFRICAN CONTROL</b>	<b>INDEPENDENCE ERA</b>	<b>CBNRM ERA</b>
 <p>Shortly after arriving to Namibia, Germany removed all native control over the land and its resources. At the time, this was mainly cattle, but it left the native population unable to properly recover when Germany proceeded to commit a genocide in the region.</p>	 <p>After the League of Nations gave control over Namibia to South Africa in 1920, South Africa continued many of the land practices that German colonial rule had established. As such, the native Namibian population still had very little control over their own resources.</p>	 <p>Namibia's Constitution Article 5 "the maintenance of ecosystems, essential ecological processes and biological diversity and the utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future"</p>	 <p>CBNRM was introduced into Namibia through laws such as the Forest Act and Water Point Act. Although it was originally targetted at wildlife conservation, CBNRM sought to solve part issues through community empowerment, involvement, and benefit from natural resources. CBNRM is meant to "carry the torch between generations" and ensure the Namibians maintain control over their environment and their own land.</p>

### c. Panel 3: Legal Frameworks

# legal frameworks

## HOW TO SUCCEED IN CBNRM

### Good Governance

To have an effective CBNRM community, it has to be governed properly. To have good governance, the committee must ensure that all decisions have the support of the majority of community members. This is easier to maintain when community members are involved in decisions alongside the committee. The running of the community must be the responsibility of the entire community, and not just a few committee members.

1. Conservancy elections

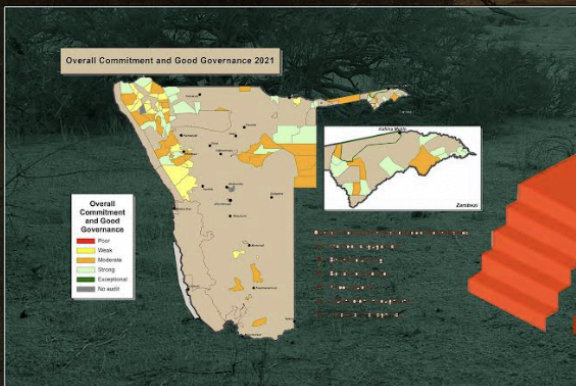
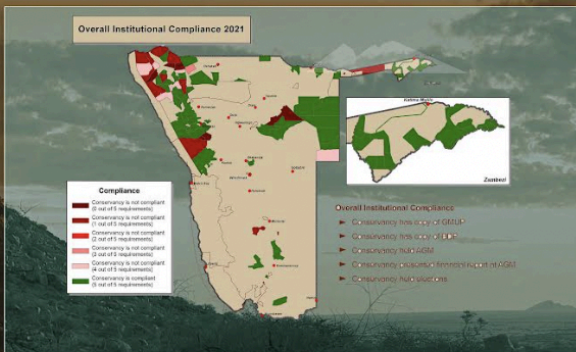
2. Annual General Meeting (AGM)

3. Presenting a financial report at the AGM

**5 COMPLIANCE REQUIREMENTS**

5. Benefit Distribution Plan (BDP)

4. Game Management Utilization Plan (GMUP)



### STEPS IN BECOMING A CONSERVANCY

3

#### STEP 3: Develop a Constitution

The Ministry will then determine if the community would benefit from being a community association through a "feasibility study" where they analyze the community's:

- Assess
- Potential to generate income
- Social Cohesion
- Importance of Biodiversity

2

#### STEP 2: Create a Governing Body

Every successful CBNRM community needs a clearly defined, and functional leadership. This is usually an elected committee with term limits.

1

#### STEP 1: Community Applies to MEFTor MFMR


The constitution will outline the essential tasks of a CBNRM community. Typical information outlined in the constitution includes:

- How members govern themselves
- Roles for members, staff, and committee members
- How committee members are elected
- The benefits for members
- Defined physical boundaries for the CBNRM community


d. Panel 4: CBNRM and the Environment

# CBNRM & THE ENVIRONMENT


## ENVIRONMENTAL CHALLENGES




**The climate is changing in Namibia.**  
 Rainfall is decreasing, leaving dry areas drier than before. In upcoming years, climate models across the board predict less rain, at more unpredictable times. In fact, German climate center GERICS projects Namibian precipitation to decrease by up to 19% by 2080. The dry season will change the most, losing large amounts of rainfall. With farmers and pastoralists already relying on inconsistent rain patterns, rural communities are at great risk.



**Increasing temperature.**  
 Temperatures are predicted to increase throughout the century. Climate models say that average temperatures could increase by up to 5.4 degrees Celsius by 2080 (World Bank, 2021). Additionally, heatwaves are projected to increase in severity and frequency. These changes will impact both humans, crops, and livestock alike.



**Unsustainable practices.**  
 Destructive agricultural, mining, and logging practices additionally worsen the environment for everyone. When people and companies hope to turn a quick profit at the expense of the land, the whole of Namibia pays the price. For example, overgrazing cattle destroys plant biodiversity, soil quality, and animal habitats. This prevents future generations from being able to raise cattle, and use the land.



**Droughts and floods.**  
 Extreme weather events are going to worsen, and happen more often. Droughts and floods will massively impact coastal inhabitants, cost Namibians massive amounts of money. Farming crops and cattle will become far less profitable in dryer areas, due to unpredictable weather.

**How can CBNRM help?**

CBNRM communities are incentivised to protect the life of the land. This can come from wildlife game guards, fish guards, and increased regulation protecting native plants. Additionally, conservancies, community forests, and fisheries are all regulated to maintain sustainable practices. This protects the land for generations to come.

**Adaptive Management.**

These techniques assist communities who rely primarily on livestock and crops, to diversify income. Additionally, Event Book and the Normalized Difference Vegetation Index (NDVI) are tools to help conservancies monitor climate change and data management systems, to counteract environmental issues.

2021 • Natural Resources at a Glance


57 conservancies with a wildlife management plan	748 game guards working in conservancies
52 conservancies with a zonation plan	54 conservancies conducting an annual game count
47 conservancies with conservation hunting concessions	74 conservancies with own use harvesting quotas
38 conservancies directly involved in tourism activities	

e. Panel 5: CBNRM Alongside Wildlife

# CBNRM ALONGSIDE WILDLIFE


## WILDLIFE EFFECTING

### Wildlife Management






Effective wildlife management helps villages protect their livestock, while protecting local ecosystems. Programs such as the Participant Funding Program, and adaptive management initiatives have provided exclusive wildlife techniques in order to mitigate wildlife conflict, improving living conditions and preserving ecosystems. Tactics such as proper fencing for cows, and game guards additionally promote healthy relationships with wildlife


### Fishery Reserves



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### Wildlife Crime




Poaching, illegal harvesting, and other forms of wildlife crime rob communities and the land. CBNRM fights wildlife crime, through helping provide game guards, fish guards, and rangers to communities. These roles protect people's local natural resources, and preserve them for future generations.

### Human-Wildlife Conflict



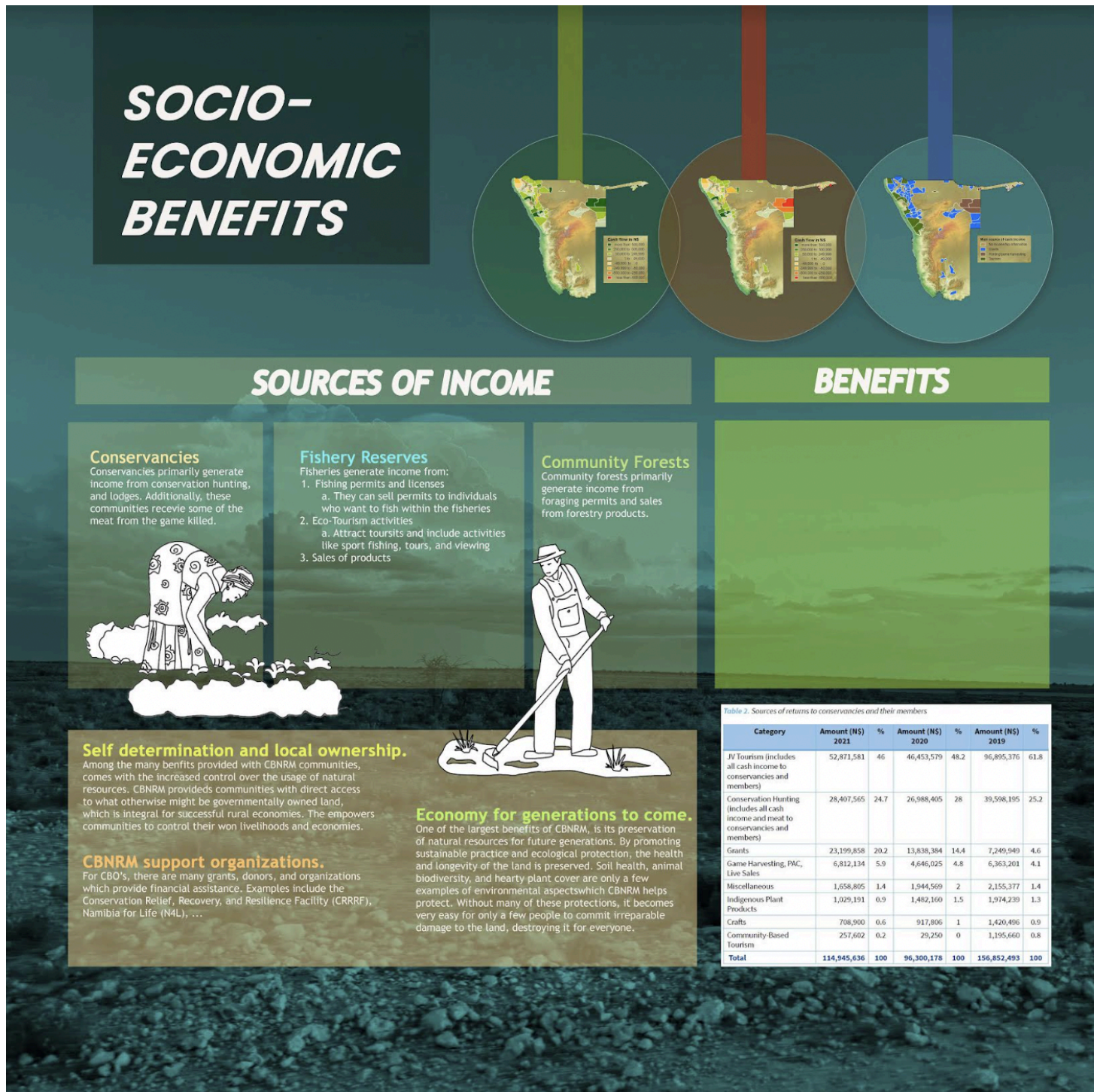
In 2022, communities spent N\$9.27 million to offset the costs of crop damage, livestock loss, and human injuries and loss of life. These issues, commonly faced by CBNRM community members, were all caused by wildlife animals. Human-wildlife conflict is expected to increase with drought, general climate change issues, and human population growth. The Human Wildlife Conflict Self Reliance Scheme (HWCSRS) is a fund created to address and offset the costs of HWC incidents.

### Community Forests



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## f. Panel 6: Socio-Economic Benefits



**Table 2. Sources of returns to conservancies and their members**

Category	Amount (N\$) 2021	%	Amount (N\$) 2020	%	Amount (N\$) 2019	%
JV Tourism (includes all cash income to conservancies and members)	52,871,581	46	46,453,579	48.2	96,895,376	61.8
Conservation Hunting (includes all cash income and meat to conservancies and members)	28,407,565	24.7	26,988,405	28	39,598,195	25.2
Grants	23,199,858	20.2	13,838,384	14.4	7,249,940	4.6
Game Harvesting, PAC, Live Sales	6,812,134	5.9	4,646,025	4.8	6,363,201	4.1
Miscellaneous	1,658,805	1.4	1,944,569	2	2,155,377	1.4
Indigenous Plant Products	1,029,191	0.9	1,482,160	1.5	1,974,239	1.3
Crafts	708,900	0.6	917,806	1	1,420,496	0.9
Community-Based Tourism	257,602	0.2	29,250	0	1,195,660	0.8
<b>Total</b>	<b>114,945,636</b>	<b>100</b>	<b>96,300,178</b>	<b>100</b>	<b>156,852,493</b>	<b>100</b>

## g. Panel 7: Challenges of CBNRM

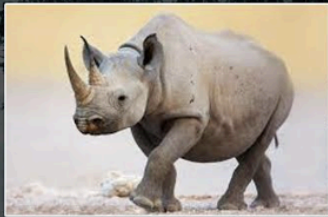


## h. Panel 8: Success Stories

# SUCCESS STORIES



"Look at you when you're coming here. It's a success because you knew [to come here]. The information to flourish out. Yeah, yeah. That is a success. Although there is a lack of funding or whatever whatever, but also on the other hand, also success. You know, they said Rome was not built in a night. But successes are there, yeah."



"The community is starting to appreciate the diversity in nature to say that everything in nature is that important. It's just that you don't understand for now, but if you study, it is important."

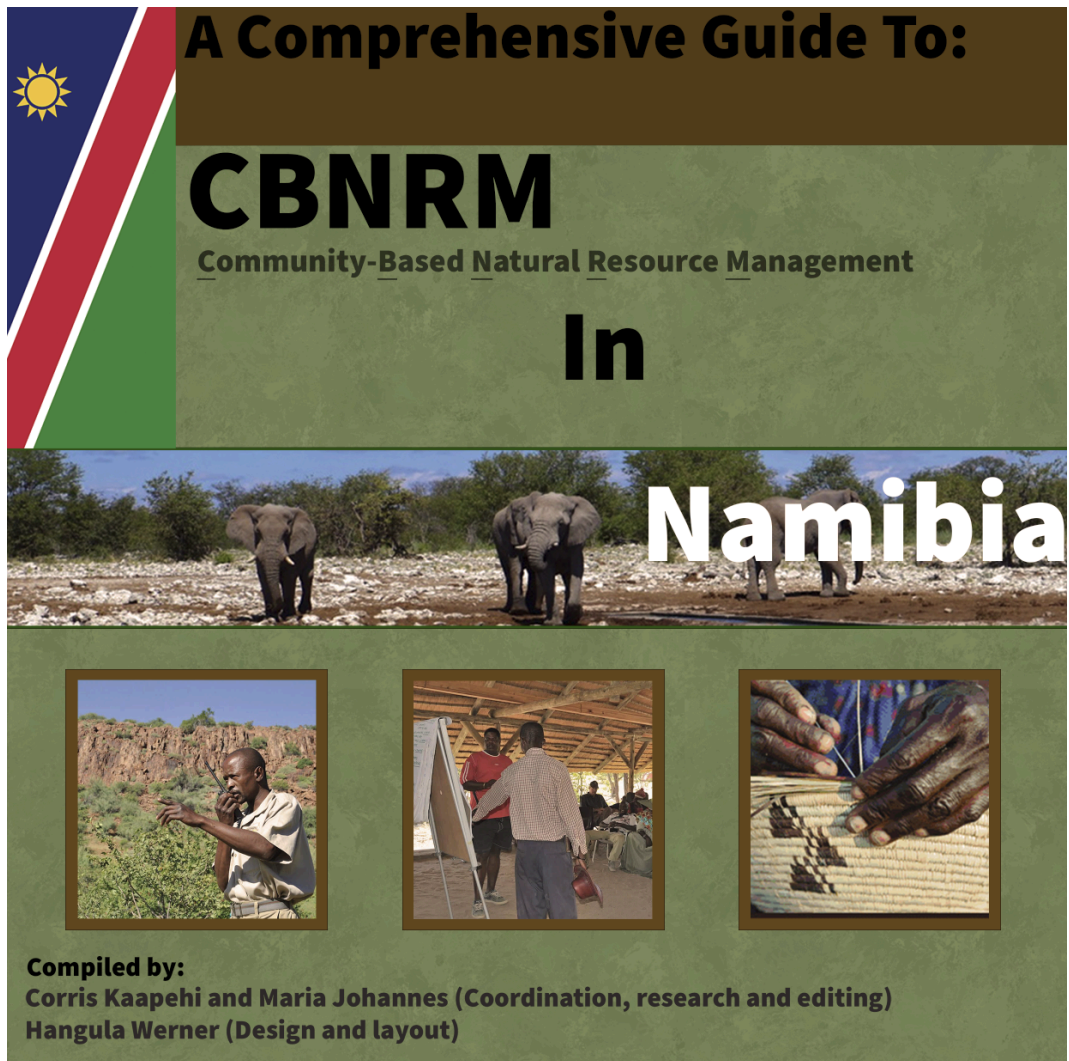


"It has truly impacted my lifestyle, as I see it. As I said, we were truly suffering. You didn't know where to turn, but now at least there's that resource available. There are opportunities. There are things to do. It also affects your lifestyle, because at times, you didn't even have enough to eat or to send your child to school. But now, with the income from selling coal or wood, you can cover your child's school fees and provide for their basic needs, including clothing and food."





## Appendix 5: Booklet



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## Aknowledgements

Lorem Ipsum



## Foreword

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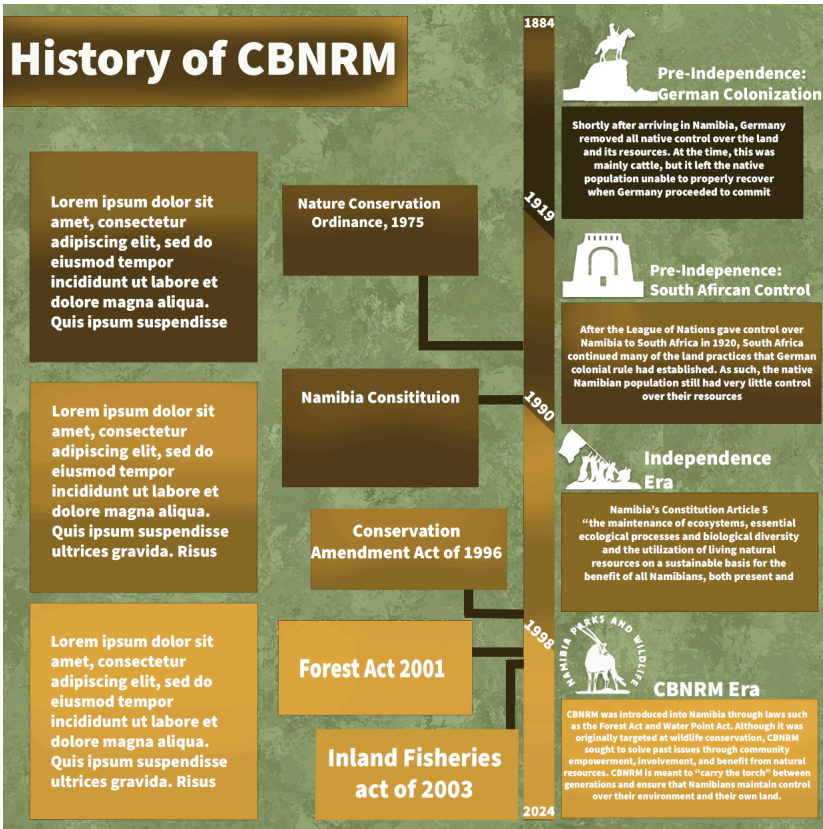
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# What is CBNRM?

Graph or chart from NACSO

<h3>Conservancies</h3> <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Quis ipsum suspendisse ultrices gravida. Risus commodo viverra maecenas accumsan lacus vel facilisis.</p>	<h3>Fisheries Reserves</h3> <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Quis ipsum suspendisse ultrices gravida. Risus commodo viverra maecenas accumsan lacus vel facilisis.</p> 	<h3>Community Forests</h3> <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Quis ipsum suspendisse ultrices gravida. Risus commodo viverra maecenas accumsan lacus vel facilisis.</p> 	<h3>Community Associations</h3> <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Quis ipsum suspendisse ultrices gravida. Risus commodo viverra maecenas accumsan lacus vel facilisis.</p> 
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# Wildlife In Namibia



Find the following words in the puzzle.  
Words are hidden → ↓ ↘ ↙

- |          |           |           |
|----------|-----------|-----------|
| ELEPHANT | LION      | WILDBEEST |
| GIRAFFE  | ORYX      | ZEBRA     |
| HYAENA   | RHINO     |           |
| LEOPARD  | SPRINGBOK |           |

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Find all the hidden items:



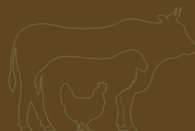
## Human-Wildlife Conflict



### Poaching



### Crop/livestock



### Illegal Harvesting



# CBNRM Challenges

**Human-Wildlife Conflict**

**Self Sustainability**

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**Governance**

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**Income Diversity**

**Global Issues**

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# Success stories

**Community-Based Organizations (CBOs)**

**Wildlife**

**Quotes**

Input graph or text about elephant recovery

Input graph or text about rhino recovery

# Future Goals



## Sustainable development goals



# Activity Notes



# Appendix 6: Conservancy Trip Photo Album









