RESILIENT WATERS BASELINE REPORT

UNDERSTANDING RESILIENCE IN THE LIMPOPO AND OKAVANGO RIVER BASINS

USAID RESILIENT WATERS PROGRAM

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USAID RESILIENT WATERS PROGRAM

Contract No. 72067418C00007

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ACRONYMS

CDC	Constituency Development Committees
CRIDF	Climate Resilience Infrastructure Development Facility
GESI	Gender Equity and Social Inclusion
SASSA	South African Social Security Agency
VDC	Village Development Committees
WASH	Water, sanitation and hygiene
ZAWA	Zambia Wildlife Authority

1. INTRODUCTION

Resilient Waters considers four capacities of resilience, which are widely recognized by resilience practice and scholarship: absorptive capacity, anticipatory capacity, adaptive capacity, and transformative capacity. While the baseline study takes all four capacities into account, we will only be able to consider transformative capacity after a follow up mid-term review, to build longitudinal data around transformative change.

The purpose of the baseline is to understand how households from different communities across the Resilient Waters footprint understand resilience, how (and if) communities are building resilience, and consider what this means for our programmatic work. The results have uncovered considerable variations in how households are defining resilience, that are driven by the region's varying government policies and capacities, varying ecological contexts, and demographic diversity in the region.

The baseline data will be presented in a range of ways, including site-specific knowledge products, and data visualization. The purpose of this initial report is to pull out key findings and trends that are particularly relevant to the Resilient Waters Program design, theory of change, and objective areas of work. While we do not want to over-simplify data that is complex and nuanced, we do want to collectively consider some key trends, and what they could mean for our work. Here, we are presenting some initial findings that will be discussed and presented in more detail as we collectively analyze the data, and match it to documentation and workshops that went into designing our theory of change. The intention of this report is not to interrogate the data in extensive detail or to present the findings to a wider audience, but rather to start a discussion about what the results mean for our planning. A further analysis and dissemination plan will be made in consultation with the Resilient Waters technical team.

2. APPROACH

The methodological approach for the baseline was designed around targeting the areas where our data would create the most value for the program. It begins with an acknowledgement that both the thematic and geographic reach of Resilient Waters work is far-reaching, and we are unable to gather data on all areas within our footprint. Therefore, we have been explicit about not replicating large surveys that include multi-dimensional poverty indices, or other measures of household wellbeing. Much of this data is already being gathered by national statistics agencies, and it is beyond our scope and focus. Instead, we are ground-testing our definitions of resilience and programmatic logic, by seeing how households are defining their own resilience, and how this relates to currently accepted programmatic and academic definitions, which are outlined below:

- **Absorptive capacity** is the ability of a household to respond effectively to shocks. Understanding that in addition to household capital, community support is critical to absorptive capacity, we explore where community members turn for support in case of a shock, and who has come, or could come to them for help. It will include relationships between both people to each other in the community, as well as people to institutions that are active across both basin areas. While the focus of this study will not be to look at their relationship to household level shocks, it will try and better understand the degree to which institutions in the region have mandates that are collectively exhaustive and mutually exclusive. It will identify areas of synergy, overlap, or gaps in existing mandates and areas of work. Given that an institutional capacity baseline will be carried out, this will be an additional piece of an institutional capacity map for the region.

- **Anticipatory and adaptive capacity** include the ability of a household to plan effectively to prevent negative results as a result of climate related or other shocks, and the ability of households and communities to make incremental changes in their behavior in response to the changing context. This includes the existence of early warning systems, trust in institutions supporting behavior change, the household uptake of available information, autonomy in decision-making of different household members, etc. This will be measured through a sense making question that explores planning at a household level, and the extent to which these plans seem to be efficient for the household.

- **Transformative capacity** looks at shifts in existing power relations to build new social dynamics that shift resilience and reduce vulnerability to shocks. We will measure transformative capacity by disaggregating absorptive and adaptive capacity by gender, language, etc., and seeing whether, over time, there appear to be changes in the spread of resilience across social fault lines.

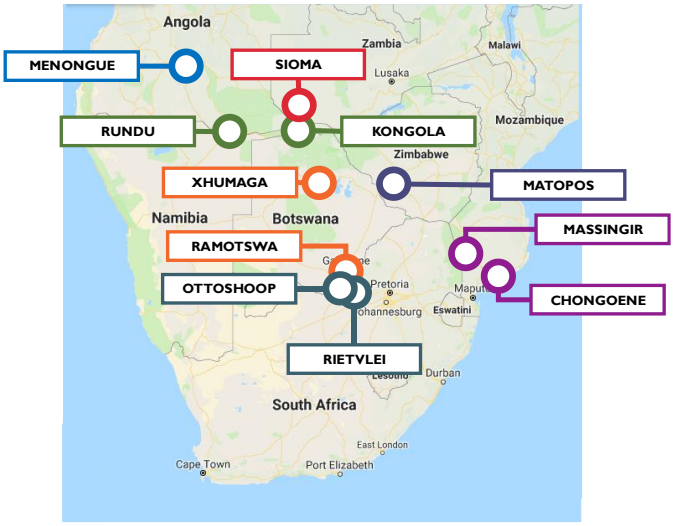
2.1. SAMPLING

The sample for this study was drawn at two levels. First, communities were chosen based on the hotspot analysis, to include as diverse a range of locations as possible. Considerations included community characteristics such as the dependency ratio in the community, population growth, language, economic base, etc. as well as ecological characteristics, such as areas that are of particular sensitivity to the river basin ecology, a diversity of land management issues, availability of water, etc.

The baseline survey was conducted across 11 sites in seven countries, as shown in Figure 1. All 11 sites fall into hotspots identified by the Resilient Waters technical team. The sites per country were:

- **Angola:** Menongue
- **Botswana:** Ramotswa and Xhumaga
- **Mozambique:** Chongoene and Massingir
- **Namibia:** Kongola and Rundu
- **South Africa:** Rietvlei and Ottoshoop
- **Zambia:** Sioma
- **Zimbabwe:** Matopos

Figure 1: Map of surveyed sites



Once communities were identified, maps were used to draw a random household level sample large enough to be representative of the entire community. In certain areas, it was possible to reach nearly the entire population in a community, in other areas, we used a selection of streets or neighborhoods that again tried to account for diversity within the community. At each household, the first available adult present responded, while data collection teams did an overall check for gender and age balance if needed.

While this sampling strategy will not allow us to generalize across both basin regions, it will allow us to generalize within the communities sampled, and given the diversity of community characteristics, will allow us to draw reasonable hypotheses about other areas within the project footprint.

2.2. DATA COLLECTION METHOD

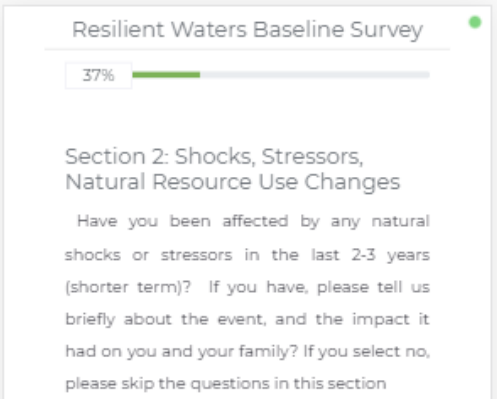
A narrative approach to data collection was used, drawing on the principles of sensemaking.

> "Sensemaking is an innovative **narrative-based** research, monitoring and decision-making methodology. It is designed to help **generate actionable insights and guide interventions in complex systems and processes**. Sensemaking recognizes that narratives may allow better access to **contextualized knowledge and interpretation** enabling respondents to analyze and give meaning to their own stories."[1]

In collecting data using a sensemaking approach, there are four key steps:

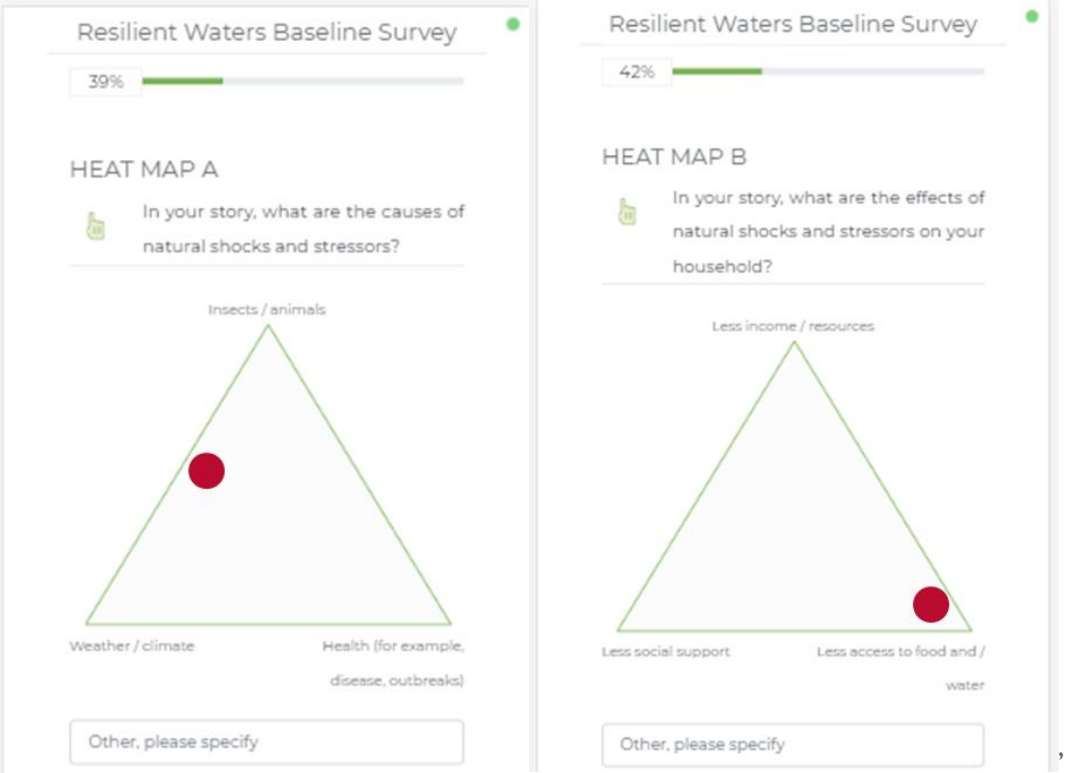
- **Prompting question:** The prompting question asks the respondent to reflect on the subject of the research and tell the enumerator a story about the subject. An example of a prompting question is shown in Figure 2 which is a screenshot from the application developed for the Resilient Waters baseline.
- **Story capture:** This answer is then captured. In the Resilient Waters baseline, the answer was both written down and captured.
- **Self-signification:** Once the story is captured, the respondent is asked to interpret the story using a series of triads or dyads. This is shown in Figure 3 below.
- **Visualization:** All of the responses are mapped to highlight key trends.

Figure 2: Sensemaking prompting question



[1] https://www.ids.ac.uk/events/sensemaker-using-micro-narratives-for-monitoring-evaluation-and-learning/

Figure 3: Examples of self-sign from the Resilient Waters baseline



3. FINDINGS

This section of the report outlines our overall findings. This section provides background information from the baseline, outlines our findings on what resilience means, how natural resources contribute to resilience and how people receive support. We then delve into our findings on the grassroots understanding of resilience, and our initial findings and recommendations for each objective area.

Section Summary 1: Findings

Background

- Water is central to resilience across both river basins, and uneven access to water was the central problem faced by most households in the baseline study.

What resilience means

- Consistently, across the region, resilience is being linked to social protection. Details varied on which processes and institutions provide this, but it is an overlooked, yet core complement of resilience in the region.

How do natural resources contribute to resilience?

- Communities with higher dependency ratios tend to displace cash needs with natural resources, but are less likely to depend on activities that convert natural resources into cash.

How do people receive support?

- People younger than 35 are more likely to report receiving the support they need than older people. Men are more likely than women to report receiving support from institutions.

3.1. BACKGROUND

Water is central to resilience across both river basins, and uneven access to water was the central problem faced by most households in the baseline study. Lack of water is threatening household health and wellbeing, limiting sources of income, threatening cultural heritage across the region, and increasing conflict within communities. These findings are illustrated in We obtained over 1,038 survey responses from 12 sites in the seven Resilient Waters countries. Fieldworkers conducted interviews in a number of different languages, including English, Setswana, Mbukushu, Portuguese, Shangaan, Ndebele, and Shona. However, most responses were translated and captured in English for ease of analysis. Table 1 indicates the number of survey responses by country as well as the total number of responses. which shows the most common responses to households being asked what their biggest source of stress is.

Figure 4: Word cloud of key sources of household stress

We obtained over 1,038 survey responses from 12 sites in the seven Resilient Waters countries. Fieldworkers conducted interviews in a number of different languages, including English, Setswana, Mbukushu, Portuguese, Shangaan, Ndebele, and Shona. However, most responses were translated and captured in English for ease of analysis. Table 1 indicates the number of survey responses by country as well as the total number of responses.

Table 1: Number of surveys conducted, by country

Country	n
Angola	136
Botswana	141
Mozambique	348
Namibia	144
South Africa	99
Zambia	77
Zimbabwe	93
Total	**1,038**

67% of respondents are female, while 57% of respondents are 35 or older. Angola reported the lowest number of years spent in the community, which makes sense given it also had the highest percentage of youth respondents. This is shown in Table 2 below.

Table 2: Percent youth and average time in community, by country

Country	Share youth (%)	Average time in community (years)
Angola	56%	14.5

Country	Share youth (%)	Average time in community (years)
Botswana	29%	35.1
Mozambique	51%	15
Namibia	49%	20.6
South Africa	26%	15.8
Zambia	47%	25.8
Zimbabwe	35%	23.4

The survey uncovered tremendous variability across the region in terms of both use of natural resources, and attitudes towards them. When disaggregated to community levels, this baseline helps us understand the granularity of experiences, as well as the trends emerging. Figure 5, Figure 6 and Figure 7 show, respectively:

- There is significant variation in the perception of animals, with most of the concentration around seeing animals as a source of food or as a threat.
- Plants are most commonly viewed as a source of food and / or income. Interestingly, predominantly older respondents view plants as a threat, which may be due to greater familiarity with invasive and / or poisonous species.
- Water is commonly viewed as a source of food or livelihood. Some respondents view water as a threat due to human-wildlife conflict.

Figure 5: How animals are viewed by households

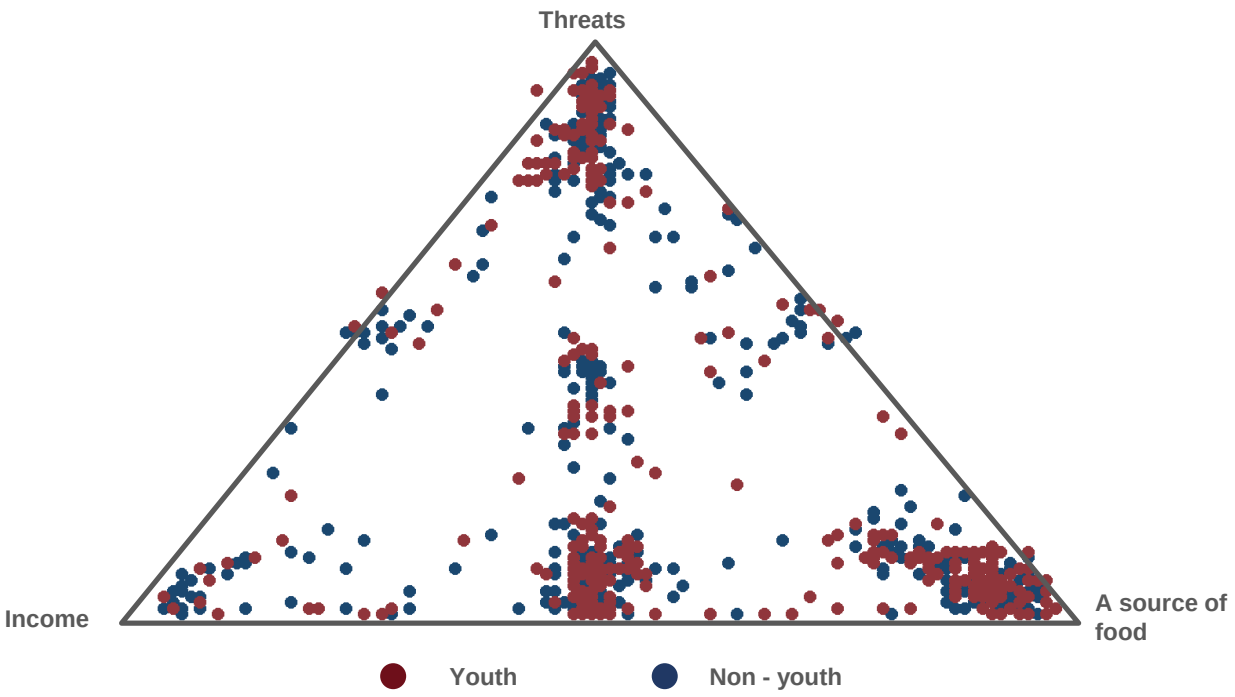


Figure 6: How plants are viewed by households

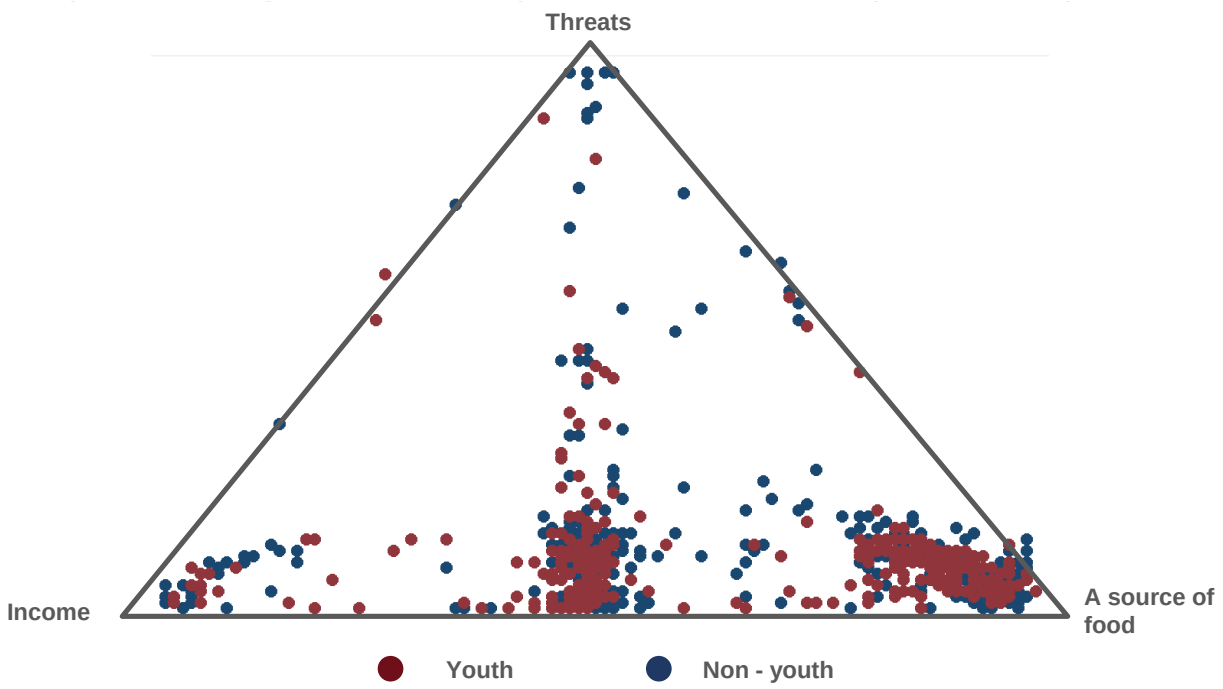
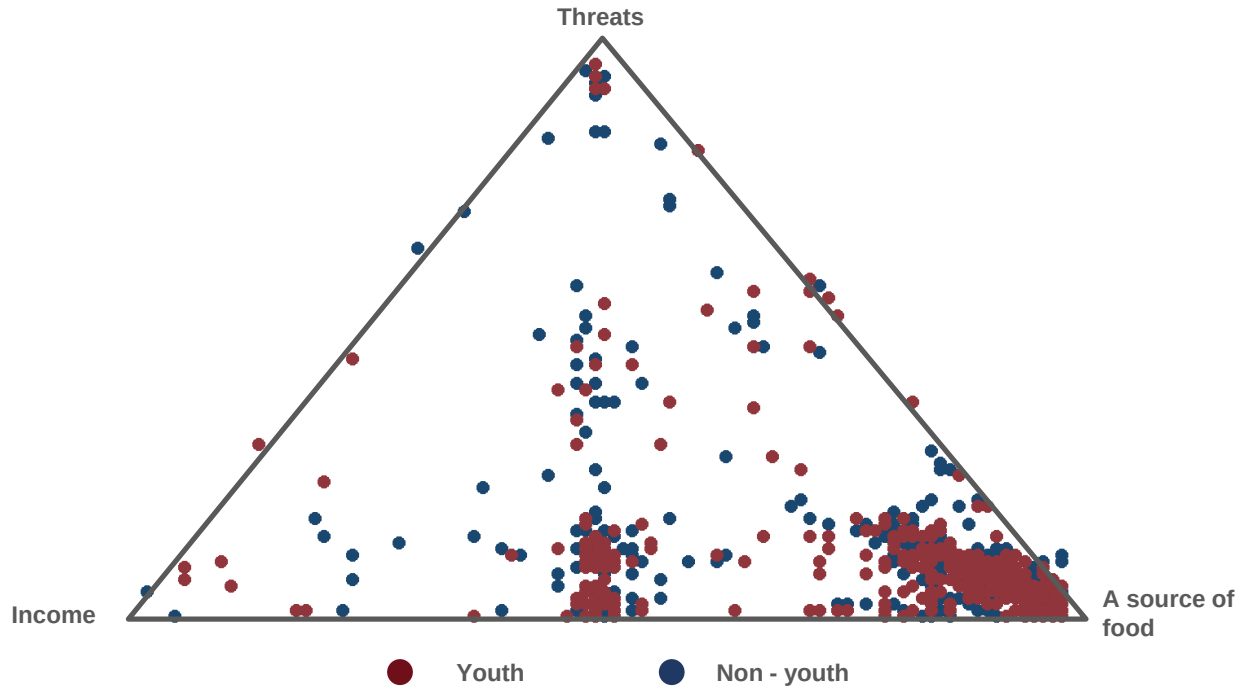


Figure 7: How water is viewed by households



3.2. GRASSROOTS UNDERSTANDING OF RESILIENCE

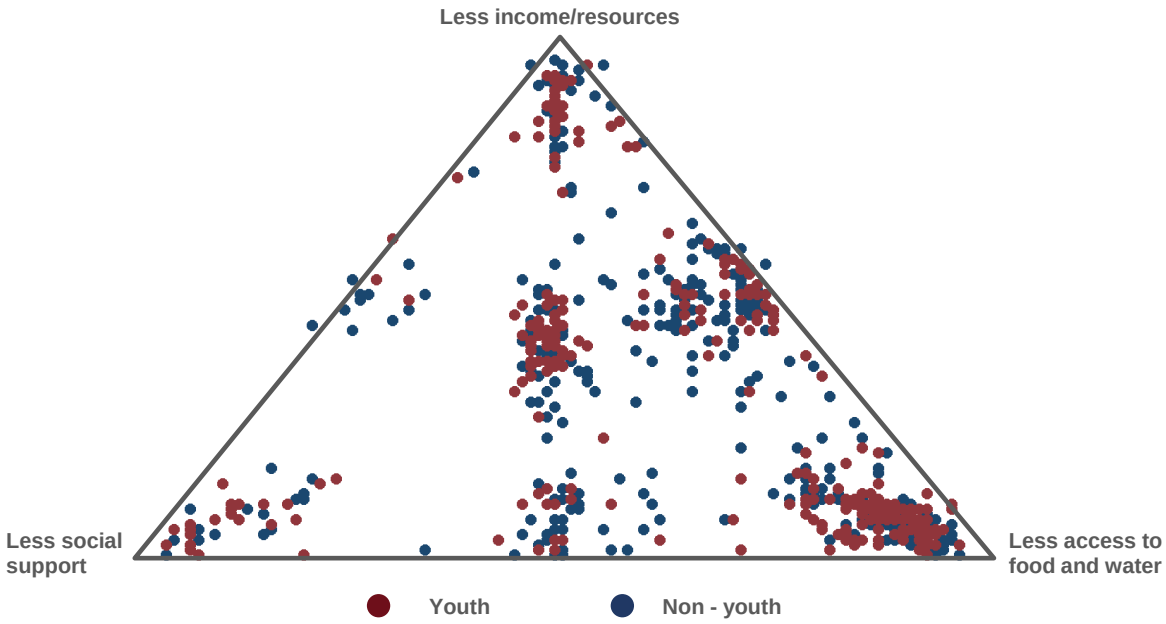
Based on qualitative data of respondents talking about their experiences responding to natural shocks and stressors that they have experienced, resilience had four determinants, all with implications for the work of the Resilient Waters Program. These are social protection, social cohesion, agency to plan and cultural heritage.

3.2.1. SOCIAL PROTECTION

Social protection was the most widely acknowledged determinant of resilience, with respondents widely referring to systems to support their access to food, housing, and other basic needs as critical to recovering from natural shocks and stressors. When discussing institutional sources of support, government social protection or welfare agencies were the most cited institution. This may be explained by the fact that a majority of households in the region responded that natural shocks and stressors limited household access to food and water. This is shown in Figure 8 below.

Figure 8: Effects of natural shocks and stressors on the household

NATURAL SHOCKS AND STRESSORS HAVE MULTI-DIMENSIONAL EFFECTS ON THE HOUSEHOLD, WITH SIGNIFICANT CONCENTRATION AROUND LESS ACCESS TO FINANCIAL RESOURCES AS WELL AS FOOD AND WATER.



3.2.2. SOCIAL COHESION

Social cohesion was also a widely cited determinant of resilience, commonly defined as "the willingness of members of society to cooperate with each other in order to survive and prosper." Respondents were more likely to be able to recover from a shock if not only their neighbors or community members helped them, but if they also helped their neighbors or community members in times of need. Conversely, social exclusion was cited as a driver of vulnerability. In places where crime was listed as a concern, other possible drivers of exclusion, like disability, gender-based violence, etc. were also discussed with more frequency.

3.2.3. AGENCY TO PLAN

Agency to plan was described as critical to resilience. In places with sufficient social protection for households to have resources to invest in the future, respondents drew the most immediate linkages between resilience and climate change.

The baseline survey asked respondents to report on whether they have made any specific plans to respond to future natural shocks and stressors, with 62% of survey respondents reporting to have some type of plan. Some of the plans described included, "run," "reinforce my home," and "seek help."

Unpredictable weather patterns, and unpredictability in the availability of water in particular was often cited as the key feature undermining their ability to plan adequately for the future. For instance, one respondent said, "If things happen, they just happen. It is beyond our control."

The survey results show interesting findings regarding respondents' planning activities. Most notably, whether the respondent is a youth or is located in more urban areas with a low dependency ratio are both significant predictors for whether they report to have a plan. These results are shown in the table below.

Table 3: Share of respondents who report to have a plan by youth and dependency ratio

Variable	Youth	Non-youth	Significance level
Have a plan (%)	67%	60%	<0.05
	Low dependency	**High dependency**	**Significance level**
	68%	55%	<0.01

3.2.4. CULTURAL HERITAGE

Cultural heritage came through as an important component of resilience. While many households were clear that they were making decisions about planting, animal husbandry, and other livelihoods activities that may not have economic payoffs and are in fact significant expenses in drought conditions, they form a background of local culture, and way of life. Appropriate activities aimed at strengthening resilience must take into consideration cultural resonance to be effective.

3.3. OBJECTIVE 1: THE RESILIENCE, INSTITUTIONS AND POLICY NEXUS

3.3.1. DESCRIPTION

Section Summary 2: The resilience, institutions and policy nexus

- Two types are organizations are particularly important to communities: social welfare organizations and departments of wildlife.
- Trust in institutions is relatively low. Women, in particular, do not feel as if they could turn to institutions for support.
- Some policies developed with institutions we are working with have had significant (positive and negative) impacts on communities.

The communities we reached in the baseline drove home the varied institutional presence in communities across our footprint. Across all respondents, only 56% reported to know of at least one organization they can turn to for help if their household is adversely affected by a natural shock or stressor and they cannot handle the situation themselves. This figure was consistent across the youth/non-youth age groups. However, there were significant differences in the share of males reporting to have at least one organization they could turn to for help; 60% of male respondents identified at least one organization, in comparison to 53% of female respondents. This is shown

in the table below and points to a need for Resilient Waters to focus on the Gender Equity and Social Inclusion (GESI) component of our work in component 1.

Table 4: Respondents reporting to know at least one organization by gender

Variable	Male	Female	Significance level
Report to know at least one organization they can turn to for help (%)	60%	53%	<0.10

Two types of organizations stood out as being particularly important to communities; social welfare organizations, such as the South African Social Security Agency (SASSA), and departments of wildlife, whether through the execution of their mandate to assist communities in dealing with problem animals and mitigating human-wildlife conflict, or through their role in reimbursing communities from livestock loss due to predation. The work of both organizations is well understood by communities, and if Resilient Waters were to aspire to integrate our institutional support work with livelihoods work there would be many impactful ways to strengthen their efficiency and effectiveness through peer learning or institutional support.

Across most sites, trust in institutions was relatively low. While respondents cited a range of institutions that they could turn to for assistance, including traditional leadership, NGOs, churches, and community associations or structures, they did not feel confident that these organizations had the mandate or capacity to support them sufficiently.

While there were no statistically significant differences by age in the share of respondents reporting to know of at least one organization that could help them in a time of need, youth were significantly more positive about the likelihood of receiving support from the organization they listed. This was similarly the case with lower dependency ratio communities. Both of these findings are indicated in the table below, where a score of one indicates "very unlikely" and a score of five indicates "very likely."

Table 5: Likelihood of receiving support from the organization listed by age and dependency level

Variable	Youth	Non-youth	Significance level
Likelihood of receiving support from the organization	3.4	2.8	<0.01
	Low dependency	**High dependency**	**Significance level**
	3.5	2.6	<0.01

Certain policies developed by the institutions we are working with have significant impact in communities, both positive and negative. In communities where confidence in institutions is weak, stronger communications around the community benefit of certain policies is essential, and the identification of good practice among departments would effective policies would be valuable.

3.3.2. RECOMMENDATIONS

- Consider deepening our work with our key beneficiary institutions to include the member country organizations, where reach is stronger in communities. The potential for significant impact to be felt on livelihoods through institutional support at this level is significant for Resilient Waters.
- To feel scaled, grounded impact in our institutional work, we should consider some path of engagement with institutions having a community reach, such as departments of wildlife.

- Strengthen the GESI focus of this area of work particularly, where results have demonstrated significant gaps in the inclusion of women.

3.4. OBJECTIVE 2: THE RESILIENCE, WATER, SANITATION AND HYGIENE NEXUS

3.4.1. DESCRIPTION

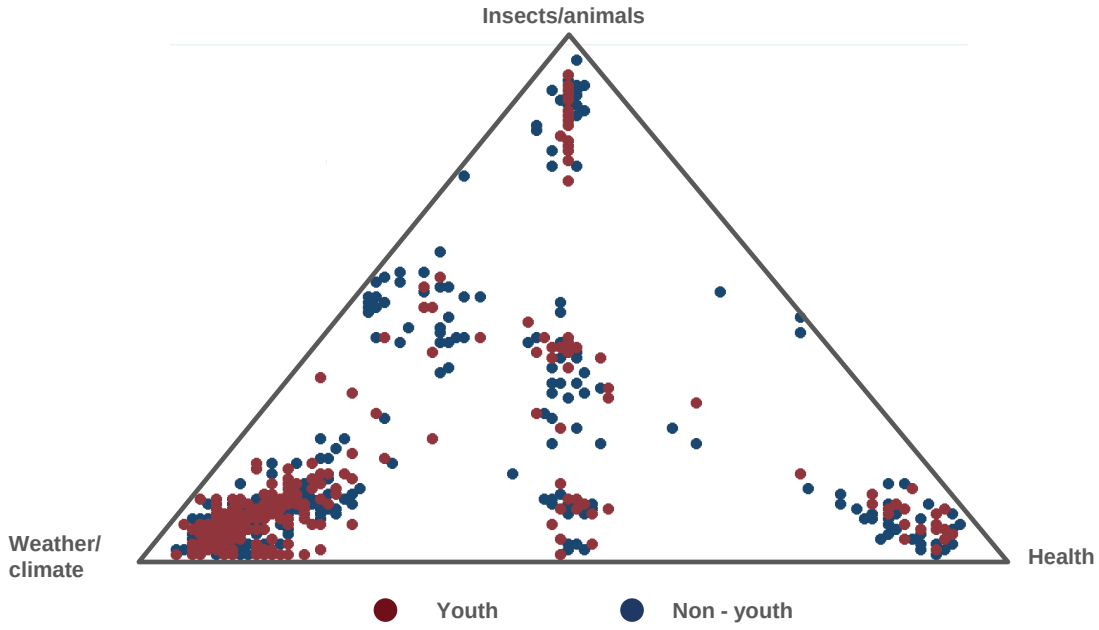
Section Summary 3: The resilience, water, sanitation and hygiene nexus

- Water is the key challenge faced by communities in the region, and a lack of water, sanitation and hygiene (WASH) infrastructure is not just a threat to livelihoods, it has also been identified as a source of conflict with humans and wildlife, undermining trust in institutions, and inhibiting future planning.
- There is strong dissatisfaction with funding mechanisms for water service provision. Water financing models were identified as a frequent source of conflict in communities, and a threat to social cohesion.
- Competition for water with animals was the primary driver of human-wildlife conflict.
- Sanitation is a pressing concern across our footprint but requires attitude changes for linkages to resilience.

There is no question that access to water is the key challenge faced by communities in the region, and there is huge need for WASH infrastructure. Figure 9 below shows that the most frequently cited cause of natural shocks and stressors was related to weather and climate issues; a review of the data revealed that this was predominantly linked to ongoing drought across the program countries, which was the most frequently cited source of shock, at 38% of respondents.

Figure 9: Causes of natural shocks

WEATHER AND CLIMATE WERE THE MOST FREQUENTLY CITED CAUSES OF NATURAL SHOCKS AND STRESSORS EXPERIENCED BY HOUSEHOLDS



While Resilient Waters cannot do everything, some areas emerged that could inform strategic interventions. Across nearly all sites, there was a strong dissatisfaction with the funding mechanisms for water service provision. The shape of this varied across sites, but included strong dissatisfaction with a revenue collection model of water service provision in urbanizing areas. Parastatals in many areas had implemented new systems of payment for services, and they often faced challenges in management, resulting in frustration and noncompliance.

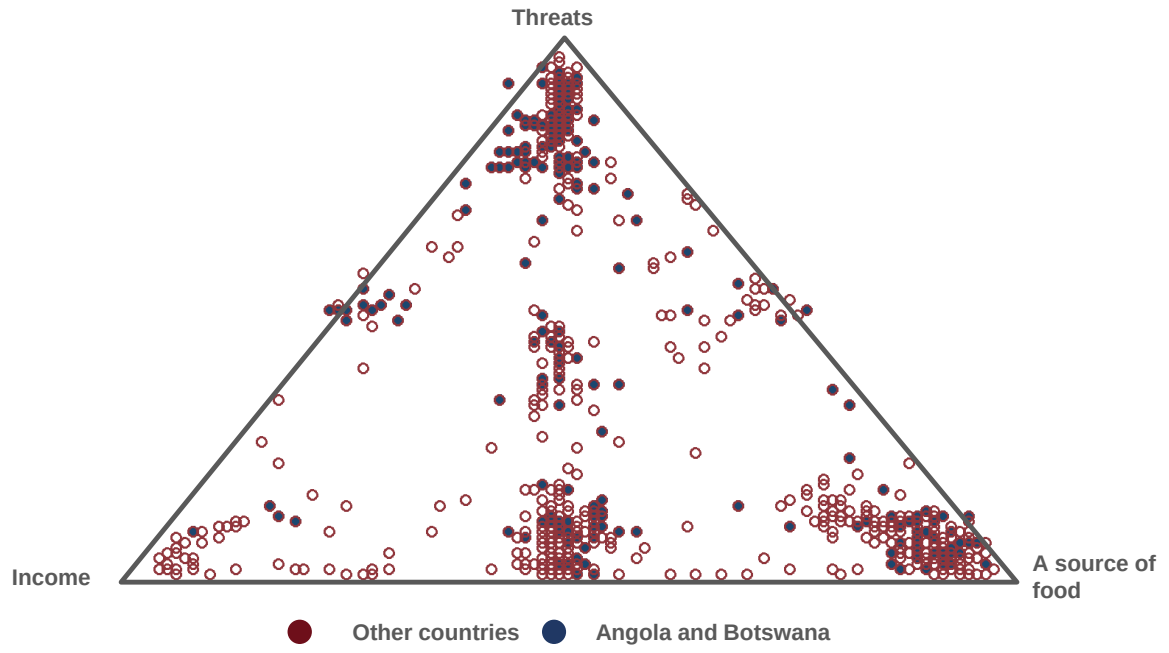
Water financing models were identified as a frequent source of conflict in communities, and the threat to social cohesion and community support was identified as a key threat to resilience. This included a case in South African where water was controlled through quasi-vigilante takeover of the only two water sources in the community, to Botswana, where the associations required for collective borehole applications were identified as frequent sources of conflict. Furthermore, a lack of viable, legal, quality water sources for household use led to households accessing public water sources such as schools or clinics. This was an additional source of stress in communities.

In addition to conflict within communities, competition for water with animals increased human-wildlife conflict significantly in the area. In several different sites in our sample, respondents noted that wildlife had not been a source of threat to households in the past, but due to ongoing drought or water scarcity, animals were being driven into human settlements, leading to a range of conflict. Human-wildlife conflict was the third most frequently cited cause of natural shocks, at 8% of survey respondents.

Not only does it make gathering water dangerous in sites where humans and animals share water sources, it caused animals to habituate themselves to settlements, creating a range of other problems, including threatening systems of grain storage, shifting patterns of care-giving with children occasionally being threatened while walking to and from school, etc. While Figure 5 showed significant variation in respondents' views of animals, disaggregating at the country level reveals that predominantly respondents Angola and Botswana reported to see animals as threats. This is shown in Figure 10 below.

Figure 10: View of animals, Angola and Botswana versus other countries

ANGOLA AND BOTSWANA WERE THE TWO COUNTRIES WHICH MOST FREQUENTLY REPORTED ANIMALS AS THREATS



Sanitation is also a huge source of concern across our footprint, with many respondents citing lack of adequate toilets as the secondary problem they faced, after poor access to water. While most respondents strongly linked water to human rights, social protection and resilience, sanitation did not receive the same priority status; there is a need for changes in attitude and behavior to underpin infrastructure development.

3.4.2. RECOMMENDATIONS

- Additional work should be done to identify water financing mechanisms that support community collaboration, as opposed to competition.
- Uneven ability to manage systems of payment for use are resulting in high levels of noncompliance, and significant community dissatisfaction. This is an area where components 1 and 2 could work together on strengthening institutional capacity.
- Where possible, partnerships should be strengthened with national governments, Climate Resilience Infrastructure Development Facility (CRIDF) and other infrastructure development initiatives; there is a reputational risk for our work in communities if there are not some connections to infrastructure service provision, as this is an expectation, even if we have not set it, and try to manage it.

3.5. OBJECTIVE 3: THE RESILIENCE, LIVELIHOODS NEXUS

3.5.1. DESCRIPTION

Section Summary 4: The resilience, livelihoods nexus

- Communities with higher dependency rations do not monetize natural resources in the same way as communities that are already more economically integrated into the cash economy.
- In communities with higher dependency ratios, there are fewer institutions and people to turn to for help and planning is more difficult.
- Farming is culturally grounded but the level of indigenous skills and knowledge is uneven.
- Local radio is a critical source of information for communities in our footprint.

The dependency ratios of communities, aligning closely to levels of urbanization, emerged as highly significant for the way we understand resilience. It shapes the availability of support from both people and institutions, as well as the use of natural resources and access to markets for them. While natural resources are widely used to offset cash needs, it is critical that we consider how multiple forms of marginalization shape the way we conceptualized our livelihoods work, and reiterates the importance of considering social protection in this area of work. It also suggests we need to consider the role of migration and remittances in our livelihood diversification work.

While there were not any significantly significant differences between age groups in the share of respondents reporting to know at least one organization they could turn to for help, Table 5 above demonstrated that youth were more confident that they would receive support. Similarly, significantly more youth reported to have at least one person they could turn to for help, and were also more confident about the likelihood of receiving support. This is shown in Table 6 below. These findings are important because we may not be sufficiently acknowledging the vulnerability faced by older strata of the population.

Table 6: Report to have one person and likelihood of receiving support by age group

Variable	Youth	Non-youth	Significance level
Report to know at least one person they can turn to for help (%)	73%	51%	<0.01
Likelihood of receiving support from the first person listed (1 = very unlikely, 5 = highly likely)	4.4	3.9	<0.01

We see similar results when we look at these variables by the level of dependency within the community. This is shown in Table 7 below.

Table 7: Report to have one person and likelihood of receiving support by community dependency ratio

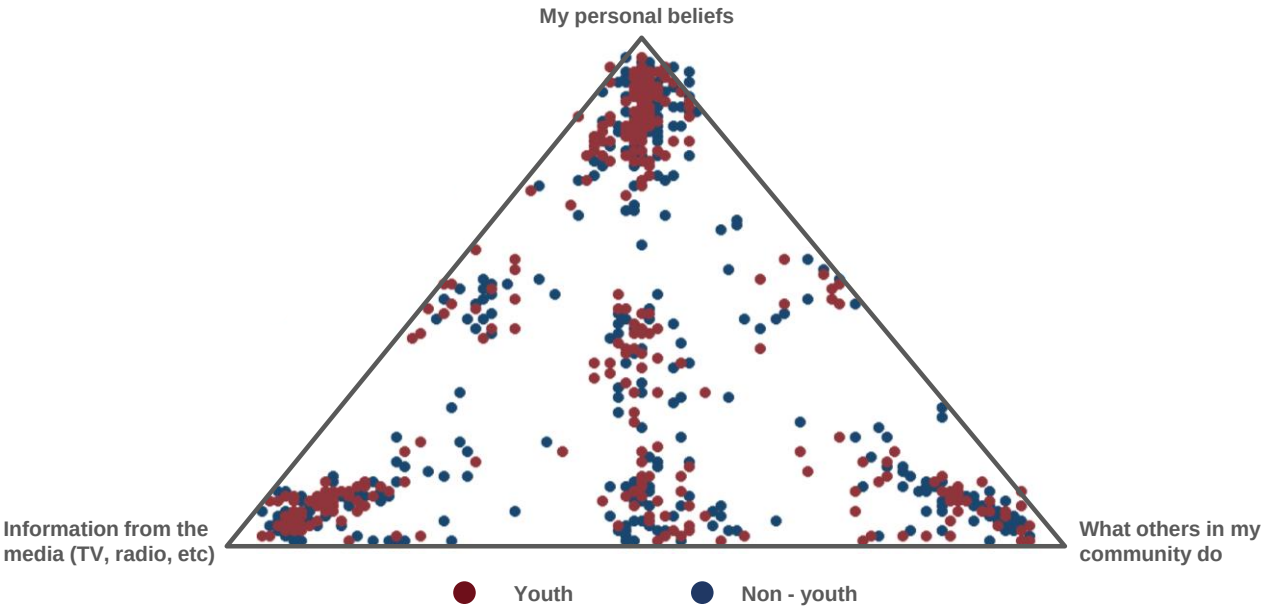
Variable	Low dependency	High dependency	Significance level
Report to know at least one person they can turn to for help (%)	74%	45%	<0.01
Likelihood of receiving support from the first person listed (1 = very unlikely, 5 = highly likely)	4.6	3.7	<0.01

Furthermore, while nearly 75% of respondents were making plans for their own future, this is not happening equally. In communities with high dependency ratios, planning is much more difficult. This was shown in Table 3 above.

In exploring approaches to livelihood diversification, two things became clear. One is that both farming and animal husbandry are culturally grounded, and including a heritage dimension in our understanding of resilience is critical to understanding how we believe change could happen. There are uneven indigenous skills and knowledge that have the potential to be identified and unlock community buy in for improved land management. Finally, in socializing any awareness or behavior change component of livelihoods work, the emphasis on local radio became apparent, with it being cited as the most highly considered information source in decision-making.

Figure 11: Sources of information when planning for natural shocks

THERE IS SIGNIFICANT VARIATION IN THE SOURCES OF DECISION-MAKING. A LARGER CONCENTRATION OF YOUTH ARE MAKING DECISIONS BASED ON INFORMATION FROM THE MEDIA, WITH THE RADIO BEING MOST FREQUENTLY CITED.



3.5.2. RECOMMENDATIONS

- Target further work on indigenous knowledge that could strengthen natural resource management practices
- Consider the cultural heritage components of resilience, and see how we can integrate this into our livelihoods work
- Target community radio in disseminating messages.

3.6. OBJECTIVE 4: THE RESILIENCE, NATURAL RESOURCE MANAGEMENT NEXUS

3.6.1. DESCRIPTION

Section Summary 5: The resilience, natural resource management nexus

- In many communities there are conservation tradeoffs being made. In bringing communities into conservation, we need to acknowledge that the starting point is characterized by distrust and conflict.
- In looking at land use planning and management, we found a misalignment between mandates, capacities and accountabilities across local governments, national departments and traditional leadership.

Our baseline study is bringing back a dilemma for the program logic of objectives 3 and 4 to work out. Resilient Waters are premised on an overall conceptual framework that links better livelihoods to better environments. While this may be true in the long run, currently, in many communities, there are tradeoffs being made that should be acknowledged, and that impact community attitudes and practices towards the environment. For

example, authorities responsible for mitigating human-wildlife conflict in many places are not trusted at all, with accusations that they are more concerned about the lives of animals that people. For instance, one fieldworker in Zambia experienced challenges in collecting data from some households, because community members saw the boots he was wearing and thought he was from the Zambia Wildlife Authority (ZAWA).

While Resilient Waters recognizes the need to bring communities into conservation, this needs to be done with an acknowledgement that we are starting in a place that is quite far from this ideal.

From a land use planning and management perspective, there is a misalignment between mandates, capacities and accountabilities. While country by country regimes differ considerably, in many places, local governments have widespread powers allocating rights to land use, while national departments then face the consequences of agriculture causing water scarcity across regions. This is creating accountability gaps, and further feeding into a lack of trust in institutions discussed above. A mapping of this could be useful not only for the work of this component, but for beneficiary organizations aiming to harmonize some components of these policies. At the crux of this is a focus on how local planning is institutionalized and cascaded upwards. This is a place where case studies and building on good practice could be particularly useful. Objective areas 1 and 4 could collaborate effectively in this area of work.

3.6.2. RECOMMENDATIONS

- Consider foundational pieces of work that can build trust between community development and conservation initiatives.
- Consider mapping mandates and accountability with regards to land use planning and management.
- Consider identifying good practices in which local planning is institutionalized and 'passed up' through spheres of government.

4. CONCLUSION

The baseline affirmed the relevance and importance of Resilient Waters in the region, given the central importance water has to households across the region. The baseline study has suggested some of the ways in which local variations across the region need to shape our work to be relevant. It has also contributed to an understanding of resilience that is appropriate to our region, and ensures social protection and cultural heritage are seen as central to our work.

Certain recommendations have been made to the objective areas of Resilient Waters, to acknowledge that women and men are not currently equally served by institutions in the region, and to acknowledge that levels of trust within communities about issues of conservation are currently quite low. Resilient Waters should look for cases of collaborative collective action, and other cases of good practice in effective institutions within communities.

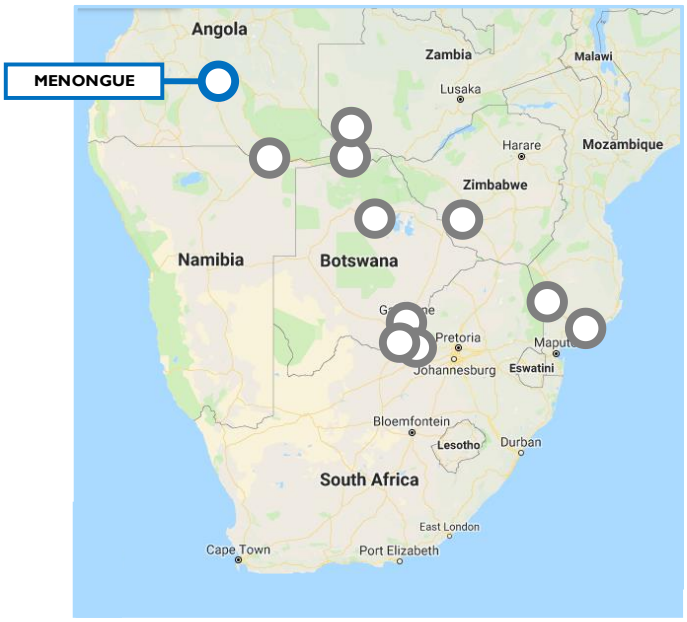
ANNEX 1: SITE DESCRIPTIONS

While many of the trends emerged through aggregated data, certain trends are more apparent at a community level. While this initial report will not delve in detail on data trends across all sites, it is important to get a sense of the varied communities and their water access landscape, attitudes towards natural resources, sources of support, and other key components of resilience. What we have below are brief descriptions of the communities, not intended to fully interrogate the data from each of these places, but simply to provide sufficient background information to get a sense of the community and its situation, to help interpret the report and its recommendations.

ANGOLA

MENONGUE

Menongue Municipality is located within the Cuando Cubango province in Angola was estimated to have a population of 320 914 people in the census conducted in 2016, and an estimated population of 372 444 people in the year 2019. Menongue is rich in wildlife and biodiversity, as well as cultural diversity. It is home to two national parks namely Mavinga and Leungue—Luinana which are both estimated to cover land area of about 6.8 million hectares[2].



BRIEF DESCRIPTION OF RESEARCH PROCESS

ACADIR supported the baselines data collection process by providing four of its staff members as enumerators, one staff from the Resilient Waters Program supported the data collection process as well as one staff member from Genesis. In total 118 surveys were collected within a period of five days. No key informant interviews were conducted. However, assistance was provided by the local administration in some of the communities as well as from the local chiefs.

NATURAL RESOURCE CHARACTERISTICS

Although some areas in Menongue are currently faced with a drought, and the land within the city area is mostly dry sand, Menongue is home to several small rivers which fall within the Okavango River Basin. The area houses some of the forests which are susceptible to wild fires, posing a threat to the wildlife biodiversity population.

The relationship between people and natural resources is very strong with a huge reliance on natural resources for the sustainability and carrying out of daily activities. Specifically, communities are heavily reliant on forests for making fires to prepare food, building houses, and other infrastructural requirements by households.

[2] https://www.bizcommunity.com/Article/7/422/150308.html

Communities are heavily reliant subsistence farming as a means of accessing food and remaining food secure, which includes planting and harvesting maize, beans and wild spinach.

LIVELIHOOD CHARACTERISTICS

Some of the livelihood strategies, especially for those who are not formally employed, include subsistence farming, as well as selling crops, petrol, and vegetables to earn an income, while others sell clothing and other items. However, as a result of the drought, most vegetables stalls contain few vegetables as stock for sale to other members of the community. Some of the challenges people indicated to their livelihoods include:

- Lack of access to employment, and healthcare.
- Human-wildlife conflict, between people and crocodiles. There are more crocodiles in the Okavango river as a result of less water which makes it hard for communities to access the river for their daily activities (washing, and bathing) and accessing their crops, especially those who have gardens near the river.

RESILIENCE IN MENONGUE

Many households noted that they would feel more resilient if they had access to resources. These included a variety of resources based on households needs. For example, in some areas, households considered these resources in the context of more economic opportunities, while others noted the importance of accessing drought resistant seeds to ensure that they can plant more crops with minimum access. In a nutshell access to resources in varying forms was central to how the sampled communities defined resilience.

BOTSWANA

RAMOTSWA

The town of Ramotswa is located near the capital of Botswana, Gaborone, and houses a population of 27,760 residents. The town is approximately a 45-minute drive from Gaborone. The community has access to natural resources, but residents do not make use of these resources as a primary means to meet their needs. Households have access to government supplied resources and make use of these. However, recently the community have been experienced changes in the way public water has been managed. Water is now manager by the Water Utilities Corporation. Households noted that the Water Utilities Corporation have not connected the water lines and therefore the community has less access to water.

BRIEF DESCRIPTION OF RESEARCH PROCESS

Research in Ramotswa was conducted over four days. In order to operationalize this, there were three local enumerators who were university students with research experience, and who could all speak both English and Setswana.

The research was conducted through the Resilient Waters survey tool through both paper-based and online surveys where data was collected from 56 residents of the community. There were also three members of the Genesis Analytics team that analyzed and synthesized the data collected by the enumerators.

NATURAL RESOURCE CHARACTERISTICS

In March 2019, the president of Botswana declared a drought in the country. The town of Ramotswa has experienced very minimal rainfall during the rainy season and the residents are worried that they will have to wait longer than normal for the next rainfall. In contrast, when they have experienced rain, there have been devastating floods and hailstorms that have done damage to households and the community at large. The direct use of natural resources is supplementary as the community makes use of resources bought or received by the government or private organizations to meet their basic needs. Natural resources are used for firewood when there are power cuts, for food and to create baskets to sell and generate income.

LIVELIHOOD CHARACTERISTICS

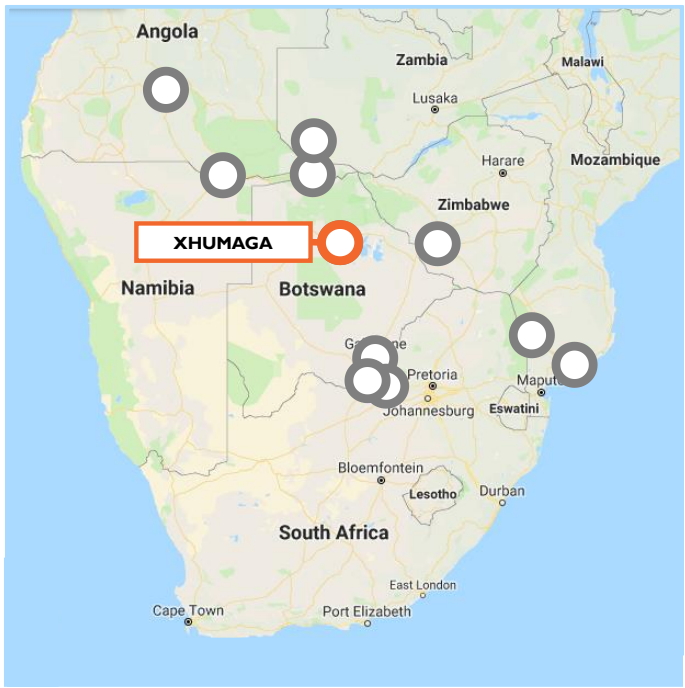
A large proportion of the residents of Ramotswa make use of resources made available to them by the government and private companies such as water, housing and food. Despite the majority of the community making ends meet, their livelihoods are still threatened by natural shocks such as floods and violent storms that damage their houses, infrastructure and natural resources. Their access to electricity and water are inconsistent. These issues influence the extent to which households are able to generate income as they have limited natural resources to leverage as well as poor access to the relevant facilities.

RESILIENCE IN RAMOTSWA

The community largely defines resilience as social protection from the government as well as increased opportunities to generate income. Households feel that they need assistance from the government to build houses and other structures that are resilient to storms such as walls and drainage systems. Households need access to alternative income streams in order to better position themselves to prepare, for and adapt to, natural shocks and stressors such as droughts and floods.

XHUMAGA

The town of Xhumaga, located on the Western end of the Makgadikgadi Salt Pans of Botswana, houses a population of 1,252 residents. The town is approximately a 2-hour drive from Maun. The community is governed by a Chief who holds regular meetings to discuss important details with the community. The community and the Makgadikgadi National Park are separated by the now largely dried out Boteti River where 2,242 African savannah elephants as well as a handful of lions are in conflict with the residents for the remaining natural resources. There have been numerous encounters between residents and the wildlife in the area that has resulted in increased fear and even casualties in some cases.



The community is characterized by residents who have spent their whole lives in the area and have

lived in harmony with wild animals for many years but changes in the availability of natural resources have put a strain on these relationships.

BRIEF DESCRIPTION OF RESEARCH PROCESS

Research in Xhumaga was conducted over four days. In order to operationalize this, there were four local enumerators as well as a fieldwork coordinator from JG Afrika, who could all speak both English and Setswana.

The research was conducted through the Resilient Waters survey tool through both paper-based and online surveys where data was collected from 85 residents of the community. There were also three members of the Resilient Waters team that were in charge of analyzing and synthesizing the data collected by the enumerators.

NATURAL RESOURCE CHARACTERISTICS

In March 2019, the president of Botswana declared a drought in the country. The town of Xhumaga has experienced very minimal rainfall during the rainy season and the residents are worried that they will have to wait longer than normal for the next rainfall. The Boteti River which the town was built next to has almost dried up and the residents share the few remaining water sources with wild animals. Wild animals have damaged the landscape within and surrounding the community in search of food and water. For example, trees within the community have been damaged by elephants passing through to find alternative sources of water.

Households collect water from the Boteti River, for household use. The river is, however, not the primary water source as the community does have access to water from the government. Households are not reliant on any other natural resources as they purchase most of their food and majority of their houses are built through construction companies as opposed to making use of natural resources. There are a few vegetable gardens and animals (livestock) that are present, however, the communities are not reliant on these. These are all supplementary and, in a few cases, these gardens are around for aesthetic purposes.

LIVELIHOOD CHARACTERISTICS

A large proportion of the residents of Xhumaga make use of resources made available to them by the government and private companies such as water, housing and food. Natural resources are supplementary and, in many cases, residents do not even make use of natural resources directly. However, the externalities resulting from the drought has resulted in livelihood challenges where wild animals, specifically elephants, pass through the community and are in conflict with members of the community. Wild animals kill the livestock that belong to members of the community and damage their crops, which could be a limitation to the community making use of the limited natural resources that they have.

RESILIENCE IN XHUMAGA

As in Ramotswa, the community is defining resilience as social protection from the government, specifically the Botswana Wildlife Department organizations as they feel threatened by wild animals on a daily basis. Households get most of their information from meetings with the leaders of the community. Members in the community help each other when the community experiences shocks or stressors, however, their abilities to assist are somewhat limited as a result of their lack of resources.

MOZAMBIQUE

CHEONGOENE

Chongoene, located in Xai-Xai in Gaza province, is a district in Mozambique 161 km north-east of Maputo, the county's capital city. Chongoene is 747km^2 with a density of 159.2km^2. The population of Chongoene increased from 70,207 in 1997 to 101,975 in 2007 to 118,911 in 2017. According to the 2017 census, 55.3% of the population are women and 50.3% of the population are between the ages of 15-64, followed by 43.7% of the population being between the ages of 0-14.

Chongoene is located approximately 15 minutes from Xai-Xai, the capital city of Gaza province and, as a result, has relatively easy access to markets. Another key feature of Chongoene is that it is located along the main road from Xai-Xai to Inhambane where a large number of trucks and cars pass by every day. This has resulted in a road site market place where residents can be found selling a wide variety of fruits and vegetables.

BRIEF DESCRIPTION OF RESEARCH PROCESS

Two Genesis staff travelled to Mozambique to oversee the data collection process. Research in Chongoene was conducted over a period of three and a half days using four local enumerators who were proficient in Portuguese, Shangaan and English.

261 surveys were conducted over the data collection period primarily using the tablets. On a few occasions, where there was no cellphone network, the enumerators captured responses on paper-based surveys and later inputted the data into the survey tool on the tablets. It is for this reason that the geo-location is not always visible/correct.

No key informant interviews were conducted as the local leadership was not available to be interviewed.

NATURAL RESOURCE CHARACTERISTICS

In the last five years, Chongoene has experienced two weather extremes; floods and cyclones as well as a severe drought. The flooding has resulted in soil erosion which has impacted the residents' ability to farm on some of their land and further exposed their homes to flooding. The drought has impacted the growth and quality of their crops as well as the health of their livestock. Additionally, community members have been unable to produce the same quantity of crops they have done in previous years. This year, rain has been sparse and residents access water either from the river or they buy water from the municipality.

Chongoene is both a subsistence farming community and a small-scale commercial farming community, with a large proportion of the community selling fruits and vegetables along the main road or in Xai-Xai (where they charge significantly more).

LIVELIHOOD CHARACTERISTICS

Key livelihood strategies involve looking for employment in the major towns as well as selling the crops that households produce. As a result of the drought, the quality and quantity of their crops have been affected and the health of their animals have been affected.

RESILIENCE IN CHEONGOENE

The community is defining resilience primarily as the ability to help themselves and their families. There is a widespread belief that you are unlikely to receive help from anyone and as a result, building personal resilience is important. To a lesser extent, the community is defining resilience as stronger social networks with their community members. Interestingly, the community members are not defining reliance as social protection from the government and local leadership which may indicate a cynicism about their ability to assist.

MASSINGIR

Massingir is a flat-plane village with very little greenery. It is home to the second largest dam in Mozambique, Massingir dam, which is a gateway to the Limpopo National Park. The dam is 5km wide and stretches 20kms into the Elephant Gorge all the way up to the South African border with the Kruger National Park.

Massingir is located in the southwest of Gaza Province in southern Mozambique

The 2017 population census indicates a population of 36 750. Women make up 53% of the population and men 47%. Majority of the population is aged between 16-64 years (48,5%).

BRIEF DESCRIPTION OF RESEARCH PROCESS

Two Genesis employees travelled to Massingir with four enumerators. During the three days that the Genesis team were in the village, 51 surveys were completed. While the team tried to have an interview with the Chief, he was not available.

NATURAL RESOURCE CHARACTERISTICS

There are limited natural resources in Massingir apart from the Massingir lake. There is some fishing activity from the lake and some of the households have cattle a few cattle. The cattle usually graze by the banks of the lake which places them at risk of being eaten by crocodiles in the lake. The damn is also home to hippos, and one can often see fish eagles perched on the tree branches. There is a lot of deforestation which has left the ground dry and sandy. Rain falls during the summer months between December and February.

There is some subsistence farming which does not happen in the community itself but rather a few kilometers out of the town where there is a greater source of water. The community sells the fish it catches and small amount of fruits and vegetables which they grow at their farms at the local market.

LIVELIHOOD CHARACTERISTICS

The economy is primarily based on family-based subsistence farming and charcoal production. A lot of the people run stalls at the local market selling fruits and vegetables (mostly tomatoes, sugar cane and bananas). Some stalls sell kapulanas (cloth), and there is also a fish market as well as other general traders. Charcoal production is a major economic activity, and locals make charcoal using the pit method. Often community member barter food for charcoal or sell the charcoal in neighboring villages. As you drive into the town there are piles of charcoal bags for sale on the side of the road. A few families have livestock which they take to graze along the banks of Massingir lake.

The community faces challenges of soil erosion, as more trees are being cut for charcoal manufacturing and for heating and cooking- the ground is left barren and unsuitable for planting seeds. The rainfall season does not last as long as it used to therefore the community is facing a drought. The communities that live close to the lake expressed that their cattle were being eaten by crocodiles close to the lake.

RESILIENCE IN MASSINGIR

As a result of little rain and vegetation, the livestock often die prematurely or are eaten by wildlife. Therefore, the owners of livestock often sell their cattle for income as they would rather have money to buy food, than worry about the possibility of losing their cattle to famine or wildlife attacks.

The community stated that they receive a lot of assistance from The World Food Program which comes to their aid on a need's basis. The community itself said they are unable to ask for help from others as they are also most likely to be affected by the natural shock. They mentioned that the more programs to help with irrigation and resilient farming options would be of great help.

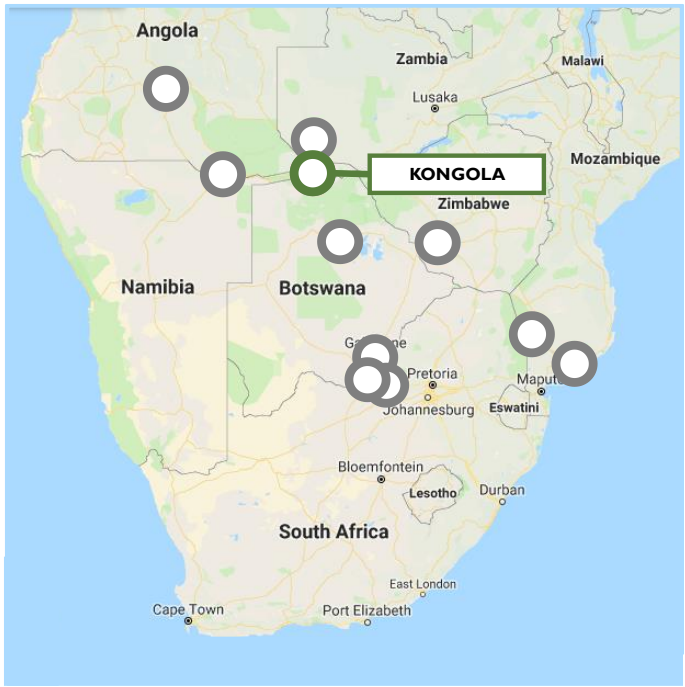
NAMIBIA

KONGOLA

Kongola is one of the six constituencies in the Zambezi region of Namibia. In the 2011 population census, Kongola had a population size of 5 658, of which 2 797 were female and 2 861 were male. There were 1 226 private households, with an average household size of 4.3.

In terms of housing conditions, the census reported that 81% of households have access to safe water, while only 16% of households have toilet facilities. 20% of households were reported to have electricity for lighting, and 98% of households used wood/charcoal for cooking.

The main source of household income was farming, with 43% of households receiving income from



farming. The second highest reported source of income was pension, at 19%.[3]

Kongola is situated across three conservation areas: the Kwandu conservancy, the Mayuni conservancy and the Suswe triangle. This reflects the presence of wild animals in the area and a prioritization of conservation.

BRIEF DESCRIPTION OF RESEARCH PROCESS

Pre-Fieldwork

Prior to going in field, the Genesis team identified and contracted four local enumerators in the Kongola area to support fieldwork. One fieldworker was assigned as a senior enumerator, and was responsible for assisting the Genesis team (2 people) in establishing contact and permissions from local leadership in Kongola. This eased the Genesis team's fieldwork and ensured that local customs were followed.

In the field

- **Training and data collection.** Fieldwork in Kongola commenced on 23 July 2019 and ran until 26 July 2019. Two Genesis team members managed the data collection process in Kongola, supported by four local survey enumerators.
- The first stage of fieldwork included an in-depth training on the baseline methodology and the survey tool. Following this training, the survey enumerators then went in field to collect data. Ahead of the first day of data collection, enumerators were provided with both the tablet and paper-based tools. At the end of the day, the Genesis team met with the survey enumerators for a debriefing session to discuss any challenges experienced that day and to identify solutions. On the first day, this was largely linked to technological challenges with the online tool resulting in enumerators resorting to the paper-based tool. Following the first 'test' day, it was decided that the data would be collected using the paper-based tool. The tablets supported the audio recording of the consent. These debrief sessions continued for the subsequent days and provided an opportunity for the enumerators to feedback and to seek any clarifications based on their experience both with the tool itself, community engagement and the ease of acquiring consent. The final number of surveys conducted in Kongola was 58.
- **Stakeholder management.** While the enumerators were in field, the Genesis team members conducted a meeting with local leadership. The meeting included the constituency Councilor as well as the Kuta representing eight of the tribal authorities in the constituency. This meeting was used to introduce the local leadership to the program and to learn more about the challenges experienced in each of their communities.
- **Site visits.** Based on the findings from this meeting, the Genesis team then conducted four site visits to observe the community challenges discussed. The site visits included the following:
    - A visit to **Choi village** to observe the deteriorating water infrastructure due to a damaged tap, as well as the broken solar panels that were initially installed to pump water to the tank.
    - A visit to **Mayuyi Police Camp** to observe the challenges in accessing the police services for help due to remoteness, as well as the vandalized generator which no longer pumps water to the tank.

[3] Republic of Namibia. 2011 Population and Housing Census: Zambezi Regional Profile. February 2014. Available: https://cms.my.na/assets/documents/p19dptss1r10kskInraqk5ne2jd.pdf.

- A visit to **Mwanzi village** to understand the distance that community members must walk to access water at Kwandu River (approximately 6 km) as well as the river banks where cattle are frequently attacked by crocodiles while feeding. The community noted that they would like to move their cattle to a different piece of land above the river, however the challenge here is that there is no water source nearby. As such, another purpose of this visit was to observe the distance that farmers must walk to access their fields and proposed area for relocating the cattle (approximately 6 km), in the opposite direction of the river. During harvesting season, when farmers relocate to their fields, they must travel approximately 12 km to access water from the river.

NATURAL RESOURCE CHARACTERISTICS

Kwandu River runs along Kongola Constituency. While the river provides an important water source for local communities, respondents engaged as part of the baseline fieldwork reported that water levels in the river have decreased substantially in the past decade due to drought.

The vegetation in Kongola is generally dry and sparse, except around the banks of the river. Sightings of wild animals were rare during data collection but were regularly cited by community members – both during meetings and via the survey.

Kongola Constituency is primarily a subsistence farming community, with the primary crops being Pumpkins, sorghum, maize, beans, ground nuts and watermelon. One community leader noted that they used to also farm chili, but have since stopped as chili production is too water intensive. Community members also keep cattle for milk as well as for transporting materials, such as water from the river and reeds harvested to construct dwellings. Finally, when they are unable to harvest due to water scarcity, community members noted that they harvest devil's claw, which they need a permit for but some are forced to do it illegally as they do not have the necessary permit.

Wild animals also share the same water sources as the local communities. This results in instances of wildlife-human conflict. Interestingly, this is primarily focused around access to the water sources. The Kwandu River is the source of water for wild animals and the local communities (both human and livestock). As such, community members cited instances of crocodiles attacking both livestock and children.

LIVELIHOOD CHARACTERISTICS

Primary challenges experienced in this community are listed below. Under each challenge, a separate line details an example of a livelihood strategy. That said, it should be noted that all engagements with both community leaders and members were laced with quiet desperation. There were instances where leaders indicated that without extraordinary intervention their communities would die due to lack of water.

Table 8: Livelihood Characteristics in Kongola

Livelihood Characteristic	Description	Mitigation Strategy
Lack of water	There is little to no water available in many areas. The communities are using boreholes, but many of these have either not been maintained and thus are non-operational, or they are dry due to the ongoing drought.	Walk further to the river, or even to a neighboring community's borehole.
Survey fatigue / lack of implementation following research stage	There is significant survey fatigue in the communities. This was cited by both local leadership and, in some cases, as a reason for not completing the survey. There were numerous instances where community members asked if the enumerator was part of another organization which had conducted research the month before.	Declined to participate in further research until action is forthcoming. Demonstration efforts towards government for lack of implementation.
Sanitation and hygiene	The communities all practice open defecation. In some instances, effort has been made with pit latrines. Even here there are limitations to the value of pit latrines as neither children nor disabled member of the community can use this equipment.	Most communities practice defecation.

Livelihood Characteristic	Description	Mitigation Strategy
Human-wildlife conflict	Instances of human-wildlife conflict were most regularly cited in reference to shared water sources e.g. crocodiles threatening lives of cattle (and children). There were ad hoc references to other wild animals as a threat e.g. inability to use pit latrines at night due to the wild animals in the vicinity.	Effort to shift cattle to higher ground (limited by no alternative water supply). There are some instances of efforts to hunt animals either for food or for protection.

RESILIENCE IN KONGOLA

Resilience in Kongola was an interesting concept to engage with. In Kongola specifically, there is a strong dependency on donor funding for even the most basic human needs such as water. Community leaders were emphatic about the concerning lack of action both on the part of the government, and by donor agencies in their region.

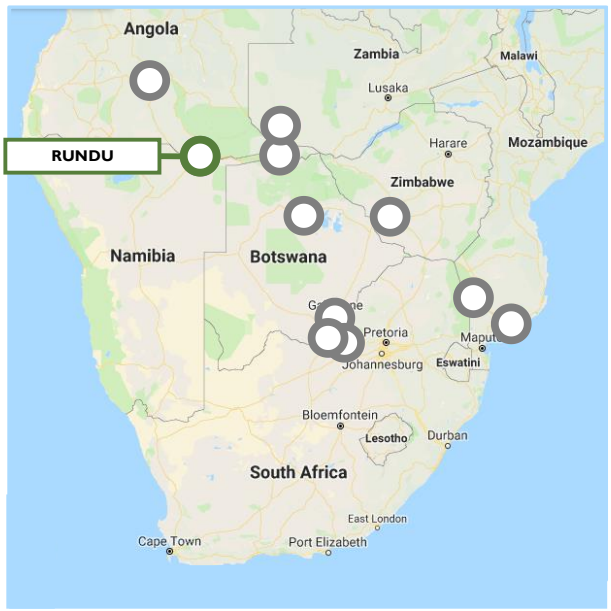
The community leaders were extremely vocal about the challenges experienced in the area, and the need for outside intervention. There is a desperation – cited both by the leaders and the community members themselves – for further intervention. The lack of services (particularly WASH and health) appeared to be the major priorities, ahead that of greater social protection or economic opportunities.

This is leading to demonstrations towards the local governance networks including the Constituency Development Committees (CDCs) and the Village Development Committees (VDCs). Government is arguing that there is insufficient funding to provide the infrastructure needed. This is resulting in further tensions with the local leadership structures.

RUNDU

Rundu is a peri-urban town and the capital of the Kavango-East Region of northern Namibia. It is situated on the banks of the Kavango River bordering Angola.

According to the 2011 census, the latest year for which data are available, Rundu has a population size of 61 900, of which 33 300 were female and 28 600 were male.[4] However, First Capital Treasury Solutions estimated that Rundu's population would meet 90 000 people in 2019.[5]



[4] Republic of Namibia. Namibia 2011 Population and Housing Census: Preliminary Results. Available: file:///C:/Users/TawneyL/Downloads/2011_Preliminary_Result.pdf.

[5] The Namibian. 2019. Rundu expects population to reach 90 000 this year. Available: https://www.namibian.com.na/181576/archive-read/Rundu-expects-population--to-reach-90-000-this-year.

Also, according to the census, Rundu is approximately 164.1 square km, with a population density of 377.3 people per square kilometer.[6]

BRIEF DESCRIPTION OF RESEARCH PROCESS

Pre-fieldwork

Prior to going in field, the Genesis team identified and contracted four local enumerators in the Rundu area to support fieldwork. One fieldworker was assigned as a senior enumerator, and responsible for assisting the Genesis team in establishing contact and permissions from local leadership in Rundu. This eased the Genesis team's fieldwork and ensured that local customs were followed.

In the field

- **Training and data collection.** Fieldwork in Rundu commenced on 01 August 2019 and ran until 03 August 2019. Two Genesis team members managed the data collection process in Rundu, supported by the four local survey enumerators.

  The first stage of fieldwork included an in-depth training on the baseline methodology and the survey tool. Following this training, the survey enumerators then went in field to collect data. At the end of each day, the Genesis team met with the survey enumerators for a debriefing session to discuss any challenges experienced that day and to identify solutions. This provided an opportunity to feedback and to seek any clarifications based on their experience both with the tool itself, community engagement and the ease of acquiring consent. The final number of surveys conducted in Rundu was 85.

- **Stakeholder management.** While the Genesis team requested interviews with the local leadership, including the mayor and three councilors, these individuals indicated that while they approved the fieldwork, they were not available for meetings. As a result, the Genesis team were not able to conduct interviews while in Rundu.

NATURAL RESOURCE CHARACTERISTICS

As in most of Namibia, Rundu's environment is mostly dry. While the Kavango River provides an important water source for Rundu inhabitants, respondents engaged as part of the baseline data collection reported that declining rainfall in recent years has caused the river levels to drop considerably. Overlooking the river from a viewing point, the survey enumerators pointed to the area at which the width of the river used to extend, in previous years when there had been higher rainfall.

As Rundu is more urban than other communities visited during baseline data collection, inhabitants reported to be less reliant on natural resources, relying instead on income through sales at local shops, for example. The one exception to this is an area called Ndama, which is a comparatively more rural area within Rundu. In this area, respondents reported to be reliant on natural resources for their livelihoods i.e. farming cattle.

[6] Republic of Namibia. Namibia 2011 Population and Housing Census: Preliminary Results. Available: file:///C:/Users/TawneyL/Downloads/2011_Preliminary_Result.pdf.

LIVELIHOOD CHARACTERISTICS

Rundu is peri-urban and thus is far more developed than the other areas in which fieldwork was conducted by this Genesis team. As such, the challenges and livelihood characteristics were for the most part very different compared to more rural settings. Based on the feedback from the enumerators, the people surveyed were frustrated with the lack of employment opportunities, the price of water (which some noted has going up since the drought) and the need for mosquito nets. Another challenge noted was that with the increasing strain on the water supply system with the worsening drought, there are times when the water supply is just turned off completely.

In these communities there appeared to be a disconnect between survival and natural resources. As such, there seemed to be less urgency to plan for the future. Based on informal discussions with the enumerators, it is suspected that some community members have moved to Rundu from more extreme circumstances in Angola or even other parts of Namibia. As such, the perspective by these communities is more positive, and reflects their livelihood strategy as their effort to move to Rundu. Alternatively, it may be the case that because the area is more peri-urban with a range of income generating activities available, community members are less dependent on natural resources.

RESILIENCE IN RUNDU

Resilience in Rundu was less tangible than witnessed in other more remote, less developed areas. Again, separate to a data review it appeared as though the challenges were felt less intensely than in some more remote communities. As such, resilience was less apparent because resources are available, and infrastructure exists. As mentioned above, there were frustrations about the lack of economic opportunities. This too reflects that resilience was not closely linked to the natural environment. This also shows that resilience in Rundu is influenced by the extreme under-development in the areas surrounding it.

SOUTH AFRICA

OTTOSHOOP

South Africa, like the rest of Southern Africa, is currently experiencing a drought that has resulted in a reduction of the country's ability to adapt to climate change. However, there is evidence of the country being more ready economically, socially and in terms of governance than most other Southern African countries (excluding Botswana and Namibia who have similar levels of readiness). The ability of the country to adapt to climate change continues to decrease on average as seen on the ND-GAIN index. This speaks to the exposure and sensitivity of sectors that are essential for human life, which includes food, water, health, ecosystem service, human habitat and infrastructure.

The town of Ottoshoop is located in the North-West Province of South Africa and houses a population of 2,043 residents. The town is approximately a 20-minute drive from a major city, the closest being Mahikeng. The community has access to a

number of natural resources but residents do not make use of these resources as a primary means to meet their needs. They have access to government supplied resources and make use of these.

BRIEF DESCRIPTION OF RESEARCH PROCESS

Research in Ottoshoop was conducted over two and a half days in an attempt to capture as much of the community as possible and to get a realistic idea of the successes and challenges this community faces on a daily basis. In order to operationalize this, there were two local enumerators who were university students with research experience, who could all speak both English and Setswana, who supported the Genesis team in collecting the data.

The research was conducted through the Resilient Waters survey tool using both paper-based and online surveys, and data were collected from 39 residents of the community. There were also three members of the Genesis team who were in charge of analyzing and synthesizing the data collected by the enumerators.

NATURAL RESOURCE CHARACTERISTICS

The town of Ottoshoop has experienced very minimal rainfall during the rainy season and the residents are worried that they will have to wait longer than normal for the next rainfall. The direct use of natural resources is supplementary as the community makes use of resources bought or received by the government or private organizations to meet their basic needs. A few households have crops, livestock and water tanks but these are as a source of additional income, food or for their livelihoods.

LIVELIHOOD CHARACTERISTICS

A large proportion of the residents of Ottoshoop make use of resources made available to them by the government and private companies such as water, housing and food. Despite the majority of the community making their ends meet, their livelihoods are still threatened by natural shocks such as droughts that limits the availability of water. Despite their access to government water, that is generally safe for use in South Africa, there are worries about water contamination in the community. This is as a result of infrastructural failures that have resulted in the waste from the ablution facilities in households mixing in with the water that the resident consumes.

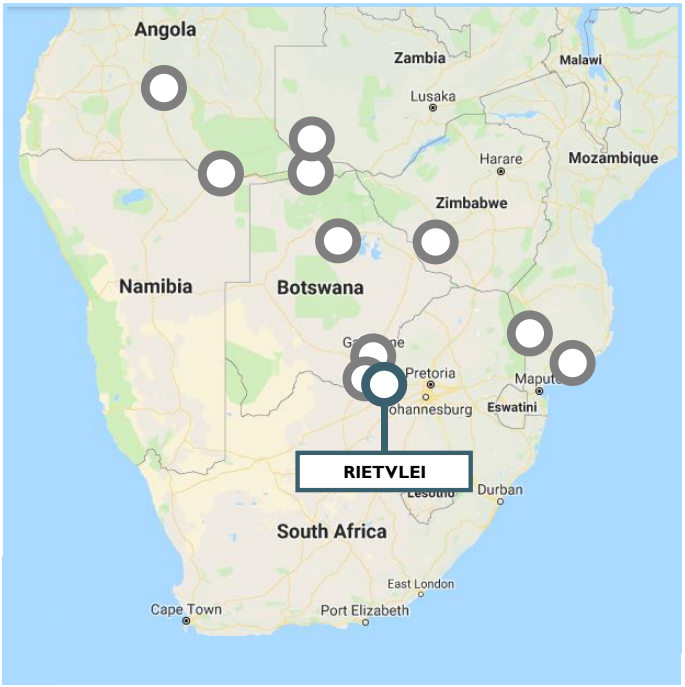
RESILIENCE IN OTTOSHOOP

The community is defining resilience as social protection from the government as well as increased opportunities to generate income. The residents have acknowledged the drought as a hindrance to income generation but have identified income as essential for the resilience of their households. The community is not well integrated into the natural resource economy and therefore does not define resilience as the need for them to sustain their livelihoods through the protection of natural resources.

RIETVLEI

South Africa, like the rest of Southern Africa, is currently experiencing a drought that has resulted in a reduction of the country's ability to adapt to climate change. However, there is evidence of the country being more ready economically, socially and in terms of governance than most other Southern African countries (excluding Botswana and Namibia who have similar levels of readiness). The ability of the country to adapt to climate change continues to decrease on average as seen on the ND-GAIN index. This speaks to the exposure and sensitivity of sectors that are essential for human life, which includes food, water, health, ecosystem service, human habitat and infrastructure.

The town of Rietvlei is located in the North-West Province of South Africa and is approximately a 30-minute drive from a major city, the closest being Zeerust. The community has access to a number of natural resources but residents do not make use of these resources as a primary means to meet their needs, with the exception of mud and sticks. They have access to government supplied resources as a result of the neighboring towns and make use of these for their primary use.



BRIEF DESCRIPTION OF RESEARCH PROCESS

Research in Rietvlei was conducted over two and a half days in an attempt to capture as much of the community as possible and to get a realistic idea of the successes and challenges this community faces on a daily basis. In order to operationalize this, there were two local enumerators who were university students with research experience, who could all speak both English and Setswana, who supported the Genesis team in collecting the data.

The research was conducted through the Resilient Waters survey tool using both paper-based and online surveys where data were collected from 46 residents of the community. There were also three members of the Genesis team that were in charge of analyzing and synthesizing the data collected by the enumerators.

NATURAL RESOURCE CHARACTERISTICS

The town of Rietvlei has experienced very minimal rainfall during the rainy season and the residents are worried that they will have to wait longer than normal for the next rainfall. However, there are occasions where they have heavy rains, which damages their households that were built with mud and sticks. The direct use of natural resources is supplementary as the community makes use of resources bought or received by the government or private organizations to meet their basic needs. Their water source is powered by a pump that requires payment of electricity to work and there are a few water tanks that are meant to service the whole community. A few households have crops and livestock but these are as a source of additional income, food or for their livelihoods.

LIVELIHOOD CHARACTERISTICS

A large proportion of the residents of Rietvlei make use of resources made available to them by the government and private companies such as water, housing and food. Despite the majority of the community making their ends meet, their livelihoods are still threatened by natural shocks such as droughts that limits the availability of water. Despite their access to government water, each household needs to pay R12 a month for electricity to pump the water, which some households are unable to afford. The paying households refuse to allow other members to "free ride" and this has caused conflict within the community.

RESILIENCE IN RIETVLEI

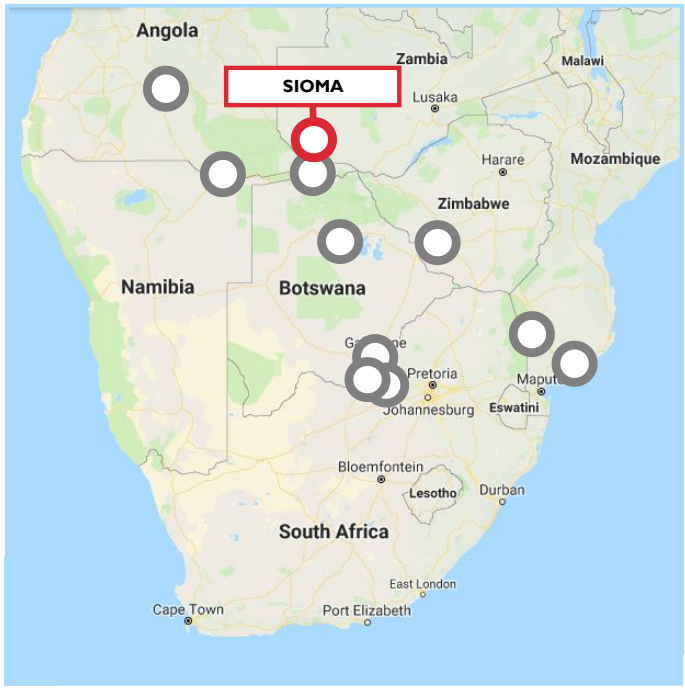
The community is defining resilience as social protection from the government as well as increased opportunities to generate income. There are numerous government social schemes that provide income but are not sustainable. There is also no support from other households in the community as a result of conflict for the only

resources that are present but a few residents have indicated that this would assist them in preparing for natural shocks.

ZAMBIA

SIOMA

The Resilient Waters team visited a district in the Western Province of Zambia called Sioma.[7] However, the team were not able to find population data related to Sioma specifically. This is likely due to the fact that Sioma District was only established in 2012, while the latest census was conducted in 2010. As a result, this section provides data related to the Western Province more broadly.



As of the 2010 census, Western Province had a population size of 902 974, of which 783 123 (87%) were rural.[8] Approximately 48% of the population were male, with 52% female.

The Western Province covers approximately 126 386 square km, with a population density of 7.1 people per square kilometer. As such, Western Province was the third least densely populated region in Zambia in 2010.[9]

BRIEF DESCRIPTION OF RESEARCH PROCESS

Pre-fieldwork

Prior to going in field, the Genesis team identified and contracted three local enumerators to support fieldwork. Given the remoteness of Sioma, the enumerators were from the Western Province more broadly, but who had previously worked or lived in Sioma and spoke the local dialect of Lozi. One fieldworker was assigned as a senior enumerator, and responsible for assisting the Genesis team in establishing contact and permissions from local leadership in Sioma District. This eased the Genesis team's fieldwork and ensured that local customs were followed.

[7] It should be noted that prior to the visit, it was understood that the specific area the team was visiting was called Cholola (as per Google maps and alternative supporting documents). However, upon arrival it was clear that this is no longer the name use. Interestingly, no one the Genesis team were able to meet with – local leadership, ZAWA or the enumerators – were able to advise where precisely Cholola was or had any knowledge about Cholola at all.

[8] Central Statistics Office of Zambia. 2010 Census of Population and Housing: Western Province Analytical Report. Available: file:///C:/Users/TawneyL/Downloads/Western%20Province%20Analytical%20Report%20-%202010%20Census.pdf.

[9] Central Statistics Office of Zambia. 2010 Census of Population and Housing: National Analytical Report. Available: https://www.zamstats.gov.zm/phocadownload/2010_Census/2010%20Census%20of%20Population%20National%20Analytical%20Report.pdf.

In the field

- **Training and data collection.** Fieldwork in Sioma commenced on 28 July 2019 and ran until 30 July 2019. Two Genesis team members managed the data collection process in Sioma, supported by the three local survey enumerators.

  The first stage of fieldwork included an in-depth training on the baseline methodology and the survey tool. Following this training, the survey enumerators then went in field to collect data. At the end of each day, the Genesis team met with the survey enumerators for a debriefing session to discuss any challenges experienced that day and to identify solutions. This provided an opportunity to feedback and to seek any clarifications based on their experience both with the tool itself, community engagement and the ease of acquiring consent. The final number of surveys conducted in Sioma District was 77.

  Stakeholder management. During this time, the Genesis team visited with the local Kuta (advisors to the Chief) as well as the Chief himself to discuss the purpose of the fieldwork and to understand, from their perspective, the key natural resources and livelihood challenges in Sioma District. Due to the remoteness of the district, these traditional authorities expressed gratitude that organizations were interested in learning more about their community.

  While the town mayor was out of office and not able to meet the Genesis team, the team conducted a courtesy call with the local constituency office. The purpose of this meeting was to confirm that the local government was aware of, and consented to, the fieldwork in Sioma District. Again, the Genesis team also used this meeting to understand the local context and challenges as they related to accessing water and other natural resources.

  In total, the Genesis team conducted three meetings/interviews with local leadership in Sioma District.

NATURAL RESOURCE CHARACTERISTICS

The Zambezi River runs along Sioma District and provides an important water source for the inhabitants. However, respondents indicated that water levels have fallen and that there are frequent illnesses in the district due to water contamination. Further to these challenges, respondents reported that accessing water at the river can be dangerous due to crocodiles and "almost weekly" a human is killed by a crocodile.

Respondents also indicated that due to the relative nascence of Sioma as a district, the district does not have the necessary water infrastructure to support the community. Few buildings have running water, and taps are scarce. Similar to other areas visited during baseline data collection, inhabitants attempt to collect water at the local school, although this is prohibited and is done illegally.

A highway separates the two sides of Sioma District; while those situated east of the highway have easier access to water from the Zambezi River (although this is not clean water), communities to the west of the highway reported that access to water is particularly challenging.

The community is reliant on subsistence farming for food and income, although noted that declining rain levels have limited their harvest.

LIVELIHOOD CHARACTERISTICS

Sioma is a very remote area, has very poor infrastructure and little variety in terms of sources of income. Key challenges cited both by local leadership and community members included:

Table 9: Livelihood Characteristics in Sioma

Livelihood Characteristic	Description	Mitigation Strategy
Lack of access to safe water	While access differs whether the community is closer or further from the river, access to the Zambezi does not negate the challenges. This is a water source shared by domesticated and wild animals as well as the surrounding human communities.	Those further from the river are increasingly required to walk long distances to the closest water source.
Human-wildlife conflict	Like much of Zambia, there are continual efforts to conserve the natural environment and wild animals native to the region. There are some core challenges linked to this particularly as this impacts on the local communities in the environs. The Zambian Wildlife Authority (ZAWA) operates in this area and is largely feared by the community due to their strong actions should they find any animal(s) which have been hurt or killed within the conservation area. Furthermore, as wild animals are driven out of the area due to drought they are increasingly coming into conflict with communities. Simultaneously, the shifting habitats of wild animals, particularly in a conservation area, could lead to reduced tourism in the region and thus a reduction in alternative livelihood solutions.	Livelihood strategy: It is perceived that in some cases (ZAWA), the wellbeing of wildlife is prioritized above that of the communities. This is of concern and is resulting in communities being increasingly negative towards conservation efforts.
Charcoaling in conservation areas	Charcoaling is an alternative means of income – particularly a source sought after when more traditional means of income (farming) are no longer reliable due to drought. However, these trees are within a conservation area. Unfortunately, there is a struggle to control the charcoaling, leading to worsening deforestation and an ongoing clash between communities and various conservation efforts.	Charcoaling is itself a solution of sorts. When drought prevents harvesting efforts, communities resort to (illegal) charcoaling as an alternative source of income.

RESILIENCE IN SIOMA

In Sioma, one of the characteristics cited was that communities are hesitant to move away from "the way they have always done things." This provides challenges when developing strategies for improved resilience. An example was shared which noted the community's disinclination to take advantage of a government relief program. Due to the worsening drought, the government advised communities to adjust their crops and/or harvest cycles to suit the changing climate. However, the communities were unwilling to implement these changes, resistant to change.

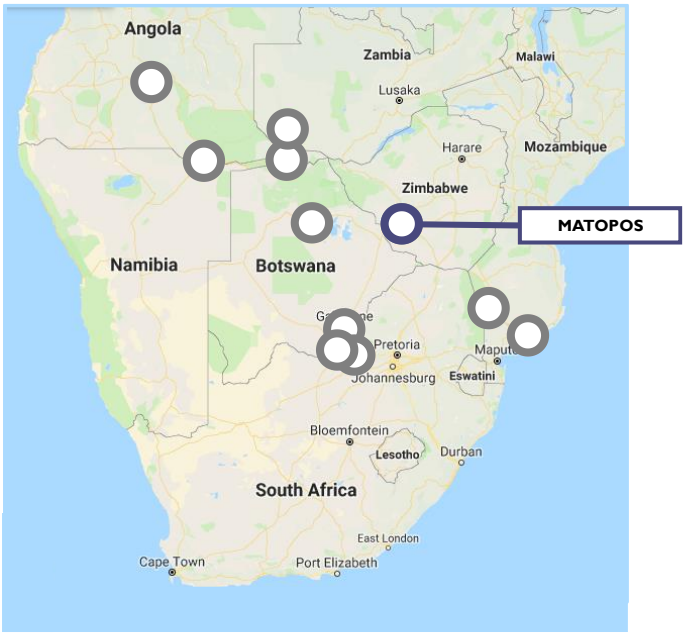
The community displayed concerns about their feedback (recorded by the enumerators) being shared with government institutions. This indicates a level of distrust between the community and government, and also suggests this may be a reason for the hesitancy to involve themselves with government initiatives. This has a consequence on integrated approaches to resilience.

Increasingly, leadership in the area is seeking international investment to support the development of the region (examples were focused on commercial large-scale farming efforts). This raises questions about how local labor may be integrated into these alternative income streams, and simultaneously, how this works in conjunction with conservation efforts.

ZIMBABWE

MATOPOS

Zimbabwe, like the rest of Southern Africa, is currently experiencing a drought that has resulted in a reduction of the country's ability to adapt to climate change. There is also evidence of the country being the least ready economically, socially and in terms of governance than most other Southern African countries when referring to climate change. However, the ability of the country to adapt to climate change continues to increase on



average as seen on the ND-GAIN index. This speaks to the exposure and sensitivity of sectors that are essential for human life, which includes food, water, health, ecosystem service, human habitat and infrastructure.

The town of Matopos is located in the South of Zimbabwe; however, the Genesis team were not able to find an estimated population size. The town is approximately a 30-minute drive from a major city, the closest being Bulawayo. The community has access to a number of natural resources but residents do not make use of these resources as a primary means to meet their needs. They have access to government supplied resources and are in close proximity to Bulawayo and therefore have some access to necessity facilities.

BRIEF DESCRIPTION OF RESEARCH PROCESS

Research in Matopos was conducted over four days in an attempt to capture as much of the community as possible and to get a realistic idea of the successes and challenges this community faces on a daily basis. In order to operationalize this, there were three local enumerators, who could all speak English, Ndebele and Shona, who supported the Genesis team in collecting the data.

The research was conducted through the Resilient Waters survey tool using both paper-based and online surveys, and data were collected from 84 residents of the community. There were also three members of the Genesis team who were in charge of analyzing and synthesizing the data collected by the enumerators.

NATURAL RESOURCE CHARACTERISTICS

The town of Matopos has experienced very minimal rainfall during the rainy season and the residents are worried that they will have to wait longer than normal for the next rainfall. The direct use of natural resources is supplementary as the community makes use of resources bought or received by the government or private organizations to meet their basic needs. Their limited water, however, has impacted on their ability to farm and has killed their livestock. Although only a few households have crops and livestock, these are as a source of additional income, food or for their livelihoods and has been noted as very important for some of the members of the community. As a result of the drought the community has seen an influx of wild animals, most likely from the Matopos National Park, which have threatened the safety of the animals and the residents.

LIVELIHOOD CHARACTERISTICS

A large proportion of the residents of Matopos make use of resources made available to them by the government and private companies such as water, housing and food. Despite the majority of the community making their ends meet, their livelihoods are still threatened by natural shocks such as droughts that limits the availability of water. The effect of the drought has knock-on effects that further threaten their livelihoods such as wild animals entering the community. The community also feels as though they do not have government support and feel that they have to do everything on their own.

RESILIENCE IN MATOPOS

The community is defining resilience as increased opportunities to generate income and the availability of alternative ways to gain access to water. The community is also religious and have identified that as a means of preparing and adapting to natural shocks and stressors.