

Livelihood Diversification through Small-scale Fisheries: A Case Study of Cactus Poort Dam, Redcliff Town, Zimbabwe

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ABSTRACT

In many developing economies, households have come to depend on diversified livelihood strategies and the informal sector due to economic downturns and the lack of formal employment opportunities. This study explores the nature of small-scale fisheries as informal entrepreneurship and livelihood diversification among households in the vicinity of Cactus Poort Dam, Redcliff, Zimbabwe. The study was guided by the Sustainable Livelihoods Framework and implemented using an exploratory mixed methods descriptive design with a sample of 23 people involved in fishing and associated livelihoods. The study employed structured and semi-structured questionnaires to gather data, which were then analysed using descriptive statistics and thematic analysis, with a triangulation approach used to combine quantitative and qualitative data. The results show that small-scale fishing is more used as a flexible complementary livelihood than as a sole commercial enterprise. About 71% of participants practiced fishing monthly and most of them practiced vending, urban agriculture, artisanal mining, and other informal income generation activities alongside fishing. In addition, 40% of the respondents caught and consumed their catch, and 29% caught and sold their catch. The results show that small-scale fisheries offer a low-entry barrier livelihood opportunity that allows resource-limited households to diversify sources of income, improve food security, and cope with economic uncertainty. The study contributes to the management and informal entrepreneurship literature by demonstrating how households strategically combine livelihood activities and allocate limited resources to enhance resilience. Policy and managerial measures to enhance market access, fish processing and storage facilities, skills development and sustainable resource management could help to further consolidate the economic contribution of small-scale fisheries and to contribute to more resilient livelihood portfolios in economically vulnerable communities.



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1. Introduction

Small-scale fishing has been important in improving rural livelihoods of Zimbabwe (Jimu et al., 2025; Kapembwa et al., 2020), with fish providing the much-needed nutrients for human health and food security (Weyl et al., 2020; Zvavahera et al., 2022). Small-scale

fisheries play an important role in economic development and job creation for the local communities (Koralagama et al., 2017), especially in the economically disadvantaged areas. Furthermore, SSF reduces poverty at household level for the fishing communities (March & Failler, 2022; Muzari, 2016). In the context of fisheries, exposure to shifting climatic variables (temperature and rainfall) and extreme weather events can be used to characterize fisheries' sensitivity to climate change. The vulnerability of fisheries productivity and the capacity of fishermen to adjust to the consequences of climate change and unpredictability by, for instance, altering fishing gear, diversifying their sources of income, or focusing on new fish species (Muringai et al., 2019). As a result, small-scale fisheries remain a critical livelihood diversification strategy that enhances food security, income generation, and household resilience in the face of economic and environmental uncertainties. For Zimbabwe, rural livelihoods have changed since the turn of the century, (Chiba, 2023; Kupaza et al., 2015) and are likely to continue changing in the near future. Zimbabwean rural communities have been affected by "socio-economic changes, the Fast-Track Land Reform Programme, and the unemployment effects of the fourth Industrial revolution", (Chiba, 2023). In this evolving path, Nyathi et al. (2023) caution on the need to enhance rural livelihoods for women to reduce vulnerability in adverse conditions related to climate change (Chidakwa et al., 2020). Furthermore, Muringai et al. (2019) cited that a lack of economic development makes these fishing communities even more vulnerable. Small-scale fishermen's ability to adapt is hampered by Zimbabwe's poor economic performance, which also makes fishing communities more vulnerable to the effects of climate change. Because of Zimbabwe's high unemployment rate, there are more fishermen overall, which puts more strain on the country's already limited fish resources and reduces their profitability.

According to Mhlanga (2020), Zimbabwe is a landlocked country with only inland fisheries. On artificial lakes like Kariba, Mutirikwi, Chivero, Manyame, Sebakwe, and Osborne, there are several small-scale fisheries. However, the nation's water bodies have yet to reach their full potential in terms of supporting small-scale and artisanal fishermen. "Traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amounts of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption" is the definition of artisanal fishing. Artisanal fisheries, sometimes called small-scale fisheries, can be commercial or subsistence fisheries that produce goods for export or local consumption. Thus, in Zimbabwe, artisanal fisheries play a vital role in supporting rural livelihoods and food security, despite the sector remaining underdeveloped and operating below its full potential.

In an era of increasing significance of small-scale fisheries for food security, income generation and livelihood resilience, it is important to understand diversification of fishing communities. Considering the economic pressures, climate variability and the pressure on fish resources, livelihood diversification has become a major tool in sustaining rural households. Therefore, this study examines the role of small-scale fisheries in promoting livelihood diversification among communities around Cactus Poort Dam in Redcliff Town, Zimbabwe, with the aim of understanding how fishing activities contribute to household welfare and socioeconomic resilience.

Wild capture fisheries involve the utilization of wild fish populations through harvesting, aquaculture/fish farming is fish production under managed conditions, and small-scale agriculture (crop and livestock production) These are important for socio-economic development of communities where they are practiced (Hannesson, 2003; Obiero et al., 2023; Woodhill et al., 2020). Given the growing importance of small-scale fisheries in supporting rural livelihoods, this study examines their role in promoting livelihood diversification among communities around Cactus Poort Dam in Redcliff Town, Zimbabwe. Specifically, it investigates livelihood activities, assesses the contribution of small-scale fisheries to household income and food security, identifies livelihood diversification strategies and key challenges, and proposes recommendations for strengthening sustainable rural livelihoods.

Although previous studies have demonstrated the importance of small-scale fisheries in enhancing food security, income generation, and rural livelihoods in Zimbabwe and other

developing countries (Jimu et al., 2025; Kapembwa et al., 2020; March & Failler, 2022; Muringai et al., 2019; Muzari, 2016), limited empirical research has examined how small-scale fisheries contribute to livelihood diversification at the community level in inland fishing areas such as Cactus Poort Dam in Redcliff Town. Existing studies have largely focused on fisheries production, climate change impacts, and resource management, with less attention given to the integration of fishing with other livelihood strategies, household resilience, and the socioeconomic challenges faced by fishing communities. This knowledge gap limits the development of evidence-based policies and interventions aimed at strengthening sustainable rural livelihoods. Therefore, this study addresses this gap by examining the role of small-scale fisheries in livelihood diversification among households around Cactus Poort Dam, providing context-specific evidence to inform fisheries management and rural development strategies in Zimbabwe.

2. Literature Review

2.1. Small-Scale Fisheries: Concepts and Characteristics

Small-Scale Fisheries (SSF) do not have a global definition. However, limited technology, low-capital fishing techniques, basic fish processing and marketing, and some advanced and sophisticated equipment that fishermen own and use are typical characteristics of small-scale fisheries (Das et al., 2023). According to Halim et al. (2019), small-scale or artisanal fisheries are "traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption." In actuality, the term differs by nation; for example, in poor developing nations, it may refer to gleaning or a one-man canoe, whereas in industrialized nations, it may refer to more than 20-meter trawlers, seiners, or long-liners. Artisanal fishing can be either commercial or subsistence, and it can be used for export or local consumption.

The term "small-scale fishing sector" describes the group of fishermen who harvest marine living resources on a full-time, part-time, or seasonal basis using traditional and/or passive fishing gear and a variety of labour-intensive harvesting, processing, and distribution technologies to guarantee food security. Additionally, this group of fishermen produces their own nets and boats, which give their communities more fishery-related jobs and revenue prospects (Isaacs et al., 2022). March and Failler (2022) stated that small-scale fisheries (SSFs), also known as artisanal fisheries, have historically been vital to coastal communities and continue to be a common source of employment. Large-scale fishing has become the primary focus of study and policy due to the development of industrial fisheries over the past century, which has increased the marginalization of SSFs or transformed them into recreational pursuits in the industrialized world. Because the bulk of people live in underdeveloped nations, SSFs are therefore mostly linked to these areas.

2.2. The Role of Small-Scale Fisheries in Rural Livelihoods

Over 90% of the 120 million people who work in catching fisheries worldwide rely on small-scale fisheries (SSF). Two-thirds of the world's fish harvest for direct human consumption is produced by an estimated 5.8 million fishermen who make less than \$1 per day. SSF reflects a way of life and is usually place-based. In this sense, they make crucial contributions to local and national economies, particularly in developing countries, poverty reduction and livelihoods, and nutrition and food security (Das et al., 2023). According to Ndlovu and Masuku (2021), the importance of small-scale agriculture in the economy is demonstrated by the fact that small-scale farmers in sub-Saharan Africa still contribute between 40 and 60 percent of all rural income through their involvement in both agricultural and non-farm activities. This highlights that small-scale fisheries are not only a global livelihood system but also a vital rural development mechanism that sustains income, nutrition, and poverty reduction in vulnerable communities.

Ndlovu and Masuku (2021) posited that by giving rural residents a different source of income and food security, small-scale farming has significantly contributed to the solution of the world food challenge. For example, 79% of people work in small-scale farming in the South African province of Mpumalanga. This demonstrates that most Mpumalanga's rural residents cultivate their own food, and small-scale farming provides most of their income. Muringai and Musakwa (2026) asserted that in 2017, Zimbabwe

launched the Command Fisheries program to enhance food security, create employment, improve access to fisheries, and build community resilience against the effects of climate change. This initiative, supported by private sector and NGO partnerships, led to fish production of 10,700 tons per year by 2018.

Millions of people in the area depend on the enormous social, economic, and nutritional benefits produced by the fishing industry. The SADC region's freshwater and marine capture fisheries produced more than 3.1 million tons of fish in 2021. Small-scale fisheries predominate in capture fisheries; in many countries, small-scale fisheries predominate over large-scale ones. Over 22.7 million men and women rely on small-scale fishing (FAO, 2024). Small-scale fisheries (SSF) are a vital economic resource on a local and global scale; their depletion affects everything from food security to the well-being and culture of society. Over 100 million people worldwide rely on SSF for their livelihoods and income, as well as for food security (Isaacs et al., 2022). From a Sustainable Livelihoods Framework perspective, these initiatives strengthen livelihood assets and diversify income opportunities, thereby enhancing the resilience and adaptive capacity of rural households.

2.3. Fisheries Vulnerability in Zimbabwe

The sustainability and viability of small-scale fisheries (SSFs) into the future are threatened by global pressures like climate change, the increasing industrialization of larger fishing activities, and declining fish stocks, despite the fact that SSFs are crucial to ensuring food security, creating jobs, and supporting livelihoods (March & Failler, 2022). Fishery sector has faced challenges such as climate change, and increased poaching (Nyathi et al., 2023). Despite being important to rural livelihoods, declining income among the small-scale fishers, also impacts negatively on sustainability of the sector (Muringai et al., 2019). According to the Muringai and Musakwa (2026), there is a lack of information about the aquaculture industry in Zimbabwe, even though it significantly contributes to socioeconomic growth, job creation, and assuring food and nutrition security, particularly in rural communities. Understanding the precise aquaculture techniques used by small-scale fish farmers, the socioeconomic advantages of fish farming operations, and the various difficulties these farmers encounter have all received little attention.

Despite their contributions, SSF communities are frequently marginalized politically and economically, are extremely susceptible to change, and, until recently, were mostly ignored in national and international policy discussions. Many factors are affecting small-scale fisheries, making them more vulnerable and highlighting possible shifts toward increased viability (Dias et al., 2023). Ndlovu and Masuku (2021) alluded that in regionalized and globalized market economies, many small-scale farmers are constantly impacted by pressures that are occasionally unpredictable. This puts smallholder farmers in direct rivalry with the large-scale commercial farming industry. Arable land, freshwater sources, pest control, and other resources that are normally unavailable to smallholder farmers are necessary for the sustainability of smallholder agriculture and its contributions to the economy, food security, and poverty alleviation. The situation of small-scale farmers in Tanzania and other developing nations is like that of South Africa; these farmers continue to struggle with basic problems including a lack of fertile land for crop production and ongoing efforts to increase the fertility of their soil.

By their nature, small-scale fisheries are not fixed assets from a socio-economic perspective, with limited formalisation in policy (Jimu et al., 2025), and can vary seasonally or spatially. Hence, there is a need for livelihood diversification in poor rural communities (Nyathi et al., 2023). Moreover, Nyathi et al. (2023), states that rural livelihoods that are dependent on fisheries have been greatly affected by climate change over the years, with impacts on aquatic systems like rising temperatures, low oxygen content, more ice coverage, extreme fluctuations in water levels and currents. Muthoka et al. (2024) alluded that beyond the aquatic systems, socio-economic effects of climate change include extreme poverty, fish disease and mortality, with knock-on effects to poor productivity, reduced incomes, and reduced access to feed. Viewed through the Sustainable Livelihoods Framework, livelihood diversification enhances households' adaptive capacity by strengthening livelihood assets and reducing vulnerability to climate-related and socio-economic shocks.

2.4. Small-Scale Fisheries and Livelihood Diversification in Zimbabwe

Roscher et al. (2022) mentioned that the process by which families create varied portfolios of activities and social support skills in their fight for survival and to raise their standard of living is known as livelihood diversification. The broader focus on social processes and consequences as they change over time distinguishes livelihood diversification from the more limited notion of income diversification. Mhlanga (2020) observe that diversification of livelihoods is becoming a key component of policy recommendations and investments in fisheries management and rural development. More varied livelihoods are typically thought to lessen fishing pressure and susceptibility to external shocks and unfavourable trends for small-scale fishing communities in low- to middle-income countries while enabling people to create paths out of poverty. However, there is still little proof of the effects of livelihood diversification in small-scale fishing.

Most rural villages now exhibit poverty, and rural residents frequently rely on food donations from humanitarian organizations, particularly during dry spells and poor harvests. Aqua farming has emerged as a supplement to Seke's ongoing efforts to establish sustainable livelihood. Zimbabwe has one of the highest rates of youth unemployment, and the increase in Aqua farming projects that have begun to be implemented has contributed to the creation of jobs through farmer training, an initiative carried out by individual service providers with the aim of educating farmers (Chipfakacha, 2024). Aquaculture is a major approach used by non-governmental organizations (NGOs) in Zimbabwe to improve food security and provide jobs in poor communities. Zimbabwe started the Command Fisheries initiative in 2017 with the goals of increasing food security, generating jobs, expanding access to fisheries, and strengthening community resilience to the effects of climate change (Muringai & Musakwa, 2026). From the lens of the Sustainable Livelihoods Framework, these initiatives strengthen households' livelihood assets, diversify income sources, and enhance resilience to economic and environmental shocks.

2.5. Livelihood Diversification Strategies among Small-Scale Fishing Communities

According to Roscher et al. (2022), rural residents in low- to middle-income nations frequently use a complex and dynamic portfolio of livelihood activities spanning several sectors. Chitongo and Ricart Casadevall (2019) argues that people in rural areas who engage in a variety of livelihood activities are either more resilient or less vulnerable than those who rely more heavily on fewer sources of income and food. This idea is also often discussed in the literature on small-scale fisheries, where a variety of livelihoods are encouraged as a means of lessening the strain on overfished coastal fisheries resources. As a result, the idea that more varied livelihoods lessen vulnerability, food insecurity, and the strain on natural resources while also empowering people to create their own paths out of poverty has taken centre stage in many policy recommendations and investments in rural development.

Fish producers receive targeted technical assistance and climate-resilient infrastructure from the local government and development partners. Establishing district-level aquaculture extension programs, encouraging smart aquaculture by using climate-resilient pond systems, and improving access to essential inputs are ways to accomplish this (Muringai & Musakwa, 2026). Likewise, Muringai et al. (2025) suggested that in order to improve climate adaptation and resilience to the consequences of climate change, stakeholders, governments, NGOs, and practitioners should give priority to areas that require intervention. Improving infrastructure, offering programs for skill development, expanding fishermen's access to early warning systems, and strengthening sanitation in both study regions are a few examples. It is important to include rural development initiatives targeted at improving fisheries' ability to adapt to the variety of climate extremes that fishing communities face.

Chipfakacha (2024) alluded that farmers can maximize income and minimize risk of loss in aqua farming by using the different service providers to teach the public how to successfully raise fish. Compared to many agricultural products, fishponds require a small amount of land, but they yield enormous revenues, and aqua is inexpensive to maintain because plantains can be created from pig and chicken dung. Muringai et al. (2025)

highlighted that it is crucial for researchers, governments, development agencies, and civil society to comprehend the factors that render inland fishing villages susceptible to the effects of climate change. In addition, including rural development initiatives to improve fisheries' ability to adapt to the variety of climate extremes that Zimbabwe's fishing communities face. Within the Sustainable Livelihoods Framework, capacity building, access to knowledge, and climate adaptation interventions enhance households' human and natural capital, thereby strengthening livelihood resilience and sustainability.

3. Theoretical Framework

3.1. Sustainable Livelihoods Framework (SLF)

The sustainable livelihood approach is a way of thinking that offers a conceptual framework for analysis and is based on a few fundamental ideas. The 1990s saw the emergence of sustainable livelihoods theory, which challenged the prevailing paradigm of economic growth-led development by aligning with participatory, bottom-up planning. It draws on the ideas of equality, environmental sustainability, and the capacity approach while acknowledging that the impoverished possess resources, capacities, and agency (Tambe, 2022). Morse (2025) posited that the Sustainable Livelihood Approach (SLA), also known as the Sustainable Livelihood Framework (SLF), is still a widely used strategy used by development professionals to optimize the efficacy of interventions intended to assist underprivileged communities. Allison and Ellis (2001) specifically adapted the framework to fisheries, arguing that fishing households rarely depend on fishing alone but combine it with other economic activities to sustain livelihoods.

The framework proposes that fishing households at Cactus Poort Dam possess different forms of livelihood capital which influence their ability to diversify livelihoods. Recent fisheries studies continue to employ the Sustainable Livelihoods Framework to explain how livelihood diversification enables fishing communities to cope with economic, environmental, and social shocks while improving household welfare. Roscher et al. (2022) argue that livelihood diversification in small-scale fisheries involves the development of multiple income-generating activities within and outside fisheries to reduce vulnerability and enhance livelihood sustainability. In the context of Cactus Poort Dam, the extent to which small-scale fishers can access and utilise various forms of capital determines the success of their livelihood diversification efforts and the sustainability of their livelihoods which is aligned to what (Allison & Ellis, 2001).

4. Methodology

The study used an exploratory mixed-methods descriptive design, combining quantitative and qualitative methods to offer a holistic picture of livelihood diversification of the artisanal fishing households around Cactus Poort Dam in Redcliff, Zimbabwe. Quantitative data were collected using structured questionnaires, while qualitative data were obtained through open-ended questions that explored participants' experiences, perceptions, and challenges related to small-scale fisheries and livelihood diversification. The two data sets were gathered in parallel and in the interpretation were combined by triangulation, with the qualitative findings providing explanation and elaboration of the quantitative findings.

The total number of participants was 23 and was obtained using convenience sampling at the landing sites and informal fish markets around Cactus Poort Dam where artisanal fishers often land, process and sell their fish. The following conditions were considered for inclusion of the participants: age ≥ 18 years, actively involved in artisanal fishing and/or fish-related livelihood activities, and ≥ 1 year of residence or work in the study area. Male and female fishers, boat owners, net operators, fish traders, and household members engaged in fish processing activities were included in the sample as full-time and part-time fishing households. The sample size was considered appropriate for this exploratory case study because it provided sufficient information to capture a range of livelihood experiences and perspectives within the study community.

The questionnaire was tested with a few members of the neighbouring community prior to the main survey, to check the clarity, relevance and sequence of the questions and

to make minor changes to the questionnaire. To ensure maximum completeness of the data and, when needed, seek clarification, researcher-administered structured and semi-structured questionnaires were employed. Descriptive statistics were used to analyse quantitative data, and theme analysis was used for qualitative responses to look for patterns and themes. Combining both data sets allowed for a more complete picture of the role of small-scale fisheries in livelihoods diversification and household resilience.

4.1. The study area

According to Mafuku and Matamanda (2025), Redcliff is a small town Midlands Province of Zimbabwe. It is situated along the Harare-Bulawayo Road around 225 kilometres from the capital city of Harare. The village is located on the southern edge of the Great Dyke, a mineral-rich geological structure. Redcliff has historically relied on the production of steel as a source of income because it is in an area rich in iron, limestone, and gold. ZISCO Steel, which was founded in 1957 by the Rhodesian government as the Rhodesian Iron and Steel Company (RISCO) and changed its name to ZISCO following independence in 1980, had a major role in the town of Redcliff's development.

The population distribution in Redcliff is skewed towards females, with women comprising 53.28% of the population and men 46.72%. Approximately 62% of the population falls within the economically active age group (15–64 years), while 36% are aged 0–14 years and only 2% are aged 65 years and above (Mafuku, 2024). This young population structure is linked to a relatively high dependency ratio and population growth. These demographic characteristics are likely to increase demand for employment and livelihood opportunities, highlighting the importance of income-generating activities such as small-scale fisheries in supporting household livelihoods and food security. These population statistics, however, pertain to the overall population of Redcliff and should not be interpreted as representative of the study sample.

4.2. Data Analysis

To summarise the respondents' demographic characteristics, livelihood activities and diversification patterns, descriptive statistical techniques such as frequencies, percentages and graphical presentations were used for the quantitative data. The qualitative data were analysed using reflexive thematic analysis according to the six-step approach outlined by Braun and Clarke (2021). The analysis was initiated by repeated reading of the obtained interview responses, to become familiar with the data. Then the responses were coded inductively, and meaningful words, phrases and statements were given initial codes that represented what participants said or felt. Similar codes were grouped into broader categories, from which preliminary themes were generated. These themes were then checked for internal consistency and differentiation with the coded extracts and full dataset. The themes were then refined, clearly defined, and appropriately named before being organised into the final analytical narrative.

To ensure the trustworthiness of the findings, the researchers were actively involved in the coding and theme development process. Codes and themes were compared, discussed and refined to reduce individual researcher bias and increase the credibility and consistency of analysis. The qualitative findings were subsequently integrated with quantitative results through triangulation, enabling qualitative evidence to explain, complement, and enriching the descriptive statistical findings on livelihood diversification among small-scale fishers. Recent methodological literature recommends reflexive thematic analysis as a flexible and rigorous approach for analysing qualitative data, emphasising researcher reflexivity, transparency in coding, and iterative theme development rather than seeking coding reliability alone (Braun & Clarke, 2021; Byrne, 2021).

4.3. Main activities sustaining the Redcliff Town area

- a) Artisanal mining – small scale mining and illegal mining
- b) Agriculture (urban and peri-urban farming)-government has also supported urban agriculture through the supply of seed and fertiliser, however the main challenge is that these urban farmers have not been allocated land, but they use any vacant

- spaces around the suburbs. Peri-urban farming is more formal where farmers have been allocated A1 or A2 plots around urban areas.
- c) Vending- Vending also mushroomed in many high-density suburbs.
 - d) Tuck shops – like mentioned previously, the closure of Zimbabwe Iron and Steel Company (Ziscosteel) has led to the closure of many large retail shops and saw the emergency of numerous tuck shops either selling groceries or clothing.

5. Results and Discussion

This section presents and interprets the key findings of the study on livelihood diversification through small-scale fisheries at Cactus Poort Dam, Redcliff Town. The results are organised thematically and draw on both quantitative and qualitative data to explain fishing patterns, livelihood strategies, consumption behaviour, and socio-economic factors influencing artisanal fisheries in the study area.

To the best of our knowledge, this is the first study to investigate the fishery at Cactus Poort Dam. As such, it provides much-needed evidence-based information on the characteristics of the fishery and the livelihoods it supports. These findings establish a foundation for future research, including ecological assessments, socio-economic studies, and long-term monitoring of fishery. Figure 1 below depicts frequency of Fishing trips to the Cactus Poort Dam.

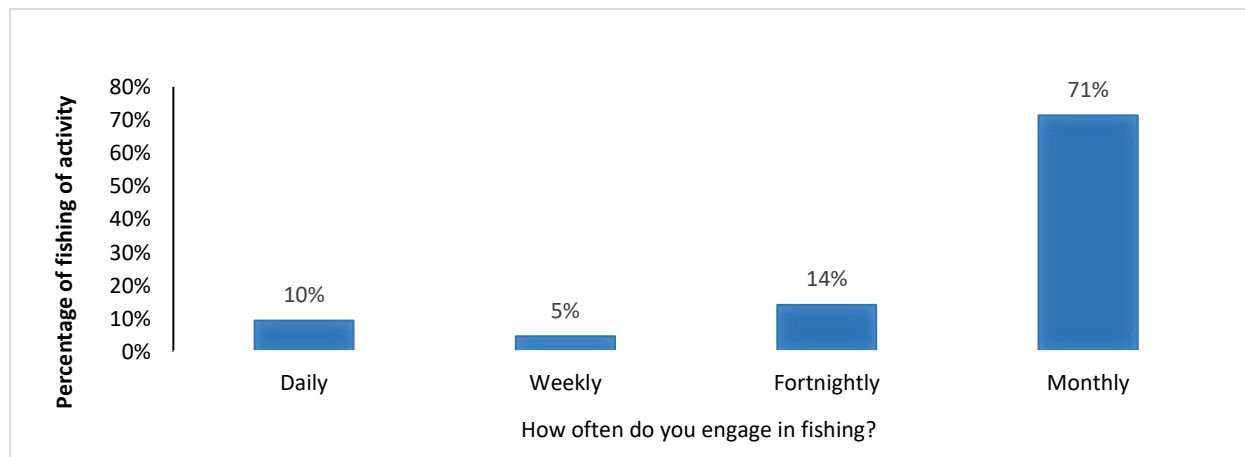


Figure 1: Frequency of Fishing Expeditions to the Cactus Poort Dam

Fisheries, particularly small-scale fisheries (SSF), are extremely complex social-ecological systems that are defined by the interplay of institutional dynamics, human behaviour, and natural processes. Overfishing, habitat degradation, and changes in fish populations brought on by climate change are issues these systems face (Fakoya et al., 2025). Fishing activity in Redcliff area is largely concentrated on a monthly scale (71%) of participants, 14% were fishing every fortnight, five percent fish on a weekly basis, and 10% set out their nets or cast their lines only once daily (see Figure 1). The higher proportion of fishermen engaging in fishing activities monthly, indicates that fishing is done on part-time basis. The proportion of fishermen fishing daily, indicates dependency on small scale fishing for survival.

One respondent explained this pattern clearly, stating that:

"I only go to the dam when I have no other income opportunities that month, so fishing helps me survive when things are difficult"

Another significant recreational feature in Ward 8 is the Cactus Poort Dam. Although the dam is surrounded by beautiful landscape and offers thrilling activities like fishing and canoeing, the area is less desirable for tourists and relaxation due to gold panners, illicit mining, and blasting. There are several enhancements that could be implemented in the area to make it more attractive to visitors, including the establishment of ziplining activities and speed boats, and the development of chalets to accommodate tourists close to the dam (Mafuku, 2024). In this context, the dam can be a recreational development site for

ziplining, speed boating, chalets and tourists to visit, but it must be set in the context of existing socio-economic factors. However, informal mining and environmental degradation are ongoing activities that further enhance the dam's role as a livelihood space and not a formal tourism destination, which demonstrates the importance of small-scale fisheries as a diversification tool in the local economy.

5.1. Purpose of Fishing Activities

The dominant category (40%) combines household consumption and selling fish for income. A further 29% fish solely for own consumption, while 20% combine recreation and consumption. Only a small proportion engage in selling only (5%) or recreational fishing alone (1%). Overall, the findings show that fishing is primarily driven by subsistence and livelihood needs rather than commercial profit or recreation (Figure 2).

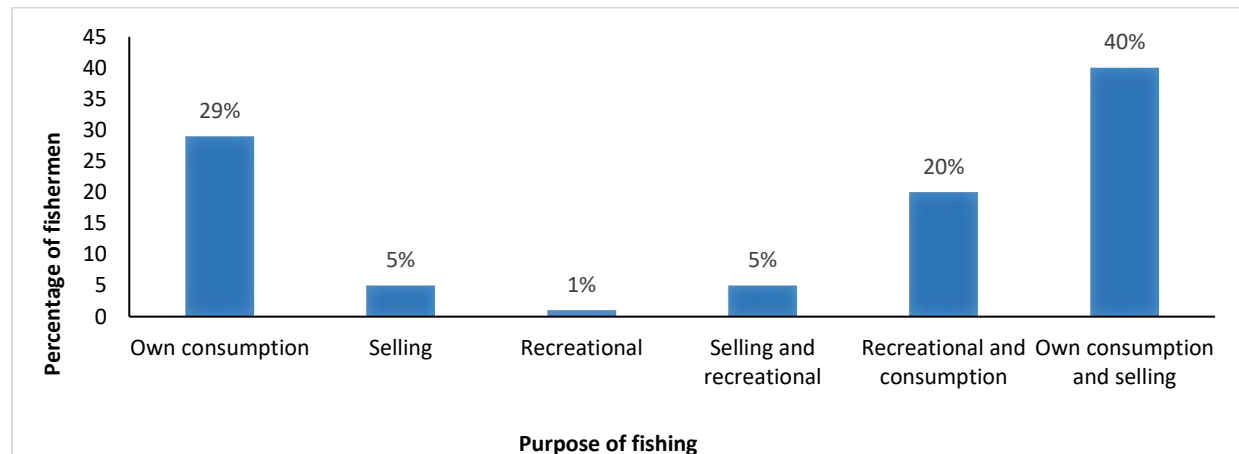


Figure 2: Main reason for fishing at Cactus Poort Dam, Redcliff, Zimbabwe.

Key findings show that none of the participants fishes exclusively for commerce, the dominant category (40%) combines household subsistence and selling for cash income (Figure 2). A further 29% kept everything they caught for their own consumption, while 20% were additionally fishing for recreation to subsistence and only five percent blended selling with leisure. Nutrition and livelihood first then profit and leisure as key drivers for local fishing.

Considering respondent 10:

"We fish mainly to eat at home first, and if there is extra, then we sell it to get small money for other needs"

There are few people engaging in recreational fishing. This could be related to the cost of fishing expeditions and gear used for fishing. Similarly, very few would do recreational fishing and sell their catch. However, some fishermen would prefer recreational and consumption of the catch if they manage to catch anything.

5.2. Fish Catch Size per Expedition from the Cactus Poort, Redcliff

Across the twenty-one fishing participant households, a typical yield is about 6kg of fish. Individual trips range from a single kilo to as much as fifteen kilograms of fish. One-third of fishing activities yield between 5–10 kg of fish; 11% of fishermen caught <1 kg, 14% caught 1 – 2 kg, 2 – 3kg or 3 – 5 kg apiece (Figure 3). Poor aquaculture training was evident in a study by Gwazani et al. (2022) "Rural small-scale aquaculture: An assessment of farmers' perceptions and technical efficiency in Masvingo, Zimbabwe," as respondents were unaware of the significance of pond water inlets and outlets to water quality management or the implications of feed and fingerling quality or quantity to growth performance.

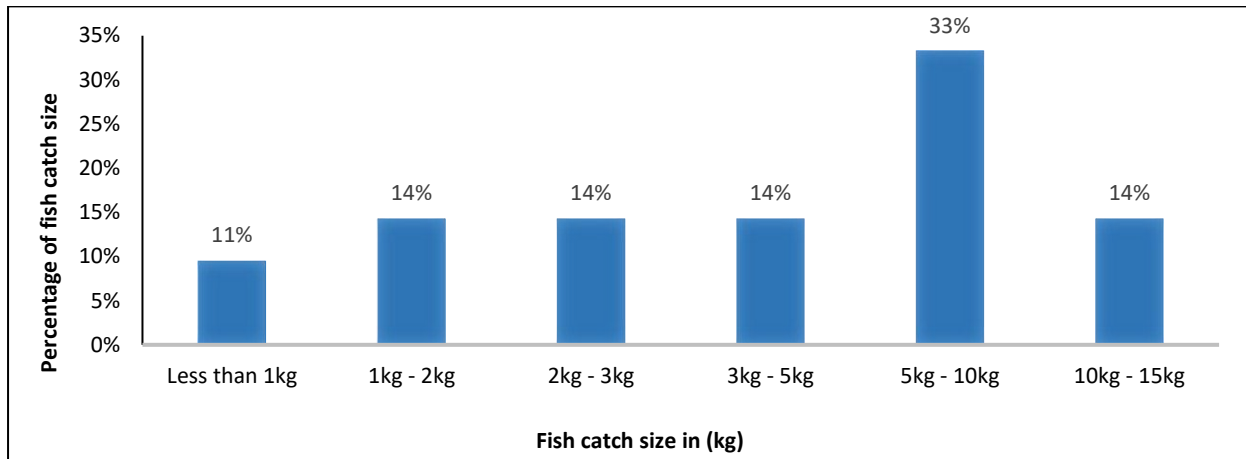


Figure 3: Average Fish Catch Obtained Per Fishing Expedition, Reflecting the Typical Harvest Levels of Local Fishers.

One respondent pointed to this discrepancy, saying:

"Some days you come home with a good catch, some days you come home with almost nothing, it's all just a matter of luck and weather"

These fluctuations further demonstrate the highly precarious and seasonal nature of small-scale fisheries at Cactus Poort Dam, which means they are used as a supplementary livelihood and not a reliable source of income. Nyathi et al. (2023) found that small scale fishers in Zimbabwe, do not use complicated equipment, but high operating costs such as fuel and repairs for equipment has prevented the sector from transforming into an economic sector. This shows financial barriers are inhibitory in the small-scale fisheries as many fishermen cannot afford complicated equipment. Such cost hinders the expansion of small-scale fisheries and for players to derive the economic benefits thereof. Financial barriers prevent those that sell the fish in the market from accessing the markets, information and financial resources. Likewise, climate change impacts have been cited as part of the reasons why fish catch has been declining in the past years (Elahi et al., 2024).

5.3. Fishing Expenditure Patterns by fishermen

Mhlanga (2020) alluded that inland fishing in Africa was expected to be worth US\$4,676 billion in the year 2020 and it was estimated that almost 2 million people were employed in inland fisheries. Many fishing participants (86%) were spending up to \$40 on fishing gear, baits and transport. Two-thirds of participants keep total out-of-pocket expenses ≤ \$20 per expedition. Ten percent of participants indicated they spent between \$51 and \$60, and 4% spent more than \$80. This comparison implies that, while the inland fisheries in Africa may be an important economic activity at the macro level, the small-scale fishers at Cactus Poort Dam are operating in a very low cost and subsistence-oriented framework, with minimum spending and careful management to maintain livelihoods, rather than maximise commercial returns.

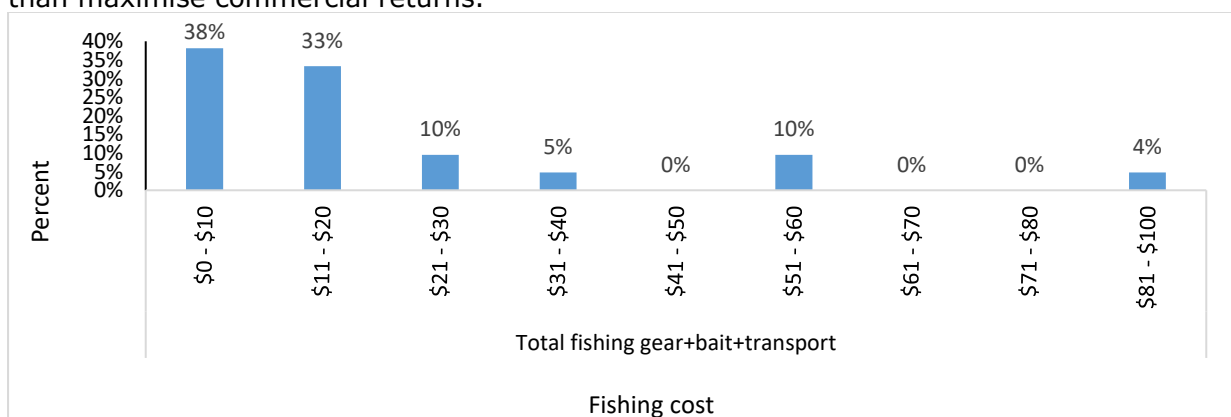


Figure 4: Expenditure on fishing trips inputs (USD)

5.4. Fishing Expenditure Patterns

The average cost of fishing equipment is just under \$13 but can be as much as \$50; the average cost of bait is below \$3 but can be as low as \$0; and the average cost of transport to the dam or river is \$5 and can be as low as \$0. The survey first established which fish types dominate both catch and cooking pots (see Table 1). Tilapia emerged as the universal species, mentioned by 90% of participants. Largemouth bass followed closely at 76%, and catfish at 57%, with the three making up the bulk of landings, and smaller quantities of silverfish, yellowfish, Kariba bream and unidentified types. This aligns with Muringai and Musakwa (2026) who reported that 99% of aquaculture production occurs in inland freshwater systems, which concentrate on native species such African catfish and tilapia.

Table 1
Fishing Expenditure Patterns at Cactus Poort Dam, Redcliff

	N	Min	Max	Mean	Std. Deviation
How much in USD\\$ do you spend on fishing gear?	21	0	50	12.71	15.232
How much in USD\\$ do you spend on bait?	21	0	8	2.57	2.357
How much in USD\\$ do you spend on transport to fishing sites?	21	0	25	5.00	5.779

Participant 3 posited that:

"Tilapia is the fish we catch most often, and it is also the one my family prefers because it is easy to prepare and provides enough food for everyone"

Proceeds from small scale fisheries used to cover other expenses which could improve the living standards (Nyathi et al., 2023). This finding highlights the importance of a few dominant fish species in supporting both household nutrition and livelihood diversification among small-scale fishers at Cactus Poort Dam.

5.5. Source of fish consumed by locals

Most participants (81%) were catching their own fish followed by 15% who were buying fish from the local marketplace, while only 4% bought directly from fisherman in the Redcliff area (See Table 2). Participants in the study showed more self-reliance by catching their own fish compared to those who buy. This was reflected in the experiences of respondents, with one participant stating:

Table 2
Main Sources of Fish Consumed by Households in The Study Area

Source	Number
Catch my own fish	81%
Buy from local fisherman	4%
Buy from local market / supermarket / shops	15%

"I like to fish myself, that's because it saves money, and I know that there will be food at home if I don't have cash to buy it"

This result highlights the significance of small-scale fisheries in improving household food security and reducing the need for market purchasing. According to Gwazani et al. (2022), the predominant fish in Zimbabwe is tilapia, and fish producers believe that catfish are not a preferred species for a variety of reasons, including religious convictions. However, respondents also expressed concerns about the safety of fish obtained from certain water sources. Some participants indicated a mistrust of fish caught in areas affected by artisanal and small-scale mining activities, fearing possible contamination of water bodies. In addition, concerns were raised about water sources polluted by sewage discharge, which are perceived to increase the risk of waterborne diseases such as cholera, typhoid, and diarrhoeal infections. This is in line with the Sustainable Livelihoods Framework which supports the maintaining and access to safe and healthy aquatic ecosystems strengthens natural capital, thereby supporting household food security, livelihoods, and long-term community resilience.

5.6. Types of fish caught in the Cactus Poort Dam

The Nile tilapia, also known as Kariba bream, is the most widely farmed fish in Zimbabwe (Chipfakacha, 2024). There are two primary species: rainbow trout (*Oncorhynchus mykiss*) and Nile tilapia (*Oreochromis niloticus*), with the former being the industry's mainstay in Zimbabwe. Other species that are raised include brown trout (*Salmo trutta*), African catfish (*Clarias gariepinus*), and Mozambique tilapia (*Oreochromis mossambicus*) (Muringai & Musakwa, 2026). Most participants (86%) ate every kind of fish they could obtain, save for the 14% who deliberately avoid catfish as a species, based on religious reasons (9%) or simple dislike (5%).

5.7. Fish Species Preferences by Consumers

This preference was reflected in respondents' views, with participant 23 stating:

"I eat most types of fish that we catch, but I do not eat catfish because of my religious beliefs"

Another respondent remarked:

"For me it is not religion; I simply do not like the taste and appearance of catfish"

The avoidance of catfish for religious reasons was particularly evident among some members of African apostolic sects, whose dietary practices prohibit the consumption of certain fish species, including catfish. However, Redcliff is characterized by a culturally and religiously diverse population comprising people from different ethnic, religious, and socio-economic backgrounds. As a result, most participants reported consuming a wide range of fish species based on availability, nutritional value, and household preferences rather than religious restrictions. These findings suggest that while cultural and religious beliefs influence fish consumption patterns among specific groups, fish remains an important and widely accepted source of food and livelihood for the broader community around Cactus Poort Dam. All the 23 artisanal fishers interviewed already engage in at least one other income-generating activity; only 48 % of those who sell fish rely on fishing alone, while 52 % deliberately combine it with other earnings, which can include urban agriculture (Ngwenya et al., 2024), vending and tuck-shop trade (Runokunda et al., 2025), artisanal mining (Jongwe & Mhlanga, 2023). This indicates that at Cactus Poort Dam, Redcliff, small-scale fisheries function firstly as a diversification device rather than as a stand-alone livelihood. This multiplicity is not accidental as the local economy was shattered by the closure of Zimbabwe Iron and Steel Company, and fishing stepped in as a low-entry-barrier income safety net that can be switched on and off as other opportunities shrink or expand. Monthly rather than daily effort is the dominant pattern (71 % of fishers go out only once a month), which shows that SSF is used to smooth consumption and cushion shocks instead of supplying continuous cash flow.

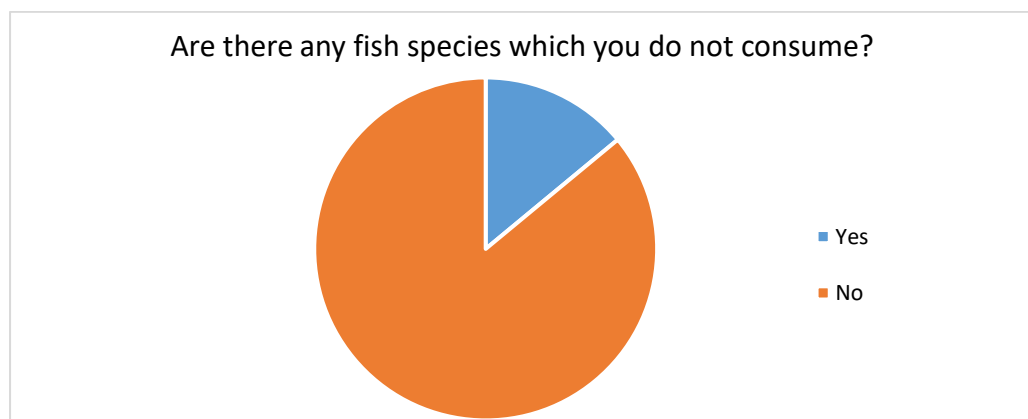


Figure 5: Species preferences by consumers and fishermen in the Redcliff Town, Zimbabwe

The nutritional motive also reinforces the diversification logic among artisanal fishers. Forty-three percent of fishers consume part of the catch and sell the surplus, while a further 29 % keep everything for the household, and no artisanal fishers were engaged in purely commercial fishing. Tilapia, bass and catfish caught in the dam were the major sources of fish protein and income for other essentials. Because the average fishing expedition yields only 6 kg and median cash outlays are US \$20 or less, low risk helps to sustain diversification coping strategies. Further, the previous recurrent patterns in unreliable electricity supply in Zimbabwe over the years (Chivandire, 2020), posed a post-harvest risk of losses for artisanal fishers, thus intentionally keeping the activity at “low-cost, low risk” bracket.

As respondent 11 explained:

"We do not catch enough fish to depend on it alone. We eat some at home and sell the rest to buy other necessities such as mealie meal, cooking oil, and school requirements for the children"

Farmers believed that fish farming had untapped potential and were inspired to keep going despite input and technical knowledge constraints. Fish is both a source of revenue and protein for families in Zimbabwe. However, because fish farmers lack freezing facilities, were unaware of fish markets and competitive selling prices, and lacked dependable transportation to transfer the product, marketing harvested fish remained difficult (Gwazani et al., 2022). These findings demonstrate that small-scale fisheries at Cactus Poort Dam serve a dual role in supporting both household food security and income generation. Rather than functioning as a specialised commercial enterprise, fishing is integrated into broader livelihood portfolios and acts as a safety net during periods of economic hardship. The combination of low operational costs, flexible labour requirements, and the ability to provide both food and cash income makes small-scale fisheries an important livelihood diversification strategy for households in Redcliff, particularly in the context of limited employment opportunities and ongoing economic uncertainty.

Seasonal or spatial flexibility is further illustrated by effort allocation where 10 % of fishers fish daily (the most dependent subset), 14 % fortnightly, 5 % weekly, and 71% monthly confirming that households adjust labour depending on other income activities, or weather. Expenditure patterns show 85 % of fishers spend ≤ US \$40 on fishing gear, that can be stored and re-used when other incomes fail. Thus, adjustment of labour allocation aligns with the sustainable methods as the fishers can also just pawn, share or idle their fishing gear at negligible cost in periods of low activity. In line with the Sustainable Livelihoods Framework, this flexibility enables households to diversify their livelihood strategies, optimise the use of available assets, and enhance resilience to seasonal, economic, and environmental shocks.

5.8. Management

This study highlights the need for integrated management of small-scale inland fisheries as part of broader rural livelihood and poverty alleviation strategies. Flexible management approaches, coupled with frequent monitoring of fish stocks, catch composition and fishing effort, are critical to avoid overfishing, while ensuring access for vulnerable communities. To sustain exploitation of key species, species specific measures are needed, including size limits, gear regulations, habitat protection and season closures, for species like tilapia, largemouth bass (*Micropterus salmoides*), and African sharptooth catfish (*C. gariepinus*). Investment in cold storage, fish processing and market infrastructure would help minimize post-harvest losses, improve income and boost the resilience of livelihoods.

The quantitative and qualitative results obtained complement each other in showing that small-scale fisheries at the Cactus Poort Dam are more of a livelihood diversification activity than a sole commercial venture. The quantitative results indicated that most of the respondents were involved in part-time fishing, complement fishing with other income generating activities and used the fish caught for household consumption and/or supplementary income. These patterns were corroborated by qualitative descriptions, where

participants referred to fishing as a coping mechanism and used it during times of unemployment, economic difficulty or seasonal income shortages. Respondents also emphasized the role of fishing in securing food for their families, earning income for household demands, and enhancing economic and environmental security. The combination of both data sets thus gives clear evidence that small-scale fisheries are important contributors to household food security, income diversification and livelihood resilience for communities around Cactus Poort Dam, and that there are some key policy interventions that can overcome the financial, environmental and institutional barriers that constrain the full potential of small-scale fisheries.

6. Conclusion

This study investigated livelihood diversification through small-scale fisheries at Cactus Poort Dam in Redcliff Town, Zimbabwe. The results indicate that small-scale fisheries are used mainly as a secondary livelihood activity and not as a major occupation. Many fishers were involved monthly, engaged in additional income-generating activities, and consumed and sold their catch in limited quantities. Fishing also helped households in terms of food security as it was an inexpensive source of protein and a source of additional income for basic needs. Fishing is accessible to economically vulnerable households, largely due to the low cost of fishing gear, bait, and transport, especially in a town where formal employment opportunities have been scarce and industrial jobs have declined. The study also revealed that fishing effort is very flexible, where households can move labour from fishing to informal trading, agriculture, mining and other activities, depending on the situation. This flexibility helps to build the resilience of the household and helps fishers cope with economic uncertainty. To enhance the contribution of small-scale fisheries to livelihood diversification, local authorities and development partners should improve access to fishing equipment, strengthen fisheries co-management arrangements, support fish processing and storage facilities, and facilitate market access. Future research should investigate the long-term sustainability of fish stocks at Cactus Poort Dam, the impacts of environmental degradation and mining activities on fisheries, and the role of small-scale fisheries in building resilient urban livelihoods under changing socio-economic and climatic conditions.

Author Contributions

Munetsi Zvavahera: conceptualization, methodology, data collection, formal analysis, interpretation of results, manuscript writing and final editing.

Barbra Mahoso: conceptualization, methodology, formal analysis, interpretation of results, manuscript writing and final editing.

Leonard Chitongo: conceptualization, methodology, formal analysis, interpretation of results, preparation and writing of the manuscript and final editing.

Conflict of Interests/Disclosures

The authors declared no potential conflicts of interest w.r.t the research, authorship and/or publication of this article.

Ethical approval

Permission to conduct the research was also obtained from the Redcliff Municipality Authorities and stakeholders responsible for the study area before data collection commenced. No live experiments were performed on vertebrate animals for this research. The research consisted of socio-economic surveys, interviews, observations, and documentation of fishing activities.

All participants received information about the study and provided written informed consent before participation. The participation was voluntary and participants could leave the study at any time without penalty.

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