

EXAMINING THE EXPENDITURES AND RETENTION OF MONEY OF RECREATIONAL FISHING ALONG THE WILD COAST, SOUTH AFRICA

A thesis submitted in fulfilment of the requirements for the degree of

MASTER OF COMMERCE

of

RHODES UNIVERSITY



By

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February 2023

ABSTRACT

Developing countries and rural communities rely heavily on the ocean for food, transport, and the sustainability of their livelihoods. While the economics of small-scale fisheries in rural areas have received much attention, there is generally less information on the economic contributions from recreational fisheries in these areas. South Africa's marine recreational fishery is large and contributes to a significant amount of economic activity. However, the retention of money from recreational fishing activities in local rural economies is unknown and thus the potential developmental benefits from this sector remain unquantified. This study examined the economic contributions from recreational fishing along the Wild Coast and retention of expenditures within the local economy. A total of 109 face-to-face economic surveys were administered during the peak recreational fishing season in December 2021. Based on the results, recreational fishing in the Wild Coast has the ability to generate R 415 446 098 in economic activity annually, however only 9.5% of this is retained within local coastal economies, which diminishes the economic contributions of the fishery to the Wild Coast region. Expenditures on items stemming from the informal collection and selling of bait and seafood, domestic work and guiding were the highest locally retained expenditures within the region. 98% of all bait and seafood was harvested and sold by local gillies, with 2% being bought through hotels (n=109). The total direct economic contribution in terms of informal harvesting was estimated at R 16 077 711 for 2021 (n= 9 601). The identification of these contributions can be used to provide recommendations for local economic development strategies which can support the recreational fishery while uplifting coastal communities that should be benefitting more from the activity.

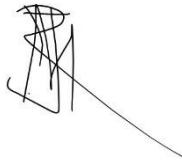
JEL Classification: Q51, Q56, Q58

Keywords: ecotourism; socio-development; money retention; economic leakage; sustainable fisheries; Wild Coast

DECLARATION

I, Michael Jonathan Pyle, hereby declare this is my original work (except where acknowledgements indicate otherwise) and that this thesis has not been submitted for a degree in any other university. The thesis is submitted in fulfilment of the requirements for the degree of Master of Commerce at Rhodes University, South Africa.

Signature:

A handwritten signature in black ink, appearing to be 'MJP', with a long horizontal line extending to the right.

Date: 14 February 2023

ACKNOWLEDGEMENTS

To my supervisors, Professor Gavin Fraser, Professor Warren Potts, and Doctor Christopher Bova, I would like to express my sincere thanks for your guidance and support throughout the past two years. Your input and tireless work was paramount to the completion of this thesis.

Special thanks to the One Ocean Hub for funding the fieldwork required for this study.

To Mrs Kerry Bullock and Doctor Bruce Mann, thank you for providing the aerial data used for this thesis. To Professor Ian Meiklejohn, thank you for assisting in drawing the detailed maps of the Wild Coast.

Lastly, I would like to acknowledge and thank the fieldworkers who accompanied me during the enduring fieldwork process in the Wild Coast, namely Andrew Meiklejohn, Chris Bova, and Kyle Hewett - your efforts in collecting data were invaluable, thank you.

DEDICATION

For my grandfather,
A true Wild Coast fisherman.

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DEFINITIONS

Consumer Surplus: Consumer surplus refers to the non-market benefits derived from activities and is measured by the additional amount an individual would be willing to pay over and above their market expenditures (Charbonneau and Hay, 1978). This value is assigned in addition to what fisherman would benefit from the resource.

Economic Contributions: the gross change in economic activity associated with a sector, industry, event, or policy in an existing regional economy (Watson *et al.*, 2007). In this case it will be money generated within an economy because of anglers' expenditures, where this money would not have been spent within the economy if fishing didn't exist.

Economic Impact: the net economic change in a host community resulting from tourist spending in this case, by fishers, in a given area (Ritchie and Goeldner, 1994; Steinback *et al.*, 2004, Ihde *et al.*, 2011).

Economic Leakage: Revenue generated by the fishery, that is lost to outside economies (Low money retention capacity). The cumulative effects of actions like buying imported food or staying in a foreign-owned hotel can be significant.

Ecotourism: responsible travel to natural areas that conserves the environment, sustains the wellbeing of local people, and involves interpretation and education.

Expenditures: refers to any spending associated with the activity of a recreational fishing, including durable goods, and the costs incurred during the duration of a trip that involved fishing. The total expenditures associated with the fishery can be viewed as the Economic Activity associated with recreational fishing.

GDP Contributions: monetary value of all finished goods and services made within a country during a specific period.

Gillie: An ancient Gaelic term for a person who acts as an attendant on a fishing or hunting trip. Along the Wild Coast, gillies generally help tourist anglers by offering their knowledge of the particular stretch of coastline, collecting bait and landing fish.

Livelihood Fishing: Fisheries, contribute to livelihoods in several ways: directly as a food source, as a form of income and other socioeconomic benefits, such as a way to diminish the effects of poverty.

Local Economic Development (LED): LED is a strategy towards economic development which allows and encourages local people to work together to achieve sustainable economic growth and development thereby bringing economic benefits and improved quality of life for all residents in a local municipal area (COGTA, 2022).

Local Economy: Coastal communities residing within the Wild Coast, Eastern Cape, South Africa, that rely on fisheries resources and the economic activity thereof.

Locals: Individuals who reside along the Wild Coast, Eastern Cape, South Africa.

Multipliers: ratios that explain the level of jobs, tax revenues or other contributions generated for each unit of currency spent. For example, a sales multiplier of 1.1 reports that R 1.10 in total sales occurs within the economy for every Rand spent by anglers.

Recreational Fishing: fishing of aquatic organisms that does not constitute the individual's primary resource to meet nutritional needs and are not generally sold or otherwise traded on export, domestic or black markets.

Regional Resident Anglers: Individuals who live in towns within close proximity to the Wild Coast (Mthatha, East London, Willowvale).

Shore-based Angling: A form of recreational angling used to target fish accessible from the shoreline.

Sustainable Livelihoods: A sustainable livelihood is one in which can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and

in the future, while not undermining natural resource bases. (Hoon, *et al.*, 1997; Chambers and Conway, 1992).

Tourist Anglers: External residing individuals visiting the Wild Coast for recreational fishing.

Willingness to Pay: Willingness to pay (WTP) is the maximum amount of money that a customer is willing to pay for a product or service.

LIST OF ABBREVIATIONS AND ACRONYMS

CV:	Contingent Valuation
GDP:	Gross Domestic Product
IDP:	OR Tambo Integrated Development Plan
LED:	Local Economic Development
MLRA:	Marine Living Resource Act 18 of 1998
MPA:	Marine Protected Area
NGO:	Non-governmental Organization
RR:	Regional Residents
SDI:	Spatial Development Initiatives
SMME:	Small, Medium, and Micro-enterprises
SSF:	Small Scale Fishery
TCM:	Travel Cost Method
TEV:	Total Economic Value
WTA:	Willingness To Accept
WTP:	Willingness To Pay

CHAPTER 1: INTRODUCTION

Marine and coastal resources are rich, diverse natural assets that support human activity, socio-economic well-being, and biological functions (Tembo, 2021). Recreational fisheries have rapidly become the dominant fishery sector in several saltwater and freshwater environments, with particular popularity in developing economies (FAO, 2012; Arlinghaus *et al.*, 2016). Arlinghaus *et al.* (2015) noted, on average about 11% of people participate in recreational fishing, amounting to a global estimate between 220 - 700 million recreational fishers (Cooke and Cowx 2006; World Bank 2012). With massive and growing participation, there is a distinct global interest in assessing the economic, socio-cultural, ecological and sustainability importance of recreational fishing (FAO 2012; World Bank 2012).

Several studies have documented the significant environmental impact of recreational fisheries, in both developed and developing countries (Coleman *et al.*, 2004; Cooke and Cowx, 2006; Potts *et al.*, 2020). Recreational fisheries are known to compete directly for resources with livelihood fisheries (commercial, subsistence and small-scale) and can wreak environmental havoc in fragile ecosystems (Brownscombe *et al.*, 2019; Potts *et al.*, 2020). If poorly managed, recreational fishers can be highly non-compliant (e.g., Bova *et al.*, 2022) and this may result in over-exploitation of marine resources (Mann *et al.*, 2003).

Despite all the negative attributes associated with recreational fisheries, they carry enormous potential benefits primarily through the substantial economic benefits associated with their activities (Ditton *et al.*, 2002; Zwirn *et al.*, 2005; FAO, 2019; Butler *et al.*, 2020; Potts *et al.*, 2022). These contributions have been defined as the gross change in economic activity associated with an industry, event, or policy in an existing regional economy (Crouch and Ritchie, 1999; Ritchie and Inkari, 2006). In this case it's the gross change in economic activity caused by spending of tourists and regional residents, within a host community (Wild Coast settlements). Recreational fisheries can generate ten-fold more economic activity than that of a commercial fishery (Arlinghaus *et al.*, 2016).

However, if such economic activity is not recognised by investors and key stakeholders, the economic sustainability of the fishery will remain questionable primarily because of missed market opportunities (Leeworthy *et al.*, 2014; Potts *et al.*, 2020; Potts *et al.*, 2022).

The economic contributions of recreational fisheries have been well quantified in the developed world (Steinback, 1999; Navrud, 2001; Tisdell, 2003; Toivonen *et al.*, 2004; Fedler, 2009; Southwick *et al.*, 2010; Pascoe *et al.*, 2014; Raguragavan *et al.*, 2014; FAO, 2019). The 2019 National Oceanic and Atmospheric Administration (NOAA) report indicated there were more than 54 million recreational fishers in the United States of America (USA) who contributed US\$ 89 billion to the economy and supported 553 000 jobs (NOAA, 2019). McIlgorm and Pepperell (2012) estimated that recreational fishing in New South Wales (Australia) contributed to AUD \$3.42 billion with an associated employment of 14 254 equivalent full-time jobs, while Hyder *et al.* (2018) estimated that there are 8.7 million recreational saltwater anglers in Europe, who contribute to €5.9 billion per annum. Herfaut *et al.* (2013) estimated France to have around 2.5 million fishers, with the total catch estimated at 24 000 tons of fish and 3 100 tons of shellfish, resulting in recreational fishing expenditure estimated between € 1200 and € 2000 million.

The dependence on this oceanic resource is no ‘new phenomenon’ within developed nations, where participation rates are high and there is a noticeable lower reliance on fish stocks for food (Mora *et al.*, 2009). However, there is a need for a better understanding surrounding the economic importance of the recreational fisheries in developing nations (Pitcher and Hollingworth, 2008), which can provide vital details for management decisions (FAO, 2002; Mann *et al.*, 2003; Mora *et al.*, 2009). Furthermore, valuation helps to make economic comparisons between various natural resources and their relevant importance (Diafas *et al.*, 2017). Of the few studies stemming from African countries, McGrath’s research, *The Economic Valuation of The South African Linefishery* (1997) was the first study to look at the economic importance of fisheries along the South African coastline, showing that 421 000 anglers contributed an estimated ZAR 1.6 billion to the Gross Domestic Product (GDP) and generated 99 180 jobs (McGrath *et al.*, 1997). More recently, the economic contribution of recreational fisheries in South Africa was assessed by Potts *et al.* (2022). The study indicated a national recreational fishing participation estimate of 1 327 633 individuals, which contributed ZAR 32.6 billion (US\$ 2.2 billion) per year to economic activity and sustained 94 070 full-time jobs. Butler *et al.* (2020) suggested that recreational fisheries generate substantial economic activity in areas that would otherwise attract little revenue from outward sources. In rural Angola, lodge fisheries generated \$125 962 in two seasons, with local fisheries generating a significant \$134 304 (Butler *et al.*, 2020). While an economic valuation of the Namibian

recreational shore-angling fishery showed that 8 800 anglers spent around 173 000 days angling and had direct expenditures of N\$29.7 million (Kirchner *et al.*, 2002).

The lack of economic data originating from developing nations, and specifically in rural areas is concerning as, based on the future development of the recreational fishing ecotourism industry (Smith 1986; Potts *et al.*, 2009; Potts *et al.*, 2022), this is where rapid growth may occur. Recreational fishing brings in an external inflow of money (e.g., Potts *et al.*, 2009; Belhabib *et al.*, 2016; Butler *et al.*, 2020) and this provides economic opportunities for local guides, hospitality providers, local retail owners and domestic workers. A shortfall of economic data in this sector will only limit the significance of such opportunities, impeding the role of ecotourism in rural areas and limiting social development (Taylor *et al.*, 2003).

On the policy forefront, the effectiveness of recreational fisheries governance has shown mixed outcomes. Potts *et al.* (2020) indicated that while recreational fishing is referred to in the main legislation of 67% of total countries reviewed, only 86 of these 152 countries provide evidence or a definition for either “recreational” or “sport” fishing. In general, recreational fisheries are not considered to be well managed in many countries, with less than a quarter of respondents claiming that management in their country is effective. Developed countries generally had better governance practices (e.g., United States of America (USA) and Australia), while others showcase no coordinated governance structure at all (Potts *et al.*, 2020). One of the primary reasons for the poor governance of recreational fishing is their lack of recognition within fishery governance systems (Arlinghaus *et al.*, 2019; Potts *et al.*, 2020). Potts *et al.* (2020) recommended that an assessment of the economic activity associated with recreational fisheries is a first, important step to obtain better recognition, more interest from stakeholders and ultimately better governance (Potts *et al.*, 2020).

After their recognition, there will be opportunities to leverage recreational fisheries as a developmental tool. However, developing nations governments’ need to acknowledge the potential socio-economic benefits of recreational fishing and view recreational fishers as a potential resource for social development through tourism (Arlinghaus *et al.*, 2016; Potts *et al.*, 2022). Rural fisheries are often overlooked in social development and resource management projects overseen by the government, inhibiting possible growth of emerging markets and the future-sustainability of oceanic resources, leading to a vicious cycle of degradation (Wood *et al.*, 2013). Taking this into consideration, Arlinghaus *et al.* (2016) highlighted the need for case studies that demonstrate effective and responsible development of recreational fisheries in

economies in transition, which accrue benefits locally as well as those that are managed sustainably in line with local culture and customs. Southwick *et al.* (2010) provides a good example of such communiqué, where local Mexican business owners and governments were informed on the vast economic activity linked with the sector, with the opportunity to use it as a sustainable form of tourism.

A large proportion of the recreational fishing tourism occurs in rural areas, where local economies are not well-developed enough to take advantage of the economic activity (Butler *et al.*, 2020). This results in marginalisation in local retention of the money associated with recreational fishing and limits the benefits accrued from this activity to local communities (Sandbrook, 2010). A foremost concern with the future development of rural fisheries and ecotourism in developing countries is the likelihood of economic leakage (Sandbrook, 2010; Butler *et al.*, 2020). Economic leakage being revenue that has been generated by a business sector, in this case a rural fishery, that is lost to outside economies (Smith and Jenner, 1992). This leakage can occur at a regional, national, or international scale and is caused by local markets having low money retention capacity (Butler *et al.*, 2020). Leakage out of local economies is even more detrimental and is triggered by low skilled individuals, poor infrastructural means, and lack of industry within rural areas (Sandbrook, 2010). The cumulative effects of actions like buying imported food or staying in an externally owned hotel can be significant to local markets in developing nations. Both Chirenje *et al.* (2013) and Butler *et al.* (2020) acknowledge the need for stronger economic linkages between the tourism sector and local livelihoods, in order to combat the effects of economic leakages. This is proposed by training local communities and giving opportunity for sustainable community participation in ecotourism activities. From the perspective of ecotourism through recreational fishing, it is vital that some money is retained locally, discouraging leakage, and giving prospect to sustainable livelihoods.

Measuring the economic activity of fisheries has taken the form of a variety of frameworks dependent on the type of value being investigated (Fedler, 2009; Southwick *et al.*, 2010; Bova, 2022). Several economic methods have been used to determine the economic activity associated with recreational angling, such as the Input-Output method, Total Economic Valuation (TEV), Travel Cost and Willingness To Pay (WTP) studies (Watson *et al.*, 2007; Bockstael and McConnell, 2007; Fedler, 2009; Potts *et al.*, 2022). The Travel Cost Method (TCM) is a proven method used to evaluate the economic values of leisure activities, such as

recreational fishing, and provides a suitable framework to assess rural areas where effort is dispersed over a large area (Shrestha *et al.*, 2002; Pokki *et al.*, 2018). The method can cater for many applications, often being used to value a change in the environmental quality at a recreational site, such as improved water quality at a beach, an improved fish catch-rate for anglers, and greater conservation at the site (Fleming *et al.*, 2008).

The Wild Coast of South Africa, within which this study is based, is an example of a poor, rural area which is renowned for its marine based recreational fishing. The area is comprised of seemingly undeveloped settlements which source most supplies from external economic hubs (Smith and Jenner, 1992; Lange, 2011; Sitinga and Ogra, 2014). The picturesque landscape offers highly contested natural resources, with subsistence use of local resources contributing extensively to local livelihoods (Guyot and Dellier, 2011). The regional economy predominately consists of individuals and firms operating in the informal sector, largely due to the area's abundant natural resources (Guyot and Dellier, 2011). The use and value of these resources are in the interest of both development and conservation projects, with the aims of protecting ecosystems as well as rectifying economic mistreatment under the Apartheid regime (Clark and Worger, 2013; Masterson *et al.*, 2019). The OR Tambo Integrated Development Plan (IDP) of 2009/2010 reported that more than 72% of the Wild Coast population live in poverty, identifying as one of the poorest regions in South Africa. The total estimated population of Wild Coast is 440 000 individuals of which approximately 67 % are unemployment (IDP, 2010).

Despite recent research having instigated the exploration into the economic potential of recreational fisheries, few publications focus on developing countries, money retention and the economic leakage concept (Libosada, 2009; Teh *et al.*, 2011). Subsequently, this study will be focusing on expenditures that are retained in the local economy, in which attention can be drawn to for economic development.

1.1 Problem Statement

Developing countries and rural communities rely heavily on the ocean for food, transport, and the sustainability of their livelihood (McGrath *et al.*, 1997; Mann *et al.*, 2003). While the economics of small-scale fisheries in rural areas have received much attention (Smith and Basurto, 2019), there is generally less information on the economic contributions from recreational fisheries on these areas. South Africa's marine recreational fishery is large and contributes to an enormous amount of economic activity. However, the retention of money from recreational fishing activities in local rural economies is unknown and thus the potential developmental benefits from this sector remain unquantified.

1.2 Aim of Study

i) Overarching Aim

- This manuscript aims to identify the social and economic contributions of the Wild Coast recreational fishery and further strategies for enhancement.

ii) Objectives

- To determine the expenditure of goods and services associated with recreational fishing within the Wild Coast Region.
- To estimate the extent of economic leakage from recreational shore fishing along the Wild Coast.
- To estimate the amount of money retained from the money generated by recreational shore fishing along the Wild Coast and identify salient industries for promoting value retention within rural communities; and
- To quantify the money generated in the informal seafood/bait harvesting sector along the Wild Coast during 2021 and to discuss the economic opportunities presented by ecotourism.

1.3.Thesis Overview

This thesis comprises of six chapters. A concise summary of the contents of each chapter is outlined below. Additional information relating to the study is found in the appendices.

Chapter 1: Introduces the study and paints the picture of the ecotourism sector, economic contributions of recreational fisheries and economic leakage. It contains the problem statement, the research goals, and thesis structure.

Chapter 2: Presents a literature review embodying the importance of recreational fisheries, ecotourism as a vector for development, sustainable livelihoods, and the economic valuation various global fisheries. The chapter introduces economic methods that have been used to value fisheries, and the various ways they have been applied.

Chapter 3: Describes the methods and materials used for this research. This section is contains the methods used to estimate the total economic activity of the fishery, a detailed description of the study site; the Wild Coast, Eastern Cape, South Africa, a method to estimate the fisherman population, various expenditures, the process of collecting the data and the means of data analysis.

Chapter 4: Displays and explains the findings of this study. The results contain regression analysis, per trip expenditure amounts, direct economic contributions in terms of informal market harvesting, economic leakage, and money retention values. This section also includes the extrapolating of the surveyed sample data onto an estimated population and the demographical aspect.

Chapter 5: Delves into an in-depth discussion, with focus drawn ecotourism, sustainable livelihoods, informal markets, and fisheries legislation.

Chapter 6: Concludes with limitations of the study and presents recommendations.

CHAPTER 2: LITERATURE REVIEW

2.1. ECOTOURISM

From a global perspective, tourism is seen as an impetus to the economic progress of developing nations, with its importance gaining widespread recognition (Durberry, 2004). Tourism was highlighted as one of the key sectors for development in the South African National Government's 1995 directive to municipalities to implement Local Economic Development (LED). This was mandated to achieve the goal of reducing poverty and promoting economic growth at the local level (Hindson and Vincente, 2005). While the lack of basic infrastructure in rural areas raises concern, niche sectors like ecotourism have proven to be effective (Lange, 2011; Butler *et al.*, 2020).

Various branches of tourism, such as ecotourism are becoming more prevalent in developing nations due to their fauna and flora attraction, natural resource abundance and sense of remoteness (Table 2.1) (Taylor *et al.*, 2003). It has been suggested that activities operating within the ecotourism sector, such as recreational fishing, can potentially buffer the overall value linked with a coastline based on high stated preference indicators (Willingness to Pay) or people's willingness to travel vast distances (Shrestha *et al.*, 2002; Taylor *et al.*, 2003; Fleming and Cook, 2008; Butler *et al.*, 2020). Furthermore, recreational fishing has proved to reduce consumption and human impact with the use of effective catch and release practices, aligning with ecotourism's push for responsible travel to natural areas that conserve the environment, sustains the wellbeing of local people, and involves interpretation and education (Danylchuk *et al.*, 2018; Butler *et al.*, 2020). Furthermore, cases of ecotourism (e.g., Mauritius) have promoted incentives for national governments to protect and develop further wildlife zones where they contribute towards local economic productivity (Durberry, 2004).

A noticeable effort has been put into focusing on the effects of community-based ecotourism initiatives suggesting that ecotourism, when implemented using 'pro-poor' principles, could generate local economic benefits for the impoverished (Ashley and Roe, 2002; Kirkby *et al.*, 2010; Lange, 2010; Tsephe and Obono, 2013). The 'pro-poor' tourism agenda is a tourism strategy, aiming to benefit impoverished individuals directly through tourism (Mitchell and Ashley, 2006). Several empirical studies have brushed upon ecotourism on the Wild Coast.

Lange (2011) examined ecotourism as a catalyst for promoting local economic development at Bulungula Lodge in Nqileni, Eastern Cape, Palmer *et al.* (2002) focussed on the conservation and development of the Dwesa-Cwebe area and Cousins and Kepe (2004) focused on the failed Mkambathi ecotourism project, where the ‘empowerment’ of local communities, entrepreneurs, and government involvement in community ‘partnerships’ with private-sector investors was central to the project. Unfortunately, misalignment of operational forces and the accountability of local bodies to the community were ignored. Project planning failed to involve local participation, which would have provided a better understanding of local livelihoods, land tenure disputes and resource tensions. Spenceley (2003) presented the case of the Mtentu Estuary, where a private sector operator engaged with a rural community in order to operate from their land. This case showcased how NGO’s have facilitated a relationship between the private sector and community partners. However, there still remains a dearth of information regarding the benefits of and enhancement strategies for ecotourism within the Wild Coast region.

Table 2.1 Typical approaches to tourism within developing nations

<i>Economists</i> generally see tourism as a route to macro-economic growth, and especially as a means of attracting foreign currency into rural areas.	For the <i>private sector</i> , tourism is a high operating-commercial activity, so the main concerns are product development, competitiveness, and commercial returns.
<i>Ecologists and conservationists</i> see tourism as a way of promoting sustainable use of natural resources, and hence as a way to buffer incentives for conservation.	<i>Rural communities and non-governmental organisations</i> (NGOs) see tourism as a significant part of rural development. Ecotourism, informal markets, and sustainable livelihoods are important talking points.

Source: Novelli and Gebhardt (2007); Ashley *et al.* (2000)

Within the context of other African countries, studies in Kenya (Pellis *et al.*, 2015) and Botswana (Mbaiwa, 2015) have found that while limited, the local economic benefits from ecotourism to host communities were increased as a result of linkages such as the procurement of local goods, conservation, and increased job creation in tourism. Empirical case studies have indicated that if managed correctly, ecotourism has the potential to promote the protection and conservation of pristine environments and stimulate local economies through the sale of local

goods (Sthrestha, 2002; Pokki, 2018; Butler *et al.*, 2020). Furthermore, governments are more likely to allocate funds towards environmental projects, given the opportunity of job creation and social upliftment (Watson *et al.*, 2007). However, Garrod (2003) warned against combining socio-developmental and ecotourism projects, with entities often failing to reach market maturity and are not always sustainable in the long term. This is due to various stakeholders having different intentions for the way the business operates, and how intensive their impact is on the environment (Hindson and Vicente, 2005; Lange, 2011). Common issues known to jeopardise ecotourism projects are a lack of transparency, poor accountability in operation and ineffective integration mechanisms between ecotourism ventures and the national development plans, resulting in mismanaged resources and ill-conceived implementation (Pasape *et al.*, 2015).

Campbell (1999) goes on to warn against certain types of ‘consumptive tourism’ operating in rural areas, which can be detrimental due to a lack of environmental education, often worsening poverty, and the sustainability of scarce resources within sensitive environments. The extent of consumptive tourism is linked with the multiple satisfaction framework of recreation experiences (Driver and Tocher, 1970; Hendee, 1974; Manfredo and Tarrant, 1996; Kyle *et al.*, 2007), which in the case of recreational fishing, acknowledges that “pursuing, catching, and retaining fish may be most important for some anglers, whereas for others fishing may be a means of attaining other experiences from which satisfaction is derived” (Sutton and Ditton, 2001; Kyle *et al.*, 2007). Such derived satisfaction can be linked with the aesthetics associated with the fishing site, the facilities, or social aspects (Fedler and Ditton, 1986; Aas and Kaltenborn, 1995; Sutton and Ditton, 2001).

Common economic leakages within the ecotourism sector relate to non-local or foreign ownership of the operating firm, reliance on imports to the region in terms of labour, services, production, food, energy, and staff recruitment, whereby hotels and businesses outsource their goods, services, and employment, leaving few opportunities available for locals (Cater, 1993; Butler *et al.*, 2020). This widespread phenomenon is common in remote areas as the levels of education and skills of the local inhabitants do not meet the occupation requirements (Lange, 2011). Chirenje *et al.* (2013) revealed that the foremost extent of leakage (87.17%) in the Nyanga District, Zimbabwe related to external service providers overriding local businesses. Out of a daily tourist spend of USD \$187, local individuals only earned USD \$24, resembling a value retention of 12.83%.

Fedler (2009) and Butler *et al.* (2020) noted that managerial and high paying jobs in recreational fishing contexts were taken by foreigners or ‘non-residents’, with locals holding low wage paying, unskilled jobs. This results in decreasing contributions of income to local revenue streams by reducing the output multiplier effects within the local economy (Rusu, 2011). Furthermore, a language barrier between guests and staff is often prevalent in remote areas, with local staff generally not being able to communicate in the languages spoken by tourists, which acts as an additional impediment to employment for locals (Butler *et al.*, 2020). Sandbrook (2010) highlighted that leakage of tourism revenue results in minimal economic benefits for host communities, particularly in rural areas of developing countries. However, past studies focussing on economic leakages have made use of defective methods, with few making the comparison of retained revenue with other sources of regional income. Sandbrook (2010) estimated a 75 % economic leakage within gorilla tracking tourism at Bwindi Impenetrable National Park, Uganda. However, the value retained was more significant than all other streams of revenue to the area combined. This poses the argument that despite the considerable economic leakage, tourism still generates noticeable revenue within local economies that wouldn’t be present if it wasn’t for the activity.

McGrath (1997) and Lange (2011) discussed ‘breaking down barriers to localised employment’ through the government playing an active role in combating this vicious cycle. Many African countries have established tourism training institutes that offer hospitality skills, basic English language lessons and technological skills aimed to allow local people to fulfil higher yielding occupations (Mayaka and Akama, 2007). Such employment ladders will allow individuals to evade poverty and later stimulate new employment opportunities in various economic sectors (Ankomah, 1991; Smith, 2019). Overall, Fedler (2009) and Butler *et al.* (2020) advocated for allocated economic shares within local fisheries ventures to incentivise local ownership and future business prospects with the anticipation to protect local ecosystems. It is believed that by doing so, more money will be retained in local economies which can enhance the contributions of that retained income to job creation and additional spending as it circulates through the economy.

2.2. SUSTAINABLE LIVELIHOODS

The circular flow of money (Figure 2.1) within the economy is an important concept to grasp within economics, particularly with cases involving the support of livelihoods (Leontief, 1991). This concept follows the exchange of income between the household (consumer) sector and the business (firm) sector (Kwatiah, 2022). Between the two sectors are the product market and the resource market. Households purchase goods and services, which businesses provide through the product market. Businesses, meanwhile, need resources to provide goods and services. Members of households provide labour to businesses through the resource market (Patinkin, 1973; Leontief, 1991). In turn, businesses convert those resources into goods and services. Since recreational fishers spend money on a wide range of services and products before, during and after their angling activities, their spending stimulates economic activity wherever it occurs, giving opportunity to alleviate poverty through economic growth in local communities (Butler *et al.*, 2020; Potts *et al.*, 2022; Bova, 2022).

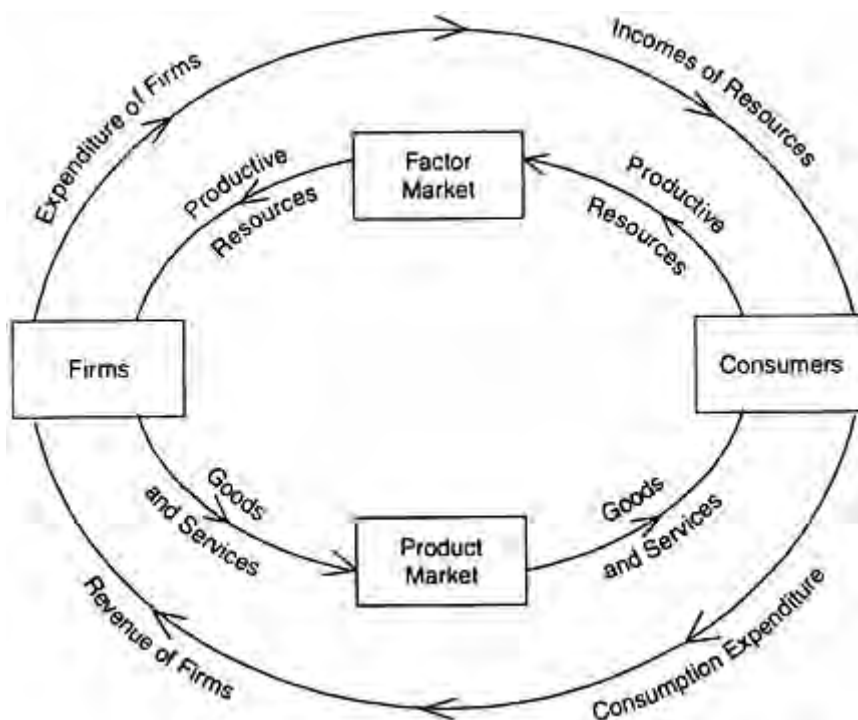


Figure 2.1. The circular flow of money. Source: (Kwatiah, 2022)

Poverty is pervasive, enrooted in rural areas throughout South Africa, with approximately 60% of rural inhabitants being poverty stricken, compared to 13% in metropolitan areas and 25% in secondary cities (Armstrong, 2010; Lange, 2011). Although there has been substantial interest shown in investing in the Wild Coast by the private sector there is a clear element of restraint (Ashley and Ntshona, 2003; Lange, 2011). Reasons that have been identified, include difficulty in accessibility, volatile governance, and questions raised in the viability of the commercial asset base, exacerbating risk averseness of investors, and limiting possible tourism development (Ashley and Ntshona, 2003). It is clear from previous Spatial Development Initiatives, that securing private investment is directly correlated with the commercial value of the asset (Ashley and Ntshona, 2003).

Ashley and Ntshona (2003) suggested that Wild Coast tourism projects have exhibited seemingly good intentions, yet various systematic issues such as ineffective state incentive programmes and clashing efforts amongst different departments within government. While local governments play a critical role in funding developmental projects, non-governmental organisations (NGOs) and community projects have proven to be effective in rural areas (Lange, 2011). These private entities offer a broad spectrum of skills tasked to deal with developmental needs of rural communities, yet insufficient funding for projects is a common trend (Vincent, 2006).

Li (2006) highlights that although locals in rural areas can benefit from ecotourism, they generally exhibit weak participation in decision-making processes, with various institutional arrangements depicting their level of engagement in the different stages of tourism development. McKercher (2003) suggested that a system that would involve broad-based community input into tourism development and management, augmenting locally situated development that uses tourism to generate economic, social, and cultural benefits within a community (Tosun, 2006; Johnson, 2010). This process occurs through increased community participation in decision making and the sustainable development of both natural and cultural resources (Johnson, 2010).

Taking this into consideration, identifying and emphasising the contributions of economic activity associated with recreational fishing along the Wild Coast of South Africa, will not only produce a form of valuation of the economic activity linked with this fishery, but will highlight expenditures that are retained in the local economies that can support employment and poverty alleviation. Economic assessments in rural areas such as Angola and South Africa conclude

that various forms of economic contributions are linked with the recreational fisheries sector (Butler *et al.*, 2020; Potts *et al.*, 2022). Potts *et al.* (2022) and Butler *et al.* (2020) acknowledged that recreational fishing contributes to employment, accommodation/lodging, construction, the livelihood of food/catering establishments and competitive sport fishing events, hence the need to incentivise local participation within the operation of the sector through the expenditures associated with the use of the fishery.

2.3. THE INFORMAL SECTOR

Trading within the informal sector is a common phenomenon in the developing world (Harriss-White, 2010), contributing largely to rural economies (Van Rooyen and Antonites, 2007). The informal economy is the diverse set of economic markets, businesses, jobs, and workers that are not regulated or protected by the government (Chen, 2010). The concept initially only applied to self-employment in micro, small scale, unregistered businesses, yet it has been expanded to include wage employment in unprotected jobs (Chen, 2010). In developing nations, informal employment makes up the majority (70%) of total employment (Bosch and Esteban-Pretel, 2012), yet the informal sector is often stigmatized in strict economic theory and by policy makers, labelled as being illegal, secretive, black, or grey (Cross and Peña, 2006; Webb *et al.*, 2009). It has been argued that the sector should not be “tarred with the same brush”, as the majority of people comprising it fall within the lower income brackets, often earning almost half or less than the formal sector (Thomas, 1995; Charmes, 2000; Carr and Chen, 2002; Charmes, 2012). For economies with significant informal sectors, business cycle fluctuations and labour market policy interventions can have important effects not only on the unemployment rate, but also on the allocation of workers across regulated and unregulated jobs (Bosch and Esteban-Pretel, 2012). Nelson and De Bruijn (2005) investigated the informal sector of the Tanzanian economy, noting that it prospers partially because informality bids opportunity to poor households, who would struggle to afford the costs of formalisation.

On the contrary, certain activities falling within the informal sector can be very lucrative and may be carried out illegally, with the chance of higher profitability and earnings of operating illegally rather than within regulation (Papola, 1980; Chen, 2010). Sand mining, abalone poaching, illicit goods across borders, food items, licences, and foreign exchange, are examples of these informal sectors (Papola, 1980; Jain, 1999; Grace *et al.*, 2014; Blackmore *et al.*, 2015).

There is a common misconception that individuals operating in the informal sector are not able to generate equal revenue per unit of their output from the market as do the formal sector operators (Papola, 1980). The contrast is not necessarily explained through demand, nor the nature of the market, but by the distinct lack of holding capacity, potential growth and marketing opportunities made available to the informal sector enterprises (Papola, 1980). This again is directly linked to their marginalisation, due to their small scale of operations and lack of resources. Individuals sell to whatever buyers are at hand, at the time their product is ready for sale, leaving very little opportunity for their commodity to mature to its full value (Papola, 1980). However, it has been suggested that an inclusive path to the formalisation of informal markets could lead to benefits for consumers, informal traders, and conservation (Blackmore *et al.*, 2015).

2.4. ECONOMIC MODELS AND METHODS USED IN VALUATING RECREATIONAL FISHERIES

Measuring the economic contributions of fisheries has taken the form of a variety of frameworks dependent on the type of value being investigated (Fedler, 2009; Southwick *et al.*, 2010; McIlgorm and Pepperell, 2013; FAO, 2019; Bova, 2022; Potts *et al.*, 2022). Generally, these methods fit into the categories of market valuation, non-market valuation, or both. Market and non-market values can be further segmented into use and non-use values (Figure 2.2).

2.4.1 Total Economic Valuation (TEV)

The total economic value (TEV) is the net social benefit of a commodity or activity and comprises of both consumer surplus and producer surplus (Toivonen *et al.*, 2004). Producer surplus relates to the real market economy and represents market value, while consumer surplus refers to the non-market benefits derived from activities and is measured by the additional amount an individual would be willing to pay over and above their market expenditures (Charbonneau and Hay, 1978; Cesar and Beukering, 2004; Wattage and Mardle, 2008).

TEV (Figure 2.2) represents benefits derived from a resource and is usually recognized as the sum of use and non-use values (Ottaviani, 2020). While use values are based on actual use of the fishery resources, non-use values are the values that people assign to ecosystem services and the fishery regardless of whether they have ever used them or will ever use them in the future (Watson *et al.*, 2007). The use values include the following: (i) the direct-use value

related to benefits received from the supply of provisioning services and cultural services (expenditures associated with a fishing activity) ; (ii) the indirect-use value related to benefits, indirectly received from the regulating, and supporting services that maintain the fishery in equilibrium; and (iii) the option value related to the benefits that could be received in the future (Rosenberger and Loomis, 2001; Ottaviani, 2020). The non-use values include the following: (i) the quasi-option value, related to the benefit of delaying the exploitation of the fishery for a future value made available through the preservation of this ecosystem service; (ii) the altruistic value, related to the benefits that others may receive from a fishery; (iii) the bequest value, related to the benefits that future generations may receive from the fishery; and (iv) the existence value, related to the benefit received by people that do not partake in the fishery (Bishop, 1987).

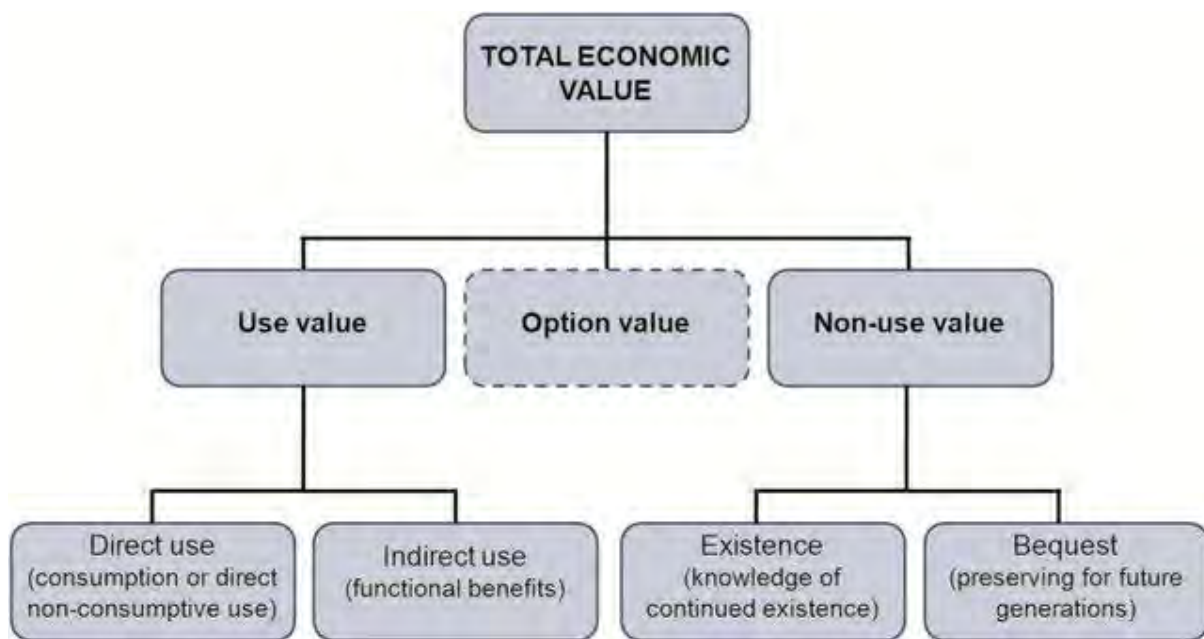


Figure 2.2. Components of the Total Economic Value (TEV) framework. Adapted from: Ledoux and Turner 2002; Chee, 2004)

Values concerning the direct use value (consumptive or non-consumptive use) are generally simplest to estimate, since they usually consist of measured quantities of products which have observable market prices (Plottu and Plottu, 2007). An example of this would be to ask respondents to report the amount paid for fishing equipment or accommodation rates (Southwick *et al.*, 2010; Potts *et al.*, 2022). Recent research has made use of estimates of

individual angler expenditure to approximate the given fisheries value (Southwick *et al.*, 2010; Prato *et al.*, 2016; Pinello and Dimech, 2017; Potts *et al.*, 2022). The most noticeable expenditures being transportation costs (fuel/flights) to reach the destination, accommodation, fishing equipment, hiring of guides, bait and food and refreshments. Measuring the benefits of recreational anglers from the indirect use warrants a more comprehensive study, with surveys being a known way to assess respondents revealed and stated preferences (Randall, 1987; Grafton *et al.*, 2004; Bova, 2022).

2.4.2 Revealed Preference

Revealed preference methods are based on observable, real actions by individuals and do not rely on hypothetical scenarios (Eom and Larson, 2006). Researchers make use of them to identify hidden or underlying preferences of individuals (Boyle, 2003; Grafton *et al.*, 2004). An example of a well-known revealed preference method is the Travel Cost Method (TCM).

2.4.3 Travel Cost Method (TCM)

Developed in 1949 by Harold Hotelling to the Director of the National Park Service, the travel cost method (TCM) estimates the economic value of recreational sites or other environmental services by investigating the full costs associated with visiting sites or participation in activities (Hotelling, 1949; Parsons, 2003). The purpose of Hotelling's initial study was to show that the benefits accrued from a park exceed the cost to the visitors, what is deemed as consumer surplus (Farrow *et al.*, 2000). Hotelling (1949) viewed trip costs (money spent to access/visit a site) as a special "price" linked to its recreational value. Later, in 1959, Clawson developed this methodology in more detail, giving it great popularity in North America (Clawson., 1959). This basic approach is known as the Clawson-Knetsch travel-cost model, used to estimate the consumer surplus for non-priced outdoor recreations. After decades, this technique has been applied and developed to evaluate a wide range of recreational activities and public resources.

The Travel Cost Model (TCM) is commonly applied in cost/benefit analysis and in natural resource damage assessments where leisure values play a role (Ward and Beal, 2000). Since the model is based on observed behaviours, it is used to estimate use values only. The travel cost model (TCM) is a demand-based model for use of a recreation site or activities related to the site (Perman *et al.*, 2003). A site might be a river for fishing, a trail for hiking, a reserve for game viewing, a beach for surfing, an area where outdoor recreation takes place, or the value associated with the activity itself (Parsons, 2003; Fleming *et al.*, 2008). The Travel Cost

method is a revealed preference method, as it uses actual behaviour and choices to infer values, thus, individuals' preferences are revealed by their choices (Ward and Beal, 2000). The TCM is a valuation technique which seeks to place a value on recreational sites by using consumption behaviour in related markets. Specifically, the costs of getting access to consuming the recreational amenity of a particular site are used as a proxy for price; these costs can include transportation costs, entry fees, on-site expenditure and outlay on capital equipment (Parson, 2003).

Emphasis is placed how researchers apply a basic modern version of the model (Herriges and Kling, 1999; Phaneuf and Smith, 2005), according to their study objective, and not on the limits of modelling, which was first applied over 50 years ago (Ward and Beal, 2000; Parson, 2003). A strategy mentioned by Parsons (2003), for estimating trip cost, access fees, and equipment cost is simply to ask individuals to report their expenses on the last trip to the area. This is done by expense categories, where the several costs incurred during the visit are summed to arrive at the trip cost. The advantage of this approach is that it uses self-reported cost information, and the researcher need not construct the cost estimates. Since individuals base trip decisions on perceptions of cost, which may diverge from actual costs, the respondents given estimate can be compelling (Perman *et al.*, 2003). The method has become widely accepted and is generally regarded as one of the success stories of non-market valuation (Smith, 1993). The most important economic and social factors affecting travel cost include age, education, and income (Parson, 2003).

Travel Cost Method models work like conventional downward sloping demand functions, where the 'quantity demanded' for an individual is the number of trips taken to a site or the number of times partaking in a certain activity in a season (Parson, 2003). The 'price' is the trip cost of visiting the site (Perman *et al.*, 2003). Discrepancy in price is caused by individuals living at different distances from the chosen site or activity offered, with the price being low for people near the site/activity and high for those living further away. This is illustrated by a downward sloping demand function where number of trips invariably decline with distance to the site (Parson, 2003).

2.4.4 Economic Contributions and Linkages

Regional economic impact assessments (EIAs) and Input-Output models (I-O) of recreational fisheries reveal how anglers' expenditures affect economic activity such as sales, income, and employment in a particular region (Steinback, 1999; Burgan and Mules, 2001; Fedler, 2009; Potts *et al.*, 2022). This model was developed to conduct systemic analyses of the economic impacts of activities and resources on local regions (BEA, 2019).

A fishery's contribution to a region can be quantified by 1) Collecting data on the value associated with fishery-activity output and 2) Multiplying the total value of the activities output by final-use industry multipliers. Results are expressed as the total expense of local economic activity that is maintained by the fishing sector (BEA, 2019). Economic impacts of a particular activity, in this case a recreational fishery must be taken into consideration: direct impacts which include employment, wages, and revenue generated by goods and services consumed by anglers. Indirect impacts which include amounts generated from local fishery-related businesses, employees, and further users (supply chains) and induced impacts which comprise of the total value of goods and services consumed by money generated by direct and indirect impacts throughout the local market (goods and services not linked with the fishery that would otherwise not be obtainable) (Storey and Allen, 1993; Stynes, 1999; Watson *et al.*, 2007; West *et al.*, 2014; BEA, 2019).

2.4.5 Stated Preferences

Stated preference methods to nonmarket valuation depend on responses to detailed survey questions (Boxall *et al.*, 1996; Brown, 2003). Specific details that are often overlooked or absent through revealed preference methods can be investigated using stated preference methods. Economic value is revealed through a hypothetical or constructed scenario (Boxall *et al.*, 1996). There are several methods for assessing stated preferences, however, the most common is contingent valuation (CV).

2.4.6 Contingent Valuation (CV)

CV approaches have been the foremost stated preference method when valuating recreational fisheries (Whitehead *et al.*, 2001; Toivonen *et al.*, 2004; Johnston *et al.*, 2006; Olaussen and Liu, 2011; Lopes and Villasante, 2018).

Contingent Valuation is a method of estimating the value that an individual places on a good (Brown, 2003). Due to CV being based on a hypothetical scenario, these methods can be used

to assess changes that have not yet taken place (Shogren *et al.*, 1994). CV approaches ask individuals to directly report their willingness to pay (WTP) for a modification in resource benefits, or willingness to accept (WTA) some amount of money for a loss of those benefits, rather than inferring them from observed behaviours in regular marketplaces (Hanemann, 1991; Shogren *et al.*, 1994; Birdir *et al.*, 2013; Bova, 2022).

2.4.7 Survey Methods

Economic data are the vital component of providing inclusive estimates for governments and fisheries management to act upon, yet collection of such data is not always straight forward (Pinello and Dimech, 2017). *The Handbook for fisheries socio-economic sample survey: Principle and Practices* (Pinello and Dimech, 2017) provides methods and tools to alleviate this situation, providing tested tools for the collection of key data related to a socio-economic assessment of a fishery. Pinello and Dimech (2017) draws upon three phases in designing an effective questionnaire: 1) determining the objectives, 2) setting the sampling design and 3) to determine the character of the survey with regards to the sampling design. Furthermore, a seamless survey should include a detailed description of the environmental resource in question, the use values (direct or indirect), the location of the survey and the socio-demographic and socio-economic attributes of the individual (Lienhoop *et al.*, 2015).

Use of surveys allows researchers to record stated preference data, as well as detailed data on individuals (Kroes and Sheldon, 1988). However, the various methods that can be applied in obtaining survey responses, frequently produce contrasting results (Cole, 2005; Taherdoost, 2016). Common methods used for survey dissemination are face-to-face, mail, phone, and online methods (De Leeuw, 1992; Mathers, 1998; Van Selm and Jankowski, 2006). Selecting the most appropriate survey method is done in a study specific manner and is dependent on objectives, time, access to technological means and budget (Moser and Kalton, 2017).

Face-to-face surveying has been deemed a practical method to utilise within a rural context, due to the versatility in reaching any population, including the lowest economic classes and being able to assist respondents in answering questions (Duffy *et al.*, 2005; Doyle, 2005). These surveys are generally clearly structured and seemingly adaptable due to the human interaction component (interviewer) (Doyle, 2005). Additionally, face-to-face interviews have been deemed more effective as respondents are less likely to suffer from survey fatigue during the interview, compared with self-completion modes (Fowler, 2002). However, this method does

have its disadvantages, such as interviewer bias, geographical limitations, and time pressure on respondents (Szolnoki and Hoffmann, 2013).

2.4.8 Participation Rates

Estimating participation rates of recreational fishers is a key component in valuating recreational fisheries, as this directly affects total economic amounts that are ultimately derived from a sample (Mann *et al.*, 2003; Southwick *et al.*, 2010; Potts *et al.*, 2022; Bova, 2022). For example, by accurately estimating the number of recreational fishers operating in a region, fishing tourism developments and investments can gain greater recognition (Arlinghaus *et al.*, 2015). Some participation estimates pay attention solely to license sales or club membership of recreational anglers (Burkett and Winkler, 2018; Gordoa *et al.*, 2019), while others have made use of aerial angler count data (Brouwer *et al.*, 1997; Mann *et al.*, 2003).

2.5. DEFINING THE RECREATIONAL FISHING SECTOR

The term recreational fishing differs worldwide due to various levels of conservation and legislation (Arlinghaus *et al.*, 2010). Recreational fishing can be defined as: “The harvesting of aquatic organisms in a manner that does not constitute the individual’s primary resource to meet basic nutritional needs and generally are not sold or otherwise traded on export, domestic or black markets” (FAO, 2017). Although this definition does not provide a clear-cut distinction between recreational fisheries and subsistence fisheries, the use of fishing activity to generate resources for one’s livelihood is considered to mark a clear tipping point between recreational and subsistence fisheries (Arlinghaus *et al.*, 2010).

Harvests from recreational fisheries have repeatedly proven too far exceed the commercial harvest in parts of the world (Michailidis *et al.*, 2020). Although recreational fishers do in some instances practice sustainable harvesting practices (Coleman *et al.*, 2004; Morales-Nin *et al.*, 2005; Font and Lloret, 2014; Prato *et al.*, 2016), this does not insinuate that recreational fishing leaves no impact on the oceanic environment and surrounds, with impacts being particularly evident in third world countries where compliance and conservation adherence is low (Bova *et al.*, 2017; Brownscombe *et al.*, 2019; Potts *et al.*, 2020; Bova *et al.*, 2022). Non-compliance with recreational fishery regulations is considered to be one of the biggest threats to the sustainability of fisheries, with Bova *et al.* (2022) indicating that approximately 52% of South African marine-based shore anglers were non-compliant with existing regulations.

Recreational fishing within developing nations can play a fundamental role in the livelihood of the local population, with emerging markets creating revenue streams aiding in individuals' well-being (Potts *et al.*, 2009). This form of fishing has been practiced for centuries, possibly even millennia, however focus is not always directed to its economic importance, with recreational fisheries often being overlooked in socio-development and resource management projects run by the government (Potts *et al.*, 2020). This can be problematic as both the local communities adjacent to the fishery and surrounding natural resources receive little sustainability attention, often leading to a vicious cycle of degradation. This is where subsequent research is vital to policy making and a general better understanding through monetary terms (Mora *et al.*, 2009). Much of the research undertaken in this field has focused on the developed world, where recreational fishing is depicted as a 'sport' instead of a way of harvesting food, expatiating the common phenomenon of a lack of scientific attention and state funding in developing countries (Arlinghaus *et al.*, 2019). This predicament raises great concern as resources are more prone to exploitation in developing countries due to a lack of conservation effort, enforcement, and financial support (Ascher, 1999).

2.6. ECONOMIC IMPORTANCE OF RECREATIONAL FISHING

Within a regional context, Southwick *et al.* (2010) highlighted the significant economic activity linked with recreational fishing in the Los Cabos region, Mexico. An estimated 354 013 people (predominantly international visitors), spent on average \$1 785 USD each on lodging, charter boats, food, transportation, tackle, fuel and more. These individual expenditures caused a series of economic effects within the local economy, contributing to \$1.125 billion USD in total economic activity (Southwick *et al.*, 2010). Fedler (2009) highlighted the vast economic importance of the Everglades fishery, that generated US\$1.2 billion in economic activity and catered for 12 391 full time jobs. It is noticeable that the saltwater expenditures made by anglers are higher than freshwater expenditures, with individuals being willing to travel further distances to their fishing destination, similar to the instance that McGrath *et al.* (1997) draws on within the South African context. The study by Sthrestha (2002) on recreational fishing in the Brazilian Pantanal showed consumer surplus values ranging from \$540.54 to \$869.57 per trip resulting in the total social welfare estimate range from \$35 to \$56 million. Furthermore, Pokki (2018) used the TCM to estimate recreational wild salmon fishing on the River Teno,

Finland. Where the estimated consumer surplus per trip ranged from 235 to 338 Euros. The estimated total recreational value of salmon fishing in the area was 2.6–3.7 million Euros.

Strikingly, less research on social and economic contributions of recreational fisheries has been done within an African context despite increasing evidence of its importance (Pitcher and Hollingworth, 2008; Potts *et al.*, 2022). McGrath's research, *The Economic Valuation of The South African Linefishery* (1997) indicated that 421,000 anglers contributed an estimated ZAR 1.6 billion to the Gross Domestic Product (GDP) and generated 99 180 jobs (McGrath *et al.*, 1997). According to McGrath *et al.* (1997), approximately 20 000 poverty-stricken households in South Africa (excluding those in the Wild Coast/ Old Transkei region) relied upon subsistence fishing, now known as small scale fishing, to sustain their livelihoods, with only a few individuals admitting to selling their catch. Zeybrandt and Barnes (2001) study, the *Economic characteristics of demand in Namibia's marine recreational shore fishery* reported on average, fishers spend in total between N\$23 million and N\$31 million on angling trips in Namibia, portraying a further Willingness To Pay (WTP) between N\$24 million and N\$27 million extra than this for the experience.

A South African recreational fishery survey by Potts *et al.* (2022) showed recreational fishing participation estimates for each angling discipline totalled 1 327 633, contributing to ZAR 32.6 billion (USD \$2.2 billion) per year, while sustaining 94 070 full-time jobs. It must be noted that the Wild Coast area was not specifically focused upon in this study. Remarkably, less than 10% of the economic activity benefitted lower-income households, suggesting a disconnect between the “first” and “second” economies that comprise the country's dualist economy (Potts *et al.*, 2022). A Namibian line fishery survey conducted by Kirchner *et al.* (2000) indicated that anglers contribute N\$29.7 million to the local economy, with 44% of the anglers being foreign visitors who contributed 55% of the expenditures. Bouaziz (2015) indicated that resident recreational anglers on the French Island of Martinique contributed between 0.36 % and 0.62 % to the Island's GDP, generating between 610 - 1 030 jobs. Non-resident recreational fishers contributed far less, with just 12 jobs created through their economic contribution. Mayock (2015) conducted a parallel study in the Bahamas and estimated that the approximately 37 000 tourists visit the country for fishing purposes, contributing to US\$527 million per annum and generating 18 000 jobs, eclipsing the commercial fishery contribution. This highlighting the economic potential of recreational fisheries (Table 2.2) and the urgency to enhance the fishery in a manner in which these expenditures are retained within the economy. Butler *et al.* (2020), indicated that the local fishery retained a higher value of income (42%), opposed to the 7.1%

of the lodge fishery, indicating the need to focus spending and support of local fishing outfitters to sustain micro-economies. It must be noted that there was a significant amount of economic leakage found within the area of study (Kwanza River), consequently hindering possible growth aspects within the local community. The main sources of the leakage stemmed from external sourcing of supplies, employees, and services due to the remoteness of the Kwanza River (Butler *et al.*, 2020).

Table 2.2. A benchmark of several economic assessments on a global scale

At the time of the study: 1 US Dollar = 17.4054 South African Rand and 1 Euro = 18.8758 South African Rand.

Location of study	Economic Contribution (expenditures)	Income Contribution	CPI adjusted income (2022)	Context	Reference
South Africa	ZAR 32.6 billion	-	-	All recreational angling types	Potts <i>et al.</i> (2022)
Seychelles	USD 167 299 115 - USD 196 385 356	USD 80 002 604 – 93 911 673	-	Marine (saltwater)	Bova (2022)
Bahamas	USD 70 million	-	-	Flats fishing	Fedler (2010)
France	EUR 1.26 billion	-	-	All recreational angling types	Herfaut <i>et al.</i> (2013)
Everglades, USA	USD 1.2 billion	-	-	All recreational angling types	Fedler (2009)
Majorca	EUR 57.1 million	-	-	Marine recreational resident anglers only	Morales-Nin <i>et al.</i> (2015)
Martinique	EUR 68 million	-	-	Marine recreational fishing	Bouaziz (2015)

It is clear that economic contributions of recreational fishing practices extend outside the initial area, suggesting an accumulation of several benefits, especially for nearby communities (employment) and fish species as these areas act as breeding grounds, later buffering other systems nearby (conservation) (Fedler, 2009; Butler *et al.*, 2020).

2.7. WILD COAST FISHERY

Geographically, the Wild Coast extends from the Kei River mouth (32°41'S, 28°23'E) in the south to the Mtamvuna River mouth at Port Edward (31°04'S, 30°11'E) in the north (Mann *et al.*, 2003). The Wild Coast is renowned for its fishing, producing a high rate of Catch Per Unit Effort (CPUE) (Mann *et al.*, 2003). This coastline generates a significant proportion of total revenue produced within the recreational fishing sector in South Africa (Mann *et al.*, 2003). Fishermen travelling to the Wild Coast contribute to the local economy by paying for accommodation, guides, domestic work, locally harvested bait, seafood, petrol, fishing equipment and other supplies, however the extent of which is not understood (Mann *et al.*, 2003). Mann *et al.* (2003) estimated there to be approximately 7 748 recreational anglers along the Wild Coast (shore-based). However, participation numbers have risen exponentially since the Mann *et al.* (2003) study due to 'coastal ribbon development' and better road networks being developed. Essentially, two obvious demographical groups utilise the fishery: the local Xhosa community and the recreational fishing sector. Fielding *et al.* (1997) estimated a rather low importance of the recreational fishery (R9.6 million) in 1995.

The severe impacts of Apartheid impeded economic growth along the Wild Coast (formally known as the Transkei), resulting in extremely high levels of poverty, political exclusion and marginalisation at the firm and household level (Muller and Tapscott, 1984; Sowman and Sunde, 2021). This regime is largely to blame for the poor socio-economic conditions prevalent in these local communities (Sowman *et al.*, 2011). These challenges have resulted in small-scale fishery systems becoming increasingly vulnerable (Gammage and Mather, 2017; Sowman and Sunde, 2021). However, a prosperous future had been predicted with the re-incorporation of the Wild Coast back into South Africa, with fiscal policy such as the Wild Coast Spatial Development Initiative that aimed to incentivise micro-tourism developments in rural areas. Shackleton *et al.* (2007) assessed the role and value of wild resources in rural livelihoods of households in the Ntubeni and Cwebe areas. Use of marine resources was showcased in Ntubeni, where over half of the total annual direct-use value was contributed by fish and shellfish (crayfish). Contributions were not as evident at Cwebe, due to residents not having access to a rocky shoreline outside of the marine reserve. Local trade was highly variable, both between resources and between households, with the average per annum value of trade across all households (i.e., traders and non-trader) amounting to R1 660 and R600 at Ntubeni and Cwebe, respectively.

Recreational fishing practice along the Wild Coast can be characterised as both consumptive and catch-and-release (C&R) orientated (Mann *et al.*, 2003), with C&R leading to a form of protection of endangered fish species, equating to a healthier ecosystem (Cooke and Schramm, 2007). It has been acknowledged that individuals travel from great distances to reap the benefits of this coastline (Rust, 2010), channelling a movement of wealth into rural areas and further presenting the opportunity to alleviate poverty and aid job creation (Lange, 2011; Butler *et al.*, 2020). A study in 1993 led by the Oceanographic Research Institute indicated that recreational fishing was the second greatest tourist attraction leading people to the Wild Coast (Fielding *et al.*, 1994). Additionally, many local people residing in the area rely on subsistence fishing that increases the numbers of anglers ten-fold (Mann *et al.*, 2003).

CHAPTER 3: RESEARCH DESIGN AND METHODS

This chapter aims to provide a comprehensive description of the design and applied methods specific to this research. Recreational fishermen spend money on a vast range of goods and services both externally and locally, contributing to economic activity wherever it occurs. To quantify the contribution that this spending has within the economy, primary data was collected on the extent of spending by a visitor (recreational fisherman) to the Wild Coast region.

3.1 Ethical Consideration (Consent and anonymity)

This project was granted ethical approval by the Rhodes University Human Research Ethics Committee (no. 2021-5225-6345). The letter of approval is found in Appendix 4.

3.2 Study Area

The Wild Coast (WC) is the coastal area of the former Transkei and now part of Eastern Cape (EC) Province in South Africa (Ashley and Ntshona, 2003). As previously stated, the Wild Coast (Figure 3.1) extends from the Kei River mouth (32°41'S, 28°23'E) in the south to the Mtamvuna River mouth at Port Edward (31°04'S, 30°11'E) in the north (Mann *et al.*, 2003).

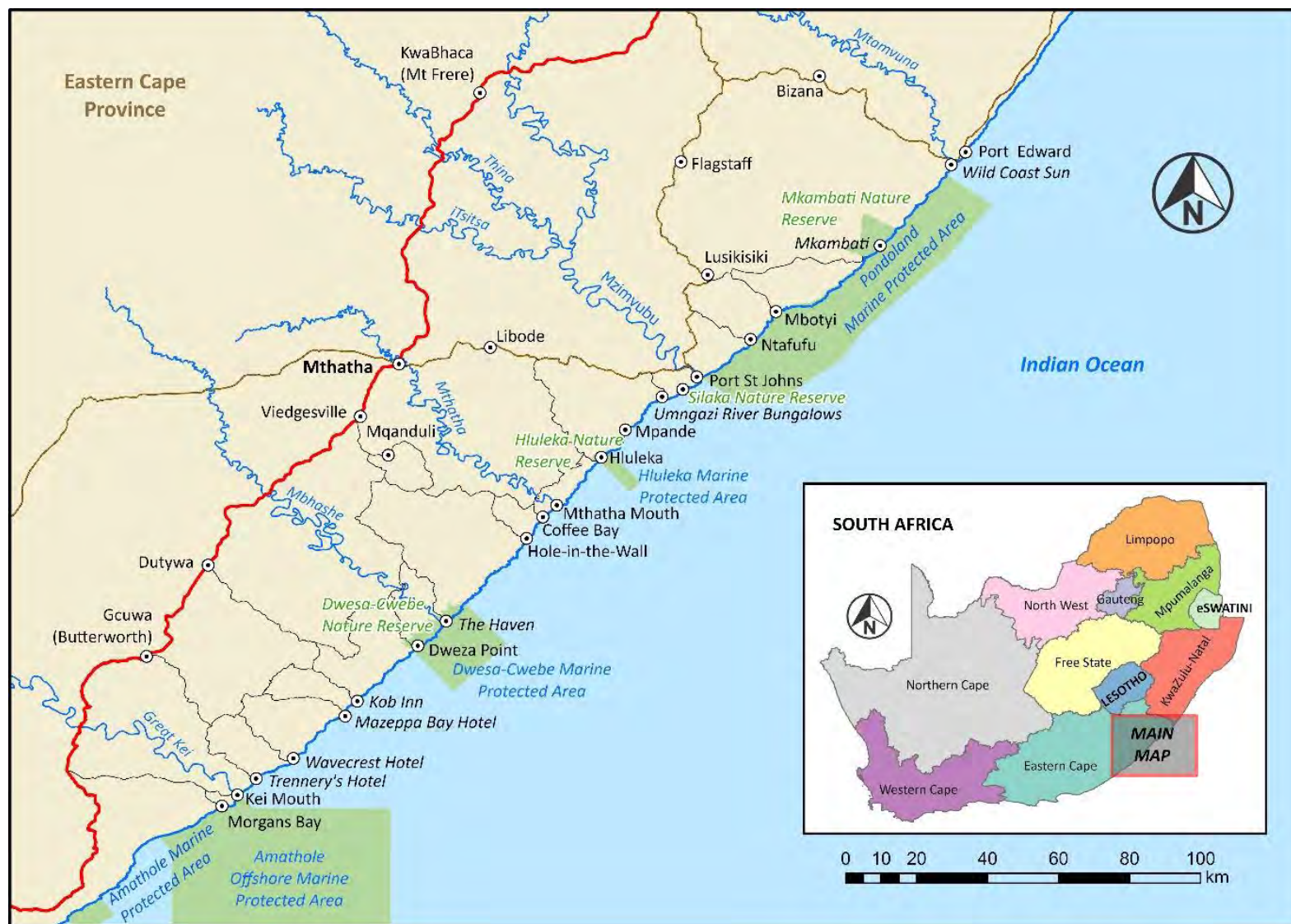


Figure 3.1. Map of the study area showing well-known fishing areas and settlements along the Wild Coast

The coastline is not easily accessible by both road or foot (Naude *et al.*, 1999), comprising of several tidal and blind rivers, eroded land, headlands and rolling hills (Figure 3.2). From the Kei River to the Xhora River, the coastline is characterised by sandy beaches with fewer rocky outcrops. Travelling northwards, the general topography is made up from dense coastal thicket, sheer rocky cliffs (headlands), limited road and coastal access points, with short sections of beach giving relief to a harsh shoreline (Mann *et al.*, 2003). With few employment opportunities being present along the Wild Coast, local artisanal fisherman known as ‘gillies’ offer their knowledge of the coastline, guiding tourists (anglers), collecting and selling bait, and selling their catch as a key component of their livelihood. Apart from shore-based recreational fishing, visitors to the coastline benefit from many other local attractions and activities. These include dining and entertainment at hotels, deep sea fishing, spearfishing, ocean tours, community-guided tours, horse-riding, and general enjoyment of the area’s natural fauna and flora attraction.

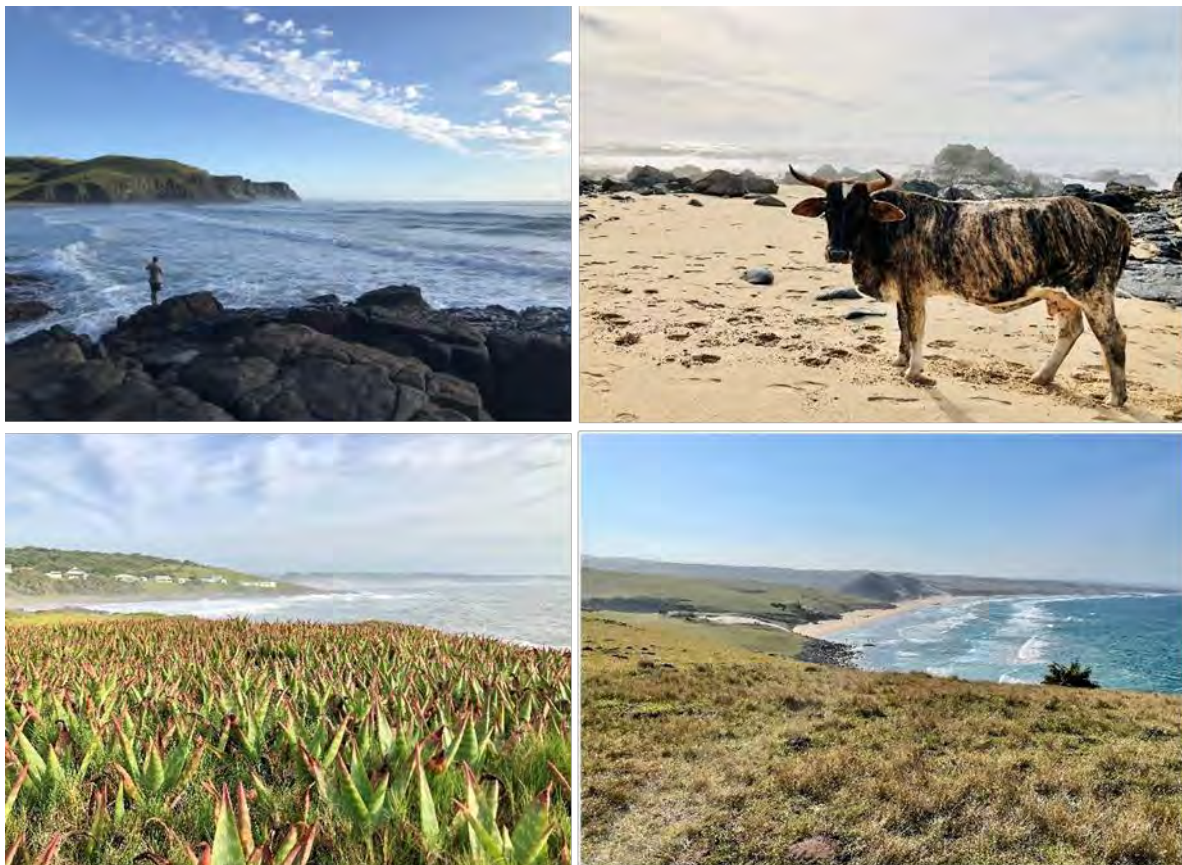


Figure 3.2. The study site, the Wild Coast, South Africa. (Photos: personal images and Chris Taylor).

For the purpose of this study, the Wild Coast was subdivided into 6 research sites (Figure 3.3): Kei Mouth (1), Mazeppa Bay (2), Kob Inn/Qora (3), Coffee Bay/Hole in the Wall (4), Mdumbi/Mthatha Mouth (5) and Port St Johns (6). These areas are renowned fishing and ecotourism hubs, with people moving through the area during the entire calendar year.

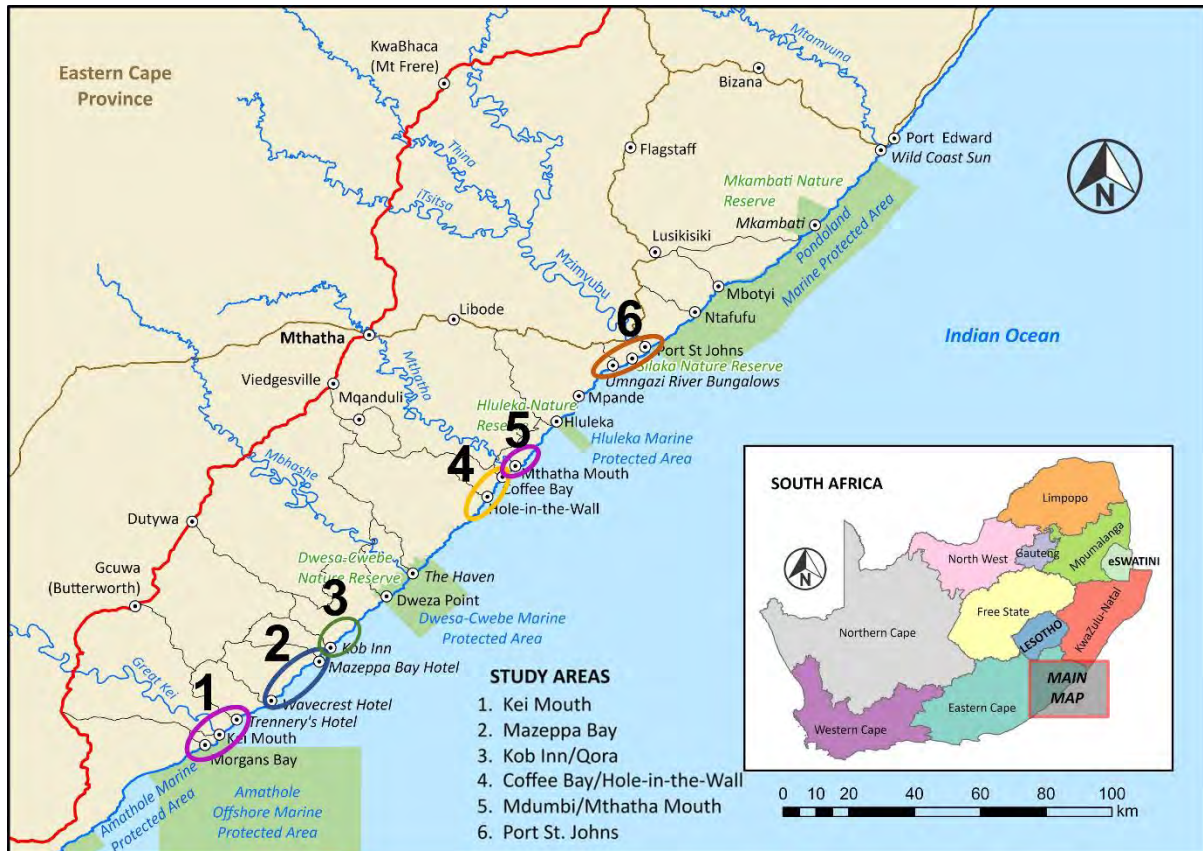


Figure 3.3. Subdivided sites of the Wild Coast recreational fishery. Kei Mouth (1), Mazeppa Bay (2), Kob Inn/Qora (3), Coffee Bay/Hole in the Wall (4), Mdumbi/Mthatha Mouth (5) and Port St Johns (6)

3.3 Angler Surveys

The designing of this survey method follows the process of identifying a target population, designing a tool/method to elicit information from the target population, and the sampling protocol for how the tool will be disseminated to the target population.

3.3.1 Target Population

The target population for this study was shore-based recreational anglers along the Wild Coast Coastline, who were over the age of 18 (Figure 3.4).

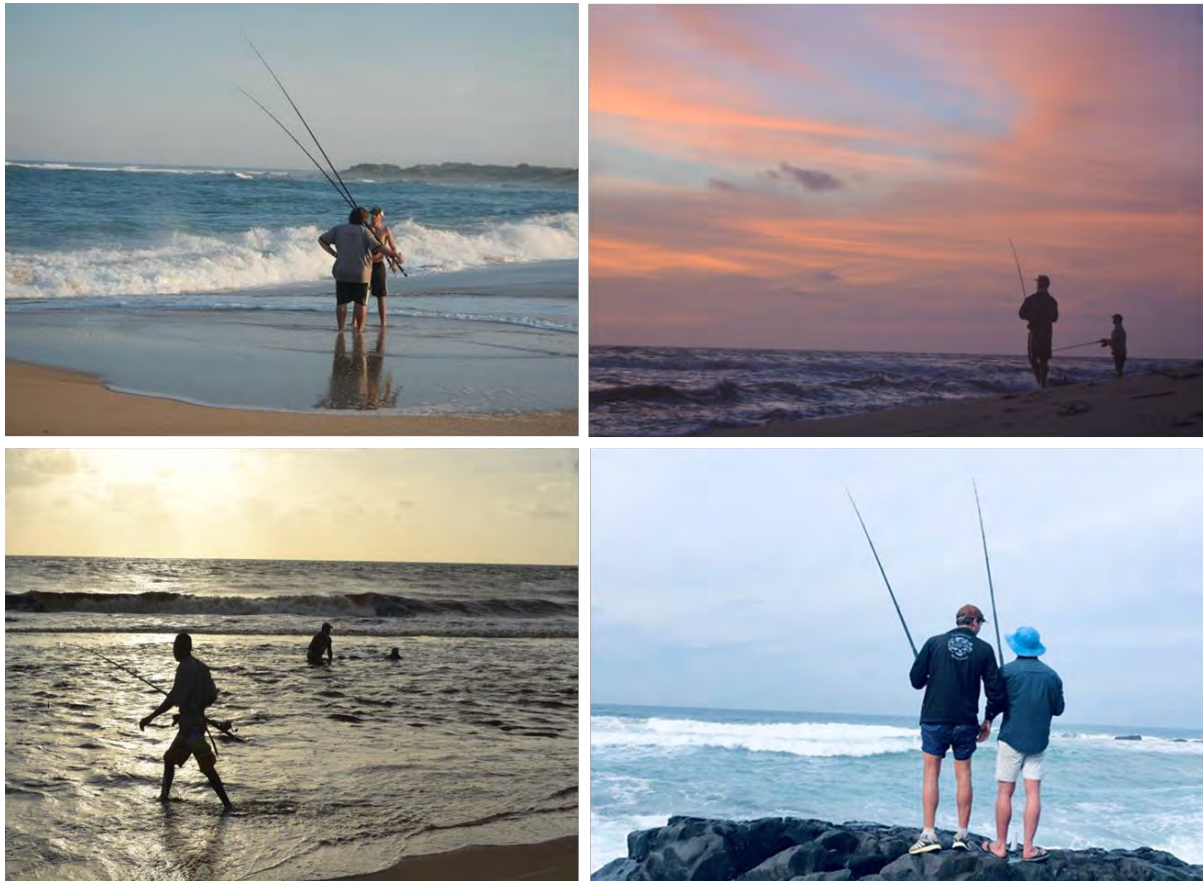


Figure 3.4. Target population of study: shore-based recreational anglers. (Photos: Matthew Farthing and personal images)

3.3.2 Questionnaire Design

A questionnaire (Appendix 1) was developed with the support of an in-depth literature review of fishery valuation questionnaires (Fowler, 2002; Doyle, 2005; Southwick *et al.*, 2010; Pinello and Dimech, 2017; Potts *et al.*, 2022; Bova, 2022). The questionnaire is in alignment with *the Handbook for fisheries socio-economic sample survey* requirements (Pinello and Dimech, 2017). Pinello and Dimech (2017) draw upon three phases in designing an effective questionnaire: 1) determining the objectives, 2) setting the sampling design and, 3) to determine the character of the survey with regards to the sampling design. Furthermore, a seamless survey should include a detailed description of the environmental resource in question, the use values (direct or indirect), the location of the survey and the socio-demographic and socio-economic

attributes of the individual (Lienhoop *et al.*, 2015). Based on these specifications, a questionnaire was shaped. The structured questionnaire consisted of open, multiple choice and closed end questions (Table 3.1), where participants were asked several short questions where values need to be provided.

The next section provides a breakdown of the 6 sections of the questionnaire (Table 3.1), with the full version found in (Appendix 1):

Section 1: The introduction of the questionnaire consisted of briefing the respondent on the purpose of the study and asking them if they would be willing to participate to gain consent (purely voluntary). The estimated amount of time it will take to complete the survey was included as well as mentioning that the questionnaire was completely anonymous.

Section 2: Focused on the respondents' place of residency, length of stay, number of trips and travel costs (use values) linked with the fishery. These background questions helped in segmenting respondents into two groups (tourists and regional residents). Two categories of expenditures were measured, namely trip costs and fixed costs. Trip costs included all non-durable items purchased pertaining to anglers last fishing trip (e.g., accommodation rates, transport costs, bait, food and beverages, consumables, terminal fishing tackle, and any other per trip item). Fixed costs included all items that could be considered durable goods or goods that last beyond a year (e.g., kayaks/boats, camping equipment, holiday homes, cooler boxes, and fishing equipment (rods, reels). Responses to report amounts were open-ended and reported in South African Rands (ZAR).

Section 3: Identified informal market (consumptive) expenditures (the purchase of bait, crayfish, oysters, mussels, or fish catches).

Section 4: Focussed on consumer surplus based on a respondent's willingness-to-pay for amenities based on a hypothetical scenario.

Section 5: Identified the motivation behind visiting the Wild Coast, relating to the net benefit accrual of various activities.

Section 6: Focussed on respondent demographics where the interviewer asked for the respondents' race, gender, age, and yearly income.

Table 3.1. Breakdown of the questionnaire, indicating the question type, question objective and reasoning behind asking the question (reference)

Question	Question Type	Question Objective	Question reference
Q1) Which of the following settlements, headlands, or rivers did you visit specifically for fishing? (Place an X at visited locations)	Open-ended	Spatial contribution Travel Cost Method	Ward and Beal (2000) Shrestha <i>et al.</i> (2002) Parsons (2003)
Q2) Where is your home located?	Open-ended	Spatial contribution, Travel Cost Method	Ward and Beal (2000) Parsons (2003) Pokki <i>et al.</i> (2018)
Q3) How many trips per year do you take to the Wild Coast region for fishing?	Open-ended	Total Economic Activity, Travel Cost Method	Ward and Beal (2000) Parsons (2003)
Q4) Per trip, how many days do you spend fishing in the Wild Coast region?	Open-ended	Participation estimate, Total expenditure	Pollock <i>et al.</i> (1994) Parsons (2003) Mann <i>et al.</i> (2003) Fedler (2009) Butler <i>et al.</i> (2020)
Q5) On your Wild Coast fishing trip(s) in the last 12 months, which of the following items did you spend money on?	Multiple choice	Expenditure estimate, Travel Cost Method	McGrath <i>et al.</i> (1997) Shrestha <i>et al.</i> (2002) Fleming and Cook (2008) Lienhoop <i>et al.</i> (2015) Potts <i>et al.</i> (2022)

Q6) What was the amount paid for the item (s) selected? Please list the item and individual cost below:	Open-ended	Expenditure estimation, Travel Cost Method	Pokki <i>et al.</i> (2018)
Q7) Which of the following items did you purchase for the PRIMARY purpose of fishing within the Wild Coast?	Open-ended	Expenditure estimation, Travel Cost Method	Fleming and Cook (2008) Southwick <i>et al.</i> (2010) Fedler (2017) Potts <i>et al.</i> (2022) Michailidis <i>et al.</i> (2020)
Q8) What was the amount paid for the item (s) selected? Please list the item and individual cost below:	Open-ended	Expenditure estimation, Travel Cost Method	Same as above
Q9) Did you purchase any of the following oceanic items during your fishing trips to the Wild Coast in the last 12 months?	Multiple choice	Expenditure estimation, Travel Cost Method Informal Harvesting	Bosch and Esteban-Pretel (2012)
Q11) Which of the following activities do you assign a greater net benefit to? (Valued above the activities market price). Please rank from 1 to 8 according to level of importance/satisfaction with 1 being MOST important and 8 being LEAST important	Rank 1-8	Stated Preference, utility/satisfaction, motivation, ecotourism activity ranking	Driver and Tocher (1970) Manfredo and Tarrant (1996) Kaplowitz and Hoehn (2001) Taylor <i>et al.</i> (2003) Weaver (2005) Kyle <i>et al.</i> (2007)
Q12) Fishery stocks and therefore the catchability/harvest of large sized fish, crayfish, mussels, oysters etc. have been documented to be in decline in the Wild Coast region for the past 10 years. If this fishery were to be closed to anglers that don't pay for a regional specific permit, how much would you be willing to pay for a permit that allows you to continue to participate in the fishery?	Open end	Willingness to pay/bequest valuation, non-use valuation, Consumer Surplus, Informal markets.	Willis and Garrod (1991) Ward and Beal (2000) Whitehead <i>et al.</i> (2001) Toivonen <i>et al.</i> (2004) Johnston <i>et al.</i> (2006) Olaussen and Liu, 2011 Lopes and Villasante, 2018 Bova (2022)

Q13) What is your gender?	Multiple choice	Demographic	Gagnon <i>et al.</i> (2021)
Q14) What is your highest level of education?	Multiple choice	Demographic	Gagnon <i>et al.</i> (2021)
Q15) Please select your age group:	Multiple choice	Demographic	Gagnon <i>et al.</i> (2021)
Q16) Choose one or more race(s) with which you identify:	Multiple choice	Demographic	Gagnon <i>et al.</i> (2021)
Q17) Please select a choice below that best describes your 2021 yearly household income:	Multiple choice	Demographic	Gagnon <i>et al.</i> (2021)

3.3.3 Sampling and the Questionnaires Dissemination

Face-to-face intercept interviews using hard copies of the questionnaire were conducted at some of the Wild Coast's most popular shore-angling destinations between December 1, 2021, and December 16, 2021. Face-to-face surveying was deemed as the most practical method to utilise within a rural context, due to the versatility in reaching any population, including the lowest economic classes (Duffy *et al.*, 2005). Additionally, face-to-face interviews have been deemed more effective as respondents are less likely to suffer from survey fatigue during the interview, compared with self-completion modes (Fowler, 2002). Temporal bias was limited by choosing a time of year between the high and low tourism period which is more representative for a short sampling frame (Corluka *et al.*, 2016).

A beach sweeping technique was utilized by the research team, due to both the time limit of this study and capital constraints. This entailed entering the fishing location at a given site and walking to the furthest end of the fishing area, sampling every encountered angler over the age of 18 along the way. This style of non-probability sampling involving random encounters with research participants (mostly avid-angler encounters) was deemed as a suitable technique to assess rural fisheries where effort is dispersed over a large area (Brouwer *et al.*, 1997; Mann *et al.*, 2003; Kaplowitz and Hoehn, 2001).

For safety protocol, beach sweeping patrols were done during the day (06:00 – 18:00). The duration of patrols depended on the distance patrolled and on the number of fishers encountered during the patrol. Because there are few access roads down to the coast, the starting point of patrols could not be randomized, but an attempt was made to patrol as much of the coast as possible near to original entrance point. Only the marine recreational shore-based fishery was assessed during this survey. Areas north from Port St Johns were not sampled due to lack of accessibility caused by excessive flooding during the period.

Fieldworkers were trained to ensure that they understood the aim of the study as well as the questionnaire. The fieldworkers were instructed to approach a broad range of participants, including anglers of different races, genders, and age categories. A detailed script was included to limit interviewer bias, guiding fieldworkers to not interfere with the interviewees responses by providing expectations or opinions (Hildum and Brown, 1956). All questionnaire data was captured into Qualtrics and later analysed in Microsoft Excel©.

3.4 Defining the Demographic groups from the data

For the purpose of this study, the sample was divided into two groups according to an individual's location of residency which was identified by the questionnaire. The tourist group constituted individuals residing anywhere outside of the specified Wild Coast. Regional residents (RR) included individuals residing along the Wild Coast coastline and surrounding nearby towns (Mthatha (40km by road), Mqanduli, Idutywa, Butterworth, and Willowvale).

Demographic data (age, level of education, gender, etc) were categorised (see Appendix 3). To compare the demographics of these groups, frequency tables were constructed, and Chi-Squared tests were performed.

3.5 Models

Based on past economic studies (Parsons, 2003; Fedler, 2009; Southwick *et al.*, 2010; Butler *et al.*, 2020; Potts *et al.*, 2022), a multifaceted approach was used in evaluating the total economic activity linked with the Wild Coast recreational fishery, procedures from Total Economic Valuation (TEV), an applied Travel Cost Method (TCM) and contingent valuation (CV) were used. The key data required to operate economic modelling are estimates of angler expenditures, number of trips and angler participation along the Wild Coast.

3.5.1 Fishing Participation

Total annual shore-fishing effort was estimated from instantaneous aerial counts using a modified version of the method developed by Pollock *et al.* (1997). Aerial count data from Bullock (2018) was used to estimate a total population of recreational shore-fisherman along the entire Wild Coast (Kei Mouth to Port Edward). Use of club data: non-club ratios and marine-fishing license data as used by Potts *et al.* (2022), was not feasible, due to the few resident Wild Coast fishers being part of fishing clubs and the tourism factor of fishers coming from all over South Africa.

Instantaneous total annual shore-fishing effort along the Wild Coast was calculated first (see equation 1 below). However, this is an instantaneous estimate (point of time) and different anglers come and go during the day. Accounting for angler turnover during the whole 24-h period (multiplier of 2.4) (see Brouwer *et al.* 1997), total annual shore-based fishing effort along the Wild Coast is then calculated (equation 3). Correcting for avidity bias (Thomson 1991) using the negative exponential, $m-mf$, where f is the frequency of days and m the

parameter estimated, the average days fished is then approximated, as well as the total angler population. Calculation:

- (1) Instantaneous total annual shore-fishing effort per day (\overline{IC}) was calculated using the following equation:

$$\overline{IC} = U (L)$$

where (U) is the number of anglers per kilometre (0.64) and (L) is the distance of the Wild Coast (275 kilometres).

- (2) Instantaneous total annual shore-fishing effort over a yearly basis (\overline{IU}) was calculated using the following equation:

$$\overline{IU} = \overline{IC} (\overline{y})$$

where (\overline{IC}) is the Instantaneous total annual shore-fishing effort per day and (\overline{y}) is the number of days within calendar year (365 days).

- (3) Total Annual shore-based Fishing Effort ($T\ddot{U}$) was calculated using the following equation:

$$T\ddot{U} = \overline{IU} (dt)$$

where (\overline{IU}) is the Instantaneous total annual shore-fishing effort over a yearly basis and (dt) is a daily angler turnover multiplier used to cater for daily angler turnover during the whole 24-h period (multiplier of 2.4) (see Brouwer *et al.*, 1997).

- (4) The Total participation (\hat{p}) estimate was calculated using the following equation:

$$\hat{p} = \frac{T\ddot{U}}{days}$$

where ($T\ddot{U}$) is the total number of fisher-days per year (Total Annual shore-based Fishing Effort) and ($days$) is the average number of days fished by survey respondents after being corrected for avidity bias (see Thomson, 1991).

3.5.2 Estimates of Individual Trip Expenditure, Fixed Expenditure, and number of trips per annum.

Economic valuation methods from past fishery studies (Fedler, 2009; Southwick *et al.*, 2010; FAO, 2019; Butler *et al.*, 2020; Potts *et al.*, 2022; Bova, 2022) were used for estimating individual per angler spending. Questions were asked in a way that allowed the respondents to only include expenditures purchased primarily for use on Wild Coast fishing trips. Individuals were asked to report their trip expenses (transportation cost, access fees, equipment cost, etc) on their last trip to the area and their fixed asset expenditure (durable items they may have purchased or were purchased primarily for use along the Wild Coast fishery) (see Appendix 1). This is done by expense category and the estimates are then summed to arrive at total trip expenditure and total fixed expenditure. The advantage of this approach is that it uses actual cost information, and the researcher need not construct the cost estimates. Since individuals base trip decisions on perceptions of cost, which may diverge from actual costs, the respondent reported estimate is compelling (Parson, 2003).

Currently, there is no information available on the relationship between expenditure and job creation along the Wild Coast. This measure is usually denoted as the “employment multiplier” and used for economic assessments. Nevertheless, expenditure by recreational anglers generally contributes to the hospitality and guiding sectors, which include daily guiding fees (gillie), accommodation, food and beverage, retail, and domestic labour.

Given the number of anglers in each demographic group (tourist or regional resident), the total economic activity, according to each group was calculated. The sum of the total economic activity from both tourist and regional residents equates to total economic contribution by recreational- shore fishermen visiting the Wild Coast.

Calculation:

Trip Expenditure

- (1) The per trip expenditure for a participant ($T\check{E}_i$) refers to the summation of all trip cost expenditures (\check{E}) of a given individual (i) (i.e., Accommodation, transport, food etc.):

$$T\check{E}_i = \sum (\check{E}_1, \check{E}_2, \check{E}_3, \dots)$$

- (2) Annual trip expenditure per individual ($A\check{E}_i$) was estimated as:

$$A\check{E}_i = T\check{E}_i * \check{N}t_i$$

where ($T\check{E}_i$) is per trip expenditure and ($\check{N}t_i$) is the number of visits (trips) by the individual to the Wild Coast within the previous 12 months.

- (3) Total trip expenditures ($TT\check{E}$), relating to per trip spending of all tourist anglers and regional residents was calculated using the equation:

$$TT\check{E} = \sum_{n=sample\ size} A\check{E}_{i1}, A\check{E}_{i2}, A\check{E}_{i3}, \dots$$

where ($A\check{E}$) refers to all Annual trip expenditures per individual (i).

- (4) Average number of trips ($\overline{\check{N}t}$) was calculated using the equation:

$$\overline{\check{N}t} = \frac{\sum \check{N}t_{i1}, \check{N}t_{i2}, \check{N}t_{i3}, \dots}{n}$$

where $\sum \check{N}t_{i_1}, \check{N}t_{i_2}, \check{N}t_{i_3}, \dots$ is the sum of all trips taken and (n) is the number of survey respondents.

(5) Average trip expenditure per-angler ($\overline{AT\check{E}}$) was calculated by using the equation:

$$\overline{AT\check{E}} = \frac{TT\check{E}}{n}$$

where $(TT\check{E})$ is total trip expenditures (tourist or regional resident) and (n) is the number of relevant survey respondents per group.

(6) The Total Average Annual Individual Trip Expenditures (\overline{TIX}) associated with the fishery was calculated using the equation:

$$\overline{TIX} = \overline{AT\check{E}} * \overline{\check{N}t}$$

where $(\overline{AT\check{E}})$ is the average trip expenditure per angler and $\overline{\check{N}t}$ is the average number of trips taking per annum (according to group).

(7) The total potential annual expenditures associated with all Wild Coast recreational fishing (TX) was calculated using the equation:

$$TX = \overline{TIX}(\hat{p})$$

where (\overline{TIX}) is Total Average Annual Individual Trip Expenditure (\overline{TIX}) and (\hat{p}) was the estimate of annual participation.

Fixed Expenditure

- (1) Total Fixed Expenditure ($F\check{E}$) per individual refers to a sum of all fixed expenditures ($F\check{E}$) within the 12 months prior to being surveyed:

$$F\check{E}_i = \sum (F\check{E}_1, F\check{E}_2, F\check{E}_3, \dots)$$

- (2) Total Fixed Expenditure ($TF\check{E}$), relating to tourist anglers and regional residents is then calculated by the summation of all fixed expenditures ($F\check{E}$) of respondents (i):

$$TF\check{E} = \sum_{n=\text{sample size}} (F\check{E}_{i1}, F\check{E}_{i2}, F\check{E}_{i3}, \dots)$$

- (3) The average Fixed Expenditure per angler per annum ($\overline{F\check{E}}$) was calculated using the equation:

$$\overline{F\check{E}} = \frac{TF\check{E}}{n}$$

where ($TF\check{E}$) is Total Fixed Expenditure and (n) is the number of relevant survey respondents.

- (4) The total annual fixed expenditures of each angling group (Td) was calculated using the equation:

$$Td = \overline{F\check{E}}(\hat{p})$$

where ($\overline{F\check{E}}$) is the average fixed expenditure per individual and (\hat{p}) is the estimate of annual participation.

3.6 Consumer Surplus (Willingness-To-Pay)

Consumer surplus refers to the non-market benefits derived from activities and is measured by valuing the additional amount an individual would be willing to pay over and above their market expenditures (Charbonneau and Hay, 1978; Spurgeon, 1992). This value is assigned in addition to what fisherman currently spend within the Wild Coast fishery. Consumer surplus was estimated from the values given by the respondents pertaining to the hypothetical scenario: *“Fishery stocks and therefore the catchability/harvest of large sized fish, crayfish, mussels, oysters etc. have been documented to be in decline in the Wild Coast region for the past 10 years. If this fishery were to be closed to anglers that don't pay for a regional specific permit, how much would you be willing to pay for a permit that allows you to continue to participate in the fishery?”*.

This hypothetical scenario proves relevant as it represents the economic value that individuals assign to gaining future access to the Wild Coast fishery and its resources. The following calculation steps were used:

(1) Average per-angler consumer surplus (\overline{CS}) is calculated using the equation:

$$\overline{CS} = \frac{\sum WTP_{i_1}, WTP_{i_2}, WTP_{i_3}, \dots)}{n}$$

where $\sum WTP_{i_1}, WTP_{i_2}, WTP_{i_3}, \dots)$ is the summation of individual Willingness to Pay (WTP_i) to participate in Wild Coast fishing (tourist or regional resident) and (n) is the number of relevant survey respondents per group.

(2) Total consumer surplus (\widehat{CS}) is calculated using the equation:

$$\widehat{CS} = \overline{CS} (\hat{p})$$

where (\overline{CS}) is the average consumer surplus per individual and (\hat{p}) is the estimate of annual participation.

3.7 Totals

Total Economic Activity

(1) Total annual expenditure (\widehat{Txa}) is calculated using the equation:

$$\widehat{Txa} = TX + Td$$

where (TX) is the Total Annual Trip Expenditure and (Td) is the Total Annual Fixed Expenditure.

Economic Value

(1) Economic Value (EV) is calculated using the equation:

$$EV = \widehat{Txa} + \widehat{CS}$$

where (\widehat{Txa}) is the Total Annual Expenditure and (\widehat{CS}) is Total Consumer Surplus.

3.8 Economic Leakage and Value Retention

To gain an understanding of the economic leakage and retention of value accruing from shore-based recreational fishing along the Wild Coast, individuals were asked to specify what proportion of each spend item was purchased locally (see Appendix 1). Under each expense category, economic leakage could then be estimated by calculating percentage revenue retained versus leaked. It was necessary to calculate the total expenditures, total tourist expenditure and regional resident total expenditure generated through recreational shore fishing.

Leaked revenue represents opportunity cost and was considered money that had been generated by the local fishery, but was lost and allocated outside the local economy due to the region's low money retention capacity (Figure 3.5). Retained revenue was defined as the money that

was retained within the local community following estimated leakage. It was calculated by subtracting estimated leaked revenue from the total economic expenditure and was calculated for both tourists and regional residents. Retained revenue was money that was spent at locally owned businesses or directly with local artisanal fishermen, guides/harvesters, food, and domestic worker salaries.

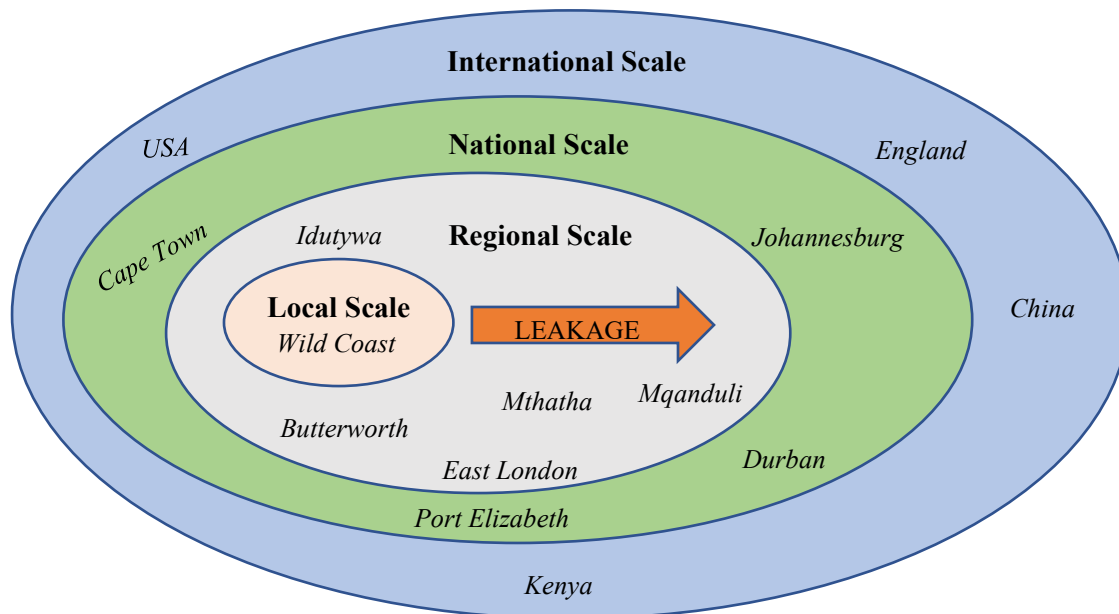


Figure 3.5. Spending from visitors contributes to local, regional, national, and international scales. The sector at most risk, being the local scale retains little revenue to nearby communities and is highly prone to economic leakage to the various regional, national, or international (out of South Africa) economies. Adapted from Butler et al. (2020)

Leaked Revenue for Trip Expenditures ($L_{T\check{E}}$) refers to the sum of all trip expenditures per group that were reported to have been purchased outside of the Wild Coast Region.

Leaked Revenue for fixed Expenditures ($L_{F\check{E}}$) relates to the sum of all fixed expenditures per group that were reported to have been purchased outside of the Wild Coast Region.

Total Economic Activity ($\widehat{T\check{x}a}$) relates to Total annual expenditure which was previously calculated (Expenditure section).

(1) The Economic Leakage Rate (γ_r) was calculated using the equation:

$$\gamma_r = \frac{\sum_{n=1}^N (LT\check{E}_{i1}, LT\check{E}_{i2}, LT\check{E}_{i3}, \dots) + \sum_{n=1}^N (LF\check{E}_{i1}, LF\check{E}_{i2}, LF\check{E}_{i3}, \dots)}{\widehat{Txa}}$$

where $\sum_{n=1}^N (LT\check{E}_{i1}, LT\check{E}_{i2}, LT\check{E}_{i3}, \dots) + \sum_{n=1}^N (LF\check{E}_{i1}, LF\check{E}_{i2}, LF\check{E}_{i3}, \dots)$ refers to all leaked expenditures and \widehat{Txa} is the total economic activity per group. It is expressed as a percentage (%):

(2) Retained Revenue ($\bar{R}r$) was calculated using the equation:

$$\bar{R}r = \widehat{Txa} - LR$$

where \widehat{Txa} is Total Economic Activity and (LR) is Leaked Revenue.

3.9 Applied Travel Cost Method (TCM)

The travel cost method involves collecting data on the costs incurred by each individual in travelling to the recreational site or amenity. This ‘price’ paid by visitors is unique to each individual and is calculated by summing the travel costs for each individual visitor. By aggregating the observed travel costs associated with a number of individuals, a demand curve can be estimated, showing the relationship between the number of trips and price per trip. This identity holds regardless of the behaviour of individual anglers. We assume that the value per trip is independent of the number of trips. This imposes a specific structure on preferences (Morey, 1994). We now have a model that defines an angler’s total economic benefit derived from recreational fishing as the product of a value per trip and the quantity of trips.

The function represents a demand model for trips to a recreation site by a person per annum. The ‘quantity demanded’ is the number of trips a person takes to the site. The ‘price’ is the per trip cost of individuals making use of the site which includes a person’s travel expenses, accommodation, food and beverages, equipment, etc. In its simplest form the model is:

$$(1) \ r = f(tc_r)$$

where r is the number of trips taken by an individual in a year to participate in the activity (recreational fishing along the Wild Coast) and tc_r is the trip cost of partaking in recreational fishing along the Wild Coast. Like any demand function, one expects a negative relationship between quantity demanded (trips r) and price (trip cost tc_r). People living closer to the site (Wild Coast) face a lower cost of reaching the site and, *ceteris paribus*, probably take more trips (Parson, 2003). Trip costs alone will not explain an individual's demand for recreation trips.

It will also depend on factors like income level, age, experience in the recreation activity (recreational fishing), and proximity to other recreation sites. To account for these factors, a more realistic demand function with a set of shifters was used:

$$(2) \ r = f(tcr, y, z)$$

where y is income, and z is a vector of demographic variables believed to influence the number of trips.

A linear function was used to estimate the effects of explanatory variables including economic and social variables on the number of visits to estimate the recreational value of the Wild Coast fishery as below (equation 3):

$$(3) \ r = f(tcr, cs, y, z) = \beta tcr + \beta cs + \beta y + \beta z$$

where r is the number of visits by one individual, tc the total travel costs linked with the recreational fishery (including trip costs, fixed expenditure, entry fees, accommodation, and other related costs), cs is consumer surplus, y is income, and z is a vector of socioeconomic characteristics. The β coefficients determine the impact of independent variables on the dependent variable (no. of trips).

Ordinary Least Squares (OLS) was used to determine the relation between variables (trip cost, fixed per annum expenses, consumer surplus (WTP), income, age, gender, and level of education). Various relations were considered, and the most appropriate model was linear relation.

3.10 Motivation of visit to the Wild Coast (Net benefit accrual)

The “Motivations” behind the visit are defined as expected psychological benefits that are sought by tourists when they decide on a particular site (Manfredo *et al.*, 1996; Bova, 2022). To gain greater understanding to why respondents chose to visit the Wild Coast (consumptive vs low consumptive behaviour), respondents were asked to rank (1-8) a list of activities offered in the area according to their greatest net benefit (Appendix 1). This was necessary as many visitors frequenting the area comprise of casual tourists, who’s primary reason in visiting may differ from fishing. Utility and satisfaction both relate either directly or indirectly to the benefits that an angler receives from his or her angling experience (i.e., the individual reward that an angler receives or expects). Proposed reasons were:

- 1) Fishing (high catch rates, large specimens, biodiversity)
- 2) Uncrowded areas (clean beaches and low congestion)
- 3) Natural attractiveness (backdrop, coastal belt, rural)
- 4) Safe and clean environment
- 5) Open Access coastline
- 6) Non-regulated oceanic harvesting (low compliance levels)
- 7) Social activities
- 8) Facilities/good accommodation

CHAPTER 4: RESULTS

4.1 Demographics

A total of 109 face-to-face questionnaires were completed. While there was no significant difference between the two visitor groups (tourist vs regional residents) in regard to participant gender, the other demographic variables of age (X^2 (4, $n = 109$) = 11.11, $p < .05$), education level (X^2 (6, $n = 109$) = 18.89, $p < .01$), income (X^2 (8, $n = 109$) = 40.77, $p < .001$), and race (X^2 (5, $n = 109$) = 50.21, $p < .001$) were significantly higher and different (race), at the 95% confidence interval for tourists (Table 4.1).

The average age for respondents (Figure 4.1) was between (35-54) years for both tourists and residents. Average education level (Figure 4.5) for tourists was a diploma and matric level for residents, with 39% of participants holding a matric certificate and 32% having a training/college diploma. The sample was predominately male (98%), with 2% being female individuals (Figure 4.3). Average per annum income (Table 4.1 and Figure 4.4) for tourists was R 400 000 - R688 000 and R86 000 – R197 000 for regional residents.

Table 4.1. The descriptive statistics of social economic features of the Wild Coast recreational shore anglers. It shows that the average age of anglers, educational level, gender, race and per annum income. The sample was categorised into tourist anglers and anglers residing along the Wild Coast (regional residents)

Variables	Tourist (n=76)			Regional Resident (n=33)			Chi-Squared	
	<i>m</i>	<i>Actual</i>	<i>SD</i>	<i>m</i>	<i>Actual</i>	<i>SD</i>	X^2	<i>p-value</i>
Age category of Individual	3.08	35-54	0.9301	2.90	35-54	0.72	11.1099	0.02535596
Education level (category)	3.10	Diploma	1.17002	2.18	Matric	0.68	18.89847	0.004339
Gender	1.02	Male	0.16114	1	Male	0.25	0.0136	0.906934
Race	3.581	-	1.25956	3.18	-	1.55	50.21	0.0000000013
Income Category	5.84	400k-688k	1.94503	3.69	86k-197k	1.72	40.77	0.000002300

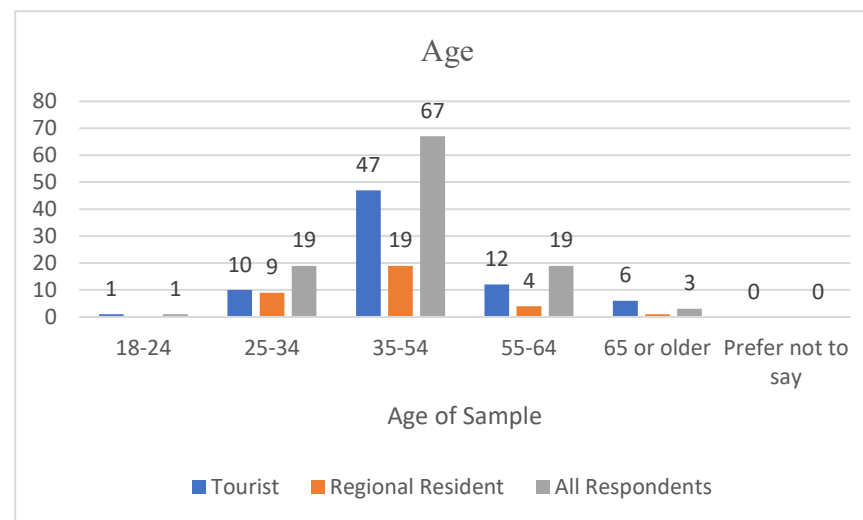
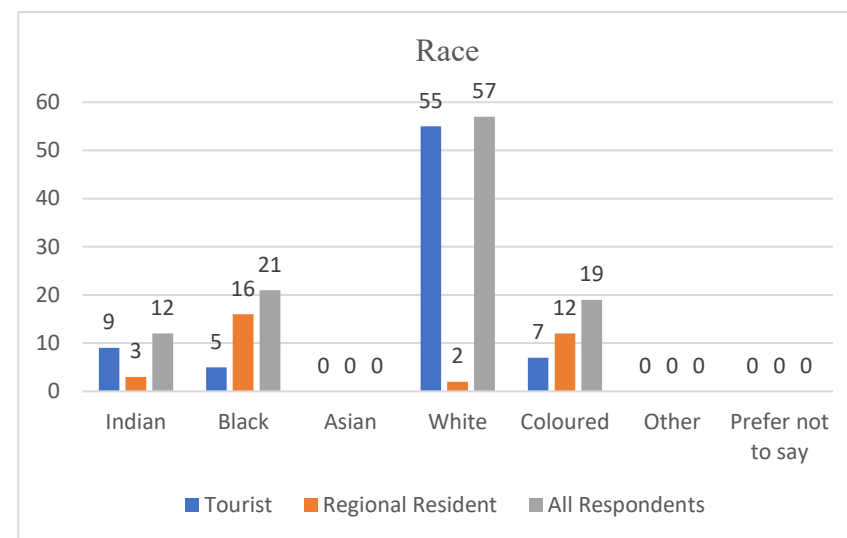
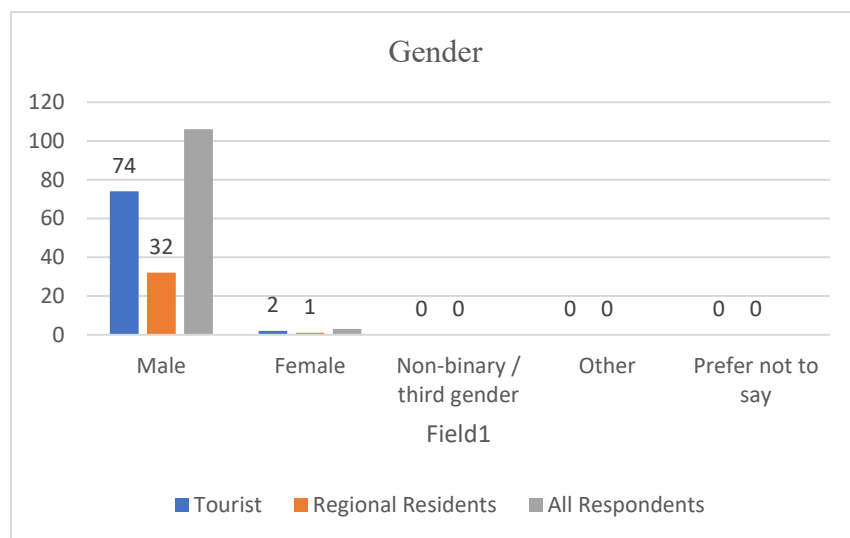


Figure 4.1, 4.2 and 4.3. Illustrating frequency of Gender (4.1), Race (4.2), and Age (4.3) of sampled individuals who responded to a face-to-face economic questionnaire along the Wild Coast in December 2021 (n=109)

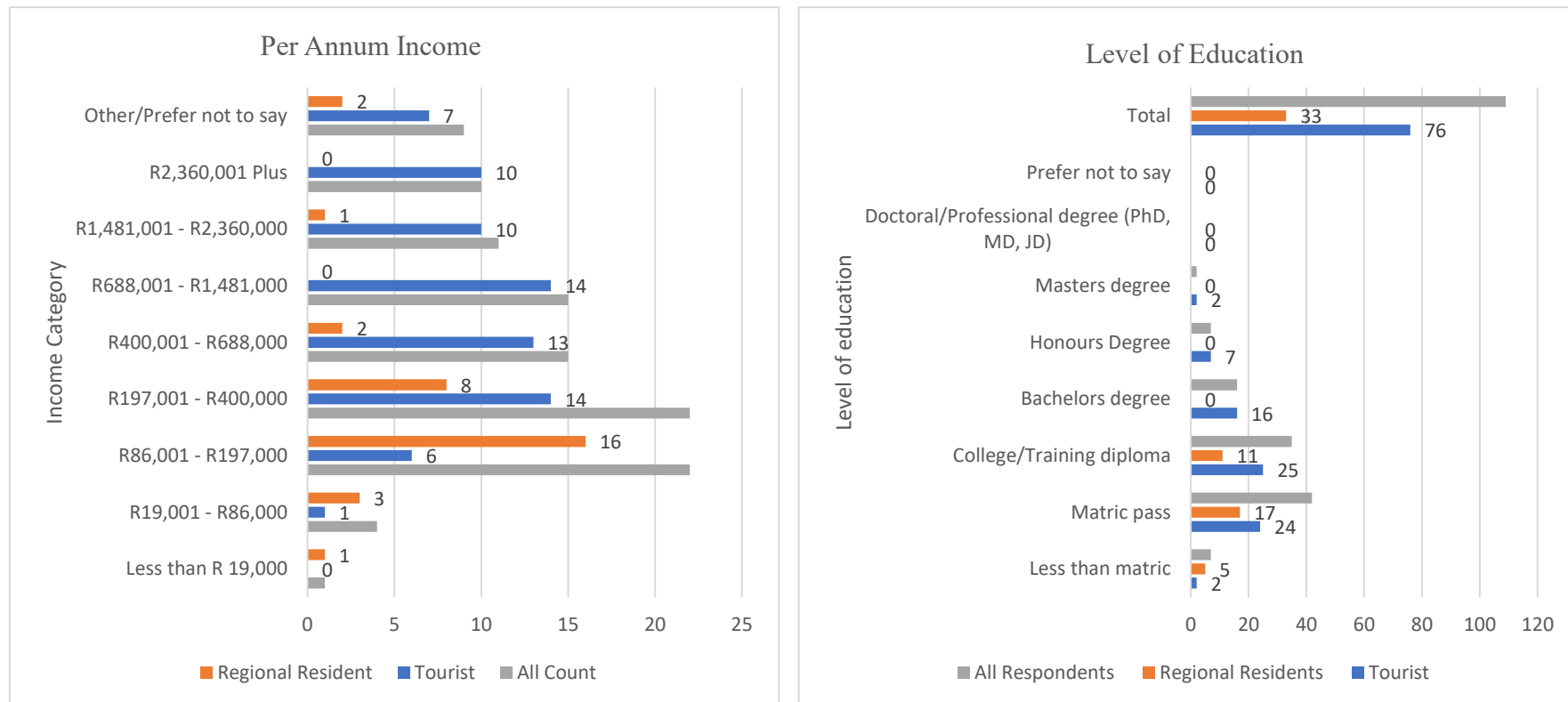


Figure 4.4 and 4.5. Illustrating the Per Annum Income category (4.4) and Level of education (4.5) of sampled individuals who responded to a face-to-face economic questionnaire along the Wild Coast in December 2021 (n=109)

4.2 Residence of Sample

A total of 69.7% of sampled individuals resided in areas outside of the Wild Coast region (tourists), while 30.3 % resided within 50 km or less of the sampled sites (regional residents). Fifty-seven percent (57%) of the respondents were from the Eastern Cape (Figure 4.6), followed by those who were from KwaZulu-Natal (19%), Gauteng (9%) and the Western Cape (7%). Three percent (3%) were from the Free State as well as Limpopo (3%), and 2% were based internationally (Kenya and England).

Tourists who had travelled from the major cities of South Africa, spent on average 7-10 days (per trip) in the Wild Coast. While regional visitors, who reside within economic hubs with close proximity of the Wild Coast (Mthatha, Willowvale, Mqanduli), spent on average 1-3 days (per trip) in the Wild Coast.

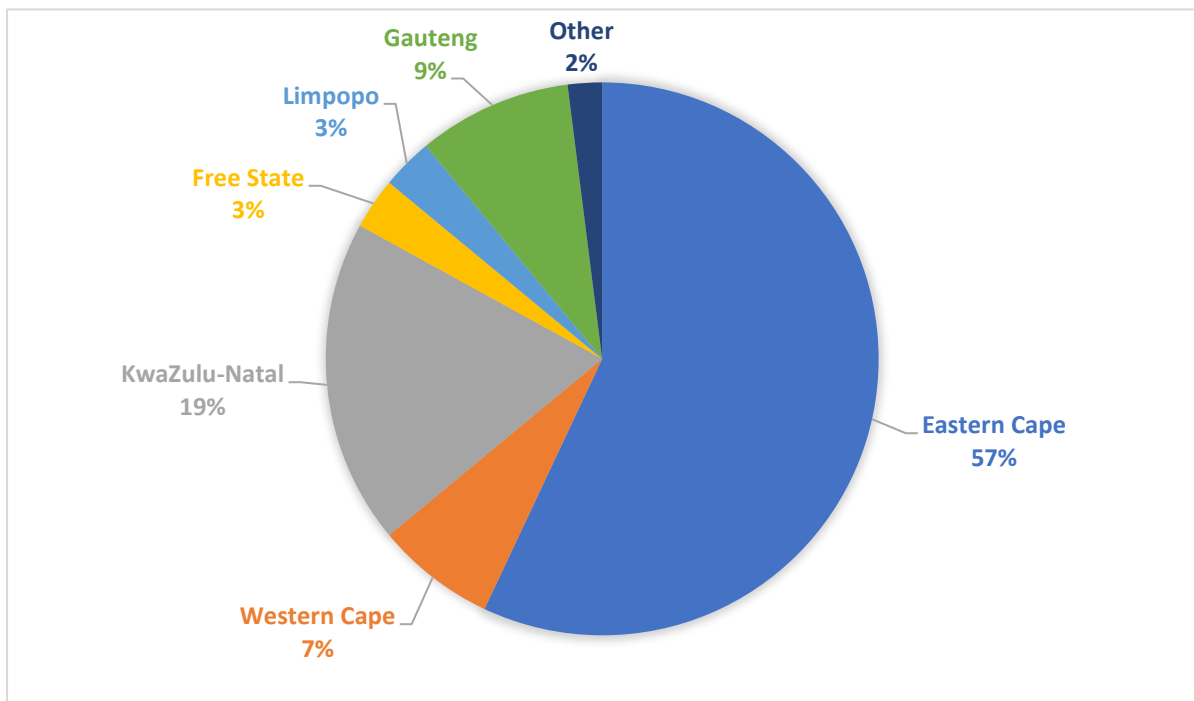


Figure 4.6. Residence of the anglers who responded to a face-to-face economic questionnaire along the Wild Coast in December 2021

4.3 Participation Estimate

Instantaneous total annual shore-fishing effort along the Wild Coast (distance= 275 kilometres) was calculated at (64 006 fisher-days year⁻¹). However, when accounting for angler turnover during the 24-h period (multiplier of 2.4), the best estimate of total annual shore-based fishing effort along the Wild Coast was 153 615 fisher-days per year. Results from the questionnaire showed that individuals fished for an average of 30 days per annum, with tourists fishing 26 days and regional residents fishing 33 days per annum. After correction for avidity bias, the average days fished per respondent was approximately 16 days per year and the estimate of participation for the Wild Coast was 9 601 shore-fishers in 2021. The estimated number of tourists visiting the Wild Coast for shore-based recreational fishing in 2021 was 6 819 tourists and 2 782 regional residents.

4.4 Expenditures

4.4.1 Per Trip Expenditure

The mean per-trip expenditure on recreational-shore fishing along the Wild Coast (Table 4.2) was R 15 507.38 (*SD* = R7 679.96, median = R8 550) for tourists, and R 2 827.52 (*SD* = R1 853.45, median = R2 200) for regional residents. As seen in (Figure 4.7), accommodation was the (1) main expenditure item (R 5 722.59 for tourists) and (R 606.06 for RR), followed by (2) travel costs/fuel (R 3197.37 for tourists) and (R 619.70 for RR), (3) food and beverages (R2 982.76 for tourists) and (R 837.10 for RR), and (4) terminal tackle (R 1 192.76 for tourists) and (R 154.55 for RR). Total spending on trip costs, for all sampled individuals was (R3 290 203) per annum, (R 2 357 122 for tourists) and (R 933 082) for regional residents).

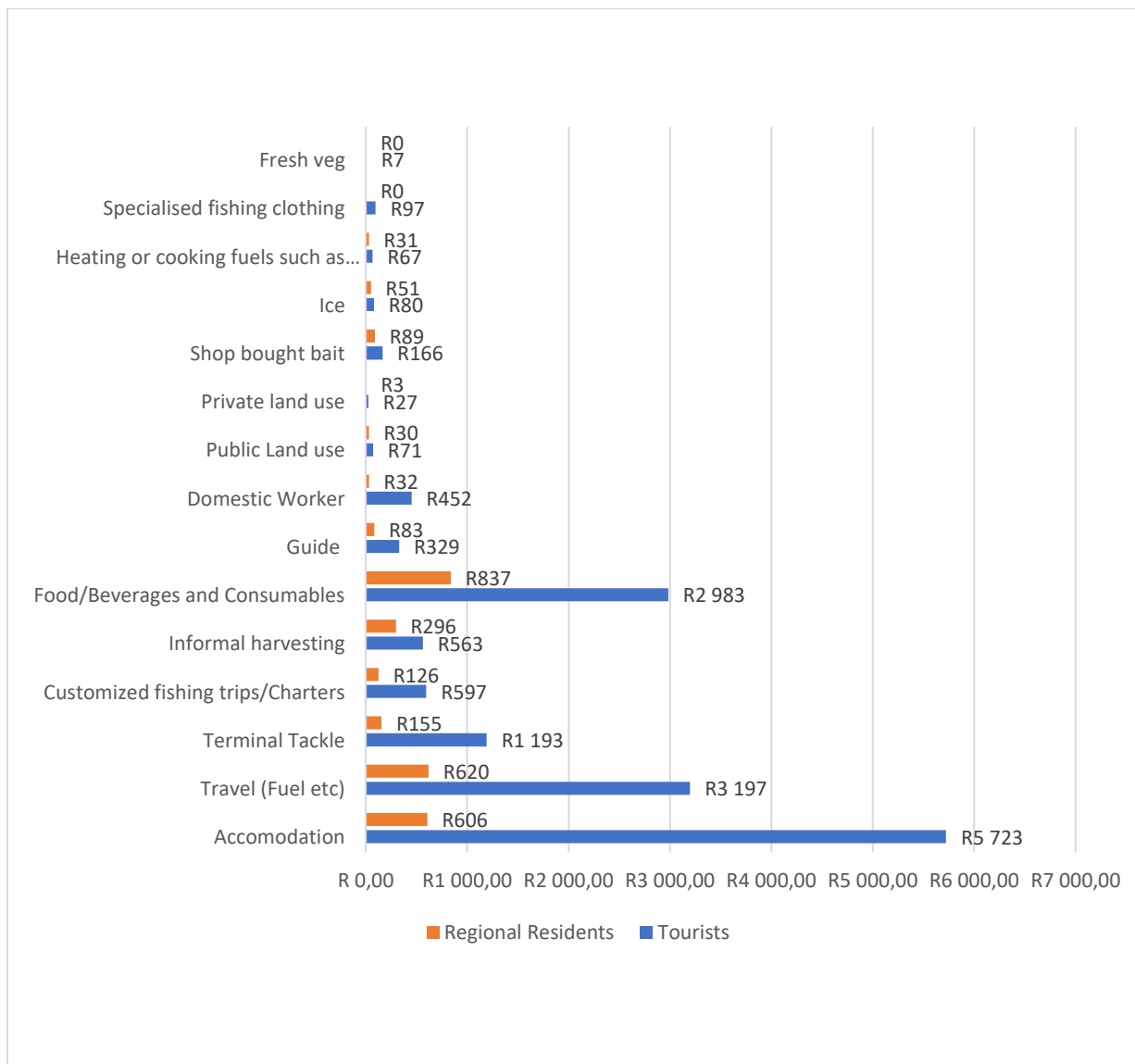


Figure 4.7. Distribution of mean per trip cost according to expense category of tourists and regional residents who responded to a face-to-face economic questionnaire along the Wild Coast in December 2021

4.4.2 Fixed Expenditure Per Annum

The mean expenditure for tourists on longer term (fixed) assets per annum (Table 4.2) was R15 527.13 ($SD = R15\ 771.50$, median = R 5 614.55) and R 5 614.55 ($SD = R7\ 789.26$, median = R 4 040) for regional residents. Main expenses (Figure 4.8) were fishing equipment (R 6 797.37 for tourists) and (R 2 596.97 for RR), non-motorised boats, kayaks (R 2 221.05 for tourists) and (R 1 146.97 for RR) and camping/travel equipment (R 1 232.24 for tourists) and (R 1 146.97 for RR). Total spending on longer-term (fixed) assets for all sampled individuals ($n=109$) was (R 1 365 342) per annum, (R 1 180 062 for tourists) and (R 185 280 for RR).

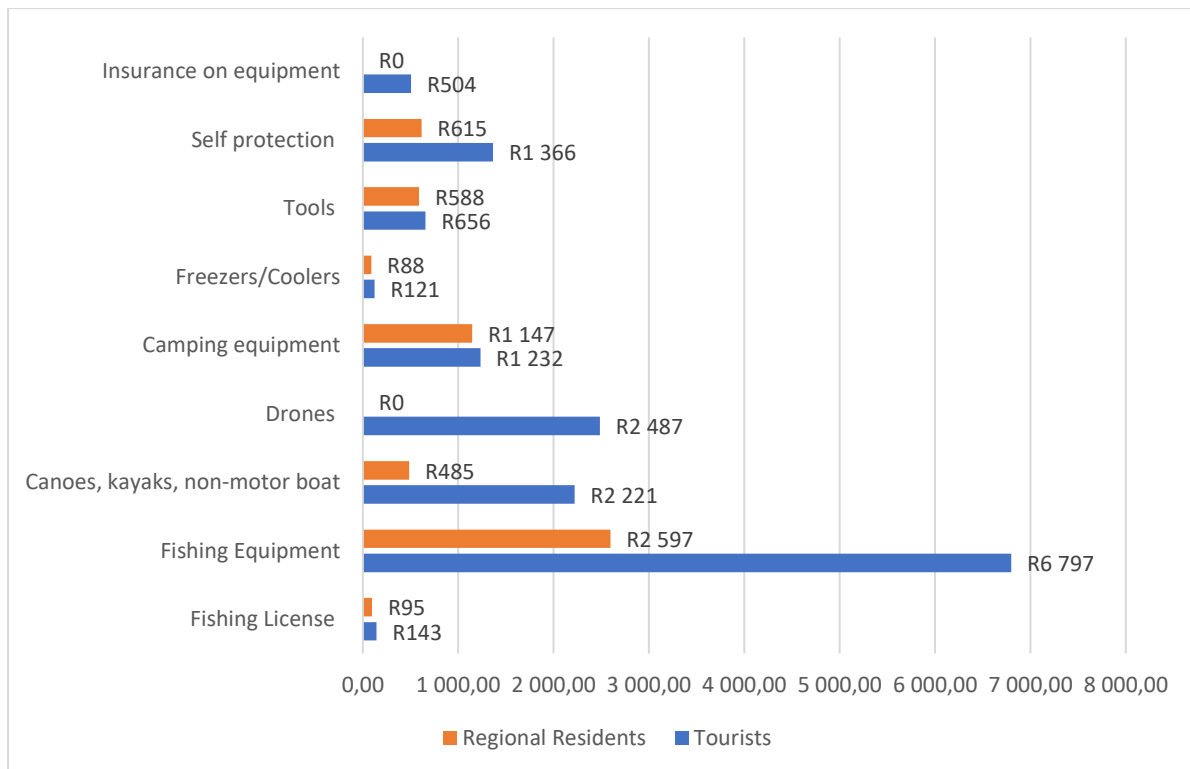


Figure 4.8. Fixed Expenditure Per Annum according to expense type of tourists and regional residents who responded to a face-to-face economic questionnaire along the Wild Coast in December 2021

4.4.3 Travel Cost Parameters

Table 4.2. Annual trip count, the mean spending per fishing tourist and regional residents, median spending, consumer surplus and annual income for the shore-based recreational fishery along the Wild Coast, South Africa over the December period (2021). (Tour = tourists, RR = regional residents)

	Mean		Median		Standard Deviation		Maximum		Minimum	
	<i>Tour</i>	<i>RR</i>	<i>Tour</i>	<i>RR</i>	<i>Tour</i>	<i>RR</i>	<i>Tour</i>	<i>RR</i>	<i>Tour</i>	<i>RR</i>
Annual Trips	2	10.2	2	10	3.4	7.6	15	30	1	2
Direct Variable Costs Per Trip	R 15 507.38	R 2 827.52	R 8 550	R 2 200	R 7 679.96	R 1 853.45	R 34 870	R 7 800	R 910	R 800
Annual Direct Fixed Costs	R 15 527.13	R 5 614.55	R 9 650	R 4 040	R 15 771.50	R 7 789.26	R 73 000	R 42 150	R 0	R 290
Consumer Surplus (WTP)	R 477.63	R 193.64	R 400	R 200	R 370.35	R 137.50	R 2 000	R 500	R 0	R 0
Annual Income (+000)	R 400-688	R 86-197	R 400-688	R 86-197	R 1.95	R 1.72	R 2 300 +	R 1 400-2 300 +	R 19-86	R <19

4.5 Number of Trips per annum

On average, regional residents partook in 10 ($SD = 7.6$) trips per year, showing high avidity, whilst tourists partook in 2 ($SD=3.4$) trips per year (Table 4.2). This relationship and the negative slope (Figure 4.9) confirms the premise that the number of visits decreases as the cost of trips and travel increases.

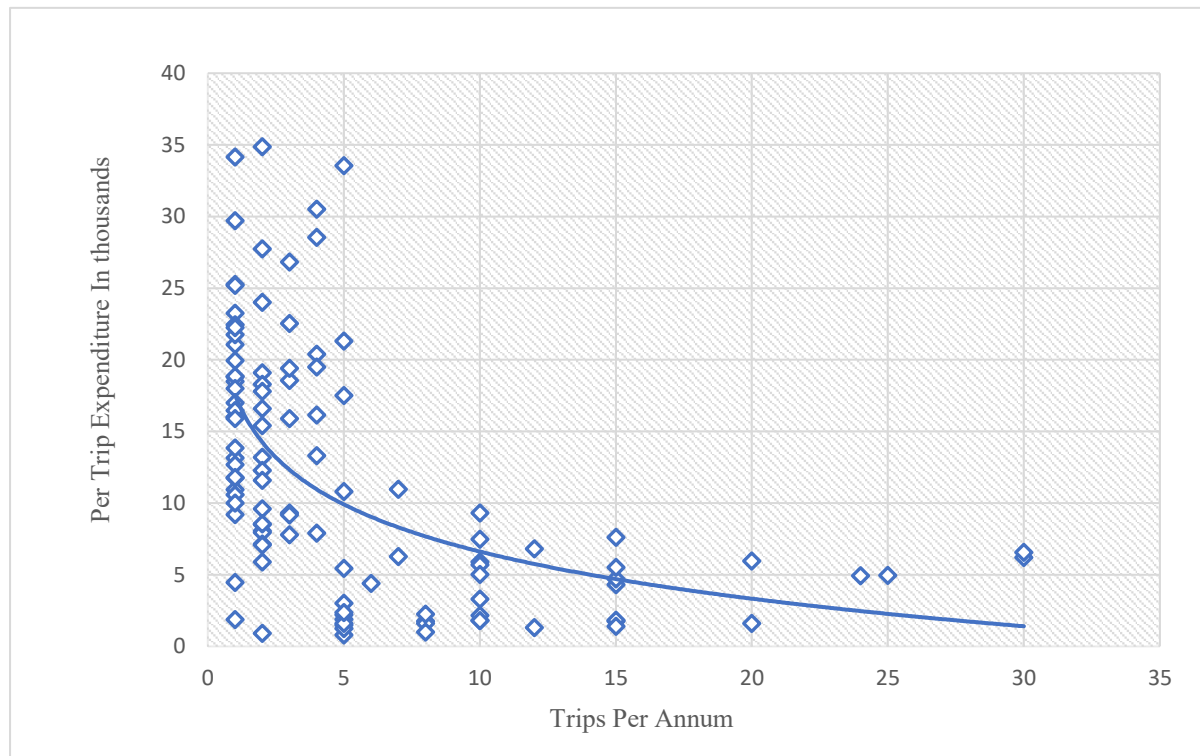


Figure 4.9. Travel Cost Demand function of Per Trip Expenditure VS Number of trips per annum

4.6 Results from regressing number of trips per annum with various explanatory variables

Out of the seven explanatory variables of the OLS regression, three variables had a statistically significant effect on the number of trips to the Wild Coast (Table 4.3). The variable coefficient of travel cost (trip cost) of tourists to visit the recreational site was -0.0001649571 , being significant at the 1% level ($p \text{ value} < 0,01$ (0.00044)). It shows an expected decline of 0.164 trips per annum for an increase in the trip cost of R 10 000, confirming the premise that the number of visits decreases as the cost of trips and travel increases.

The variable coefficient for fixed per annum expenses for tourists was 0.000620374, being significant at the 1% level (p value < 0.01 (0.0041) and positive. It shows an increase in the number of trips per annum by 0.62 will increase the fixed expenditure per annum by R 10 000, confirming that as number of visits increase, fixed expenditure per annum increases.

The variable coefficient of the WTP scenario (CS) for tourists was 0.002218261, being significant at the 5% level (p value $< 0,05$ (0.025). This, signifying that as number of visits increase, the higher an individual values the benefits accrued from continued access of the recreational fishery along the Wild Coast. The remaining variables proved not to be statistically representative.

Table 4.3. Variables from regressing number of trips per annum with various explanatory variables

Variable	Coefficient		Standard Error	
	Tourists (n=76)	RR (n=33)	Tourists (n=76)	RR (n=33)
Trip Cost	-0.0001649571 ***	0.000929484	0.0000446588 ***	0.00078872
Fixed per annum expenses	0.000620374 **	-0.000136346	0.000208995 ***	0.00019749
Consumer Surplus	0.0022182616 *	0.008645035	0.0009724407 *	0.01100673
Income	0.1195008290	-2.4878	0.2042847041	1.94954934
Age	0.9909686503	-2.753423576	0.5115922657	1.95761914
Gender	-1.1183123418	-6.574335261	2.0405306941	7.84581514
Level of education	-0.5838439342	-1.756261295	0.3116915148	2.10947391

*Significance. codes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

4.7 Consumer Surplus (WTP scenario)

The hypothetical scenario of a proposed blanket ban on access to the Wild Coast recreational fishery showed that 94 % of respondents assigned value to an access permit if their number of trips fell to zero (denied access), while 6 % protested the hypothetical scenario by indicating an amount of zero. On average, tourists were Willing-To-Pay R477.63 ($SD = R370.35$), and regional residents R193.64 ($SD = R137.50$) per annum for continued access to fish the Wild Coast. In total, individuals were willing to pay an additional R 42 690 per annum to gain continued access to the fishery, with tourists (n=76) being willing to pay R 36 300 and regional residents (n=33) being willing to pay R 6 390 per annum. Once extrapolated to the estimated participation (n= 9601), total consumer surplus was estimated at R 3 795 665.

4.8 Economic Value of sample

The total economic value, which included spending on fishing trips, fixed expenditures, and consumer surplus (WTP hypothetical scenario) of the 109 participants in 2021 amounted to R 4 698 235.00 (Table 4.4)

Table 4.4. The total economic activity of 109 respondents, categorised into total trip cost per annum, total fixed expenditure, and total consumer surplus

	<i>Tourist (n=76)</i>	<i>Regional Resident (n=33)</i>	<i>All Respondents (n=109)</i>
Total Trip Cost per annum	R 2 357 122	R 933 082	R 3 290 203
Total Fixed expenditure	R 1 180 062	R 185 280	R 1 365 342
Total Consumer Surplus	R 36 300	R 6 390	R 42 690
Total Expenditure (TC+FE)	R 3 537 184	R 1 118 362	R 4 655 545
Economic Value (TE+CS)	R 3 573 484	R 1 124 752	R 4 698 235

4.9 Full Estimate of the Economic Value of the Wild Coast Recreational Fishery

If the results from the sampled individuals were extrapolated to the estimated number of shore-based recreational fisherman along the Wild Coast (n= 9 601), the total spending on fishing trips by all recreational-shore fishers along the Wild Coast in 2021 can be estimated at R 411.6 million, with tourists contributing to an estimated R 317.3 million and regional residents R 94.2 million (Table 4.5). Total economic value can be estimated at R 415.5 million once taking consumer surplus (WTP) into consideration.

Table 4.5. Full economic activity estimate using angler expenditure averages, consumer surplus and estimated population of Wild Coast shore-based recreational fishery (n=9 601)

	<i>Tourist (n=6 819)</i>	<i>RR (n=2 782)</i>	<i>All (n=9 601)</i>
Total Trip Cost per annum	R 211 489 648	R 78 661 606	R 290 151 255
Total Fixed expenditure	R 105 879 499	R 15 619 678	R 121 499 178
Total Consumer Surplus	R 3 256 959	R 538 706	R 3 795 665
Total Expenditure (TC+FE)	R 317 369 148	R 94 281 285	R 411 650 432
Economic Activity (TE+CS)	R 320 626 107	R 94 819 991	R 415 446 098

4.10 Direct Economic Contribution in Terms of Informal Market Harvesting

On average, a tourist would contribute R563 and regional residents R296 per trip while purchasing harvested seafood/bait (Figure 4.10). A total of 98% of all seafood was harvested and sold by local guides, while 2% was bought through hotels (Table 4.7). In terms of per annum contribution, sampled tourists amounted to R 85 530, while regional residents spent R 97 000 (Table 4.8). The total direct economic contribution in terms of informal harvesting within the sample was calculated at R182 530 for 2021 (n= 109) and the potential total direct economic contribution was calculated at R 16 077 711 for 2021 (n= 9 601). The frequency of informal harvesting according to type (Figure 4.11 and Table 4.6) indicates the popularity of bait sales (30%), fish (17.62%) and oysters (17.62%) for tourists. While regional residents showcased high frequency in bait (37.25%) purchases and East Cape Rock Lobster (23.53%).

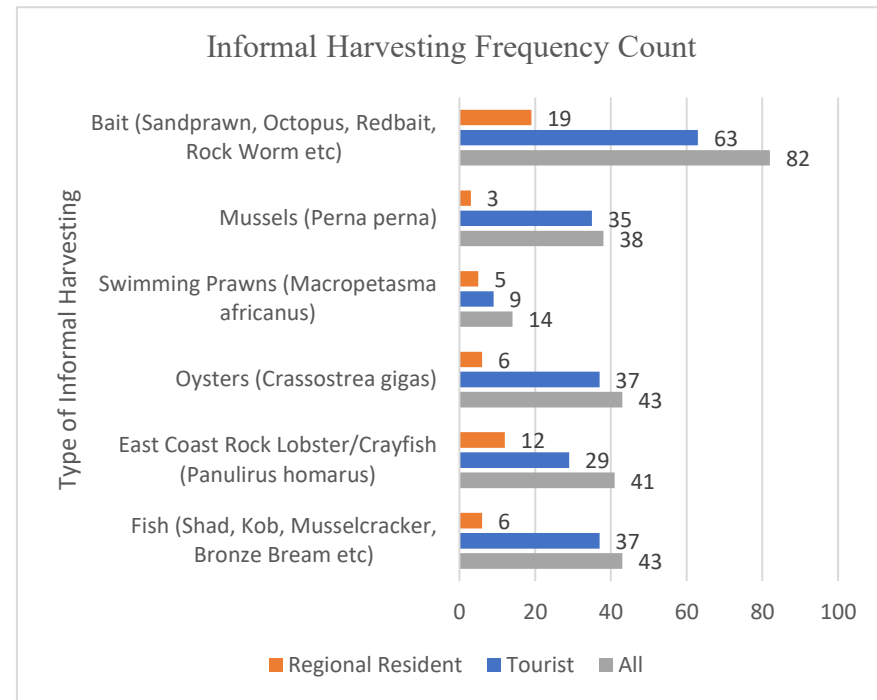
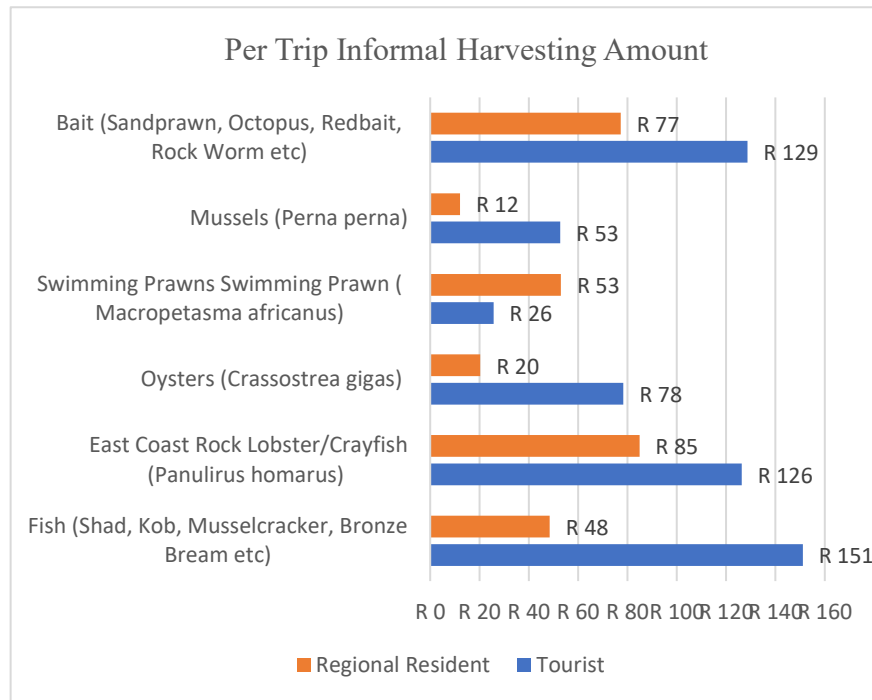


Figure 4.10. and 4.11. Mean Per Trip spend on different types of seafood goods and bait (fish, crayfish, mussels, prawns, etc) along the Wild Coast in December 2021 (Figure 4.10) and frequency of different types of seafood goods and bait (fish, crayfish, mussels, prawns, etc) (Figure 4.11) sold informally along the Wild Coast in December 2021

Table 4.6. The frequency of Informal seafood and bait harvesting sales according to type of collected seafood. These data relate to individuals who responded to a face-to-face economic questionnaire along the Wild Coast in December 2021 (n=109)

Type of Informal Harvesting	All %	All Count	Tourist %	Tourist Count	Regional Resident %	RR Count
Fish	16.48	43	17.62	37	11.76	6
East Coast Rock Lobster/Crayfish	15.71	41	13.81	29	23.53	12
Oysters	16.48	43	17.62	37	11.76	6
Swimming Prawns	5.36	14	4.28	9	9.80	5
Mussels	14.56	38	16.67	35	5.88	3
Bait	31.42	82	30	63	37.25	19
Total	100	261	100	210	100	51

Table 4.7. Table depicting where the seafood or bait was purchased along the Wild Coast, South Africa

#	Question	From a Local harvester/guide (%)	No.	Hotel/Restaurant (%)	No.	Shop/Spaza (%)	No.	Total
1	Fish (Shad, Kob, Musselcracker, Bronze Bream etc)	97.67	42	2.33	1	0	0	43
2	East Coast Rock Lobster/Crayfish (<i>Panulirus homarus</i>)	100	41	0	0	0	0	41
3	Oysters (<i>Crassostrea gigas</i>)	100	43	0	0	0	0	43
4	Swimming Prawns (<i>Macropetasma africanus</i>)	100	14	0	0	0	0	14
5	Mussels (<i>Perna perna</i>)	100	37	0	0	0	0	37
6	Bait (Sand prawn, Octopus, Redbait, Rock Worm etc)	100	80	0	0	0	0	80

4.11 Economic Leakage and Value Retention

Spending of the sampled anglers (n=109) along the Wild Coast amounted to R 4 655 545 in 2021. Of this, only (9.5%) was directly retained within local coastal economies. These retained contributions stemmed from the informal collection and selling of bait and seafood (R 183 230), guiding (R50 833) and domestic work (R79 200) (Table 4.8). Although small, these contributions had near (100%) retention rates, showing a high direct contribution to livelihoods in the region, with these activities being directly supported by the existence of recreational fishery. The majority of hotel, fishing lodge and external visitors supplies (food and beverages, consumables, gas, and fuel) were sourced in nearby economic hubs (East London, Mthatha and Butterworth), therefore the economic leakage from local coastal economies to the regional, national, and international scale was significant (90.5%).

Tourists

Total per annum expenses incurred by the tourists amounted to R 3 537 184, (R 2 357 122 in trip costs) and (R1 180 062 in fixed expenses) in 2021, with a mean per trip value of R 15 507.38 (Median = R8 550). With per trip expenses, leakage amounted to (28%) and (71%) retention in regional markets. This high retention figure is not a true reflection of per trip retention due to external ownership of hotels, self-catering units, and various forms of accommodation not being run by local individuals. The sheer spending linked with accommodation further offsets the accumulated money retention figure. The same applies for consumables and food and beverages, as these goods get trucked in from regional economic hubs and not truly sourced locally. Leakage for per annum fixed expenditure amounted to (93.9%), with (6.1%) money retention. Fixed expenditures that had retention value were tools (30% of total amount), camping equipment (10.5% of total amount).

Regional Residents

Total per annum expenses incurred by regional residents amounted to R1 118 362 (R933 082 in trip costs) and (R 185 280 in fixed expenses) in 2021 (Table 4.8), with a mean per trip value of R 2 827.52 (Median = R 2 200). Of this, leakage amounted to (1.5%) of trip expenses with (98.5%) retention in regional markets. Leakage for per annum fixed expenditure amounted to (20.2%), with (79.8%) money retention. Most goods were sourced in economic hubs such as Mthatha, Willowvale, Mqanduli and Port St Johns. Domestic work (100%) and the selling of crayfish, fish, and bait (100%) were activities where money retention was high in remote fishing location.

Table 4.8. Detailed total spending of a shore-based recreational fishing along the Wild Coast, South Africa, during 2021 (survey performed in December 2021). (LEAK = leakage, RET = retained)

Trip Expense Category	Tourists						Regional Resident					
	Mean Per trip EXP	Total P/A Trip EXP	LEAK	LEAK %	Retained	RET %	Mean per trip EXP	Total P/A Trip EXP	LEAK	LEAK %	Retained	RET %
Accommodation	R5 723	R869 833	R0	0.0	R869 833	100.0	R606	R200 000	R0	0.0	R200 000	100.0
Transport Cost	R3 197	R486 000	R238 140	49.0	R247 860	51.0	R620	R204 500	R0	0.0	R204 500	100.0
Terminal Tackle	R1 193	R181 300	R174 048	96.0	R7 252	4.0	R155	R51 000	R14 346	28.1	R36 659	71.9
Customized fishing trip fee	R597	R90 700	R7 800	8.6	R82 927	91.4	R126	R41 500	R0	0.0	R41 500	100.0
Public land use or access fee	R71	R10 800	R1 544	14.3	R9 256	85.7	R30	R10 000	R0	0.0	R10 000	100.0
Private land use or access fee	R27	R4 100	R0	0.0	R4 100	100.0	R3	R1 000	R0	0.0	R1 000	100.0
Shop Bait (live or dead)	R166	R25 200	R7 762	30.8	R17 438	69.2	R89	R29 500	R0	0.0	R29 500	100.0
Ice	R80	R12 180	R1 876	15.4	R10 307	84.6	R51	R16 800	R0	0.0	R16 800	100.0
Gas, charcoal, firewood etc	R67	R14 700	R2 940	20.0	R11 760	80.0	R31	R10 250	R0	0.0	R10 250	100.0
Specialised fishing clothing	R97	R14 700	R14 700	100.0	R0	0.0	R0	R0	R0	0.0	R0	100.0
Domestic workers	R452	R68 700	R1 718	2.5	R66 983	97.5	R32	R10 500	R0	0.0	R10 500	100.0
Food/Beverages/Consumables	R2 917	R443 380	R230 558	52.0	R212 822	48.0	R786	R259 500	R0	0.0	R259 500	100.0
Informal Harvesting	R563	R85 530	R0	0.0	R85 530	100.0	R296	R97 700	R0	0.0	R97 700	100.0
Guide	R329	R50 000	R0	0.0	R50 000	100.0	R83	R833	R0	0.0	R833	100.0
Total	R15 507	R2 357 122	R681 085	28.9	R1 676 068	71.1	R2 828	R933 082	R14 346	1.5	R918 742	98.0
Per Annum Fixed Expenditure												
Canoes, non-motor vessel	R2 221	R168	R158 875	94.1	R9 925	5.9	R485	R16 000	R0	0.0	R16 000	100.0
Drones	R2 487	R189 000	R189 000	100.0	R0	0.0	R0	R0	R0	0.0	R0	0.0
Freezers/Coolers	R121	R9 200	R9 200	100.0	R0	0.0	R88	R2 900	R0	0.0	R2 900	100.0
Tools	R656	R49 870	R34 909	70.0	R14 961	30.0	R588	R19 400	R0	0.0	R19 400	100.0
Self-protection	R1 366	R103 816	R103 816	100.0	R0	0.0	R615	R20 300	R0	0.0	R20 300	100.0
Camping equipment	R1 232	R93 632	R83 800	89.5	R 9 831	10.5	R1 147	R37 850	R13 357	35.3	R24 489	64.7

Insurance on equipment	R504	R38 304	R76 600	100.0	R0	0.0	R0	R0	R0	0.0	R0	0
Fishing license	R143	R10 868	R21 790	100.0	R0	0.0	R95	R3 130	R157	5.0	R2 974	95.0
Rod/Reel and tackle	R6 797	R516 572	R479 895,38	92.9	R36 676	7.1	R2 597	R85 700	R23 996	28.0	R61 704	72.0
Total	R15 527	R1 180 062	R1 108 078	93.9	R71 393	6.05	R5 615	R185 280	R37 510	20.2	R147 766	79.8

4.12 Motivation of Visit (Net Benefit Accrual)

A total of 52% of respondents identified fishing (with its high catch rates, large specimens, and biodiversity) as the most important motivation to visit the Wild Coast, and thus the activity with the greatest net benefit accrual (Figure 4.12). This was followed by uncrowded areas (clean beaches and low congestion) (22%) and natural attractiveness (backdrop, coastal belt, rural) (17%). Non-regulated oceanic harvesting: low compliance levels (1%) and facilities/good accommodation (1%) provided the lowest utility concerning the attributes of the coastline (Table 4.12). Of the regional residents, 64% ranked fishing as the activity with the greatest net benefit accrual compared with 49 % of the tourists (see in Appendix 2).

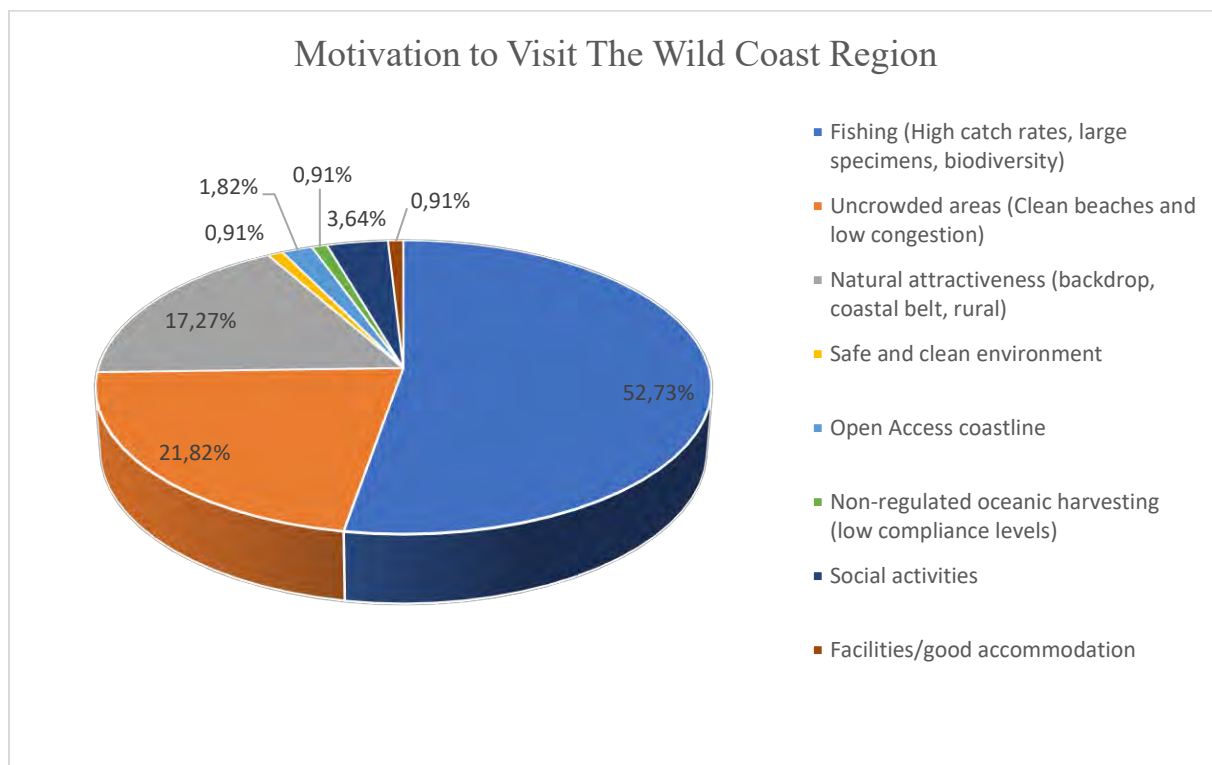


Figure 4. 12. Activities according to what individuals assign a greater net benefit (Valued above the activities market price). Ranked from 1 to 8 according to level of importance/satisfaction with 1 being Most important and 8 being Least important (Full sample, n= 109)

CHAPTER 5: DISCUSSION

The recreational fishery along the Wild Coast has the potential to generate significant economic activity within a rural setting, signifying that the Wild Coast recreational fishery contributes considerably to local tourism and sustainable livelihoods. Expenditure stemming from the sample was high (R 4 655 545 per annum, n=109) when compared with other ecotourism studies done in rural areas (Butler *et al.*, 2020), indicating market opportunities, high fisher avidity and a target group of high spenders. Based on these expenditures of the respondents, once extrapolated to an estimated population (n= 9 601), recreational fisheries in the Wild Coast could potentially contribute R 415 446 098 to the economy. However, there is a large amount of economic leakage (90.5 %) in this expenditure which represents an opportunity cost. This opportunity cost can be reduced by focussing on items that pertained high leakage rates and looking at formalizing markets such as the informal seafood/bait collection and subsistence fish sales within the region. Studies such as this that quantify the economic activity associated with recreational fishing have the potential to improve the recognition and support of the sector by investors and management authorities. This will encourage the development of enterprises that improve the market opportunities for local people and management plans that maintain healthy fisheries and limit ecological damage (Potts *et al.*, 2020; Potts *et al.*, 2022).

The economic expenditures of the Wild Coast recreational fishery and their potential contribution to the economy is comparable with other regional studies and lower than the totals estimated for total national contribution (Potts *et al.*, 2022) (Table 2.2). While total expenditures on fishing activities along the Wild Coast were much lower than in the developed world. For example, expenditure in the Everglades, USA was considerably higher (Fedler, 2009). Similarly, expenditure in the developing world was considerably higher in the small island state of the Bahamas (Fedler, 2010). However, this is not surprising since this country is largely visited by international fishing tourists from the developed world, similar to the Seychelles fishery (Bova, 2022). The most similar comparison within a developing world context and similar size fishing area where local economic expenditure information is available was Namibia (Barnes and Kirchner, 2000). Accounting for a discrepancy in over 20 years between studies, the economic values are comparable.

The spending patterns of recreational fishers in this study indicate that this activity primarily contributed to categories such as transport, food and beverages and accommodation. This was similar to the study by Potts *et al.* (2022) who estimated the economic activity associated with all recreational fishing in South Africa and suggests that the national patterns of expenditure are reflected along the Wild Coast. Similar expenditure behaviour was reported in the Los Cabos region, Mexico (Southwick *et al.*, 2010), in the Seychelles (Bova, 2022) and in a nationwide assessment of marine recreational fishing in France (Herfaut *et al.*, 2013). This suggests that spending in the recreational fishing sector is characterised by high spending in the same categories which is typical of the tourism industry (Mihalic, 2014). Together, these findings suggest that the recreational fishery along the Wild Coast, like in many parts of the world contributes considerably to local tourism.

There were noticeable differences in the spending patterns of tourist and regional residents (Table 4.2). Generally, tourists spent more during their trips and on their fixed per annum costs than regional residents (Figure 4.7 and 4.8). This may be attributed to the significantly higher annual household income. Based on the categories used by Statistics South Africa (2022), the findings of this survey suggested that the tourist fishers largely (46.8%) fell into the income bracket earning in excess of R400 001 per annum, while the local residents largely (48.5%) fell into the middle-class income bracket (see in Appendix 3).

Tourists contributed more to local services which resulted greater retention of economic expenditure when compared with regional residents. Per annum contributions from tourists for guiding and domestic work was considerably higher when compared with the contributions from regional residents (Table 4.8), even though regional residents undertook significantly more trips each year (Table 4.2). This may be explained by higher mean annual income of tourists (Djeri *et al.*, 2014), their need for local fishing knowledge (guiding), or their demand for a more luxurious stay, as reflected in their contribution to accommodation and food and beverages (see Figure 4.7). This pattern is not unusual. For example, Bova (2022) found the largest contributions from the recreational fishery to Seychelles' economy stem from non-resident participation (tourists), which also represents new money into the local economy. This suggests that efforts should be made to increase the number of tourists, rather than regional residents in the fishery. Mechanisms for this are proposed in the recommendations section.

The hypothetical scenario of a blanket ban of the recreational fishery was presented in the questionnaire, to assess non-market benefits accrued by anglers. The consumer surplus (WTP) results relating to continued participation (access) in the recreational fishery is an indicator of fishing quality along the Wild Coast. The fact that both tourists (R 477.63 per individual) and regional residents (R 193.64 per individual) are willing to pay a significant access fee per annum, on average, to simply participate in the fishery signifies there are additional non-market benefits derived from recreational angling in the Wild Coast region.

Out of seven explanatory variables in the linear regression model, three of these are statistically significant and have an effect on the number of trips pertained to visiting the Wild Coast for recreational fishing. The trip cost estimate for tourists was significant at the 1% level ($p\text{ value} < 0.01$) and negative, confirming the premise that the number of visits decreases as the cost of trips and travel increases, and confirming the results of this study were in line with the results of other studies such as Brown and Mendelsohn (1984); Shrestha *et al.* (2002); Fixon and Pangapanga (2016) and Zandi *et al.* (2018). The fixed per annum expenses for tourists were significant at the 1% level ($p\text{ value} < 0.01$) and positive, confirming that as number of visits increase, fixed expenditure per annum increases. Consumer surplus for tourists was significant at the 5% level ($p\text{ value} < 0.05$), signifying that as number of visits increase, the higher an individual values the benefits accrued in the ability to participate in recreational fishing along the Wild Coast. Although income of tourists did not reach statistical significance, its positive relationship with number of trips suggests that individuals with higher incomes would partake in more trips per annum.

The estimated shore fishing participation level along the Wild coast (9 601 individuals) was relatively low when compared to the national participation in South Africa (471 786 shore-based individual) (Potts *et al.*, 2022). However, it was relatively high when compared with other rural fisheries (e.g., Namibia). Although this is probably an underestimate of total participation, due to many people partaking in fishing infrequently (tourists), it may be a reasonable estimate of more avid, and therefore more regular, fishers along the Wild Coast. This estimate of participation, however, remains highly uncertain. Historical comparisons of angler participation were presented for the shore-based marine recreational fishery (Mann *et al.*, 2003), who estimated participation of 7 748 recreational anglers. The lack of noticeable growth in participation over 20 years can be explained by disruptions caused by the COVID pandemic, economic hardships (negative GDP

trajectories, see: <https://tradingeconomics.com/south-africa/gdp>), limitations in terms of road accessibility caused by flooding and lack of site development. Seemingly, a low growth rate in rural recreational fisheries and ecotourism as a whole, could lead to a reduction in overall economic contributions accrued by locals. Identifying the drivers to limit this phenomenon will be a vital step in sustaining recreational fisheries as an economic developmental vice.

The results of this study suggest that the primary motivation of the respondents to visit the Wild Coast was for the fishing opportunities (high catch rates, large specimens, biodiversity). There is no doubt that for these respondents, fishing was the activity with the greatest net benefit accrual along the Wild Coast. Furthermore, more regional residents (64%) indicated that their primary motivation of visiting was fishing, compared to tourists (49%). This suggests that every effort should be made to maintain the fishing quality along the Wild Coast. This can be done through improvements in the governance of the fishery in the region. Other important motivations for visiting the Wild Coast included the uncrowded areas (clean beaches and low congestion) (22%) and natural attractiveness (backdrop, coastal belt, rural) (17%). Non-regulated oceanic harvesting: low compliance levels (1%) provided the lowest utility concerning the attributes of the coastline, suggesting that some respondents have a non-consumptive interest in the fishery (conservation or catch and release). While substitution to other activities (guided tours, diving, hiking, kayaking) does occur (see Alderman and Sahn, 1991), the findings suggest recreational fishing is a primary reason for individuals visiting the area.

Value Retention Vs Economic Leakage

Ecotourism continues to be hailed as a pro-poor growth sector that offers opportunities to small, medium, and micro enterprises (SMMEs), while also accounting for leakages that leave most of the tourist moneys in the hands of firms far away from the destination (Ashley and Roe, 2002; Mitchell and Ashley, 2006; Lange, 2011; Mihalic, 2014; Butler *et al.*, 2020). As previously stated, many rural communities are heavily impeded by loss in income due to local economies not having the capacity to retain wealth, with such leakages often outweighing the benefits felt through recreation (Butler *et al.*, 2020). The notable deliberation over the extent of linkages and retention in the ecotourism sector is prevalent in this research, with the high per-trip spending behaviour of shore-based recreational fishers conforming with known spending patterns of tourists (main expenses: accommodation, food and beverages and fuel), yet only a small percentage of the total

contribution is retained within the local coastal community (9.5%), with individuals' sourcing the majority of their supplies from regional economic hubs inland (East London, Mthatha, Butterworth, Mqanduli). Findings showcase the main sources of economic leakage were through the sourcing of food supplies, fuel, and long-term assets. This money is therefore lost through the local economies not having the capacity to retain such wealth. This is similar to the findings of Potts *et al.* (2022) where a considerable disconnect between the first and second economy was suggested, with only 8.9% of the economic benefit accruing to low-income households.

Fixed expense categories that showed evidence of money retention in regional areas were tools (30% of total amount) and camping equipment (10.5% of total amount). This could be explained by the presence of large hardware stores in economic hubs due to increased construction linked with road works and a growing population (Ndabeni and Rogerson, 2005; Guyot and Dellier, 2009). Although respondents indicated that the majority of money spent on accommodation was retained along the Wild Coast, this is not necessarily the case, as many hotels, lodges and self-catering units are owned by external individuals. Additionally, tools, refrigerators and camping equipment that were bought in the Wild Coast are not a true reflection of retained value as they are manufactured externally to the region. This is similar to the studies by (Cater, 1993; Chirenje *et al.*, 2013 and Butler *et al.*, 2020) where local hotels and businesses outsource their goods, services, and employment, leaving few opportunities available for locals. Through this, it can be argued that the money retention rate stemming from accommodation should be far lower due to external owners. Furthermore, a large proportion of tourists sampled, indicated that food and beverages were predominantly purchased locally through lodges and hotels along the Wild Coast. However, such food and consumables were bought from East London or nearby economic hubs (Mthatha, Mqanduli, Idutywa), suggesting inflated per trip retention amounts due to this caveat.

Informal Sector

The informal collection and selling of bait and seafood, guiding by local gillies and domestic work were by large the highest locally retained expenditures within the region (close to 100%). While respondents fish recreationally, noticeable spending on seafood (fish, crayfish, oysters, etc) was accounted for (Figure 4.10 and 4.11), suggesting visitors and recreational fishers buy seafood from locals, small businesses, hotels, and gillies. The strict demarcation between pure recreational fisheries and pure subsistence fisheries is often difficult, however, using fishing activity to generate

resources for one's livelihood marks a clear tipping point between recreational fisheries and subsistence fisheries (Arlinghaus *et al.*, 2010). While recreational fisherman are known to harvest and consume some of their recreational catch, the extent of the spending suggests respondents are buying in excess. The high per annum expenditure of regional residents on seafood items (R 97 700, n=33), could further suggest a form of food security for several individuals and their families residing near the Wild Coast (Cooke *et al.*, 2018; Funge-Smith and Bennett, 2019). This demand is likely to have been enhanced by the ongoing COVID pandemic, with retail goods proving to be severely overpriced due to supply chain shortages, and a substitution in goods purchased (locally sourced seafood) taking place (Guan *et al.*, 2020). The level of spending indicates a noticeable supply and demand for collected bait, harvested fish, crayfish, mussels, and oysters. This is likely due to the marginalisation of many "subsistence" fishers, who do not qualify as small-scale fishers, due to the new small-scale fisheries policy (Potts *et al.*, 2020). This highlights an important need for the amendment of policy and without this, it is likely that the proportion of subsistence fishers who harvest fish to meet their nutritional requirements, yet are forced to identify as recreational fishers due, will increase.

Findings from the study suggest policy surrounding informal markets could be seen as a money retention strategy within rural markets, through contributing directly to livelihoods in the region and being directly supported by the existence of recreational fishery. Focus must be drawn on the local guides and informal marine harvesting (seafood) sector in terms of the most provident form of money retention within the Wild Coast recreational fishing market. The concept of creating 'linkages' between the services local 'gillies' provide and economic development within a rural economic space, may lie in formalisation of the sale of fish, crayfish, oysters, and bait. Presently, the sale of bait and seafood is illegal as only small-scale fishers that belong to co-operatives can sell seafood. However, as local fishing guides have been largely marginalised from this process yet contribute 98% of all the bait and seafood that is sold to recreational anglers, sustainable ways to accommodate, formalise or license bait and seafood collection may be necessary. In addition to these changes, a plan that informs local economic development strategies to support the recreational fishery and uplift coastal communities is necessary. This should start by better understanding the requirements of anglers while on their fishing trips and an evaluation of the local capacity to service these requirements.

Following the revelations of the results of this study, major policy questions surrounding the informal bait and seafood sector are:

"To what scale is this sector capable of?" (provided suitable policies and fostering mechanisms are implemented to mitigate its short comings);

"To provide sustainable employment opportunities to an increasing poor coastal community?";

"Will not the policies to endorse growth of the informal sector lead to 'formalisation' and hence further marginalisation of the benefits they accrue as small informal businesses (Papola, 1980)?";

"Should the strategy be that of advocating the informal sector in preference to an attempt of full blown 'market formalisation' or should it comprise of a collaborative development using the potential linkages between the two sectors (Papola, 1980)?" and finally;

"Is the informal bait and seafood sector depicted as an instrument for employment generation and economic growth in the short run only, or as an embedded model concerning conservation, sustainable livelihoods, and education?"

If the sale and collection of bait and seafood were to be formalised for subsistence fishers, it would only be effective with adequate monitoring and compliance. For example, individual fishers would need to purchase permits and comply with the formalised regulations. Currently, subsistence fishers cannot operate as "small-scale" fishers if they are not registered in a small-scale fishing cooperative. As a result, subsistence fishers (who operate on recreational permits) are not legally allowed to sell what they catch and harvest.

Specific recreational permit regulations are bound in the Marine Living Resource Act 18 of 1998. The MLRA aims to ensure the sustainable utilisation of marine living resources in a manner that is beneficial to all citizens. Whilst the small-scale and commercial permits have overarching legalities bound in several acts, yet incorporate stipulations that can be changed or be overruled easily without having to consult at a national level. This is because the act that governs the small-scale and commercial fishery sectors states that permit regulations are subject to "stipulations" which can be changed at the ministerial level, whilst the recreational permit regulations are actual laws and have to be nationally gazetted for public consultation before they can be changed.

This suggests difficulty to adapt the South African recreational fishery permit legislation to anything other than what it entails, without a significant rewriting of the act itself. A possible way forward would be the subsistence sector gazetting its own version of the small-scale fishery (SSF) through implementing a new promulgated sector: subsistence fishery (further research and legislation would need to contemplate how to define and ring fence it (poor, unemployed, pro), to avoid affluent recreationalists taking advantage of it), or the SSF needs to make room for growth to incorporate the needs of the subsistence sector. A suggestion would be to involve subsistence individuals in SSF decisions.

The shortfall of direct engagements made with the informal seafood and bait collectors with regards to their needs is evident. Currently, informal bait and seafood collectors are unprotected operators, who on account of their disadvantaged position are unable to truly derive the benefits and safeguarding effect linked with formal market prices (Papola, 1980). There is some effort put in consulting with the local individuals, but little evidence of stronger forms of participation within the drafting and implementation of policy (Ashley and Ntshona, 2003). Nationally, there are few policies that put decision-making power in rural-community hands.

Ecotourism

Tourism was identified as a key sector for economic development in the National Government's 1995 mandate to municipalities to implement Local Economic Development (LED), with the aim of reducing poverty, and promoting economic growth at the local level (Hindson and Vincente, 2005; Lange, 2011). The New Development Paradigm of Multinational Projects in Africa,' identifies four overarching organisational values required for successful policy within the ecotourism developmental scope, these being: sensitivity to local needs and culture; organisational partnerships; capacity building and consistent monitoring (Backman and Munanura, 2015). In spite of having a policy base to support growth, the benefits linked with tourism have evaded low-income households, with rural municipalities being largely at blame, due to corruption, lack of resources, skills, and enrooted levels of poverty (Nel and Goldman, 2006; Rogerson, 2008; Lange, 2011).

This study focussed on contributions from recreational fisherman, showcasing one dimension of the ecotourism market along the Wild Coast, however besides the services directly associated with the fishery, anglers regularly take several non-fishing family members or friends on trips, creating

opportunities for other forms of local spending (Potts *et al.*, 2022). This form of activity-based segmentation is predicted on the assumption that different tourism products appeal to different types of tourists, where discrete market segments are identified (McKercher *et al.*, 2002). Focus should be put on further activities for family members to capture the ecotourism market, such as Marine Protected Area (MPA) guided tours, birding, cultural visits, diving, adventure racing (mountain biking/trail running) and kayaking. Tooman (1997) argued that increasing the degree of diversity within a local economy when developing tourism is essential. For example, linkages between recreational fishing tourists and other opportunities, such as visiting local craft markets, hiking trails, canoe trails and local produce markets, will increase the local economic benefits derived from recreational fishing tourism. For this, local government agencies are encouraged to identify the potential for alternative income generation from recreational fishing tourists and invest in skills training, infrastructure development and the facilitation of micro-economic opportunities for entrepreneurs.

Sustainable Livelihoods

Findings in this study align with the notion of tourism enacting as a possible mechanism to redistribute wealth from the rich to the poor (Butler and Rogerson, 2016). As tourists travel to settlements along the Wild Coast, they spend money on travel, accommodation, gillies' day-rates, food and drinks, seafood and domestic work. With the noticeable contributions stemming from domestic work and guiding/gillies, it is clear that the fishery has the potential to sustain several local households. This supports the premise of sustainable livelihoods and that recreational fisheries can support economic growth in rural areas. Furthermore, this finding also highlights how households would be negatively impacted if there were to be considerable decay in fish stocks and participation.

Traditionally, the only way in which local residents enter the tourism market is by selling handmade goods, selling firewood, selling surplus harvests, or providing part time labour (Rogerson 2001). Small, retail and artisan enterprises are highly differentiated, yet a common trait is their severely limited and stagnated growth potential (Rogerson 2001). However, several researchers are showcasing the immense potential for rural South African markets, in which local culture, political history, and engagement with residents are key parts of the product (Ashley and Ntshona, 2003; Viljoen and Tlabela, 2007; Lange, 2011; Rogerson and Rogerson, 2021). The Wild

Coast is seemingly underdeveloped, and currently large hotels and lodges source the bulk of their consumables and food supplies (except for sporadic purchases of fresh vegetables, fish, and seafood) from outside of the local area. Yet, there are certain commodities and services that could, in theory, be locally obtained. These would, for example, include fresh produce such as bread and vegetables, local Xhosa community culture or historical tours and guided marine tours. Building capacity within social development and tourism systems of low to middle-income nations requires coordinated efforts across all sectors, effective governance, adequate funding, skilled staff and continuous monitoring, evaluation, and improvement cycles; it also requires partnerships with the private sector, communities, and stakeholders (Nores and Fernandez, 2018).

CHAPTER 6: RECOMMENDATIONS, LIMITATIONS & CONCLUSION

6.1 Recommendations

While it is recognised that the ecotourism sector has many dimensions, based on this rural case study's results, we propose a few recommendations to enhance recreational fisheries as a developmental catalyst.

These results suggest that the economic contributions from fisherman are largely one dimensional, this suggesting that a holistic approach focussing on further activities for the family members of fishing tourists will be a step towards expanding the ecotourism market (MPA guided tours, diving, adventure racing (mountain biking/trail running), kayaking) along the rural Wild Coast. Therefore, forthcoming research that incorporates other tourist activities along the Wild Coast such as guided community tours and ocean tours (i.e., sardine run) could provide insights into additional economic activity linked with the local ecotourism sector.

There is still much to be understood about the Wild Coast recreational fishery. Additional research is necessary for other parts of the fishery, especially the small-scale sector. Future research reviewing the effectiveness of the current permit system and fisheries legislation is suggested, with focus on critically assessing the benefits of the legal recognition to the local fishers that have been marginalised from the small-scale sector. In other words, what would it do and allow individuals to do that they aren't already doing. Will it give them access to a different basket of species or different bag limits (quotas)? Allow individuals to build a business? Then what happens when they no longer rely on subsistence for food and instead are running a business selling bait/seafood? This can be supported by a call for the informal seafood harvesting and bait sector to be recognised through formalisation and as a large contributor to coastal economies. Through this a form of market price can be determined. The assignment of a monetary value to a natural resource can lead to further conservation). This has been illustrated in a recreational hunting context (Walls and Ashenfarb, 2022).

In the short term, the reduction of leakages can be addressed by visitors adopting a greater ‘support local’ ideology, with further community projects aimed at ecotourism, further highlighting the need for further small business owners’ incentives/skills development and training. A call for more community owned accommodation, similar to the Bulungula community project, Eastern Cape, South Africa (Lange, 2011) is necessary to aid in money retention within the hospitality industry. Partnerships between the state and private entities/NGO’s may be necessary to ensure the implementation and sustainability of projects. However, governments must resist pressure from vested interests and show legitimate commitment to supporting progressive, effective, and inclusive policies (Blackmore *et al.*, 2015).

It is recommended, that where possible, capacity building and the training of local community members may allow for the provision of local resources. Resident gillies could be provided with the opportunity to attend a marine guiding course, allowing for accreditation (FGASA), a better understanding of the dire straits of our oceanic resources and the chance in climbing the income ladder with the new knowledge acquired. Ulovane offers a similar course along the Sunshine Coast, Eastern Cape, South Africa. It is likely that some training may be required and should be facilitated by local hotels or government (Butler *et al.*, 2020; Nores and Fernandez, 2018).

6.2 Limitations and Potential Bias

It is important to note that this study had a number of limitations:

- (1) Financial constraints: The fieldwork necessary for the study proved to be very expensive due to extensive vehicle usage, fuel costs, accommodation, and the geographic location of the site.
- (2) Limited time: Due to the short data collection period, many anglers may have been overlooked, which may affect the results of the study. A longer study period would account for variations in economic activity throughout a calendar year.
- (3) Lack of trust from survey respondents: Some of the respondents were reluctant to partake in the study due to the research team being seen as outsiders.

- (4) No regional multipliers (employment, income, and output) pertaining to the Wild Coast were available from the government or statistical agencies at the time of the study.
- (5) The COVID 19 pandemic. This would have directly affected respondents spending due to the financial implications brought about during this unprecedented period. The pandemic also added further time constraints to the study as face-to-face participants surveying took place.
- (6) Excessive flooding and severe weather conditions occurred during the surveying period, likely resulting in less tourist and regional resident activity during this period, thus limiting the probability of encountering many survey participants.

Potential Bias:

- (1) While the results suggest the possibility that the face-to-face surveys produced responses from more avid and dedicated anglers, there are no straightforward risk mitigation solutions for this instance. However, future researchers could ask respondents their level of specialisation (which will include questions about avidity, level of expertise, centrality of fishing to their lifestyle and catch orientation) to correct for such bias (March *et al.*, 2014; Bova, 2022).
- (2) It is possible that the responses of fishers to the survey questions were influenced by recall bias (as seen in Frijlink and Lyle, 2010) or expressing inflated spending estimates. This may be due to ‘rounding up’ or because some responses may be referring to the travel expenditures that are actually shared at a group level (family/friends), but reported at an individual level. An example of this was an economic research survey by the United States of America (USA) Forest Service highlighting that individuals will often report group expenditures when asked for their individual shares (Stynes and White, 2006; Southwick *et al.*, 2010). In these cases, the food, accommodation, or travel costs were often inflated to represent group spend. Future studies could address this bias by asking individuals to report the number of people accompanying them on the trip and dividing their shared costs thereof (Southwick *et al.*, 2010).

6.3 Conclusion

In summary, this study highlights that there is substantial economic activity pertaining to the Wild Coast recreational fishery. However, less than 10 % of these expenditures are retained within local coastal economies. This diminishes the economic contributions of the fishery to the Wild Coast region. It is suggested that the potential value of the recreational fishery should be communicated to and realised by the local government and other stakeholders operating in the area in order to foster better linkages and reduce leakages within local markets. The informal collection and selling of bait and seafood, domestic work and guiding were the highest locally retained expenditures within the region. The identification of these contributions can be used to provide recommendations for local economic development strategies which can support the recreational fishery while uplifting coastal communities that should be benefitting more from the activity whilst introducing environmental stewardship and conservation aimed at sustainable oceanic harvesting.

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APPENDIX I



RHODES UNIVERSITY
Where leaders learn

ECONOMIC VALUATION OF THE WILD COAST/TRANSKEI RECREATIONAL FISHERY

Presented is a survey used to highlight contributions/expenditures linked with the Wild Coast/Transkei shore-based Recreational Fishery, promoting sustainable oceanic use and social development.

You have been chosen to participate in this research because you have been identified as a key participant.

- Your participation in this research study is voluntary.
- This questionnaire is PURELY ANONYMOUS.
- You may choose not to participate.
- If you decide to participate in this research survey, you may withdraw at any time.
- You may refuse to answer any questions.

This survey will take approximately 10 minutes to complete. The results of this study will be used for research and academic purposes only. This research is not affiliated with any law enforcement agency or media/market-related agency and this information will not be used in any way that could cause harm to you. You may refuse to answer any question and may withdraw from the survey at any time. If you have any questions about the research study, please contact the lead researcher Michael Pyle (michael.p.sa@gmail.com) or the Rhodes University Ethics Committee (Please contact committee@ru.ac.za).

This research has been reviewed according to Rhodes University ethics procedures for research involving human subjects National Health Research Ethics Council (Reg no.5225).

Choosing the "agree" box below indicates that:

- You have read the above information
- You voluntarily agree to participate
- You are at least 18 years of age.

By proceeding with the survey, you are indicating that you are willing to participate in the survey. Do you agree to proceed?

- ☐ AGREE
- ☐ DISAGREE

The following questions are about your fishing trips and the costs for equipment and other items you may have purchased in South Africa, PRIMARILY for use in Wild Coast/Transkei fishing activities. Include the purchase of both new items and items previously owned by others.

Q1) Which of the following settlements, headlands, or rivers did you visit specifically for fishing? (Place an X at visited locations)



List of settlements/areas

- ☐ Kei Mouth
- ☐ Mazzeppa Bay
- ☐ Qora Mouth/Kob Inn
- ☐ Dwesa/Cwebe
- ☐ Mbashe River Mouth
- ☐ Xhora Mouth
- ☐ Hole in the Wall
- ☐ Coffee Bay
- ☐ Hluleka Nature Reserve
- ☐ Port St Johns/ Umngazi River Bungalows
- ☐ Mthatha
- ☐ Willowvale
- ☐ Idutywa
- ☐ Butterworth
- ☐ Mqanduli

Q2) Where is your home located?

Q3) How many trips per year do you take to the Wild Coast/Transkei region for fishing?

Q4) Per trip, how many days do you spend fishing in the Wild Coast/Transkei region?

Q5) On your Wild Coast/Transkei fishing trip(s) in the last 12 months, which of the following items did you spend money on?

- ☐ Accommodation at backpackers, cabins, lodges, community accommodation, campgrounds, etc.
- ☐ Private vehicle expenses including fuel, tolls, oil etc.
- ☐ Terminal Tackle
- ☐ Customized fishing trip packages (including fees for charters, social gathering, guides, etc.)
- ☐ Public land use or access fees (including fees for any land owned by local, state/provincial, or national government land)
- ☐ Private land use or access fees (including entrance, secure parking, privileges)
- ☐ Shop bought Bait
- ☐ Ice
- ☐ Guide
- ☐ Domestic Worker
- ☐ Heating or cooking fuels such as gas, charcoal, firewood etc.
- ☐ Specialized fishing clothing, severe weather gear, boots, waders, etc.
- ☐ Donations or contributions to MPAs, national parks or local Transkei oriented conservation.
- ☐ Books, magazines, or digital media devoted to the Wild Coast/Transkei region
- ☐ Food, beverages, and consumables
- ☐ Other _____

Q6) What was the amount paid for the item (s) selected? Please list the item and individual cost below:

What proportion of these items were purchased in the Transkei/Wild Coast region?

	Amount spent on items	None	Less than half	About half	More than half	All
<i>Accommodation at backpackers, cabins, lodges, community accommodation, campgrounds, etc.)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Private vehicle expenses including fuel, flights, tolls, oil etc.</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Terminal Tackle</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Customized fishing trip packages (including fees for charters, social gathering, guides, etc.)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Public land use or access fees (including fees for any land owned by local, state/provincial, or national government land)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Private land use or access fees (including entrance, secure parking, privileges)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Shop bought bait</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Ice</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Heating or cooking fuels such as gas, charcoal, firewood etc.</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Guide</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Domestic Worker</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Specialised fishing clothing, severe weather gear, boots, waders, etc</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Donations or contributions to MPAs, national parks or local Transkei oriented conservation.</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Books, magazines, or digital media devoted to the Wild Coast/Transkei region</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Food, Beverages, and consumables</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These questions are about long-term assets, equipment, and other items you may have purchased or were purchased PRIMARILY for use in the Wild Coast/Transkei fishery. Include purchases of both new items and items previously owned by others.

Q7) Which of the following items did you purchase for the PRIMARY purpose of fishing within the Wild Coast/Transkei?

- ☐ House/Cottage
- ☐ Land ownership (in part or whole)
- ☐ Land leases (in part or whole)
- ☐ Canoes, kayaks, or boat
- ☐ Drones
- ☐ Cooler box
- ☐ Tools
- ☐ Self-protection (firearm, knife, pepper spray)
- ☐ Freezer
- ☐ Fishing equipment (rod, reel, etc)
- ☐ Off-road vehicles such as a 4-wheeler, 4x4 vehicle, trail bike, or beach buggy
- ☐ Camping equipment (such as backpacks, sleeping bags)
- ☐ Insurance on equipment, etc

Q8) What was the amount paid for the item (s) selected? Please list the item and individual cost below:

What proportion of these items were purchased in the Transkei/Wild Coast region?

	Amount spent on items	None	Less than half	About half	More than half	All
<i>House/Cottage</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Land ownership (in part or whole)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Land leases (in part or whole)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Canoes, kayaks, or boat</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Drones</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Freezer/Cooler box</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Tools</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Self-protection (firearm, knife, pepper spray)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Camping equipment (such as backpacks, sleeping bags)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Insurance on equipment, boats etc</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Fishing License</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Fishing Equipment (Rod, reel etc)</i>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9) Did you purchase any of the following items during your fishing trips to the Transkei/Wild Coast in the last 12 months?

- ☐ Fish (Shad, Kob, Musselcracker, Bronze Bream etc)
- ☐ East Coast Rock Lobster/Crayfish (*Panulirus homarus*)
- ☐ Oysters (*Crassostrea gigas*)
- ☐ Swimming Prawns Swimming Prawn (*Macropetasma africanus*)
- ☐ Mussels (*Perna perna*)
- ☐ Bait (Sandprawn, Octopus, Redbait, Venus Ear, Rock Worm etc)

Q10) Please answer the following questions pertaining to your purchases:

	Where were the following goods purchased?			How much did you spend on these items?	Quantity purchased? (Kgs, or counts)
	From a Local harvester/guide	Hotel/ Restaurant	Shop/ Spaza	Amount in Rands	Kilograms or number of items
<i>Fish (Shad, Kob, Musselcracker, Bronze Bream etc)</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<i>East Coast Rock Lobster/Crayfish (Panulirus homarus)</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<i>Oysters (Crassostrea gigas)</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<i>Swimming Prawns (Macropetasma africanus)</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<i>Mussels (Perna perna)</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
<i>Bait (Sandprawn, Octopus, Redbait, Rock Worm etc)</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		

Utility and satisfaction both relate either directly or indirectly to the quality that an angler receives from his or her angling experience (i.e., the individual reward that an angler receives or expects).

Q11) Which of the following activities do you assign a greater net benefit to? (Valued above the activities market price). Please rank from 1 to 8 according to level of importance/satisfaction with 1 being MOST important and 8 being LEAST important

- _____ Fishing (High catch rates, large specimens, biodiversity)
- _____ Uncrowded areas (Clean beaches and low congestion)
- _____ Natural attractiveness (backdrop, coastal belt, rural)
- _____ Safe and clean environment
- _____ Open Access coastline
- _____ Non-regulated oceanic harvesting (low compliance levels)
- _____ Social activities
- _____ Facilities/good accommodation

Q12) Fishery stocks and therefore the catchability/harvest of large sized fish, crayfish, mussels, oysters etc. have been documented to be in decline in the Wild Coast/Transkei region for the past 10 years. If this fishery were to be closed to anglers that don't pay for a regional specific permit, how much would you be willing to pay for a permit that allows you to continue to participate in the fishery?

R _____

Thank you! You are almost finished with the survey, there are a few more vital questions to help us better understand our respondents. Your answers will not be shared with anyone (PURELY ANONYMOUS). Below are demographic questions that will help us better understand the participation in, and demand patterns of recreational fishing on, the Wild Coast.

Q13) What is your gender?

- ☐ Male
- ☐ Female
- ☐ Non-binary / third gender
- ☐ Other
- ☐ Prefer not to say.

Q14) What is your highest level of education?

- ☐ Less than matric
- ☐ Matric pass
- ☐ College/Training diploma
- ☐ Bachelor's degree
- ☐ Honours Degree
- ☐ Master's degree
- ☐ Doctoral/Professional degree (PhD, MD, JD)
- ☐ Prefer not to say.

Q15) Please select your age group:

- ☐ 18-24
- ☐ 25-34
- ☐ 35-54
- ☐ 55-64
- ☐ 65 or older
- ☐ Prefer not to say.

Q16) Choose one or more race(s) with which you identify:

- ☐ Indian
- ☐ Black
- ☐ Asian
- ☐ White
- ☐ Coloured
- ☐ Other _____
- ☐ Prefer not to say.

Q17) Please select a choice below that best describes your 2021 yearly household income:

- ☐ Less than R 19,000
- ☐ R19,001 - R36,000
- ☐ R36,001 - R67,000
- ☐ R67,001 - R134,000
- ☐ R134,001 - R268,000
- ☐ R268,001 - R536,000
- ☐ R536,001 - R1,072,000
- ☐ R1,072,001 - R2,144,000
- ☐ R2,144,001 Plus
- ☐ Other/Prefer not to say.

APPENDIX II

Net Benefit ranking by all respondents (n=109) of characteristics of the Wild Coast

#		1		2		3		4		5		6		7		8		T
1	Fishing (High catch rates, large specimens, biodiversity)	52.73%	58	28.18%	31	13.64%	15	2.73%	3	1.82%	2	0.91%	0	0%	0	0%	0	109
2	Uncrowded areas (Clean beaches and low congestion)	21.82%	24	29.09%	32	27.27%	30	18.18%	20	3.64%	3	0.00%	0	0%	0	0%	0	109
3	Natural attractiveness (backdrop, coastal belt, rural)	17.27%	19	11.82%	13	17.27%	19	21.82%	24	20.00%	22	10.91%	12	0.91%	0	0%	0	109
4	Safe and clean environment	0.91%	1	3.64%	4	5.45%	6	12.73%	14	30.00%	33	25.45%	28	17.27%	19	4.55%	5	109
5	Open Access coastline	1.82%	2	4.55%	5	5.45%	6	8.18%	9	14.55%	16	26.36%	29	30.91%	33	8.18%	9	109
6	Non-regulated oceanic harvesting (low compliance levels)	0.91%	1	0.91%	1	6.36%	7	2.73%	3	3.64%	4	9.09%	10	27.27%	29	49.09%	54	109
7	Social activities	3.64%	4	10.91%	12	16.36%	18	17.27%	19	8.18%	9	8.18%	9	12.73%	13	22.73%	25	109
8	Facilities/good accommodation	0.91%	1	10.91%	12	8.18%	9	16.36%	18	18.18%	20	19.09%	20	10.91%	12	15.45%	17	109

Net Benefit ranking by Tourists (n=76) of characteristics of the Wild Coast

#	Question	1		2		3		4		5		6		7		8		T
1	Fishing (High catch rates, large specimens, biodiversity)	48.68%	37	31.58%	24	15.79%	12	1.32%	1	1.32%	1	1.32%	1	0.00%	0	0.00%	0	76
2	Uncrowded areas (Clean beaches and low congestion)	22.37%	17	31.58%	24	28.95%	22	14.47%	11	2.63%	2	0.00%	0	0.00%	0	0.00%	0	76
3	Natural attractiveness (backdrop, coastal belt, rural)	21.05%	16	10.53%	8	19.74%	15	21.05%	16	14.47%	11	11.84%	9	1.32%	1	0.00%	0	76
4	Safe and clean environment	1.32%	1	1.32%	1	5.26%	4	18.42%	14	35.53%	27	21.05%	16	14.47%	11	2.63%	2	76
5	Open Access coastline	1.32%	1	3.95%	3	5.26%	4	7.89%	6	14.47%	11	25.00%	19	35.53%	27	6.58%	5	76
6	Non-regulated oceanic harvesting (low compliance levels)	1.32%	1	1.32%	1	7.89%	6	2.63%	2	5.26%	4	9.21%	7	25.00%	19	47.37%	36	76
7	Social activities	3.95%	3	10.53%	8	11.84%	9	18.42%	14	9.21%	7	9.21%	7	11.84%	9	25.00%	19	76
8	Facilities/good accommodation	0.00%	0	9.21%	7	5.26%	4	15.79%	12	17.11%	13	22.37%	17	11.84%	9	18.42%	14	76

Net Benefit ranking by Regional Residents (n=33) of characteristics of the Wild Coast

#	Question	1		2		3		4		5		6		7		8		T
1	Fishing (High catch rates, large specimens, biodiversity)	63.64%	21	21.21%	7	9.09%	3	3.03%	1	3.03%	1	0.00%	0	0.00%	0	0.00%	0	33
2	Uncrowded areas (Clean beaches and low congestion)	21.21%	7	21.21%	7	24.24%	8	27.27%	9	6.06%	2	0.00%	0	0.00%	0	0.00%	0	33
3	Natural attractiveness (backdrop, coastal belt, rural)	9.09%	3	15.15%	5	12.12%	4	24.24%	8	30.30%	10	9.09%	3	0.00%	0	0.00%	0	33
4	Safe and clean environment	0.00%	0	9.09%	3	6.06%	2	0.00%	0	18.18%	6	33.33%	11	24.24%	8	9.09%	3	33
5	Open Access coastline	3.03%	1	6.06%	2	3.03%	1	9.09%	3	15.15%	5	30.30%	10	21.21%	7	12.12%	4	33
6	Non-regulated oceanic harvesting (low compliance levels)	0.00%	0	0.00%	0	3.03%	1	3.03%	1	0.00%	0	9.09%	3	30.30%	10	54.55%	18	33
7	Social activities	0.00%	0	12.12%	4	27.27%	9	15.15%	5	6.06%	2	6.06%	2	15.15%	5	18.18%	6	33
8	Facilities/good accommodation	3.03%	1	15.15%	5	15.15%	5	18.18%	6	21.21%	7	12.12%	4	9.09%	3	6.06%	2	33

APPENDIX III

Numbered categories of demographic characteristics

Level of Education	Age	Race	Per Annum Income
1 Less than matric	1 (18-24)	1 Indian	1 Less than R 19 000
2 Matric	2 (25-34)	2 Black	2 R19 001 - R86 000
3 Diploma	3 (35-44)	3 Asian	3 R86 001 - R197 000
4 Bachelors Degree	4 (45-54)	4 White	4 R197 001 - R400 000
5 Honours Degree	5 (55-64)	5 Coloured	5 R400 001 - R688 000
6 Masters degree	6 (65 0r older)	6 Other	6 R688 001 - R1 481 000
7 PHD, Professorship			

Frequency of sampled individuals (n=109) income brackets during a recreational fishery survey in 2021, Wild Coast

#	Full Sample Per Annum Income Categories	All %	All Count	Tourist %	Tourist Count	Reg Res %	Reg Res Count
1	Less than R 19,000	0,92%	1	0.00%	0	3.03%	1
2	R19,001 - R86,000	3,67%	4	1.31%	1	9.09%	3
3	R86,001 - R197,000	20,18%	22	7.89%	6	48.48%	16
4	R197,001 - R400,000	20,18%	22	18.42%	14	24.24%	8
5	R400,001 - R688,000	13,76%	15	17.11%	13	6.06%	2
6	R688,001 - R1,481,000	13,76%	15	18.42%	14	0.00%	0
7	R1,481,001 - R2,360,000	10,09%	11	13.16%	10	3.03%	1
8	R2,360,001 Plus	9,17%	10	13.16%	10	0.00%	0
9	Other/Prefer not to say	8,26%	9	9.21%	7	6.06%	2
	Total	100%	109	100%	76	100%	33

APPENDIX IV: ETHICAL CLEARANCE LETTER



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13/10/2021

mike pyle

Email: g16p6599@campus.ru.ac.za

Review Reference: 2021-5225-6345

Dear Prof Gavin Fraser

Title: The Economic Importance of the Wild Coast/Transkei Recreational Fishery

Principal Investigator: Prof Gavin Fraser

Collaborators: Mr Michael Pyle, Dr Christopher Bova, Prof Warren Potts

This letter confirms that the above research proposal has been reviewed and **APPROVED** by the Rhodes University Human Ethics Committee (RU-HEC). Your Approval number is: 2021-5225-6345

Approval has been granted for 1 year. An annual progress report will be required in order to renew approval for an additional period. You will receive an email notifying when the annual report is due.

Please ensure that the ethical standards committee is notified should any substantive change(s) be made, for whatever reason, during the research process. This includes changes in investigators. Please also ensure that a brief report is submitted to the ethics committee on the completion of the research. The purpose of this report is to indicate whether the research was conducted successfully, if any aspects could not be completed, or if any problems arose that the ethical standards committee should be aware of. If a thesis or dissertation arising from this research is submitted to the library's electronic theses and dissertations (ETD) repository, please notify the committee of the date of submission and/or any reference or cataloging number allocated.

Sincerely,

Prof Arthur Webb

Chair: Rhodes University Human Ethics Committee, RU-HEC

cc: Ms Danielle de Vos - Ethics Coordinator