

**An analysis of selected stakeholder dynamics  
in the South African recreational  
freshwater angling sector**

by

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## ABSTRACT

Angling as a sport and recreational activity attracts millions of participants worldwide, making it the most popular pastime on the planet. Freshwater bank anglers in South Africa account for approximately 60% of the angling community and contribute billions to the economy.

The freshwater bank angling industry as such is largely informal, with the exception of the small organised angling section. The technical aspects of angling receive an abundance of covering in magazines and increases in popularity through the electronic media. This study focuses on lesser known aspects regarding the angling industry stakeholders and put the activities of South African freshwater bank anglers in perspective. Valuable information was gathered describing the socio-economic profile and various preferences and habits of anglers. The information should form the basis of future studies to formalise the freshwater bank angling industry.

A general and mutual concern among stakeholders for the future sustainability of freshwater angling was identified. The apparent lack of enforcing angling and environmental legislation was singled out as a serious shortcoming in protecting the interests of stakeholders. The study calls for organised angling to engage all stakeholders in a national strategy for developing the structures and creating the momentum to promote and grow this undervalued industry to its potential.

**List of key terms:** Recreational angling, freshwater bank angling, sustainability, economic impact, industry stakeholders, national strategy

## OPSOMMING

Hengel as sport en ontspanningsaktiwiteit lok miljoene deelnemers wêreldwyd, wat dit die gewildste tydverdryf op aarde maak. Varswater-oewerhengelaars in Suid-Afrika maak ongeveer 60% van die hengelgemeenskap uit en dra miljarde by tot die ekonomie.

Die varswater-oewerhengelbedryf as sodanig is grotendeels informeel, met die uitsondering van die klein georganiseerde afdeling. Die tegniese aspekte van hengel geniet oorvloedige dekking in tydskrifte en word toenemend gewild deur middel van die elektroniese media. Hierdie studie fokus op die minder bekende aspekte rakende die belanghebbendes in die hengelbedryf en plaas die aktiwiteite van varswater-oewerhengelaars in Suid-Afrika in perspektief. Waardevolle inligting is ingesamel wat die sosio-ekonomiese profiel en verskillende voorkeure en gewoontes van hengelaars beskryf. Hierdie inligting kan die basis vorm van toekomstige studies om die varswater-oewerhengelbedryf te formaliseer.

'n Algemene en gemeenskaplike besorgdheid onder belanghebbendes oor die volhoubaarheid van varswaterhengel in die toekoms is geïdentifiseer. Die klaarblyklik gebrekkige toepassing van wetgewing rakende hengel en die omgewing is uitgesonder as 'n ernstige tekortkoming in die beskerming van alle betrokke partye se belange. Die studie doen 'n beroep op die georganiseerde hengel om alle belanghebbendes te betrek by 'n nasionale strategie vir die ontwikkeling van strukture en die skep van momentum om hierdie ondergewaardeerde bedryf te bevorder en tot sy volle potensiaal te laat groei.

**Sleutelwoorde:** Ontspanningshengel, varswater oewerhengel, volhoubaarheid, ekonomiese impak, industrie belanghebbendes, nasionale strategie

God, You spoke and I obeyed.  
I would rather be a fisher of men.  
I am going where You said I will.

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The Author

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## LIST OF TERMS

- **Recreational angling**

According to the European Anglers' Alliance (EAA) (EAA, 2004a:1) recreational angling is line fishing using the hooking method and specifically the activity of catching or attempting to catch fish, principally by rod, line and hook, pole or hand-held line for non-commercial purposes, that is, they do not sell the fish they catch. Recreational angling is often referred to as sport and recreational angling, which includes all types of angling activities, both formal in a club environment and informal as a casual activity.

- **Recreational angler**

A recreational angler is defined as a person who at least once a year, for sport and/or recreation purposes, participates in angling activities, either in a formal or an informal environment, for non-commercial purposes (EAA, 2004a:1).

- **Recreational freshwater bank angling facets/disciplines**

Recreational angling facets refer to the activity associated with various angling categories as determined by the nature, practices and requirements of the activity. Freshwater bank angling includes conventional bank angling, match angling and carp angling, with competitive and specimen carp angling falling under the latter (Louw, 2010:40).

## LIST OF ABBREVIATIONS

CIPS	International Sport Angling Confederation
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DT	Department of Tourism
DWAF	Department of Water Affairs
EAA	European Anglers' Alliance
FIPS-ed	International Freshwater Sport Angling Federation
FOSAF	Federation of Southern African Flyfishers
GAIFS	General Association of International Sports Federations
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GIWA	Global International Waters Assessment
GPS	Global Positioning System
ICGF	International Commonwealth Games Federation
IOC	International Olympic Committee
IPF	International Paralympic Federation
MLRA	Marine Living Resources Act
NWU	North-West University
SADSAA	South African Deep Sea Angling Association
SAFBAF	South African Freshwater Bank Angling Federation
SAS	Statistical Analysis System
SASCOC	South African Sport Confederation and Olympic Committee
SCS	Statistical Consultation Services
SOSACC	South African Sport Anglers and Casting Confederation
SPSS	Statistical Package for Social Sciences
SRSA	Sport and Recreation South Africa
SWOT	Strengths Weaknesses Opportunities Threats

# CHAPTER 1

## NATURE AND SCOPE OF THE STUDY

### 1.1 INTRODUCTION

Recreational bank angling is a social sport attracting participants from the entire South African population. Although South Africa is classified as having a temperate, subtropical climate, it is often regarded as a country with low and variable water resources. There are, nevertheless, ample fresh water locations for recreational bank angling ranging from rivers and streams to small, privately owned dams, as well as large dams and reservoirs. The sustainable use of these resources regularly comes under scrutiny as water quality nationally deteriorates, and justifies being investigated. This has important implications from a management point of view since existing stakeholder involvement could be failing in its strategy and the execution thereof.

The bank angling industry traditionally comprised a multitude of recreational anglers who mainly used domestically acquired angling skills, and techniques and products locally developed over many years. The outward face of bank angling, as portrayed by angling magazines, television reality programmes and outdoor exhibitions, was transformed over the past years with the increase in competitive angling, international exposure, new products and techniques, and the availability of learning material from professional competitive anglers.

However, the question remains to what extent the industry was able to transfer this transformation through business principles to recreational anglers and whether anglers feel they benefitted in the process. Likewise one would have to know where South African organised freshwater angling finds itself in the international picture and the South African sports environment to determine what business approach should be taken for the future.

In 2008 freshwater bank angling was reported to be a R3,9 billion industry with around 1,5 million participants. The total angling fraternity of approximately 2,5 million participants contributed R18,8 billion to the South African economy (SportsTrader, 2009). The deduction from these facts would be that an industry contributing 1% of the South African gross domestic product (GDP) would be formally managed with good stakeholder integration. The assessment of the validity of such a deduction and the positioning of

recreational bank angling in the total angling industry from the perspective of the anglers' activities will be included in the problem statement and the primary objectives of the study.

## **1.2 PROBLEM STATEMENT**

Freshwater bank angling as a recreational activity is mostly about leisure except for a few thousand professional and amateur competitive anglers. Hence media productions and literature publications focus mainly on the recreational and technical aspects of bank angling, with knowledge about the behavioural patterns of South African freshwater anglers remaining largely undocumented.

The continuous influx of new products and technologies together with economic cycles and subsequent angler behaviour are strong driving forces subjecting market dynamics to annual fluctuations. The implications of this industry, which makes a significant contribution to the economy, for business management right through the value chain are that many businesses could be flying blind with information limited to that acquired by experience, networking and word-of-mouth. The same scenario is likely to apply to other stakeholders who may be largely functioning detached from the angling masses due to the inherently informal nature of the industry.

## **1.3 OBJECTIVES OF THE STUDY**

### **1.3.1 Primary objective**

The primary objective of the study is to profile the South African freshwater bank angling industry from the perspective of the angler in order to assess what the overall business strategy of stakeholders should be. The study will provide a profile to the industry describing the behaviour of anglers when making decisions concerning their angling activities. This behavioural profile should be considered in the strategic management decisions of value chain stakeholders as to how it applies to their products and services.

### **1.3.2 Secondary objectives**

The secondary outcomes of the study would be to:

- gauge from the profile how much the industry contributes to the economy;

- identify angler-specific trends and behaviours which determine the managerial approach of stakeholders business strategy;
- obtain an outlook of the future of the industry.

## **1.4 SCOPE OF THE STUDY**

The coverage and extent of the empirical study will be geographically limited to two of South Africa's premier freshwater bank angling venues, the Bloemhof Dam and Vaal Dam. These two venues host the majority of competitive angling events and attract the biggest concentration of recreational bank anglers in South Africa. For this reason the study will present information of significant value to the angling industry. Resorts at the dams will be selected based on the concentration of anglers at the time of visiting. The literature study will be used to study the global fishing and recreational angling market environments, and position the South African recreational freshwater bank angling fraternity.

## **1.5 RESEARCH METHODOLOGY**

### **1.5.1 Literature study**

The literature study will be qualitative and is aimed at providing an overview of the commercial and the recreational market activities of the industry. The acquired literature will be used to contextualise empirical findings to the mentioned market activities. The main sources of information will be the internet, magazines and interviews or e-mail correspondence with industry experts and stakeholders. A very limited collection of academic documentation of scientific and especially business relevant studies of the South African market exists, which will require the researcher to generate a topic-specific literature database.

### **1.5.2 Empirical study**

#### **1.5.2.1 Questionnaire**

The empirical study will comprise a questionnaire to be completed by a convenience population sample of bank anglers at resorts around the Bloemhof and Vaal Dams (Annexure 1 – Sample questionnaires Afrikaans and English). The use of convenience sampling is appropriate to the empirical study as participants will be selected on the

grounds of their convenient accessibility and proximity to the researcher and the geographic limitations to the study.

The questionnaire will consist of four sections covering the following areas: Personal information, the respondent's angling activity, interest profile and expenses, and general angling related questions. Descriptive and inferential statistics will be used to process acquired data and to describe the features and characteristics of the information obtained in a management appropriate format.

#### **1.5.2.2 Interviews**

Non-structured interviews will be conducted where necessary to acquire industry information from stakeholders and industry experts. These will include information sourced from participants during interaction around the introduction of the questionnaire and are likely to fall outside the scope of the questionnaire.

The empirical assessment of angler and industry activities will be placed in context with global and local market activities as obtained from literature research.

### **1.6 LIMITATIONS OF THE STUDY**

As a result of the informal nature of the angling industry few scientific and business publications of academic origin are available which are directly related to the topic. This required the researcher to generate a database from various sources.

The limitation in approaching the study from the perspective of angler activities is the geographical restriction. Due to budget (travel and accommodation) and time (limited to weekends) constraints the geographic location of the study was limited to the Bloemhof and Vaal Dams. The offset to the above restrictions was to visit several venues at the dams and in total over a six-week period. Despite the geographical limitation the choice of dams covered much of Gauteng and the North West provinces, which account for more than 50% of the national freshwater angling activity.

## 1.7 CONTRIBUTIONS OF THE STUDY

The relevance of undertaking this study lies in the contribution it will make to angling industry stakeholders, such as manufacturers, retailers, venues, marketers and the various government departments by providing a scientific and business orientated document in an industry where such information is lacking. It is envisaged that the various existing business and managerial practices of stakeholders will be challenged for their effectiveness in a changing market climate. This study should also be used as a foundation for future market orientated research of the angling industry and to form the basis of a bigger business strategy for the formalisation of this high potential industry.

## 1.8 LAYOUT OF THE STUDY

**Chapter 1 – Nature and scope of the study:** In the first chapter the objectives of the study are summarised in its scope and methodology within the limitations of the problem investigated.

**Chapter 2 – The angling industry in context:** The second chapter of the study will be devoted to a literature overview of various commercial and recreational aspects of fishing, recreational angling and the South African freshwater bank angling industry.

**Chapter 3 – Empirical study:** A presentation of the empirical study will be done with feedback from questionnaires and personal interviews. The formulation of the questionnaire, the processing and interpretation of results and a discussion of the results will be presented.

**Chapter 4 – Conclusions and recommendations:** Conclusions and recommendations will be made based on the literature and empirical studies. The success of the study will be critically evaluated.

## 1.9 SUMMARY

The primary objective of this chapter is to set the scene for contextualising the South African freshwater bank angling industry in chapter 2 and creating a behavioural profile of recreational bank anglers in chapter 3. This chapter introduces the study and provides background to the topic of study. The objectives, scope and method of study are

introduced for orientation purposes. It sets out the primary concerns of the freshwater bank angling industry to be analysed and to what degree the study was designed to address these within certain limitations. The chapter describes the analysis methodology used to profile the behaviour of recreational bank anglers in terms of their activities. Finally, this chapter summarises the layout of the study and the contents of each chapter.

In chapter 2 various aspects of the angling industry will be discussed to place the South African industry in context and to isolate market areas for specific attention.

# **CHAPTER 2**

## **THE ANGLING INDUSTRY IN CONTEXT**

### **2.1 INTRODUCTION**

In this chapter selected aspects of angling are introduced to set the context within which the study was done. Understanding the context is important to the interpretation of the empirical study in chapter 3.

The first aspect is the history of angling, which really sets the tone for this chapter. The angling industry is dynamic and constantly transforming, setting challenges and opportunities for all involved. The fishing industry is discussed in broader terms to position this freshwater bank angling study. A section dealing with various aspects of angling and the economy follows.

The latter sections of this chapter deal with South African freshwater bank angling, starting with an overview of the structure, activities and achievements. South Africa's natural resources and general matters concerning regulation are addressed before the attention is turned to the role of industry stakeholders and the angler's value chain.

The chapter is completed with a Strengths, Weaknesses, Opportunities and Threats analysis of organised freshwater bank angling with managerial implications for recreational angling in general and the strategic issues facing the industry.

### **2.2 THE HISTORY OF ANGLING**

The earliest recordings of the history of angling with a rod and hook can be traced back to about 2000 B.C., and fishing by means of net and spear to around 3500 B.C. (Radcliffe, 1921:5). Already since the time of the patriarchs around 1845 B.C. in the book of Job chapter 41 verse 1 it was written, "Can you draw out Leviathan with a hook, or snare his tongue with a line which you lower?" (Bible, 1979:471).

William Radcliffe (1921:xi) published his work with a focus on angling through the ages and included Greek, Roman, Egyptian, Assyrian, Jewish and Chinese angling. These being the oldest studied civilisations Radcliffe strongly support his writings with archaeological evidence. Most notably after almost ninety years Radcliffe's writings about the history of angling were still deemed to be the most authoritative and formed the basis for modern-day articles on the topic.

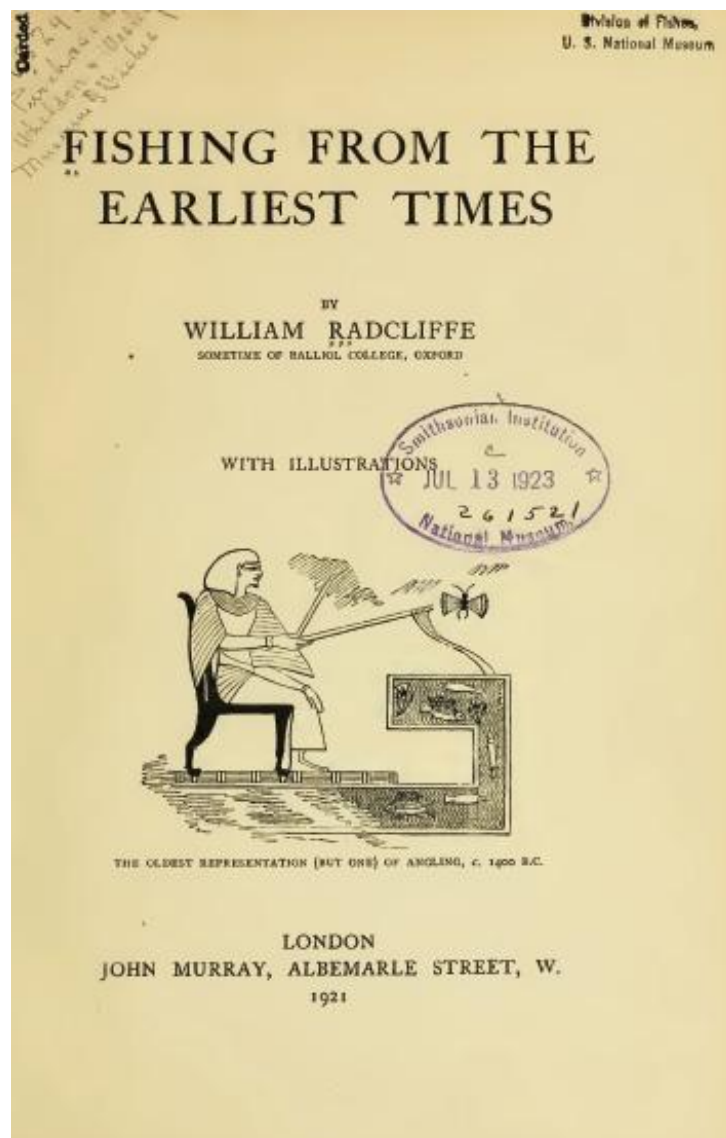
Many early writers on angling appear to have drawn their inspiration from "Father Izaak", better known as Izaak Walton, who lived from 1593 to 1683. Walton was an English biographer best known for his publication *The Compleat Angler*, in 1653, a combination of manual, meditation and poetry (Liukkonen, 2008). In his book Walton said, "... and so, if I might be judge, God never did make a more calm, quiet, innocent recreation than angling" (1653:15). This assertion indicates that at the time angling was already considered a recreational pastime, with Walton's enthusiastic writings further popularising angling as an exhilarating sport.

The literature is by no means clear on when catching fish became more than gathering food, but it was never deemed a chore. Whether for survival or sport, the activity remains filled with adventure and excitement, and requires the use of the imagination and intellect. The logical explanation for the existence of recreational angling is that fish as a food source became a secondary requirement at some time due to the growth of commercial fishing, hence the decision to employ tackle which included hooks to "give the fish a chance" (Broughton, 2000).

The history of sport angling is said to have begun in England with the printing of the *Treatyse of Fysshynge With an Angle* by Wynkyn de Worde in 1496. The *Treatyse* described a dozen of artificial flies of which six are still in use in modern angling.

Radcliffe (1921:xv) shows 56 illustrations of various ancient angling activities, mostly from Grecian and Roman origin. Amongst others it depicted an Egyptian angling scene with rod and line, and with nets. Radcliffe (1921:451) also quotes from Lieh Tzû, a fourth-century B.C. Chinese writer: “By making a line of cocoon silk, a hook of a sharp needle, a rod of a branch of bramble or dwarf bamboo, using a grain of cooked rice as bait, one can catch a whole cartload of fish.” Figure 2.1 shows an illustration from Egyptian history of about 1400 B.C. of what according to Radcliffe’s research is the second oldest illustration of angling with a rod and hook.

**Figure 2.1: Title page of Fishing From The Earliest Times from the Smithsonian Institution National Museum**



(Source: Radcliffe 1921)

The early days of angling in South Africa were mostly penned by Flip Joubert, a well-known radio personality and angling writer of his time. Joubert's writing of angling articles began in 1937 with publications in *Die Vaderland* and later in *Dagbreek*. He was also the editor of *Stywe Lyne/Tight Lines* magazine for four years (Joubert, 1970:7). At the time of writing his book in 1970, *Die Groot Varswaterhengelboek*, he pertinently wrote about a huge increase in the popularity of angling and indicated that about 200 000 people participated in the Transvaal province. Joubert's 1947 publication, *Langs die Viswaters*, with fellow angler Joubert Louw, was a groundbreaking work as the first South African book for anglers. Figure 2.2 from this book depicts young children angling in a stream, showing how popular recreational angling already was at the time.

**Figure 2.2: Emerging young anglers**



(Source: Joubert & Louw, 1947)

The challenges of the modern angler amidst continuous popularity growth remain the same though as those of his predecessors over many years. These are largely contained in the technical aspects of angling, such as where to find fish, how to lure it and use the appropriate bait and what tackle to use. This challenge also explains why so much literature dedicated to the dynamics of angling techniques is available relative to literature addressing the market dynamics of the industry as a whole.

Following on from the history of angling the next section will cover the modern-day angling industry.

## **2.3 THE FISHING INDUSTRY**

It should be considered in this section that fishing includes all forms of angling, but that angling only refers to catching fish with a rod and hook. The entire fishing industry comprises commercial, recreational and traditional fishing, each of which can relate to saltwater and freshwater fishing. The purpose of including all the facets of fishing in this section is to picture the global scene for marine and freshwater fishing and in Section 2.5 to position the focus area of South African freshwater bank angling within the larger scope of activities.

### **2.3.1 Commercial fishing**

The branch of the fishing industry which engages in the exploitation of natural resources from oceans, seas, lakes, rivers and other water reservoirs is included in the commercial fishing industry. Activities include both producing and processing fisheries resources or products for sale, hence it is also referred to as the “seafood industry” (Aslin & Byron, 2003:9).

The world total commercial capture production was 89 740 919 tons in 2008, some 2 630 000 tons less than the peak in 2004. Inland waters were accredited with 10 220 459 tons of the total tonnage in 2008, of which 8 870 959 tons accounted for freshwater fish. Asia produced more than 50% of the world capture production, while Africa produced 25% of the total from inland waters (FAO, 2009).

### **2.3.2 Recreational angling**

The recreational branch of fishing is correctly termed angling, from the basic technique employed using a fishing rod, line and hooks (McPhee *et al.*, 2010:1). This type of angling is non-commercial, is done for leisure and has a strong social inclination, including angling as a sport (Aslin & Byron, 2003:9). The availability of marine and freshwater resources and the relative inexpensive nature of angling as an individual and family activity make it the world's most frequent recreational activity.

### **2.3.3 Traditional fishing**

Traditional fishing is also known as artisanal fishing. Traditional or artisanal fisheries can be subsistence or commercial fisheries and are sometimes referred to as small-scale fisheries. The term has a socio-economic foundation, which implies that it is a simple, self-employed or family-type enterprise (FAO, 2010). Thus, this form of fishing is often done with the support of the household and in support of the household, and employs relatively low levels of technology.

### **2.3.4 Natural resources challenges**

There is hardly a challenge to the industry that does not have its roots in water, earth's most precious resource. These challenges will be summarised in this and the next section on recreational angling sustainability, with relevant stakeholder management thereof to be discussed in section 2.4.

The Global International Waters Assessment (GIWA) project published a comprehensive study on the world's aquatic resources in February 2006 as done by the United Nations Environmental Programme (UNEP), the Global Environmental Facility (GEF) and the University of Kalmar, Sweden (UNEP, 2006:7). Unsurprisingly the sub-Saharan Africa region registered the highest number of top priority concerns regarding sustained and clean water sources out of nine mega world regions, thus including South Africa.

The issues studied by GIWA were freshwater shortage, pollution, overfishing, and habitat and community modification. Serious challenges are posed to the sustainability of all forms of fishing, that is, commercial fishing and recreational angling. Freshwater shortage was mainly attributed to overabstraction from rivers and lakes, which caused adverse

downstream productivity of wetland ecosystems (UNEP, 2006:8). The report concluded that the agricultural sector was responsible for water impoundment, abstraction for irrigation, deforestation and thus drainage of wetlands, and low water levels in reservoirs.

Pollution concentrated in inland and near-shore water systems was found to be the most severe threat to the fishing industry. The sediment load in waters was increased through infrastructure development, deforestation and agriculture (UNEP, 2006:7). Water oxygen depletion is a serious threat to aquatic life, which is caused by eutrophication, the presence of extreme levels of organic and mineral nutrients. This condition mostly occurs where partially or untreated waste water is released into water sources.

Overfishing was not considered as a big threat for freshwater sources by the GIWA report (UNEP, 2006:8), but large-scale commercial fishing was singled out for overexploitation. Overexploitation has the most dramatic socio-economic impact on artisanal fisheries as communities frequently have no alternative livelihoods. With over 200 million people dependent on a fishery livelihood and over one billion people depending on fisheries for their protein supply, overexploitation is expected to intensify as a result of population growth and lack of implementation and enforcement of regulations.

Habitat and community modifications were found to influence freshwater sources resulting from the conversion of mainly forests and wetlands into agricultural land. The introduction of invasive species was highlighted as the major modifiers of freshwater habitats (Naylor *et al.*, 2000:1023). Urban and industrial developments as a result of direct conversion of habitats were also listed as major causes of habitat modification. No threats to freshwater aquatic life directly associated with climate change have been documented (UNEP, 2006:9).

Population growth and the subsequent direct impact on economies is one of the root causes of pressure on fishing resources. For example, rising income levels are expected to increase fish consumption levels at almost double the rate of population growth in Asia (UNEP, 2006:10). Another root cause is the expansion of the agricultural sector and its contribution to water shortage, pollution from fertiliser run-off and erosion with subsequent eutrophication, overfishing and habitat modification.

The threats to natural resources also present the biggest challenges to the long-term sustainability of recreational angling, an issue to be addressed together with the responsibilities of stakeholders.

### **2.3.5 Sustainability of recreational angling**

The question regarding recreational angling should probably not be whether it can be sustained as it is, but how future sustainability can be ensured. The problem with doubting continuous sustainability is that despite a multitude of surveys and data available, it is not possible to quantify the catch ascribed to recreational angling and its full ecological impact on natural resources. The limited information available should rather form the basis for well-planned and well-executed management functions by stakeholders which will evolve as action plans are implemented.

The fact that recreational angling contributes substantially to the total fish harvest cannot be disputed. However, the common issue is that review papers mostly consider marine fisheries while inland fisheries are inadequately accounted for. Furthermore, inland fisheries in industrialised countries have largely been replaced by recreational angling, thus ruling out harvest ratio studies on freshwater fishing (Coleman *et al.*, 2005:1561). Factors that do affect the sustainability of recreational angling in freshwater ecosystems are intensive, highly selected angling of species, high discard mortality rates of fish and poor management actions by stakeholders directly overseeing natural resources.

Kearney (1991) indicated that the potential impact of recreational angling on a number of fish species was greater than previously thought. The finding was ascribed to a substantial increase in the amount and the effectiveness of recreational angling with inevitable declines in catch rates. Technological advances in fishing tackle, the use of position fixing and fish sounding equipment, and the role of the media in information proliferation assisted in increasing the knowledge base and competence of recreational anglers (McPhee *et al.*, 2010:42).

Birkeland & Dayton (2005:1) make specific reference to the tendency of recreational anglers of targeting large fish. They indicate that removing older individuals of some fish species also removes larvae which have greater fecundity and thus better survival potential. The suggestion is made that the growth rate of fish and the yield of fish stock will

improve when smaller fishes are targeted, a concept totally contrary to the behaviour of any angler.

Two patterns in angling exploitation that are emphasised as particularly threatening to sustainability are mentioned by Lewin *et al.* (2006:308). The first is the exploitation rate of a species. This is the fraction of fish in a population at a given time that is caught and removed during a particular time interval, for example a year, which can range from less than 10% to more than 80% for some species. The second is the issue of selectivity with respect to species, size classes, ages, sex or behavioural traits. Angler preferences leading to selection are either because of considering fish of high culinary value, because they offer higher angling challenges and excitement, or because some species are generally of greater appeal to anglers than others.

Accordingly Lewin *et al.* (2006:311) list the direct consequences of such exploiting behaviour as being (i) truncation of age and size structure, (ii) loss of genetic diversity, (iii) evolutionary changes due to selective angling, (iv) bycatch and catch-and-release fishing. Bycatch, the term used for fish caught unintentionally while intending to catch other fish, is not only a commercial fisheries reality as it applies to a varying degree to recreational angling activities.

Catch-and-release angling is the practice within recreational angling intended as a means of conservation whereby fish are unhooked and returned to the water after being weighed and photographed. In a study to determine catch-and-release effectiveness and mortality Reiss *et al.* (2003) found a mortality rate just below 3% for a variety of marine and freshwater fishes. The practice of catch-and-release holds significant benefit for the survival and proliferation of species and should be encouraged at all levels of angling.

Lack of public knowledge and awareness together with policy failures in developing as well as many developed countries adds to the challenges of sustainability. The combined management efforts of stakeholders are required to successfully face up to these challenges.

## **2.4 RECREATIONAL ANGLING STAKEHOLDERS**

In this section the stakeholders in the South African freshwater recreational angling industry are introduced with information about the scope of their activities. The management responsibilities of the stakeholders for addressing the natural resources and sustainability challenges identified and discussed in the previous section will be dealt with.

### **2.4.1 Public sector**

- 1) The Department of Water Affairs (DWA) is the custodian of South Africa's water resources. It is primarily responsible for the formulation and implementation of policy governing this sector. It also has the overriding responsibility for water services provided by local government (DWA, 2010c). While striving to ensure that all South Africans have access to clean water and safe sanitation, the water sector also promotes effective and efficient water resources management to ensure sustainable economic and social development. The water resources management responsibility of DWA is a combined function with the Department of Environmental Affairs (DEA), with DWA focused more on the development thereof as an economic resource and DEA on the sustainability from the environmental perspective. The challenges of addressing freshwater shortages in several regions of South Africa reside with DWA. Given the cyclical drought periods experienced in various South African provinces, this government department has to implement a water provision strategy which will also consider population and industrial growth rates.
  
- 2) The Department of Environmental Affairs' (DEA) vision is: "A prosperous and equitable society living in harmony with our natural resources." Its mission is: "To create a prosperous and equitable society that lives in harmony with our environment" (DEA, 2010). The DEA has the following strategic objectives:
  - a) To protect, conserve and enhance our environment, natural and heritage assets and resources.
  - b) Proactively plan, manage and prevent pollution and environmental degradation to ensure a sustainable and healthy environment.
  - c) Provide leadership on climate change adaptation and mitigation.
  - d) Contribute to sustainable development, livelihood, green and inclusive economic growth through facilitating skills development and employment creation.

- e) Contribute to a better Africa and a better world by advancing national environmental interests through a global sustainable development agenda.

The majority of the environmental and nature conservation issues are the responsibility of the DEA while liaison exists with DWAF and the Department of Agriculture, Forestry and Fisheries (DAFF). The threats to natural resources and their challenges that fall under the DEA jurisdiction are primarily water pollution and habitat and community modification. Issues having overlapping responsibility are overfishing and environmental issues arising from agricultural and mining activities. DAFF and the Department of Mineral Resources thus have prominent roles to play in support of the DEA strategic objectives.

- 3) The Department of Agriculture, Forestry and Fisheries (DAFF) strives towards a united and prosperous agricultural sector, with the aim of supporting sustainable agricultural development (DAFF, 2010). The agricultural sector has formal and informal activities to be managed by DAFF. Rural and informal agricultural activities are difficult to manage, similar to recreational angling activities, as both are vast in numbers and area.
- 4) The vision of the Department of Sport and Recreation South Africa (SRSA) is: “An active and winning nation” (SRSA, 2010). In striving to create an active and winning nation, SRSA not only indicates the core focus of current endeavours, but also expresses a firm commitment to keep on doing whatever it takes to have a significant and positive impact on the entire South African nation. The responsibilities of SRSA are directed towards the organised angling bodies and will also be included in section 2.6.1.
- 5) The Department of Tourism’s (DT) vision is: “To be globally celebrated as a leader in tourism excellence” and its mission: “Collectively and boldly promoting responsible and sustainable tourism for the benefit of all South Africans” (DT 2010). The development potential of sport and recreational angling and the accompanying tourism are substantial with indirect and induced economic effects also potentially significant in terms of jobs, wages and supplying industries. Particularly eco-tourism relating to recreational angling is bound to benefit increasingly. The requirement, though, is for a cohesiveness to be developed among stakeholders, which has not yet been initiated.

- 6) District and local municipalities are the lowest level of democratically elected government authority and have a shared responsibility over natural resources relevant to angling in conjunction with the provincial departments. Local authorities have to execute national management strategies as directed by DWAF, DEA and DAFF.

#### **2.4.2 Private sector**

- 1) The scope and responsibilities of the South African Sport Anglers and Casting Confederation (SASACC), the South African Freshwater Bank Angling Federation (SAFBAF) and provincial angling bodies will be discussed in section 2.6.1. As the primary private sector stakeholders of recreational angling and the core of organised angling structures they assume important responsibilities regarding industry coordination. Functions include that of serving as a link between the private and public sectors and being the mouthpiece of recreational angling.
- 2) The formal business sector consists of suppliers, manufacturers, importers and wholesalers, and retailers. The local manufacturing industry has a strong presence to some degree due to the uniqueness of South African angling techniques and past isolation years. The trend during the recent years of economic recession was as much as 30% growth for some freshwater only associated businesses, perceived to be resulting from a switch from more expensive sea angling (Van Breda, 2010). Importers and wholesalers occupy the position of providing the market exposure to overseas products suitable for local conditions. Retailers vary from suburban tackle shops to supermarkets, outdoor stores and franchises.
- 3) The media as a stakeholder are growing in importance, but to most anglers remain in the form of angling magazines. The internet has not yet caught up with magazines as a source of information, but an increasing number of anglers are turning to television as a source of technical information. Together with retailers, media as a point of marketing and information provider are the only other direct contact point to anglers. This is of particular importance to the angling communication network as there is a continuous challenge to promote product and technology information down the supply chain to anglers.

- 4) Angling venues are either privately owned and managed, or fall under the management of a provincial Department of Nature Conservation. Venues vary significantly in the facilities provided and are often criticised by anglers for the lack of facilities or poor maintenance. The enforcing of angling regulations is generally not considered the responsibility of venue owners and management unless managed by a provincial department.
- 5) The angler as stakeholder, unless affiliated into organised angling, is an isolated participant. While this might be a preferred status of anglers for the sake of peace in leisure and recreation, it presents challenges to industry communications and stakeholder integration. Angler specific activities will be addressed in section 2.5.3 as a value chain experience.

### **2.4.3 Stakeholder responsibilities**

In order to overcome the industry obstacles identified and integrate them with stakeholder responsibilities, stakeholder involvement and commitment are essential. The GIWA report (UNEP, 2006:11) found that agreements reached among stakeholders frequently fail due to:

- (i) weak human and financial resources;
- (ii) a lack of political commitment;
- (iii) weak institutional frameworks;
- (iv) inadequate information;
- (v) corruption; and
- (vi) inappropriate regulations.

The implementation and management of policies are difficult and inputs from stakeholders most affected by policies are frequently disregarded. Practising catch-and-release, controlling bag limits and imposing biodiversity regulations will result in recreational angling having a relatively negligible impact on fish resources, stocks and species conservation. The enforcing of these regulations among recreational anglers is basically non-existent and needs addressing from government and private sector stakeholders.

Negative publicity about the impact of recreational angling on fish resources and stocks is mostly unsubstantiated; it cannot, for instance, be compared with subsistence or

commercial fishing. The reality is that only now data is acquired to map dams and fish resources and stocks, although it is still a low-level activity. The evidence indicates that the current potential for a substantial positive increase in sport and recreational angling activities in South Africa is huge. The requirement for an integrated approach among stakeholders, including conservation, effective resource utilisation, social equity, and economic impact issues and policies, should now become a common goal (Leibold & Van Zyl, 2008:26). Not all stakeholders are fully cognisant of the effect their key responsibilities should have and how important an integrated approach is. An integration model will be presented in chapter 4 to address the issues that have been identified.

## **2.5 ANGLING AND THE ECONOMY**

Public and private sector stakeholders benefit financially in different ways from the recreational angling industry, but the overall contribution to the economy is an important aspect of the combined stakeholder activities. At the beginning of this paper it was stated that its contribution to the recreational angling industry would be the documentation of activities of a mostly informal industry with subsequent implications for stakeholder supply chain management and the management of natural resources by state departments. In order to appreciate the full-scale economic impact of recreational angling the global picture of recreational angling relative to commercial fishing was reviewed, followed by that of the South African market and the concept of the angler's value chain.

### **2.5.1 The global picture**

The global picture of fishery resources is put into perspective by Cooke and Cowx (2004:857). Their primary goal is to highlight the role of recreational angling in what they call the "global fishing crises". They agree with Arlinghaus *et al.* (2002) that commercial fisheries had dramatic effects on both marine and freshwater fish stocks as well as on ecosystems. Using participation rates as a starting point, Cooke and Cowx draw a number of conclusions about the magnitude of recreational angling.

Participation in recreational angling varied from 1% in Southern Europe to 40% in Finland, with Scandinavia having a catch retaining percentage of up to 90%. The Canadian Department of Fisheries released very complete participation rates in 2000 on basis of which it was established that around 11,5% of the world population engages in

recreational angling of some sort (Cooke & Cowx, 2004:857). By making some assumptions about the global human population, the retain percentage and an average of 0,635 kilograms per fish, according to the United States Department of Commerce in 2003, they estimated the global annual recreational fish harvest at 10,86 million tons. This meant that recreational angling could contribute as much as 10% to the global annual fish harvest based on the FAO numbers reported in section 2.3.1 on commercial fishing.

Based on the quantity and quality of publications available from Australian authorities on recreational fisheries through its Department of Agriculture, Fisheries and Forestry, it would appear that Australia is probably at the forefront of knowledge in this regard. The Australian Fisheries Research and Development Corporation (Aslin & Byron, 2003:9) reported their national recreational angling participation rate at 25-30% of the population and estimated the number of participants in 2002 at 3,4 million, contributing \$1,9 billion to the economy. This equated to 20,6 million days of angling and the harvesting of 138 million aquatic animals (Campbell *et al.*, 2003:9).

In the United Kingdom (Environment Agency, 2009) angling was described as showing “a dramatic resurgence” despite the recession with tackle trade doing very well and licence sales approaching 1,5 million (not needed for sea fishing), generating £24 million to fund most of the Environment Agency’s fisheries service (Environment Agency, 2010). Labelled as Britain’s most popular pastime, angling was worth over £3 billion by 2004 and had it followed similar trends to the United States during the recession it would be exceeding £5 billion in 2010 (McCarthy, 2004). Even the comparatively modest Northern Ireland economy benefits by £22,5 million per year from recreational angling including £1,8 billion from tourism (BBC, 2008).

In the United States (US) a study was done in 2004 on the relative economic contribution of recreational angling and commercial fisheries on behalf of the Theodore Roosevelt Conservation Partnership (TRCP, 2006). Although the study reported for marine angling only it put the contribution of recreational angling in perspective and probably even more so that of freshwater angling, which is not always statistically comparable to a freshwater commercial industry.

In brief, approximately 82 million recreational angling trips undertaken by 14 million anglers generated \$34 billion in total economic activity while supporting nearly 360 000

jobs. In contrast, commercial fishing economic activities totalled \$9,9 billion and supported 126 477 jobs equating to only 28,5% of the total national economical impact from recreational angling (TRCP, 2006). By June 2009 the American Sportfishing Association released figures indicating recreational angling was still one of the largest outdoor recreational sport activities and according to licence sales were growing by 11%.

Almost 60 million anglers generated over \$45 billion in sales with a \$125 billion economic impact and providing employment to more than one million people, thus making angling an economic contributor outstripping golf and tennis combined in popularity. Although not pertinently stated in the report the interpretation was that data included marine and freshwater recreational angling activities, hence the big difference from the TRCP marine angling data (Marinewebclub, 2009).

US bait sales were reported at 25% up in 2009, and a 12% higher and 10-year high rod and reel sales of \$356 million despite the recession. One of the explanations for the boom in recreational angling activities was that angling is a cheap alternative at \$6 a bucket of bait direct cost compared to, for example, skiing at \$80 for a lift ticket (Szep, 2009). Many Americans would therefore rather substitute fishing for more expensive outdoor activities.

The European Anglers' Alliance (EAA) estimated 25 million recreational anglers to be active in the European economy with an estimated value of €25 billion (EAA, 2002b). Apart from the total economic value generated, angling supports 2 900 companies and 60 000 jobs in the European tackle trade. A further 12 900 tackle shops employ 39 000 people. With Europe being the world's favourite tourism destination, tourism is expected to soon become the largest European service industry, already generating up to 12% of the gross domestic product (GDP) and providing 6% of employment. Although data for eco-tourist anglers is lacking, it is viewed as potentially becoming a sustainable tourism industry and has to benchmark with angling studies done by Australia, Canada and the US (Kappel, 2007).

As the world's most popular pastime recreational angling has an enormous financial impact on national economies and necessitates appropriate stakeholder management of resources.

## **2.5.2 Angling and the South African economy**

At the request of the South African Deep Sea Angling Association (SADSAA) Leibold and Van Zyl (2008:4) produced an extensive report on the overall economic impact of sport and recreational angling in South Africa. The total number of anglers was reported as 2,5 million, including both marine and freshwater, of which less than 30 000 had formal membership while the rest had no affiliation.

Approximately 1,5 million anglers, 60% of the total, were associated with the freshwater discipline of bank angling with carp and match angling adding a minor number to the total. The annual overall economic impact of recreational angling was determined at R18,8 billion, which consisted of a R15,9 billion direct impact, a R3,3 billion indirect impact and an induced impact of R1,2 billion less R1,6 billion in outflows. The estimated percentage contribution to the GDP was 0.97%.

To put the numbers into perspective, the combined figure for rugby and cricket reported at the time, including sponsorship, franchising, travel development, transformation and advertising rights, totalled only R5,5 billion. Global seafood and fish trade is worth more than R480 billion per year, to which the South African commercial fisheries industry contributed a mere R4,3 billion in 2009 (Moolla, 2010). Although commercial fishing is overshadowed by recreational fishing in terms of its economic contribution, the general observation was that commercial fishing received far more publicity because it forms part of the formal business sector and has a measured contribution to the GDP.

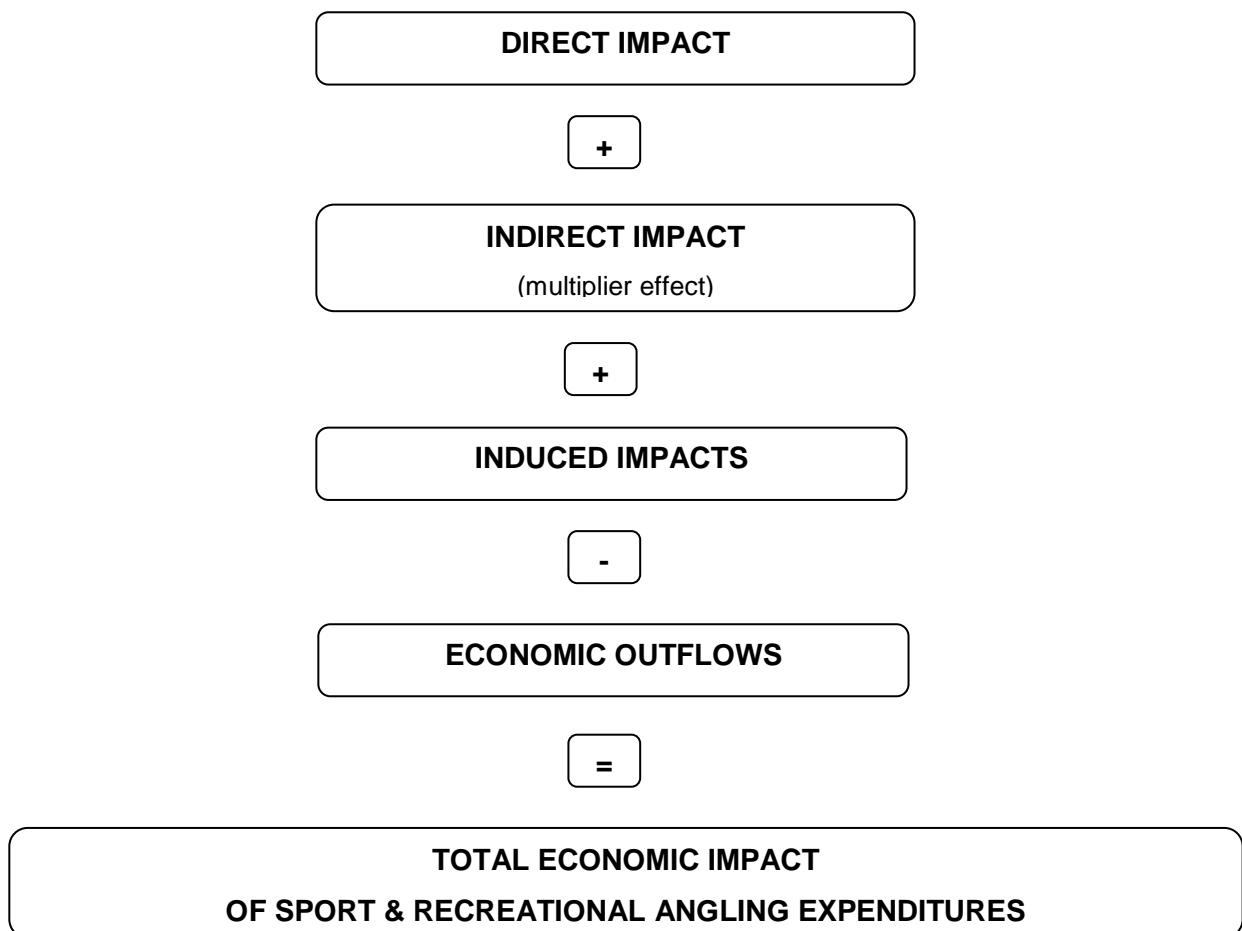
The purpose of doing economic impact studies is to measure the changes within an economy as ascribed to activities (TRCP, 2006). The expression of measurements is usually in income, retail expenditures, tax revenues and jobs and the impact can be divided into components of the direct, indirect and induced impact for most economic models.

Direct impact refers to the economic impact made by the initial purchase by a customer, such as the money spent at a retailer to buy tackle. Indirect impact measures the effect direct impact sales have on supporting and supplying industries to re-stock the sold item. Induced impact represents jobs created and the salaries and wages paid to employees, who in turn will spend their income to complete the economic cycle. Induced economic

impact thus relates to second round expenditure effects of local income derived from the indirect variable cost impact.

The multiplier used for this effect was based on international norms for this type of activity and applied only to the variable cost figure incorporating indirect effects. The total impact is obtained from the sum of the direct, indirect and induced impacts and the total economic impact will be multiplied as the process repeats itself. Outflows to be accounted for will be items like cross-border events and outward angling tourism (TRCP, 2006). The calculation of the total economic impact from the individual impacts was done and is depicted in Figure 2.5.

**Figure 2.5: Schematic representation of calculation of total economic impact**



(Source: Leibold & Van Zyl, 2008)

The data produced by Leibold and Van Zyl (2008:9) for freshwater bank angling was summarised as follows:

Number of anglers (2008):		1 506 141
Direct impact:		R3 739 million
Annual fixed costs (formal + informal)	R1 032 million	
Annual variable costs (formal + informal)	R2 707 million	
Indirect impact:		R373,8 million
Fixed costs x 0,1	R103,2 million	
Variable costs x 0,1	R270,6 million	
Total direct + indirect impact		R4 113 million
Induced impact		
Variable induced cost multiplier (0.05) = 2706,5 x 1,1 x 0,05		
Total induced impact		R149 million
Economic outflow (% factor on capital values)		R344 million
Total economic impact (freshwater bank angling)		R3 918 million
Individual impact per annum (R3,9 billion/1 506 141)		R2 589/person

Comparative data from eight European countries indicated that the annual expenditure per angler was about €284 (EAA, 2002c) which equated to R2 500 – R3 000 and correlated well with that found by Leibold and Van Zyl. The average annual expenditure per participant of all sport and recreational angling in South Africa amounted to R7 250 (R18,8 billion/2,5 million participants). In line with the international scenario, where the value of commercial fisheries is smaller than that of sport and recreational angling, South Africa's recreational angling is almost 80% larger than its commercial fishing (Leibold & Van Zyl, 2008:4).

The surprising finding about South African sport and recreational angling was that there was a low appreciation and little knowledge of its significant economic impact on the GDP among public and private sector organisations. The angling industry is undervalued and less regarded (has a relative poorer overall image) among policy makers and resource-oriented managers relative to comparative sports such as big game hunting (Leibold & Van Zyl, 2008:26).

### **2.5.3 The angler's value chain**

The angler's value chain is not classified along that of contemporary business models. The value chain is defined as the angler's transformation of secondary sequential angling trip planning activities (inputs) into the primary goal of an optimal value-added recreational experience (outputs). Setting out on an angling trip takes the angler through a decision-making cycle and expenditure processes to prepare for the execution and completion of the trip. All of these input activities remain secondary to what is the primary output and measure of the value-added experience, and that is fish in the bag. Ultimately the angler would like to return home from a trip with a feeling of value for money, having enjoyed the outdoors and the activity for its pleasure, relaxation and satisfaction.

Expenses include those directly related to angling and associated or non-angling expenses. Non-angling expenses start with the choice of venue and subsequent entrance and day fees. Depending on the duration of the trip day fees will accumulate accordingly. Likewise the decision to camp in a tent or caravan or stay in accommodation at the venue adds to the expenses. This is generally the first and only mental budget an angler produces simply because many additional expenses are regarded as obvious and are not taken into account. Lodging expenses, however, are likely to constitute only 10% of the total angling trip budget (Lechner & Pustejovsky, 1993:3).

The angler's normal thought process is that getting there and back costs nothing because "we're going in any case", but in reality travelling expenses, depending on the distance, can be 10-30% of the total cost of a trip (EAA, 2002c). In a similar fashion the bait and tackle and food expenses are not always taken into account beforehand because these are a given expense. Food and drinks were determined to account for about 40% of the total expenses, while 25% of costs (direct angling expenses) will normally be spread across bait, tackle and various accessories likely to be purchased at a local tackle shop

and outdoor retailer (Lechner & Pustejovsky, 1993:3). The psychology of direct angling expenses is that purchases often follow the trend of shopping with children. Anglers tend to return with some necessities and with a lot of extras, be it at the advice of the tackle shop sales assistant, an article read in a magazine or the endorsement of a friend or professional angler.

On the round trip the angler is likely to spend a considerable amount on refreshments, forgotten items and sundries, often from a venue tuck-shop at inflated prices. In the process the proportion of the 75% non-angling expenses grows as the trip progresses. This type of value chain analysis of the South African recreational angler would be extremely beneficial to stakeholders. All in all the recreational angler himself has very little direct contact with industry stakeholders other than retailers, perhaps the Department of Nature Conservation or local municipality and venue management, and for the rest he is exposed to the electronic and written media.

The following section about organised angling will position the recreational angler relative to stakeholders.

## **2.6 SOUTH AFRICAN FRESHWATER BANK ANGLING**

The structures, activities and achievements of South African freshwater bank angling are briefly summarised in this section. The purpose of including this section is firstly to emphasise the significance of the economic impact and the need for appropriate resource management of freshwater recreational angling by showing its position in national and provincial structures. The importance of existing structures lies in the communication roles they should fulfil between stakeholders. Secondly the exceptional achievements of freshwater recreational angling warrant recognition and may serve as motivation for the integration of its stakeholders in a national development strategy for the industry.

### **2.6.1 Structures and activities of organised angling**

In order to properly position freshwater bank angling in the South African context one has to consider all organised sport in South Africa with reference to the Organisation Structure of Sport in South Africa (SAFBAF, 2010a) (see Annexure 2). In terms of Government as a

stakeholder there is the governance involvement of the Minister of Education and the Minister of Sport and Recreation into Sport and Recreation South Africa (SRSA).

From the side of international controlling bodies the International Commonwealth Games Federation (ICGF), the International Olympic Committee (IOC) and the International Paralympic Federation (IPF) are involved in the South African Sport Confederation and Olympic Committee (SASCOC). All national sport federations relevant to this study, including the South African Sport Anglers and Casting Confederation (SOSACC), fall under SASCOC and SRSA with funding administrated through the latter.

The Organisation Structure of Organised Angling in South Africa (SAFBAF 2010b), (Annexure 3) shows freshwater bank angling falling under SASACC with its international relation to the International Freshwater Sport Angling Federation (FIPS-ed), the International Sport Angling Confederation (CIPS) and the General Association of International Sports Federations (GAIFS). Thus, SASACC represents the four angling federations for sea anglers, casting, freshwater bank angling and art lure and fly anglers at SASCOC and SRSA, while each federation still has its own international affiliation.

Annexure 4, the SAFBAF organisational structure after full implementation of the high performance programme, indicates the activities coordinated by SAFBAF through which each of the angling disciplines is served (SAFBAF 2010c). This structure will ensure that bank angling will comply with SASCOC and SRSA requirements while providing professional support at all levels of organised angling. Herein are included sport research, talent identification and development, coaching and educational support, and relevant logistical and administrative functions.

Feeder angling as endorsed by FIPS-ed is the latest addition to SAFBAF, effectively replacing traditional bank angling, sometimes referred to as “papgooiers”, as it is known. This move was in order for freshwater bank anglers to achieve international eligibility and recognition and be awarded national Protea colours similar to carp anglers.

Activities at provincial level are controlled by fourteen provincial member associations of SAFBAF. The list of members is:

1. Central Gauteng Freshwater Bank Angling Association
2. Central North-West Freshwater Bank Angling Association

3. Eastern Province Freshwater Bank Angling Association
4. Free State Freshwater Bank Angling Association
5. Gauteng Freshwater Bank Angling Association
6. Gauteng North Freshwater Bank Angling Association
7. KwaZulu-Natal Freshwater Bank Angling Association
8. Limpopo Freshwater Bank Angling Association
9. Mpumalanga Freshwater Bank Angling Association
10. North-East Mpumalanga Freshwater Bank Angling Association
11. North-West Freshwater Bank Angling Association
12. Northern Cape Freshwater Bank Angling Association
13. Southern Cape Freshwater Bank Angling Association
14. Western Province Bank Angling Association

The notable feature of the provincial list is that eight of the associations fall within the geographical borders of the old Transvaal province. This gives a clear indication of where the balance of power in the industry lies and where the hub of South African freshwater bank angling activities is. This information is important for the geographical demarcation of the empirical study and also to direct initiating responsibilities to the stakeholders in this geographical area.

### **2.6.2 South African freshwater bank angling achievements**

The first impression of the South African freshwater bank angling fraternity could easily be that it is very isolated given the limited competitive international exposure and lack of funding. The lack of funding is attributed to two primary factors, (i) angling not being a spectator sport and (ii) not qualifying for government funding due to non-compliance with SRSA regulations. Despite the lack of state funding and corporate sponsorship South African bank anglers have gained ample international experience over many years at own expense.

The excellence and class associated with South African freshwater bank anglers are shown by the achievements of the World Carp Angling Championship team of the past three years. After first participating in 2003 with some individual and team success, but negligible compared to top-placed European medal contenders like Croatia, Italy and Romania (Dicks, 2008), South Africa hosted the 10<sup>th</sup> edition of this event in 2008 with great

success. In the first event in African waters South Africa dominated the competition and won gold in the team section and gold, silver and bronze in the individual section while setting new championship records.

In 2009 South Africa entered the competition in France as defending champions, but was not rated among the favourites of 21 participating countries, which were mostly European and on home soil. The team scored another runaway win with team gold and individual gold and bronze medals (Lubbe, 2009). At the 12<sup>th</sup> edition of the championship in October 2010 the team achieved the unprecedented national honour of being crowned world champions for the third consecutive year. Team gold and individual gold and bronze medals were added to the cumulative championship medals tally as South African anglers reflected the level of excellence and professionalism associated with the technical abilities of the country's organised freshwater bank angling (FIPS-ed, 2010a).

The exceptional achievements of freshwater bank angling point not only to technical abilities, but also to well-managed structures and policies. Organised angling as a primary stakeholder has the challenge to convert its managerial capacities into a workable business approach to attract the interest of other stakeholders.

The interest of Government as a majority stakeholder in natural resources and their regulation justifies a brief section on these activities.

## **2.7 NATURAL RESOURCES AND REGULATION OF FRESHWATER BANK ANGLING**

### **2.7.1 Natural resources**

South Africa is well-known for its diversity, riches and beauty in natural resources. Anglers have the privilege of accessing and using many of these resources associated with water supply and the appropriate recreational activities. At the same time this places the responsibility for conservation and preservation on the anglers, which equates to personal management responsibilities.

The right to participate in recreational angling came in the spotlight at the 2010 conference of the Federation of Southern African Flyfishers (FOSAF). A paper by McCafferty *et al.*

(2010) asking the question: “Why should the Department of Agriculture, Forestry and Fisheries (DAFF) consider recreational angling in its long-term plans for inland fisheries?” raised the above issue. The DAFF mandate applying to the development of inland fishery resources and the execution of national policy as promoted by DAFF may or may not result in a conflict situation involving recreational angling.

Recreational angling historically has right of access to most national and private waters and is the major user of inland water fisheries. By making organised angling a formal partner of DAFF in developing a policy on inland fisheries it should be possible to find arrangements whereby recreational angling can contribute to sustainable use of water resources together with subsistence and commercial fishermen. The challenge to recreational angling as a billion rand industry is to show how it can contribute to national policy objectives which will benefit related industries (Kruger, 2010:16). Recreational angling is still to provide a representative mouthpiece which can present a national strategy that includes multiple stakeholders and attractive mutual objectives. This issue highlights one of the questions asked during this study regarding a billion rand industry which is practically an informal sector as less than 5% of recreational anglers are affiliated with organised angling bodies.

In proactive fashion a comprehensive assessment of all South African dams (more than 200) was done for SASACC and included essential information like the relevant water management agencies responsible for dams, drainage regions, the most important angling species found in the dams, the purposes for which venues are used and special activities, the national importance of venues and Global Positioning System (GPS) coordinates (SASACC, 2010). Similar projects will have to be initiated by industry stakeholders having the expertise and resources with the goal of obtaining a national resources database which can benefit recreational angling and related industries.

### **2.7.2 Regulation of freshwater bank angling**

South African freshwaters hold 146 fish species. About 30 of these species are endangered and this in itself calls for the conservation and protection of the environment and habitats as well as appropriate protocol when encountering all species (Anon., 2010). Concerns exist about the effectiveness of legislation and the management of conservation measures with such a high number of endangered species.

Regulations governing the catching of freshwater species vary widely from province to province and indicate a lack of regulatory standardisation. The involvement of state departments is limited and regulation is assigned to and enforced by more than one department. The law that most commonly applies is that one cannot fish without a licence, although it is generally known among recreational anglers that obtaining a licence can be a near impossible task unless it is as easy as buying it at a nature conservation office at some venues.

The Cape provinces require being in possession of a licence issued by the Director of Nature and Environmental Conservation, a Receiver of Revenue or any other authorised person to fish in inland waters. Valid licences are also required for fishing in KwaZulu-Natal waters. Free State legislation requires anglers to be able to present licences, but this does not apply to private landowners. Legislation also empowers authorities to prohibit by proclamation angling of a particular species or during a closed season. In Gauteng, North-West, Mpumalanga and Limpopo all anglers over the age of 16 must have a licence and have it available when angling (Anon., 2010).

Apart from provincial legislation enforced by the provincial government and the Department of Environmental Affairs (DEA) it is also the responsibility of provincial angling bodies to communicate regulatory and legislation affairs to clubs and members in each province. National legislation is through the Department of Water Affairs and the Department of Agriculture, Forestry and Fisheries. The major challenge regarding legislation is that each province has different views on angling and angling permits, conservation and the management of freshwater resources, which through the volume and complexity thereof create confusion, even to the angler who does care about it (Viljoen, 2010:30). The fact that few anglers care is a serious concern and warrants correction of existing legislation.

The lack of income from licence fees, whether due to poor administration, contradictory legislation or lack of enforcement, prevents any national projects from being launched to benefit natural resource conservation or related industries through job creation. Projects should include the monitoring of water quality, the removing of invasive plant species, the replenishing of endangered fish stocks and the prevention of water pollution. For example, by working from the assumption that 20% of freshwater anglers can be engaged to

purchase an annual angling licence, a very modest number of approximately 300 000 licences can be sold. At the reasonable price of R100, and the assurance that funds will not disappear into unknown coffers, anglers will be generate R30 million towards projects which must benefit not only themselves as primary stakeholders but secondary stakeholders as well.

Provincial angling bodies, SAFBAF and SASACC should assume more dominant roles in communicating regulations and the code of conduct for recreational angling, setting out the principles and standards of behaviour for responsible angling practices. SASACC is already obligated to engage various stakeholders when bidding for and hosting international angling events. This shows the existence of structures and processes which could form the basis for the expansion of cooperative agreements among stakeholders. The stakeholders included by requirement of SRSA are (i) SASACC (compulsory), (ii) the district municipality (compulsory to support), (iii) the local municipality (compulsory to support), (iv) the provincial sport councils (compulsory to support), (v) the provincial Departments of Sport and Recreation (optional), (vi) national, provincial and local tourism bodies (optional), (vii) Community support at the hosting locality (optional), (viii) Provincial Nature Conservation Bodies (optional) and (ix) Provincial Department of Water Affairs (optional) (SASACC 2010b).

Regulation of the angling industry has always been a difficult task and more so because of the vastness of water resources providing easy access to anglers who generally exhibit complex behaviour. Hence, the industry can always have a strong informal tendency, which in itself can make full control an ever elusive goal.

The next section of this chapter will be devoted to a SWOT analysis of the angling industry to integrate issues identified in the chapter.

## **2.8 A SWOT ANALYSIS OF THE ANGLING INDUSTRY**

The SWOT analysis of the South African freshwater bank angling industry includes issues pertinent to all stakeholders. The analysis is not comprehensive and was included to integrate literature findings and to assist in structuring the chapter summary.

## **Strengths**

- Local manufacturing and supplier base
- High value economic contributor
- Diversity of natural resources
- Loyal customer base
- Multiple world champions and recognised at the highest levels in international angling
- A vast pool of highly experienced anglers at all levels
- Succession of very competent anglers

## **Weaknesses**

- Overexploitation by selective angling and angling pressure
- Lack of enforcement of environmental and angling regulations
- Lack of state funding and corporate sponsorship
- Policy failures
- Inability to overcome the inherently expensive nature of the sport
- Weak human and financial resources
- Weak or inappropriate institutional frameworks
- Inadequate information
- Corruption
- Inappropriate regulations
- Inability to increase the value perception of the industry
- Informal nature of the industry
- Contradictory legislation

## **Opportunities**

- Media assuming higher prominence as promotional partner
- Private sector involvement in development projects
- Job creation
- Educational projects and community upliftment
- Export opportunities for high quality locally developed and produced products
- Development of eco-tourism

## **Threats**

- Water pollution
- Habitat modifications
- Increasing angler numbers
- Lack of public awareness of threats to recreational angling
- Possibility of Government prescriptions contradicting current values
- Increasing cost of angling as an activity
- Lack of political commitment

## **2.9 SUMMARY**

In the introduction to this study and in a number of remarks thereafter reference was made to the strong informal nature of the South African recreational freshwater bank angling industry. Observations made from studying especially Australian, Canadian and European recreational angling publications were, firstly, the high level of availability of study material, secondly, the knowledge base represented by the content, and, thirdly, the level of professionalism and expertise and the resources at the disposal of their organisations.

The findings of Leibold and Van Zyl (2008:27) called for SASACC, SAFBAF and other affiliated bodies to initiate a number of strategic issues relevant to organised angling, which looked quite similar to the above observations made from literature. The responsibility for proactive and initiating actions lies with organised angling as it should assume the central coordinating function between stakeholders. The challenge lies in the fact that roughly 95% of freshwater bank anglers have no formal affiliation with organised angling or any accountability to governmental authorities. The resulting situation is one of anglers being constantly uninformed about matters regulating their angling activities and a low willingness to take responsibility for issues concerning the future sustainability of freshwater angling. Improving communication abilities should be a starting point to the strategy and involve existing structures of organised angling.

The major shortcoming over many years, and which must be gradually addressed, is the lack of a business appropriate approach to managing the industry, also outside the borders of organised angling. The local freshwater angling industry stands out internationally in technical knowledge, experience and expertise, and the excellence with which the sport is exercised. While many of these abilities should be called upon for

transformation and education initiatives, there must also be a professional business orientated approach.

Transformation initiatives in the industry need to be designated as high priority for equity and image considerations and should be coordinated with relevant public and private business sector organisations. A coordinated education strategy should be devised and implemented with the aid and support of the Department of Education and other educational organisations. Formal membership should be expanded to the benefit of recreational anglers and can not be limited to the activity of obtaining licence fees. The level of coordination and influence of the industry among public and private sector organisations needs drastic improvement and is critical to the development of the industry. Sport and recreational angling in South Africa is of such nature and size that a significantly higher level of strategic marketing expertise is required towards internal marketing to existing and prospective members. Along the same line the industry is in need of professional external communications expertise and increased communications influence. This is essential to improve the image of the industry among stakeholders and interested parties.

The economic value of recreational angling in South Africa is totally undervalued. Its considerable development and growth potential require professional efforts to expand the industry. In striving towards a professional business orientated approach for the industry stakeholders like participants, government and business should develop the strategic value of the industry. The industry lacks infrastructure like dedicated angling facilities and should develop facilities in conjunction with government and the private sector. The media should be engaged to play a more pertinent role in orientating national, provincial and local government into a mutually beneficial relationship. Finally the industry should develop an overall strategic plan addressing topics such as resources, capabilities, costs, benefits and long-term development to benefit members and stakeholders.

Hence, there is a strong call for organised angling to initiate, plan and execute a national strategy for the total activity of freshwater sport and recreational angling. Studies such as this one and the many used as references should form the basis of a freshwater sport and recreational angling database to support the national strategy to the benefit of multiple stakeholders.

# **CHAPTER 3**

## **EMPIRICAL STUDY**

### **3.1 INTRODUCTION**

The empirical research part of the study involved the design of an appropriate questionnaire and the participation of a sample population in the completion thereof. This chapter deals with the design and methodology of the empirical study as developed in conjunction with findings from the literature study and discussions with industry experts.

The process of data collection is described and the subsequent processing, presentation and interpretation of the data will be set out. The presentation of statistical data analyses and findings will be categorised by means of the method of analysis to simplify interpretations. Each section of data analysis and interpretation includes explanations about the data and findings, and is followed by management implications for stakeholders.

### **3.2 RESEARCH DESIGN AND METHODOLOGY**

#### **3.2.1 Questionnaire design**

The primary purpose the questionnaire was designed for was to profile the behaviour of recreational freshwater bank anglers. The information obtained included some socio-economic aspects, and gauged preferences and motives determining the activities of anglers. Due to the extremely large contingency of recreational anglers, the large geographical scope of angling, and cost and time restrictions the study was limited to the use of a convenience sample. According to Castillo (2009) convenience sampling is defined as follows: "Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher."

In the design of the questionnaire consideration was given to three parameters. Firstly, the problem initiating the research was stated to determine the information needed to solve it. Secondly, the population who has the information was defined and, thirdly, the best means of collecting the information was chosen (Jobber, 1995:176). To obtain valid feedback from questionnaires it was important for participants to understand each question, to be able to

provide information pertinent to the question and to be willing to provide the information. Under these conditions the information gathered can be accepted as valid.

The questionnaire consisted mostly of structured questions with the option to select from structured responses for easy understanding, to reduce the timeframe for completing a questionnaire and to create a willingness to participate. Participants remained anonymous and individual contributions were all incorporated in the full sample statistics. Questions were limited to dichotomous questions and multiple-choice questions with single answers, and only seven structured questions for open response were included (Martins *et al.*, 1996:221).

The questionnaire was designed on the basis of a compilation of questions from related studies, questions deemed to be pertinent to this study and literature research findings. Consideration was given to the environment in which questionnaires were to be completed to prevent anglers from experiencing participation as complex and time-consuming.

Section 1 of the questionnaire consisted of ten questions related to demographics. Section 2 comprised twelve questions designed to acquire information about the participant's activity and interest profile. Section 3 comprised ten questions enquiring about participants' spending on angling and their angling experience. Section 4 had six questions, three relating to fishing licences and the others relating to angling in general.

### **3.2.2 Methodology and data collection**

The decision to hand out questionnaires personally to participants was made for two reasons. Firstly, it was learnt from previous studies done in the South African industry that the response from angling magazine subscribers and via e-mail was extremely poor, but studies done in person yielded a high response rate (Viljoen, 2007:53). Secondly, the researcher wanted to make personal contact with anglers to gain an understanding of the various experiences and opinions of anglers generally not captured by questionnaires and to convey these observations to the relevant industry role players. Questionnaires were handed out one per independent household to ensure that the data would be representative of a household.

The questionnaire was made available in English and Afrikaans to accommodate these languages most spoken around the fishing waters. The questionnaire was finalised with

input from the NorthWest University's (NWU) Statistical Consultation Services, Potchefstroom campus, and correctness verified in a pilot trial and used to sample data. Data collection started off at Bloemhof Dam, where attendance was high despite August being one of the colder months. Anglers were approached at the Sandveld Resort on the Free State side of the dam and at the NorthWest Nature Reserve just outside Bloemhof. Bloemhof Dam was commissioned in 1970. It is a composite dam with a 305-metre central concrete spillway and earth-fill flanks, giving it a total crest length of 4 270 metres. The dam capacity is 1 269 million cubic metres and the surface area is 223 square kilometres, making it a very shallow reservoir. The dam is of high national importance, contains carp, barbell, yellowfish and mudfish, and is renowned for its premier angling status, including the hosting of international events (DWAF, 2010a). An annual trip to Bloemhof Dam in December or at a long weekend is an entry in the diary of many South African anglers. During the empirical study done over a long weekend in August 2010 anglers from as far as Phalaborwa, the Kalahari and KwaZulu-Natal were met.

Data collection at the Vaal Dam took place over four weekends from the end of August to middle September at three venues. Because of the Vaal Dam's close proximity, especially the northern shores, to the Vaal Triangle and the eastern suburbs of Gauteng, no particular consideration was given to date or time other than convenience of sampling. The Vaal Dam was completed in 1938. The wall was subsequently raised on two occasions, the second time in 1985 to give it a capacity of 2 536 million cubic metres, while a further 26% or 663 million cubic metres can be stored temporarily for flood attenuation. During the February 1996 flood the dam peaked at a record 118.5% of full storage capacity, leaving only 194 million cubic metres flood absorption capacity. The inflow volume from 15 December 1995 to 15 March 1996 was estimated at 7 605 million cubic metres, sufficient to fill the dam three times over. The Vaal Dam is from an economic viewpoint the most important South African water reservoir and owing to its proximity to the greater Gauteng it is the most popular angling venue in South Africa, with the northern shores most developed and commercialised. The Vaal Dam holds carp, barbell, yellowfish and mudfish, and accommodates a high level of social activity and competitive angling (DWAF, 2010b).

Despite its recent popularity due to good catches of medium to big carp and its proximity to a fairly high volume of anglers, Hartebeespoort Dam was not considered because of the continuous and extreme pollution associated with the dam.

Questionnaires were handed out personally during the mornings and early afternoons and the purpose of the research was explained to participants. Collection of questionnaires occurred on the return trip back to the starting point in the late afternoon. This method was followed consistently at all data collection venues. Although the method was fairly time-consuming, it was found to be highly effective in terms of the response rate exceeding 85%. Additionally, this method of personal contact and casual interview produced very valuable insights and observations, which are included in the research findings and discussions.

The schedule according to which the data collection occurred was as in Table 3.1. Data sampling days were limited to Saturdays and Sundays, when access to a high number of anglers was assured.

**Table 3.1: Schedule of data collection**

<b>Date</b>	<b>Venue</b>	<b>Total</b>
<b>7 Aug</b>	Sandveld, Bloemhof Dam	48
<b>8 Aug</b>	NorthWest Nature Reserve, Bloemhof Dam	23
<b>28 Aug, 4 &amp; 11 Sep</b>	Boschkop Resort, Vaal Dam	73
<b>29 Aug</b>	Island Shores Resort, Vaal Dam	19
<b>18 Sep</b>	Boschkop Farm, Vaal Dam	14
		<b>177</b>

Source: Own compilation

The venues producing the bulk of questionnaire respondents were the popular Sandveld venue at Bloemhof Dam, which is known for good catches, and the Boschkop venue at Vaal Dam, which is easily accessible to Gauteng anglers and has good facilities and a long shoreline.

### **3.2.3 Statistical procedures and analysis**

Questionnaires (Annexure 1) were submitted to the NWU Statistical Consultation Services, Potchefstroom campus, after data collection. Data capturing was done from the questionnaires and statistical analyses performed. The statistical packages used by the Statistical Consultation Services (SCS) to analyse the data were (i) Statistical Analysis System (SAS, 2005), (ii) STATISTICA (2009a) and (iii) Statistical Package for Social Sciences (SPSS, 2009). Descriptive statistics methods, such as frequency analysis and the calculation of descriptive statistics, were used to summarise and present data for

interpretation depending on the nature of the data. In order to draw conclusions from the sample data about the entire population selected methods of inferential statistics were used at the advice of the SCS. These included correlations, independent *t*-tests, and cross-tabulations and Chi( $\chi^2$ )-tests for independence (Levine *et al.*, 2008:3).

### 3.3 RESULTS AND FINDINGS

#### 3.3.1 Descriptive statistics

Descriptive statistics for numerical data enable the researcher to summarise data in tables and present it in diagrams and charts. Mean and standard deviation data, and frequency analysis data were included in the descriptive statistics (Levine *et al.*, 2008:3).

##### 3.3.1.1 Mean and standard deviation data

Table 3.2 summarises average expense data. The maximum amount spent on tackle, bait and accessories per trip was R3 000, at an average of R534. The maximum spent on non-angling items per trip was R5 000, at an average of R854. The high maximum values were most likely reported by those individuals who do one or two longer trips per year, typically at the Easter weekend or at least four or five days. Relatively high standard deviations, R503 and R751 respectively, indicated a wide spread in responses as the sample would have included day picnic makers, who would spend far less per trip. Considering the mode values of most frequent occurrence for this reason to eliminate outliers was not viable as it was R500 and R1 000 respectively. Using the median values of R400 and R600 respectively will have removed outliers and provide a practically acceptable average of R1 000 per trip across the board. Anglers spent 50% more on non-angling items such as travelling costs, fees, food and accommodation than on angling products, whereas tackle shop expenses accounted for 40% of the total expenses per trip.

**Table 3.2: Descriptive statistics for households and expenditure**

Question	Number of respondents	Median
3.1 - Tackle shop expense per trip	169	R400
3.2 - Non-angling expense per trip	165	R600

Source: Own compilation

Literature reports direct angling-related costs to be approximately 25% of the total trip expense. The result of 40% in this study is significantly higher and shows the tendency of

South African anglers to spend considerable amounts at tackle shops. Stakeholders along the product supply chain appear to create a high interest in their products through marketing and promotions.

### **3.3.1.2 Frequency analysis data**

The average household included in the sample had 3.6 family members of whom 1.9 adults would be anglers, but on average 0.8 children per family would be involved in angling. A high standard deviation of 1.1 indicates that some families have a high number of children involved in angling and other families none. The tendency is there for children to acquire angling interests and skills from parents, but this is a highly variable measure. The low child participation was somewhat unexpected, but not regarded as an indication that children are not attracted to angling.

The distribution of participants indicates that 40% of the total of 177 participants were engaged with at Bloemhof Dam and 60% at the Vaal Dam. Afrikaans was the preferred home language of 85% of participants and the rest were all English-speaking. The age group 31-40 years accounted for almost a third of the anglers and in total 78% fell in the age group 21-50 years. The angling environment is clearly male dominated, with only 7% female respondents. Respondents were mostly married, 70%, while 22% were single. This information provides an important profile of the target market for advertising and promotional purposes.

As expected from the sample locations the majority of anglers (89%) were from Gauteng and NorthWest. Visitors to Bloemhof Dam represented seven of the nine provinces. The Vaal Dam is known for hosting a high number of anglers from the East Rand, often just for Sunday leisure and picnic. Despite safety concerns at public dams the majority of anglers (69%) visit there and do not have cheap accessible alternatives. Angling at private dams was preferred by 16% of participants, while 15% visited other venues like rivers. The implementation of improved natural resources control and the enforcement of regulations should start at public dams. Easy access is possible and anglers will best benefit at these venues from coordinated stakeholder functions.

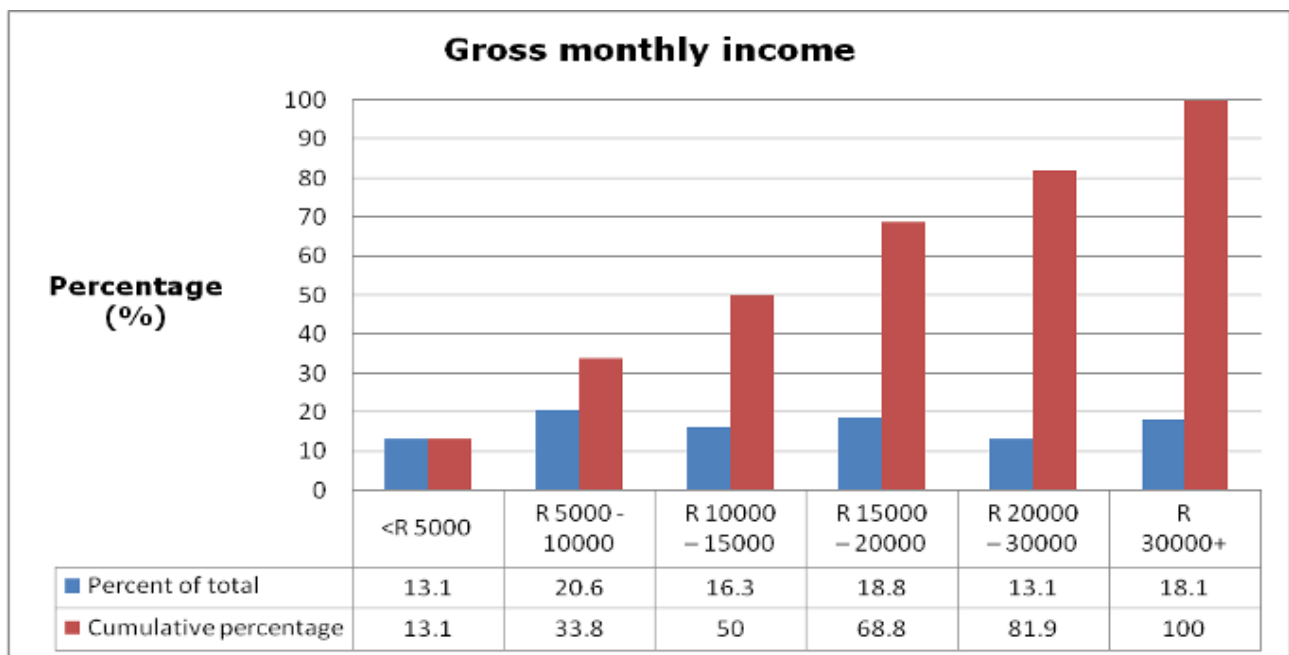
Included in the angler profile was the response indicating the highest level of education. Matric (Grade 12) as the highest qualification accounted for 48% of participants with those

having a post-school certificate and diploma completing the bulk of numbers with 18% each.

Angling is sometimes labelled a hobby of the rich, but this tends to be a generalisation as there are considerable differences in the costs associated with the different angling facets as determined by the technicality of the facet and the need for specialised equipment and accessories (Leibold & Van Zyl, 2008:17). The participation cost for freshwater bank anglers reported by Leibold and Van Zyl was the lowest of all the facets. It was determined to be just under R2 600 per year.

Figure 3.1 presents the percentage anglers in each gross monthly income bracket and the cumulative percentages. There is no significant tendency towards a particular income bracket and indications are that angler participation is very evenly spread across income.

**Figure 3.1: Bar chart of gross monthly income distribution**



Source: Own compilation

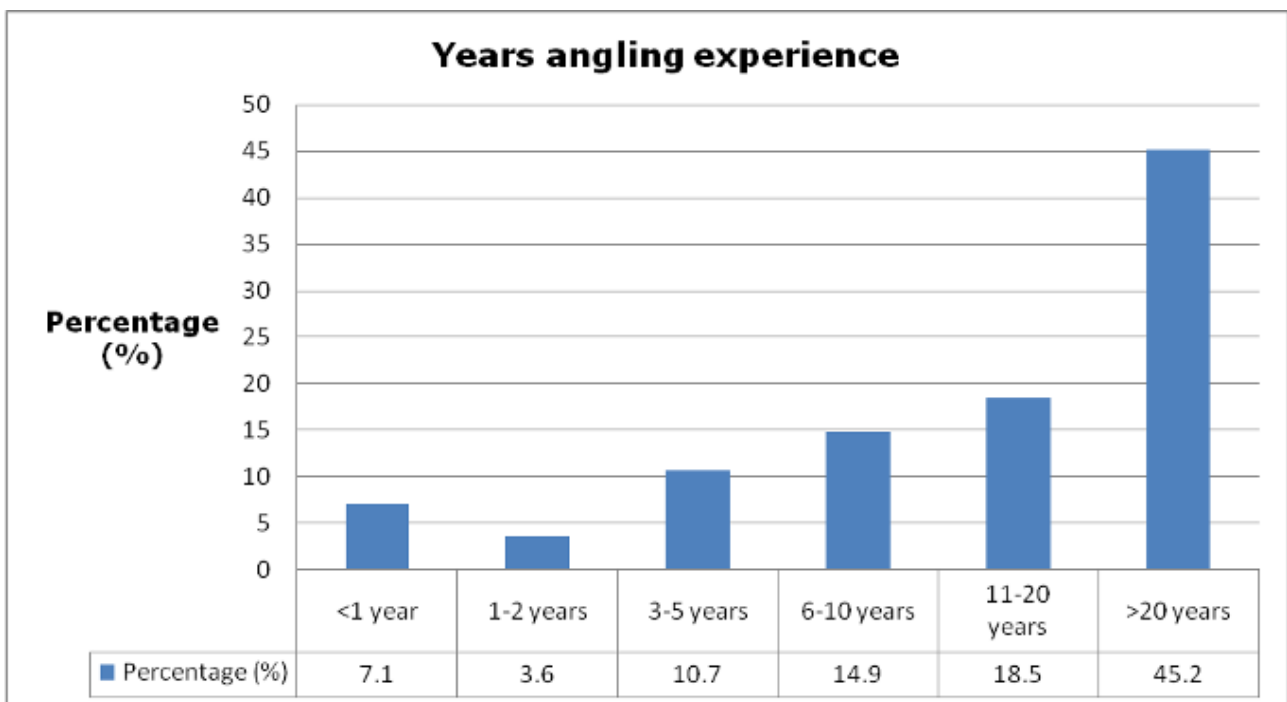
Participants in this study went angling on average once a month. The cost per trip on median values including all costs was R1 000. At an average reported distance of 300 kilometres per round trip fuel alone accounted for an estimated R240 or 24% of costs, which was in line with literature findings of 10-30%. Participants thus spent on average R12 000 per person per year on angling trips as a direct impact on the economy. This equates to an estimated direct economic contribution of R18 billion from 1.5 million

recreational freshwater anglers. Not including indirect and induced impacts the value was already substantially higher than that reported by Leibold and Van Zyl.

Consideration should be given to the possibility that the use of a convenience sample was likely to include more anglers with a high angling frequency. The majority of participants were encountered at the Vaal Dam, an easily accessible and very popular venue with high frequency anglers. Bloemhof Dam had a higher percentage of low frequency anglers, which should normally be the profile on long weekends with anglers travelling further for a once-off trip.

The data on angling experience was interesting in its distribution (Figure 3.2), especially from a marketing perspective. Statistics confirmed that 45% of anglers have been angling for more than 20 years and 80% have been angling more than 6 years. The significance of this is that with such a mature and experienced customer base retailers need to have the appropriate marketing strategy. A number of participants (10%) also responded to question 2.10 that they did not need to learn more about angling as they knew everything. The tendency is for people to be less willing to learn and experiment as they grow older.

**Figure 3.2: Bar chart of years angling experience**



Source: Own compilation

Conventional bank angling has a fairly steep learning curve during the first 2-3 years, after which it evens out rapidly and anglers may look for new challenges. Retailers thus have to be innovative in their marketing approach when aiming to sell new concepts or products in order to keep drawing conventional anglers for more than replacing consumables such as bait and feed.

In terms of the total angling activity of participants the questionnaire focused on freshwater, sea and art lure angling. The results as presented in Table 3.3, arranged from most to least popular, show that freshwater bank anglers are also involved in many other facets of angling to varying degrees. In principle it appears that most anglers would engage in other facets of angling given the opportunity and resources to do so, considering that freshwater bank angling is significantly cheaper to participate in.

The 75% response rate for carp angling is surprisingly high and may be interpreted as follows. Carp angling includes specimen carp angling (hunting big carp only) and competitive carp angling. Although most recreational anglers catch carp, they are not carp anglers by default. Conventional recreational anglers use techniques associated with carp angling to improve their catching and thus were likely to tick carp angling as an activity as well. Whatever the case is, the overlapping nature of angling by default provides retailers with the opportunity to get anglers interested in products of other angling facets.

**Table 3.3: Other angling facets freshwater bank anglers participate in**

Angling facet	Yes (%)	No (%)	No response (%)
<b>Freshwater – Bank</b>	100	0	0
<b>Freshwater – Carp</b>	75	24	1
<b>Sea – Shore/bank</b>	44	54	2
<b>Art lure – Bass</b>	35	63	2
<b>Art lure – Art lure</b>	31	68	1
<b>Sea – Deep sea</b>	25	73	2
<b>Freshwater – Match</b>	21	77	2
<b>Art lure – Fly</b>	16	82	2
<b>Sea – Light tackle boat</b>	15	81	4

Source: Own compilation

Anglers are generally introduced to the sport by family members (68%) and friends (22%). At the question of how they prefer to learn more about angling the responses are arranged from high to low as summarised in Table 3.4. Magazines occupy the top position, followed by television, which clearly indicates that marketing initiatives should be through these avenues. Finding the internet as the least popular source of learning was somewhat surprising.

**Table 3.4: Anglers' preferred source of learning**

Source of learning	Yes (%)	No (%)	No response (%)
Magazines	68	29	3
Television	61	36	3
Friend	53	45	2
Family member	47	50	3
Local tackle shop	48	49	3
DVD series	45	52	3
Angling expo	43	54	3
Internet	42	55	3

Source: Own compilation

The preferred topics anglers want to learn more about are summarised in Table 3.5. More valuable information was obtained from this profile especially for marketers, magazines and producers of television programmes, as well as for presenters of angling clinics in their planning.

**Table 3.5: Preferred topics for learning**

Preferred topic for learning	Percentage (%)
Fishing resorts and venues	17
Tactics for different seasons	16
Bait strategies	14
Fishing and the environment	10
Baits	10
Feeding strategies	9
Tackle and gear	6
Rigs	5
Competitions	3
Casting techniques	2
Tackle shops / retailers	2
Planning a fishing session	2

Source: Own compilation

Anglers were asked to choose only one product from a list on which they spend most money and the results are as in Table 3.6. Most money is spent on expendable products as could be expected, while tackle is lower on the list. A third of anglers indicated that they do not purchase all bait, feed and dip products from tackle shops but prepare some themselves at home. The equipment anglers are most prepared to spend money on for feeding activities is boats, canoes and remote-controlled bait boats. Feeding equipment specifically associated with carp angling found low application.

**Table 3.6: Products most money is spent on**

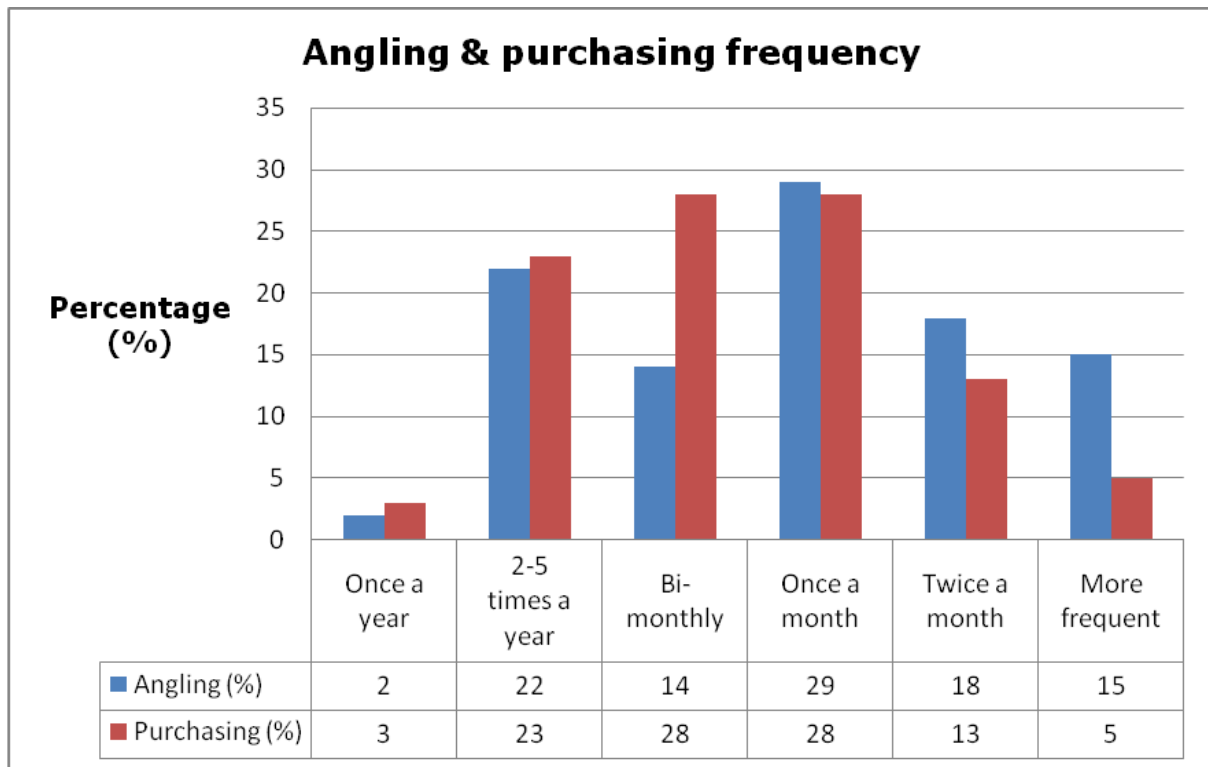
<b>Product</b>	<b>Percentage (%)</b>
<b>Baits</b>	43
<b>Feed</b>	14
<b>Reels</b>	10
<b>Dips</b>	9
<b>Rig components</b>	7
<b>Rods</b>	7
<b>Line</b>	5
<b>Camping equipment</b>	4
<b>Magazines</b>	1
<b>Clothing</b>	0

Source: Own compilation

The typical duration of an angling trip was 2 days for 51%, 1 day for 29% and 3-7 days for 20% of participants. 82% of anglers visited venues within an average radius of 300 kilometres from home. Anglers preferred camping and caravan (76%) to day-visiting (22%), with only 2% opting for a private lodge or Bed & Breakfast. The preference of a companion on a fishing trip was almost 40% each for a fishing partner or friend and family, indicating the high value recreational anglers place on the social aspect of angling.

The frequency of angling and angling purchases is as presented in Figure 3.3. More than 60% of anglers fall into a group of higher frequency angling of at least once a month. A higher frequency of angling can be possible for a number of reasons such as time, money, interest in angling, a family, social or club commitment, competitiveness or quick and easy access to venues. Indications from the questionnaire responses are that higher frequency anglers visit tackle shops less frequently. Their spending pattern appears to be independent of angling frequency, meaning they are more likely to purchase larger product quantities for frequent angling and thus avoid purchases for each trip.

**Figure 3.3: Bar chart of angling and purchasing frequency**



Source: Own compilation

Table 3.7 shows what forces influence anglers most in their final decision to purchase a specific product. It is evident that anglers are susceptible to personal endorsement and convincing in purchasing products which they can see are successful. Products should have considerable success when endorsed by well-known personalities in the angling fraternity. Angling clinics can play an important role in promoting products by demonstrating that products are effective. Price is evidently not a real concern as long as anglers are convinced the product works.

**Table 3.7: Factors influencing the final purchase decision**

Influencing purchase decision	Yes (%)	No (%)	No response (%)
Watching another angler use it successfully	69	27	4
Reading magazine product reviews	68	28	4
A friend's recommendation	65	31	4
Store assistant's recommendations	49	48	3
Seeing the product on TV or a DVD	45	51	4
Advertisement	45	51	4
Price	45	51	4
Professional endorsement	34	62	4
Reading good reviews on the internet	33	59	8

Source: Own compilation

The issue of angling licences gave rise to discussion with questionnaire participants. Anglers who annually purchase licences account for 41% of the sample and several anglers from those who do not purchase licences complained they did not know where to obtain them. Table 3.8 indicates what amount anglers are willing to spend on a licence.

**Table 3.8: The amount anglers are willing to spend on angling licences**

<b>Amount (Rand)</b>	<b>Percentage (%)</b>
<b>0 – 20</b>	23
<b>20 – 50</b>	27
<b>50 – 75</b>	16
<b>75 – 100</b>	22
<b>&gt; 100</b>	12

Source: Own compilation

The response to how licence fees should be applied represented anglers' concern about the sustainability of natural resources for recreational angling purposes (Table 3.9). The primary concern was with the quality of water and environmental conservation. During introductions to anglers the researcher often used their experience at the venue as a starting point. Anglers frequently commented on the poor condition of facilities and the pollution of banks with wastage from anglers' camping and fishing. Judging from the questionnaire and discussion feedback anglers want something to be done to improve angling conditions in general and to ensure there are sufficient and healthy fish stocks. The entire responsibility, however, according to anglers would be with venue owners and managers and government departments.

**Table 3.9: Preferred application of angling licence funds**

<b>Application of licence fees</b>	<b>Yes (%)</b>	<b>No (%)</b>	<b>No response (%)</b>
<b>Conservation of fish habitat</b>	78	16	6
<b>Combating water pollution</b>	78	16	6
<b>Conservation of fish stocks</b>	75	18	7
<b>General environmental conservation</b>	74	20	6
<b>Upkeep of angling waters</b>	72	22	6
<b>Administration and enforcement of angling legislation</b>	50	44	6
<b>Community upliftment &amp; awareness</b>	47	47	6
<b>Funding of angling bodies &amp; clubs</b>	27	66	7
<b>All of the above</b>	18	75	7

Source: Own compilation

Only 25% of the sample participants are members of an angling club and inferential statistics are used in the next section to determine how their behaviour differs from anglers not affiliated to clubs.

As far as security is concerned 70% of anglers indicated they had concerns when planning trips. Open questions asked in the questionnaire revealed that the changes anglers make in their behaviour or planning in order to feel safer are to visit selected safe venues only, to be more watchful around the water, to fish through the night and not sleep, to take a dog along where possible or carry firearms, reduce trips to a day outing, put tackle and equipment away at night and to camp in larger groups.

The percentage of anglers reporting an improvement in their own angling in recent years was only 64% despite the fact that 76% felt angling in general improved. The reasons for improved angling were given as:

- Purchase of better tackle and gear
- The technological improvement in tackle and gear
- Better feed and bait products
- The application of better techniques and personal learning

Participants were also asked in an open question to comment on the challenges facing freshwater recreational angling. The following important responses were received:

- A need for developing angling at school level
- The conservation of fish species and habitat
- Property development of waterfront sites
- Government funding to conserve habitat, and uplift and maintain venues
- The media should give more coverage to the challenges and threats to angling sustainability
- Keep venues accountable for enforcing legislation and for protecting the eco-system
- Pollution and mismanagement at venues
- The poor condition of facilities or lack thereof at venues
- Security
- Entrance and day fees are increasing
- Catch-and-release practice to be enforced at venues

The questionnaire responses of anglers concerning challenges and threats to recreational freshwater angling closely resembled those identified in the literature. The same responsibilities were implicated to the same stakeholders to ensure the sustainability of angling. The most immediate visible differences can be effected through the enforcement of national angling legislation whereby anglers will be held responsible for their actions to help protect and conserve natural resources, and Government involvement and visibility will act as a stimulant to attract other stakeholders into action.

### **3.3.2 Inferential statistics**

The inclusion of inferential statistics served the purpose of determining the significance of relationships existing between questionnaire variables. While descriptive statistics have been used to literally describe the data characteristics, inferential statistics determine the significance of the underlying mutual influences of variables.

#### **3.3.2.1 Correlations**

Correlations, the measure of the relation between two variables, were performed by means of the Spearman rank order correlation coefficient ( $r$ ). Spearman assumes that the individual observations can be ranked into two ordered series, that is, the variables were measured on an ordinal/rank order scale. Correlation coefficients can be interpreted as effect sizes, giving an indication of practically significant correlations (Ellis & Steyn, 2003:51).

Practical significance is an arbitrary limit whereby an observed difference is of some practical use in the real world. Statistical significance, on the other hand, is an arbitrary limit whereby an observed difference may reasonably be assumed to be due to some factor other than pure chance.

Since a convenience sample was obtained from the study population and not a random sample,  $p$ -values and statistical significance were not applicable and not included for study of correlations. The criteria for the interpretation of the Spearman rank order correlation coefficient are (i)  $r = 0.1$ ; small effect – no practically significant correlation, (ii)  $r = 0.3$ ; medium effect – practically visible correlation and (iii)  $r = 0.5$ ; large effect – practically significant correlation (StatSoft, 2009b).

The correlation coefficients determined are presented in Table 3.10. Practically significant correlations were identified between age and years of angling experience, and between angling and angling purchase frequency. Practically visible correlations were seen between age and gross monthly income, between household size and the number of adult and child anglers per household, and between the duration of an angling trip and the distance to the destination. None of these correlations are particularly surprising, and it is important to take note of some correlations with no practical significance. For instance, neither age nor the years of angling experience appear to determine how often people go fishing. There is also no correlation between education and gross monthly income, and gross monthly income does not appear to be a significant determining factor of spending behaviour.

**Table 3.10: Summary table for Spearman rank order correlation coefficient (r)**

Variable 1	Variable 2	Correlation coefficient (r)	Practical significance
Age	Highest education level	0.015	Not practically significant
	Gross monthly income	0.364	Practically visible
	Years angling experience	0.535	Practically significant
	Angling frequency	0.112	Not practically significant
	Duration of angling trip	-0.061	Not practically significant
	Angling purchase frequency	-0.088	Not practically significant
	Amount willing to pay for angling licence	-0.050	Not practically significant
Household size	Adult anglers per household	0.300	Practically visible
	Children anglers per household	0.458	Practically visible
	Highest education level	-0.140	Not practically significant
	Gross monthly income	-0.026	Not practically significant
Adult anglers per household	Fishing frequency	-0.008	Not practically significant
Highest education level	Gross monthly income	0.256	Not practically significant
Gross monthly income	Angling frequency	0.095	Not practically significant
	Duration of angling trip	-0.063	Not practically significant
	Angling purchase frequency	0.034	Not practically significant
	Amount willing to pay for angling licence	0.215	Not practically significant
Years angling experience	Angling frequency	0.128	Not practically significant
	Duration of angling trip	0.070	Not practically significant
Angling frequency	Angling purchase frequency	0.567	Practically significant
	Average distance to angling destination	-0.056	Not practically significant
	Amount willing to pay for angling licence	0.023	Not practically significant
Duration of angling trip	Average distance to angling destination	0.357	Practically visible

Source: Own compilation

Further investigation into practically significant relationships between variables was done using *t*-tests and cross-tabulations.

### 3.3.2.2 *t*-test for independent samples

The method most commonly used to evaluate the differences in means between two groups is the *t*-test (Levine *et al.*, 2008:371). When there is a significant difference in response to the two options for a question it implies dependence. The effect size used here is Cohen’s *d*-value and the criteria for interpretation are (i)  $d = 0.2$ ; small effect – no practically significant correlation, (ii)  $d = 0.5$ ; medium effect – practically visible correlation and (iii)  $d = 0.8$ ; large effect – practically significant correlation (Ellis & Steyn, 2003:4). Data with  $d \geq 0.8$  is considered as practically significant since it is the result of a difference having a large effect.

As presented in Table 3.11 there was only one practically significant correlation from the *t*-test analyses, that is, where a significant difference was recorded between the mean values for the “Yes” and “No” responses. This correlation implies that anglers who are not club members tend to go on longer angling trips. The practical interpretation of this statistic is that club members tend to have day angling excursions with typical club competitions taking place on a Saturday from 08:00 to 15:00.

**Table 3.11: Summary table for independent t-tests, p-values and effects sizes for club membership**

Are you a member of an angling club?		Mean	Standard deviation	Effects size ( <i>d</i> -value)	<i>t</i> -test ( <i>p</i> -value)	Practical significance
Highest education level	Yes	2.65	1.131	-0.1	0.615	None
	No	2.75	1.126			
Gross monthly income	Yes	3.61	1.839	0.1	0.781	None
	No	3.51	1.634			
Years angling experience	Yes	5.02	1.369	0.3	0.087	None
	No	4.58	1.602			
Angling frequency	Yes	4.44	0.934	0.5	0.000	Visible
	No	3.65	1.467			
Duration of angling trip	Yes	1.51	0.592	-0.8	0.000	Significant
	No	2.05	0.699			
Amount willing to pay for angling licence	Yes	3.03	1.349	0.3	0.162	None
	No	2.68	1.365			

Source: Own compilation

Furthermore a practically visible correlation was found indicating that members of angling clubs angle more frequently than non-members. Practically this finding implies that angling

club members have a higher level of commitment and especially to organised angling. For this reason clubs should form an integral part of organised angling's efforts to develop angling and integrate stakeholders.

In Table 3.12 the data for *t*-test analyses relating to angling security concerns is summarised. From these analyses it appears that anglers make no behavioural adjustments of practical significance based on their safety concerns as identified by means of structured questions.

**Table 3.12: Summary table for independent t-tests, p-values and effects sizes for security concerns**

Do you have concerns about security when planning a trip?		Mean	Standard deviation	Effects size ( <i>d</i> -value)	<i>t</i> -test ( <i>p</i> -value)	Practical significance
Age	Yes	4.32	1.243	0.2	0.375	None
	No	4.11	1.370			
Child anglers per household	Yes	0.72	0.907	-0.1	0.387	None
	No	0.93	1.516			
Gross monthly income	Yes	3.45	1.566	-0.1	0.488	None
	No	3.67	1.933			
Years angling experience	Yes	4.82	1.524	0.2	0.194	None
	No	4.47	1.558			
Angling frequency	Yes	3.93	1.346	0.2	0.214	None
	No	3.63	1.482			
Duration of fishing trips	Yes	1.93	0.660	0	0.937	None
	No	1.91	0.830			

Source: Own compilation

### 3.3.2.3 Cross-tabulations and Chi-squared tests for dependence

A cross-tabulation table is a combination of two or more frequency tables arranged such that each cell in the resulting table represents a unique combination of specific values of cross-tabulated variables. Thus, cross-tabulation allows the examination of frequencies of observations that belong to specific combinations of categories on more than one variable. In the Chi-square test of independence, the frequency of one nominal variable is compared with different values of the second nominal variable. This test is applicable in situations where the frequencies in the table represent dependent samples (Statistics Solutions, 2009; StatSoft, 2009c).

Chi-square tests produce a *p*-value and if  $p < 0.05$ , there is a statistically significant dependence between the two variables. However, since a convenience sample was used and not a random sample, effect sizes and practical significance were used. The *phi*-

coefficient was the effect size applied with the interpretation that (i)  $\phi = 0.1$ ; small effect – no practically significant correlation, (ii)  $\phi = 0.3$ ; medium effect – practically visible correlation and (iii)  $\phi = 0.5$ ; large effect – practically significant correlation (Ellis & Steyn, 2003:4).

An analysis of 207 cross-tabulations produced 17 phi-coefficients indicating medium and large effect sizes, which are included for discussion (Annexure 5). The cross-tabulations producing practically visible and practically significant dependences, all of which were statistically significant, are summarised in Table 3.13 by question numbers. All dependences arose from questions 2.5 and 3.5, with the exception of cross-tabulation number 1.

Some of the dependences, albeit of practical value, were fairly obvious. For example, cross-tabulation number 16 produced a practically significant dependence indicating that participants who preferred to learn more about angling on the internet were also likely to be influenced in their final purchasing decision of angling products from reading good interviews on the internet. The internet, though, was found to be the factor that least influenced anglers' decisions to purchase items.

**Table 3.13: Cross-tabulations which produced practically visible and practically significant dependences (Source: Own compilation)**

Number	Variable 1	Variable 2	Chi-square ( $p$ )	Phi-coefficient
1	1.4	4.3.8	0.002	0.297
2	3.5.1	2.5.6	0.001	0.259
3	3.5.1	2.5.7	0.001	0.267
4	3.5.2	2.5.6	0.001	0.258
5	3.5.4	2.5.1	0.001	0.259
6	3.5.4	2.5.3	$\leq 0.0001$	0.375
7	3.5.4	2.5.4	$\leq 0.0001$	0.278
8	3.5.4	2.5.5	$\leq 0.0001$	0.270
9	3.5.4	2.5.6	$\leq 0.0001$	0.348
10	3.5.4	2.5.7	$\leq 0.0001$	0.315
11	3.5.6	2.5.3	$\leq 0.0001$	0.308
12	3.5.6	2.5.5	$\leq 0.0001$	0.383
13	3.5.6	2.5.6	0.001	0.259
14	3.5.6	2.5.8	$\leq 0.0001$	0.329
15	3.5.8	2.5.2	$\leq 0.0001$	0.283
16	3.5.9	2.5.3	$\leq 0.0001$	0.546
17	3.5.9	2.5.6	$\leq 0.0001$	0.344

Source: Own compilation

In general this analysis shows that the factors that influence anglers' purchasing decisions are visibly dependent on their preference for learning about angling. The analysis reaffirms the importance of the written and electronic media as the strongest communication mediums, which should be used with greater effect by stakeholders who want to reach the broad angler base. The findings of the study and other aspects are summarised in the next section.

### **3.4 SUMMARY**

The empirical study provided an information database platform of recreational angling which can be of substantial use to industry stakeholders. The socio-economic and angler preference data obtained assisted in creating a profile of general angler behaviour, while trends observed in the literature research continued and were affirmed.

A strong concern exists among anglers regarding the sustainability of natural resources for recreational angling. Environmental conservation, fish and habitat conservation and combating water pollution were highlighted by the majority of participants as serious issues. Of greater concern probably is that the apparent lack of momentum from both private and public sector stakeholders is mirrored in the low commitment shown by anglers to assume responsibility for ensuring angling sustainability. Recreational anglers appear isolated from organised angling and Government as the most prominent stakeholders and no established line of communication could be confirmed. With the lack of authoritative guidance recreational anglers assume no accountability and blame stakeholders with whom they should partner. The majority of anglers also strongly expressed support for the improved enforcement of angling legislation to see catch-and-release practised, to prevent the removal of big fish and to reduce angling pressure on waters.

New product technology and techniques featured highest on the list of forces driving the industry from the angler's perspective, together with a growing interest in carp angling facets. The value of television programmes, DVD series, magazines and angling clinics was evident and not only as a means of angling education. These should become communication channels to create awareness about industry challenges and to educate and motivate anglers to take responsibility for issues affecting their sport, hobby and leisure activity. Apart from the rising costs of angling products anglers are concerned

about increased entrance and day fees to venues, some of which have deteriorating, poor or no facilities at all.

The choice of introducing questionnaires by direct contact with anglers turned out to be very valuable for acquiring unstructured information and ensured a response rate in excess of 85%. Personal experience and literature showed that questionnaires initiated or to be returned by e-mail produce extremely low response rates.

A great need for recreational anglers to learn about technical aspects from organised angling was identified. The learning culture of recreational angling is a hands-on passing on of experience. Organised angling should lobby for funding from the private and public sectors towards the establishment of angling facilities of the nature of an academy. The academy will have to be a multi-functional facility suitable for hosting competitions, clinics, conferences and angling development and education programmes. Freshwater bank angling in general should exhibit the intent to engage with stakeholders on a number of issues addressed in this study and the establishing of the proposed facility will go a long way towards creating a common forum.

A very broad angler behavioural profile was created in the empirical study, but two topics dominate the findings. Firstly, important information for product marketing and promotions were obtained from topics related to angler spending patterns and those determining purchasing decisions. The second important topic which featured frequently was the central communication role of particularly angling magazines and to a lesser albeit increasing extent, the electronic media. There are numerous constraints on a hands-on learning culture, which is best compensated for by reading magazines and watching angling programmes on television, both at the angler's own leisure and time.

The opportunity for stakeholders at the various stages in the product supply chain and for those involved in a communications or promotional capacity lies in considering the findings of this study and possibly refining them into further business-specific research for their own application.

The concluding chapter will provide a summary of the empirical and literature findings and recommendations, including an industry integration model developed to motivate the implementation of the study recommendations.

# **CHAPTER 4**

## **CONCLUSIONS AND RECOMMENDATIONS**

### **4.1 INTRODUCTION**

The study set out focusing predominantly on the behaviour and activities of recreational freshwater bank anglers. In addition considerable attention had to be given to organised angling, which provided the bulk of literature to the study and assisted in positioning angling as the field of study in the broader context of the entire fishing industry.

This final chapter integrates the findings from the literature and empirical studies. The study conclusions discuss findings in the context of the primary and secondary objectives. Key success factors and driving forces of freshwater bank angling are briefly discussed. Recommendations are accordingly made to various stakeholders as part of a development and growth strategy for the sustainability of recreational angling.

A critical evaluation of the study is done to determine to what extent the primary objective was met and how successful the study was in making a contribution to stakeholder activities. Opportunities and scope for potential future research on the topic of this study and related topics are discussed.

### **4.2 STUDY CONCLUSIONS**

The primary objective of the study was to profile the South African freshwater bank angling industry from the perspective of the angler. Initially there was a concern about the integration of the literature and empirical studies because of the lack of literature pertinent to the activities of South African recreational freshwater anglers. As the empirical study developed through a combination of personal observations, unstructured personal interviews with questionnaire participants and data analysis, it became evident that several common issues existed.

The approach from a literature perspective was to position recreational angling in the bigger scope of the fishing industry, starting with a historical overview of angling as a facet of fishing. Industry challenges and the threats to the sustainability of recreational angling were of importance to both commercial fishing and organised and recreational angling. Water pollution, habitat and community modification, eco-system conservation, overfishing

and the removal of big fish, and the lack of catch-and-release practice were found to be the major environmental and sustainability issues.

Failure to address issues appeared to primarily implicate Government for a number of important reasons, but this did not exempt other stakeholders from being implicated by omitting to become involved in activities of mutual benefit. Weak human and financial resources in an industry of such high economic value indicated a lack of stakeholder involvement and coordination, and a lack of political commitment. Weak institutional frameworks and inadequate information plus inappropriate regulations where these did exist, were other reasons for failure.

The major driving force in the freshwater angling industry was the continued growth in angler numbers as the popularity of angling as a recreational and leisure activity continued to grow. The conservation of the environment and the impact of environmental issues were undoubtedly another major driving force, but in the opposite direction. The biggest obstacle to continued sustainability of recreational angling in all its facets was the lack of a practical and working strategy to develop the value of the industry. Should such a strategy be successfully implemented involving all stakeholders, the industry can benefit from the combined impact of existing individual driving forces. Local tourism, the manufacturing and retail industry and anglers are likely to be the immediate beneficiaries of a successfully implemented strategy.

The integration of key success factors of currently individually operating stakeholders should serve as a strong motivating factor for combining strengths. Organised angling has a prominent role to play and can draw from its various successes as world champions and from the wealth of very competent anglers with their skills and capabilities. Local manufacturers and retailers provide technologically advanced and high quality angling products. Government, anglers and venues alike should benefit from the enforcement of legislation and the collection of licence fees to ensure proper facilities and environmental conservation. The media have a role of growing importance to play in the promotion of angling as a sport and recreational activity and to attract private sector interest and sponsorships. Angling magazines especially hold a unique position, which should be exploited as a communication and education medium.

The study estimated the direct economic contribution of anglers to be about three times higher than that found in literature. This is highly dependent on the population sample, which included high frequency anglers. With a fast growing freshwater angling population from the 1.5 million determined in 2007 and with the economic recession driving marine anglers to freshwater angling, the total economic value of freshwater angling alone will be well in excess of the documented R3.9 billion.

The trend in anglers' inclination to new activities is to participate in carp angling facets. Magazine articles, television programmes and DVD have played an increasing role in exposing anglers to new trends and techniques. Anglers are most susceptible to magazine marketing, the influence of family and friends, and marketing means showing the successful use of products. Anglers spend more money on bait and feeding products than on other products, and stakeholders in this market should find this study a valuable contribution.

Finally, it is concluded that organised freshwater angling will largely determine the future of the sport as well as recreational activities of angling and recommendations to this effect are made in the next section. Studies similar to this one and others contributing to this study will have to be undertaken in the South African context to create an information database that will support the future endeavours of freshwater angling.

### **4.3 RECOMMENDATIONS**

Organised angling South Africa as represented by SASACC and SAFBAF has to obtain and make resources available in order to appoint a knowledgeable team with the responsibility of drawing up a national strategy for the future of freshwater bank angling. Two initial primary focus areas in the strategy should be (i) an assessment of existing industry knowledge and how the knowledge database should be expanded with relevant and specific research, and (ii) the development of a contact network database among private and public sector stakeholders.

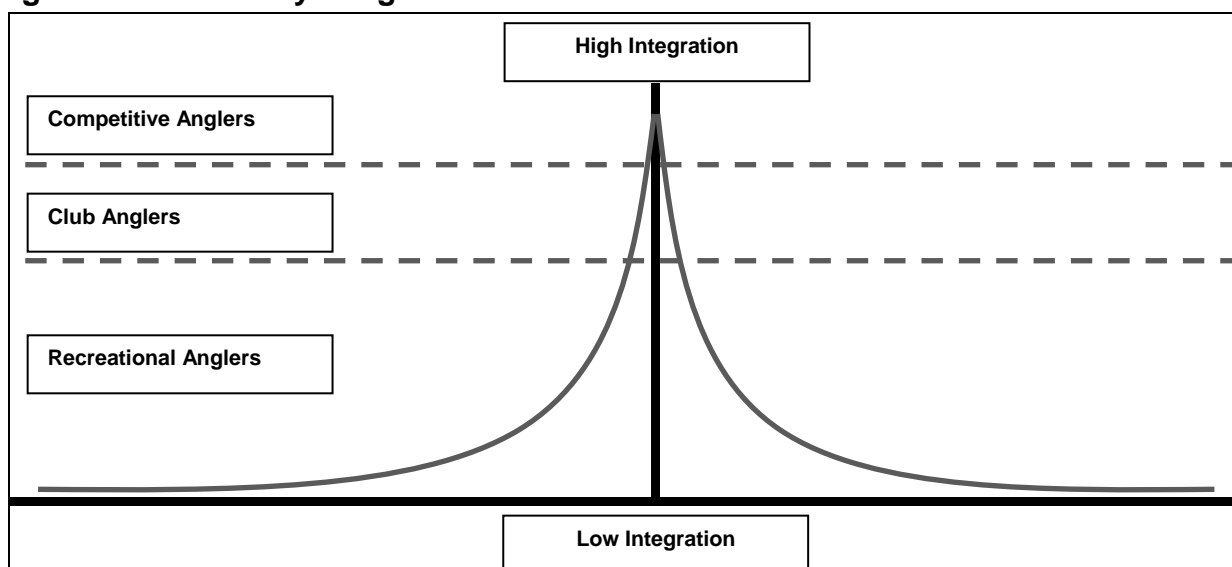
After the initial assessment of the existing knowledge base, a team of professionals should be tasked with the responsibility of initiating the development and managing the knowledge database and of establishing and facilitating communication among major stakeholders. The process should be started in a province where existing procedures and

processes will complement the strategy and from where it can be expanded to national level. The collection of angling licence fees and the distribution of funds to relevant stakeholders, for example, can create immediate funding and momentum for the process.

The knowledge database is to include topics such as environmental and economic impacts, fish habitat and conservation, and angler numbers and profiles. A stakeholder needs analysis should be conducted to ensure stakeholder involvement and commitment, and to prevent exclusion from decision-making processes. Establishing and facilitating communication with stakeholders should involve marketing and public relations professionals. The activities at both levels will be focused on improving the image of angling, improving coordination capabilities and formalising the industry.

Organised angling as the stakeholder having the senior initiating and coordinating responsibilities need to assume a business-appropriate approach to its functions, especially that of marketing, communications and public relations. The biggest challenge lies in mobilising recreational anglers, who account for about 95% of freshwater anglers. In order to demonstrate the magnitude of the challenge and its context an industry integration model was developed as in Figure 4.3. The diagram depicts the relative integration of recreational, club and competitive anglers in organised angling.

**Figure 4.3: Industry integration model**



Source: Own compilation

The areas under the hyperbola on either side of the central axis represent the percentage of anglers involved at different levels of integration as separated by the horizontal dotted

lines. The challenge to integrate anglers towards increased responsibility and accountability for the future sustainability of their leisure activity increases down the vertical axis. The flat and broad base of the diagram represents the mass of recreational anglers of which a significant proportion will not be able to integrate for various reasons.

Angler groups with a higher existing integration level have more exposure to industry stakeholders and have the knowledge and networks in place to drive integration down. The importance of the model is that it provides a framework whereby the challenges facing the angling industry can be described. It can also serve as the basis for needs-specific stakeholder integration at the various angler levels.

Thus, organised angling should be used as a platform for promoting a national development agenda, which should include top priority issues identified in the study, like environmental conservation and projects to sustain natural resources. Funding, currently an issue for organised angling, is to a large extent the factor that will determine the success of the strategy and the future success of the total industry. In order to produce sustained funding for freshwater bank angling through the private sector the establishment of networks through a business-orientated approach must be of the highest priority.

#### **4.4 STUDY EVALUATION AND FUTURE RESEARCH**

The primary objective of the study was met as a profile of the South African freshwater bank angling industry was created. In addition to industry stakeholders the average recreational angler will also be able to read the study with interest and find information applicable at global, national and personal level. This includes information on socio-economic levels, personal preference and angler activity, as well as what the industry needs to do to remain sustainable and develop to its full potential.

In terms of secondary outcomes the study was able to gauge the economic contribution of the industry, but the information was subject to the population sample. Further deductions from this information indicate that the angling industry may be even more undervalued than previously determined. Other outcomes of the study produced valuable information for industry marketers, angling venues, and retailers and organised angling. The study provides a good opportunity to assess the future of angling and to make valuable recommendations.

Literature limitations to the study were overcome by accessing small sections of applicable information from a variety of sources. The population sample was also a limitation, but the personal contact made by the researcher and the subsequent high response rate added value to the study. The time and resource constraint on the inclusion of more information about the private sector involved in the angling industry is seen as a shortcoming of the study and could have provided a link with the formal industry.

Numerous opportunities for future research are identified in the study, all of which will make significant contributions to the recreational angling industry. A complete analysis of industry stakeholders could be an extensive future field of study. Such a study should be done from the perspective of what sport and recreational angling as the central stakeholder should know about all other stakeholders and vice versa. The proposed study may serve as the basis for a detailed population study using a questionnaire structured to obtain information very specific to the needs of other stakeholders. The need for future research should be promoted among stakeholders and proceed with their inputs without much delay.

## **4.5 CONCLUSION**

The largely informal and unregulated nature of the South African freshwater angling environment made this study difficult and potentially covering a very wide field. Several international studies used as reference are of the exact nature of what the South African industry needs and should be consulted for further research. However, the applicability of information from these studies is limited as each industry is unique.

Any further research related to this study topic will need careful planning and execution as industry information is fragmented, scarce and often undocumented. Studies would need to be preceded by pilot studies to ensure that the right questions are asked and appropriate answers obtained.

The significance of the contribution made by this study can be summarised in the way the activities of recreational freshwater bank angling impact numerous stakeholders. The study produced results for application to the interests of stakeholders and provides strategic pointers for the angling industry to develop its potential together with its stakeholders.

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# ANNEXURE 1: QUESTIONNAIRE

## Recreational Bank Angling Questionnaire

Thank you for taking the time to complete this questionnaire. The questionnaire should not take longer than 5 minutes to complete. You are requested to tick the relevant block underneath each question. When choosing the "Other" option, please briefly motivate this option. The questionnaire is completed in full anonymity and individual responses will be incorporated into the full sample statistics. **Please answer Section 1 to 4 on both sides of the form.**

### Section 1

#### 1.1 Age

18 or younger	18 - 21	21 - 30	31 - 40	41 - 50	51 - 60	Older than 60
1	2	3	4	5	6	7

#### 1.2 Gender

1. Male	2. Female
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#### 1.3 Marital status

1. Single	2. Married	3. Divorced	4. Widow/er
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#### 1.4 Province of residence

1. North-West	2. Gauteng	3. Free State	4. Northern Cape	5. Limpopo
6. Eastern Cape	7. Western Cape	8. Mpumalanga	9. KwaZulu-Natal	

#### 1.5 Home language

1. Afrikaans	2. English	3. Other (specify):
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#### 1.6 How many people are in your household?

1	2	3	4	5	6	7	8	9	>9
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#### 1.7 How many adults in your household are active anglers?

0	1	2	3	4	5	6	7	8	9	>9
---	---	---	---	---	---	---	---	---	---	----

#### 1.8 How many children in your household are active anglers?

0	1	2	3	4	5	6	7	8	9	>9
---	---	---	---	---	---	---	---	---	---	----

#### 1.9 What is your highest level of education?

1. Less than matric	2. Matric	3. Post-school certificate	4. Diploma	5. University graduate
6. Other (specify):				

**1.10 What is your gross monthly income?**

<R5000	R5000 - R10000	R10000 - R15000	R15000 - R20000	R20000 - R30000	R30000+
1	2	3	4	5	6

**Section 2**

**2.1 How long have you been bank angling?**

< 1 year	1-2 years	3-5 years	6-10 years	11-20 years	>20 years
1	2	3	4	5	6

**2.2 Where do you most often go when bank angling? Choose one**

1. Public dams	2. Public river banks	3. Private dams	4. Private river banks
5. Other (specify):			

**2.3 What forms of recreational angling are you involved in? Select Yes / No for each**

		Y		N		Y		N		Y		N	
<b>1. Freshwater</b>	1. Bank	1	2	2. Match	1	2	3. Carp	1	2				
		1	2		1	2		1	2				
<b>2. Sea</b>	1. Shore/bank	1	2	2. Deep sea	1	2	3. LT boat	1	2				
		1	2		1	2		1	2				
<b>3. Art lure</b>	1. Art lure	1	2	2. Bass	1	2	3. Fly	1	2				
		1	2		1	2		1	2				

**2.4 How were you introduced to bank angling? Select one**

1. Family member	2. Friend	3. Colleague at work	4. Community or school program	5. Television program	6. DVD or video series
7. Other (specify):					

**2.5 How do you prefer to learn more about angling? Select Yes / No for each**

		Y		N		Y		N		Y		N	
1. Family member	1	2	2. Friend	1	2	3. Internet	1	2	4. Magazines	1	2		
	1	2		1	2		1	2		1	2		
5. Professional DVD series	1	2	6. Angling expo	1	2	7. Local tackle shop	1	2	8. Television programme	1	2		
	1	2		1	2		1	2		1	2		
9. Other (specify):													

**2.6 Are you a member of an angling club?**

1. Yes	2. No
--------	-------

**2.7 How often do you go fishing? (At any venue)**

1. Once a year	2. 2-5 times a year	3. Bi-monthly	4. Once a month	5. Twice a month	6. More
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**2.8 How long on average are your fishing trips?**

1. One day	2. Two days	3. 3-7 days	4. More than a week
5. Other (specify):			

**2.9 Who do you go fishing with most often? Choose one**

1. Fishing partner/friend	2. Club members	3. Family	4. Parents	5. Children	6. Alone	7. Colleagues
---------------------------	-----------------	-----------	------------	-------------	----------	---------------

**2.10 What topics are you most interested to learn about? Choose one**

1. Tackle and gear	2. Bait	3. Bait strategies	4. Feeding strategies	5. Casting techniques	6. Rigs
7. Tackle shops/Retailers	8. Tactics for different seasons	9. Fishing resorts and venues	10. Fishing and the environment	11. Competitions	12. Planning a fishing session
13. Other (specify):					

**2.11 What factors do you think strongly affect recreational bank angling?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**2.12 What do you think is the most important trend in bank angling?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Section 3**

**3.1 How much is your estimated average spending at tackle shops per trip? (Include all tackle, bait and accessories)**

R.....

**3.2 How much is your estimated average spending per trip on non-fishing items? (Include travel costs, fees, food & accommodation, etc.)**

R.....

**3.3 How often do you make angling purchases at tackle shops? (For any small item)**

1. Once a year	2. 2-5 times a year	3. Bi-monthly	4. Once a month	5. Twice a month	6. More
----------------	---------------------	---------------	-----------------	------------------	---------

**3.4 How far do you travel on average to a fishing destination? (Return trip)**

0-100 km	100-300 km	300-500 km	500-1000 km	1000+ km
1	2	3	4	5

**3.5 When purchasing any angling product, what factor/s is/are most likely to influence your final decision? Select Yes / No for each**

	Y	N		Y	N		Y	N
1. Advertisement	1	2	2. Professional endorsement	1	2	3. Price	1	2
4. Watching another angler using it successfully	1	2	5. Store assistant's recommendations	1	2	6. Seeing the product on TV or a DVD series	1	2
7. Reading magazine product reviews	1	2	8. A friend's recommendation	1	2	9. Reading good reviews on the internet	1	2
10. Other (specify):								

**3.6 What products do you spend most money on at tackle shops? Choose one**

1. Rods	2. Reels	3. Line	4. Feed	5. Dips
6. Baits	7. Camping equipment	8. Clothing	9. Magazines	10. Rig components
11. Other (specify):				

**3.7 Do you buy all bait, feed and dip products?**

1. Yes	2. No
--------	-------

If "No", which products do you prepare at home?

\_\_\_\_\_

**3.8 What feeding equipment do you use? Select Yes / No for each**

	Y	N		Y	N		Y	N		Y	N
1. Boat/canoe	1	2	2. Bait boat	1	2	3. Kettie	1	2	4. Spod rocket	1	2
5. Throwing pipe	1	2	6. Throwing pod	1	2	7. Catapult	1	2	8. Throwing by hand	1	2
9. Other (specify):											

**3.9 Did fishing in recent years in general improve or decline (Explain)?**

\_\_\_\_\_

\_\_\_\_\_

**3.10 Did your personal fishing in recent years improve or decline (Explain)?**

\_\_\_\_\_

\_\_\_\_\_

## Section 4

### 4.1 Do you annually buy a fishing licence?

1. Yes	2. No
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### 4.2 How much are you willing to pay for a national fishing licence per year?

1. R0-20	2. R20-50	3. R50-75	4. R75-100	5.>R100
----------	-----------	-----------	------------	---------

### 4.3 What should the licence fees be used for? Select Yes / No for each

1. Administration and enforcement of angling legislation		2. General environmental conservation		3. Funding of angling bodies and clubs		4. Upkeep of angling waters such as supplying security or sanitation		5. Conservation of fish stocks	
1. Yes	2. No	1. Yes	2. No	1. Yes	2. No	1. Yes	2. No	1. Yes	2. No
6. Conservation of fish habitat		7. Combating water pollution		8. Community upliftment & awareness		9. All of the above			
1. Yes	2. No	1. Yes	2. No	1. Yes	2. No	1. Yes	2. No	1. Yes	2. No
10. Other (specify):									

### 4.4 Which form of accommodation are you most likely to use on a fishing trip?

1. Day visitor	2. Camp/caravan	3. B&B/private lodge
4. Other (specify):		

### 4.5 Do you have concerns about security when planning a fishing trip?

1. Yes	2. No
--------	-------

If "Yes", how did it affect your angling habits?

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### 4.6 What do you view as the biggest challenge to the future of recreational bank angling and give possible solutions?

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Dam:  
Resort:  
Language:

## Oewerhengel Vraelys – Ontspanningshengelaars

Dankie dat u tyd afstaan om hierdie vraelys te voltooi. Die vraelys behoort nie langer as 5 minute van u tyd in beslag te neem nie. U word versoek om die geskikte blokkie onder elke vraag met 'n kruisie te merk.

Wanneer u die "Ander" opsie kies, motiveer asseblief kortliks hoekom. U identiteit bly anoniem met die invul van die vraelys en antwoorde word opgeneem in die volle statistiese verwerking. **Beantwoord asseblief Afdelings 1 tot 4 op beide kante van die vorm.**

### Afdeling 1

#### 1.1 Ouderdom

18 of jonger	18 - 21	21 - 30	31 - 40	41 - 50	51 - 60	Ouer as 60
1	2	3	4	5	6	7

#### 1.2 Geslag

1. Manlik	2. Vroulik
-----------	------------

#### 1.3 Huwelikstatus

1. Ongetroud	2. Getroud	3. Geskei	4. Wewenaar/weduwee
--------------	------------	-----------	---------------------

#### 1.4 Provinsie van verblyf

1. Noordwes	2. Gauteng	3. Vrystaat	4. Noord-Kaap	5. Limpopo
6. Oos-Kaap	7. Wes-Kaap	8. Mpumalanga	9. KwaZulu-Natal	

#### 1.5 Huistaal

1. Afrikaans	2. Engels	3. Ander (spesifiseer):
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#### 1.6 Hoeveel gesinslede is daar in u huis?

1	2	3	4	5	6	7	8	9	>9
---	---	---	---	---	---	---	---	---	----

#### 1.7 Hoeveel volwassenes in u huis is aktiewe hengelaars?

0	1	2	3	4	5	6	7	8	9	>9
---	---	---	---	---	---	---	---	---	---	----

#### 1.8 Hoeveel kinders in u huis is aktiewe hengelaars?

0	1	2	3	4	5	6	7	8	9	>9
---	---	---	---	---	---	---	---	---	---	----

#### 1.9 Wat is u hoogste kwalifikasie?

1. Minder as matriek	2. Matriek	3. Naskoolse sertifikaat	4. Diploma	5. Universiteitsgraad
6. Ander (spesifiseer):				

### 1.10 Wat is u bruto maandelikse inkomste?

<R5000	R5000 - R10000	R10000 - R15000	R15000 - R20000	R20000 - R30000	R30000+
1	2	3	4	5	6

## Afdeling 2

### 2.1 Hoe lank beoefen u al oewerhengel?

< 1 jaar	1-2 jaar	3-5 jaar	6-10 jaar	11-20 jaar	>20 jaar
1	2	3	4	5	6

### 2.2 Waarheen gaan u meestal wanneer u oewerhengel? Merk slegs een

1. Publieke damme	2. Publieke rivier-oewers	3. Privaat damme	4. Privaat rivieroewers
5. Ander (spesifiseer):			

### 2.3 Watter vorme van ontspanningshengel beoefen u? Merk Ja / Nee by elke opsie

		J	N		J	N		J	N
1. Varswater	1. Oewer	1	2	2. Match	1	2	3. Karp	1	2
2. See	1. Strand/oewer	1	2	2. Diepsee	1	2	3. LT boot	1	2
3. Kunshengel	1. Kunshengel	1	2	2. Baars	1	2	3. Vlieg	1	2

### 2.4 Hoe het u kennis gemaak met oewerhengel? Merk slegs een

1. Familielid	2. Vriend	3. Kollega	4. Gemeenskaps- of skoolprogram	5. Televisie-program	6. DVD- of video-reeks
7. Ander (spesifiseer):					

### 2.5 Hoe verkies u om meer te leer van oewerhengel? Merk Ja / Nee by elke opsie

	J	N		J	N		J	N		J	N
1. Familielid	1	2	2. Vriend	1	2	3. Internet	1	2	4. Tydskrifte	1	2
5. Professionele DVD-reeks	1	2	6. Hengel-skou	1	2	7. Plaaslike hengelwinkel	1	2	8. Televisie-program	1	2
9. Ander (spesifiseer):											

### 2.6 Is u lid van 'n hengelklub?

1. Ja	2. Nee
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### 2.7 Hoe gereeld gaan u hengel? (By enige hengelplek)

1. Een keer per jaar	2. 2-5 keer per jaar	3. Elke tweede maand	4. Een maal 'n maand	5. Twee maal 'n maand	6. Meer
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**2.8 Gemiddeld hoe lank is u hengeluitstappies?**

1. Een dag	2. Twee dae	3. 3 – 7 dae	4. Meer as 'n week
5. Ander (spesifiseer):			

**2.9 Saam met wie hengel u die meeste van die tyd? Merk slegs een**

1. Hengelmaat/ vriend	2. Klublede	3. Familie	4. Ouers	5. Kinders	6. Alleen	7. Kollegas
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**2.10 Watter onderwerpe sou u die graagste meer oor wil leer? Merk slegs een**

1. Gerei	2. Aas	3. Aasstrategie	4. Voerstrategie	5. Werp- tegniek	6. Stroppe
7. Gerei- winkels/-handelaars	8. Taktieke vir elke seisoen	9. Hengeloorde en areas	10. Hengel en die omgewing	11. Hengel- kompetisies	12. Beplanning van hengelsessies
13. Ander (spesifiseer):					

**2.11 Watter sterk invloede dink u is daar op oewerhengel?**


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**2.12 Wat dink u is die belangrikste tendens in oewerhengel?**


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**Afdeling 3****3.1 Wat is u geskatte gemiddelde uitgawe by hengelwinkels per uitstappie? (Reken alles visgerei, aas en toebehore in)**

R.....
--------

**3.2 Wat is u geskatte gemiddelde uitgawe aan nie-hengel verwante items per uitstappie? (Reken reiskoste, fooie, kos, akkommodasie, ens. in)**

R.....
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**3.3 Hoe gereeld doen u aankope by die hengelwinkel? (Vir enige kleinigheid) Slegs een**

1 .Een maal 'n jaar	2. 2-5 keer per jaar	3. Elke tweede maand	4. Een maal 'n maand	5. Twee maal 'n maand	6. Meer
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**3.4 Hoe ver reis u gemiddeld na 'n hengel bestemming? (Heen en terug) Slegs een**

0-100 km	100-300 km	300-500 km	500-1000 km	1000+ km
1	2	3	4	5

**3.5 Wanneer u enige hengelproduk aankoop, watter faktor sal u finale koopsbesluit beïnvloed? Merk Ja / Nee by elke opsie**

	J		N			J		N			J		N	
1. Advertensies	1	2			2. Professionele onderskrywing	1	2			3. Prys	1	2		
4. Sien die suksesvolle gebruik deur 'n ander hengelaar	1	2			5. Aanbevelings deur die winkel-assistent	1	2			6. Deur die produk in gebruik te sien op TV of professionele DVD's	1	2		
7. Die lees van produk oorsig artikels in tydskrifte	1	2			8. 'n Vriend se aanbeveling	1	2			9. Om goeie besprekings op die internet te lees	1	2		
10. Ander (spesifiseer):														

**3.6 Aan watter produkte in die hengelwinkel spandeer u die meeste geld? Merk een**

1. Stokke	2. Katrolle	3. Lyn	4. Voer	5. Boldip
6. Aas	7. Kampeertoerusting	8. Klere	9. Tydskrifte	10. Stropkomponente
11. Ander (spesifiseer):				

**3.7 Koop u alle aas, voer en dipprodukte?**

1. Ja	2. Nee
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Indien "Nee", watter produkte berei u self voor?

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**3.8 Watter voertoerusting gebruik u? Kies Ja / Nee by elkeen**

	J		N			J		N			J		N	
1. Boot/Kanoe	1	2			2. Aas-bootjie	1	2			3. Kettie	1	2		
5. Gooi-pyp	1	2			6. Gooi lepel	1	2			7. Slingervel	1	2		
9. Ander (spesifiseer):														

**3.9 Het hengel na u mening die afgelope jare verbeter of verswak?(Verduidelik)**

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**3.10 Het u eie hengel die afgelope verbeter of verswak? (Verduidelik)**

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## Afdeling 4

### 4.1 Koop u jaarliks 'n hengellisensie?

1. Ja	2. Nee
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### 4.2 Hoeveel is u bereid om per jaar te betaal vir 'n nasionale hengellisensie?

1. R0-20	2. R20-50	3. R50-75	4. R75-100	5. >R100
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### 4.3 Waarvoor sou u reken moet die lisensiegelde aangewend word? Merk Ja / Nee by elke opsie

1. Administrasie en afdwing van hengel =wetgewing	2. Algemene omgewings-bewaring	3. Befondsing van hengelliggame en klubs	4. Onderhoud van hengeloorde - soos vir sekuriteit en sanitasie	5. Bewaring van vissoorte
1. Ja   2. Nee	1. Ja   2. Nee	1. Ja   2. Nee	1. Ja   2. Nee	1. Ja   2. Nee
6. Bewaring van vishabitat	7. Bestryding van waterbesoedeling	8. Gemeenskaps-opheffing en bewustheid	9. Al die bogenoemde	
1. Ja   2. Nee	1. Ja   2. Nee	1. Ja   2. Nee	1. Ja   2. Nee	1. Ja   2. Nee
10. Ander (spesifiseer):				

### 4.4 Water vorm van akkommodasie is u meer geneig om te gebruik tydens 'n hengeluitstappie?

1. Dagbesoeker	2. Kamp/karavaan	3. B&B/privaat losies
4. Ander (spesifiseer):		

### 4.5 Is u bekommerd oor sekuriteit wanneer u 'n hengeluitstappie beplan?

1. Ja	2. Nee
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Indien "Ja", hoe het dit u hengelgewoontes beïnvloed?

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### 4.6 Wat sou u dink is die grootste uitdaging vir die toekoms van ontspanningshengel? Verskaf moontlike oplossings.

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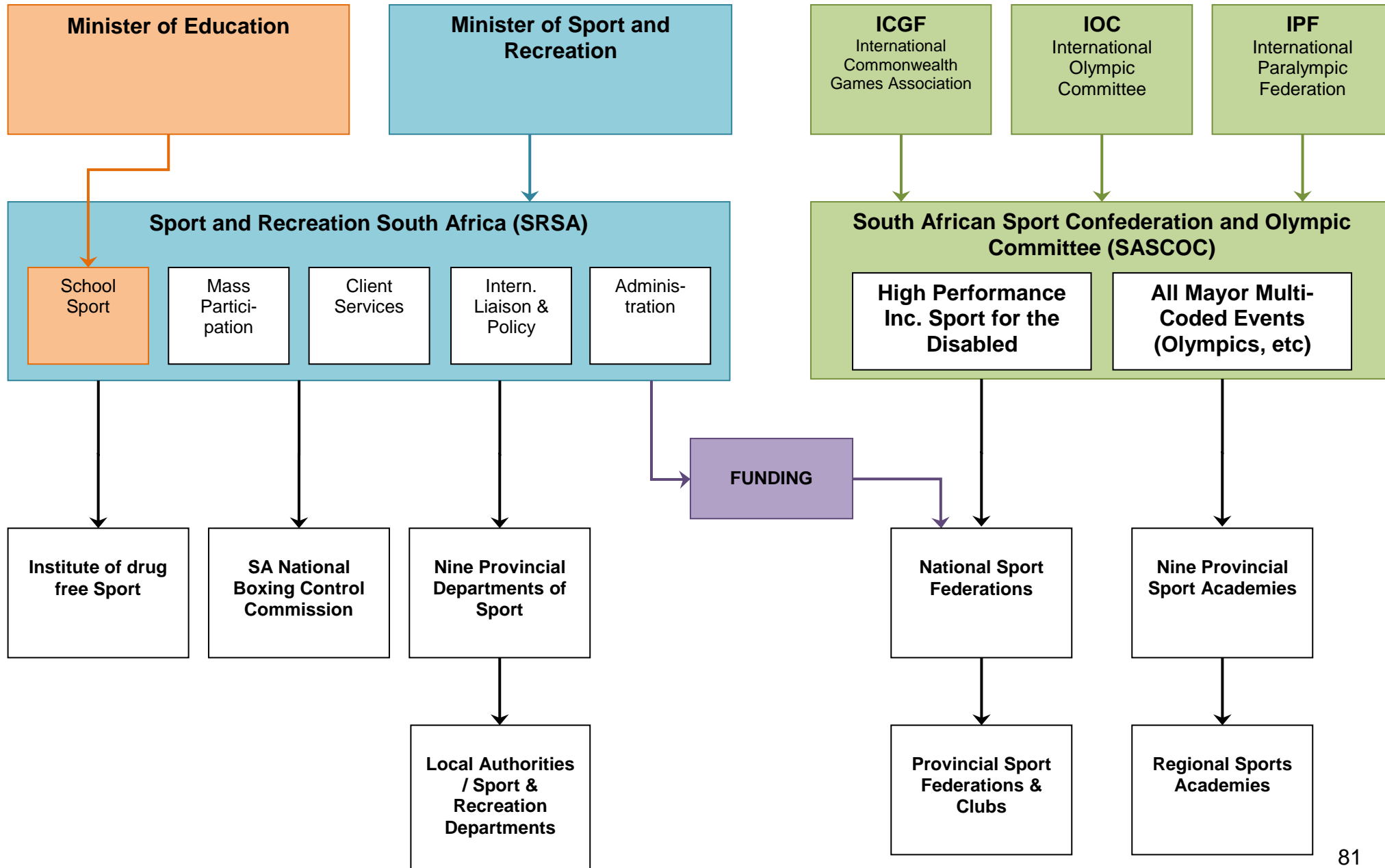
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Dam:  
Oord:  
Taal:

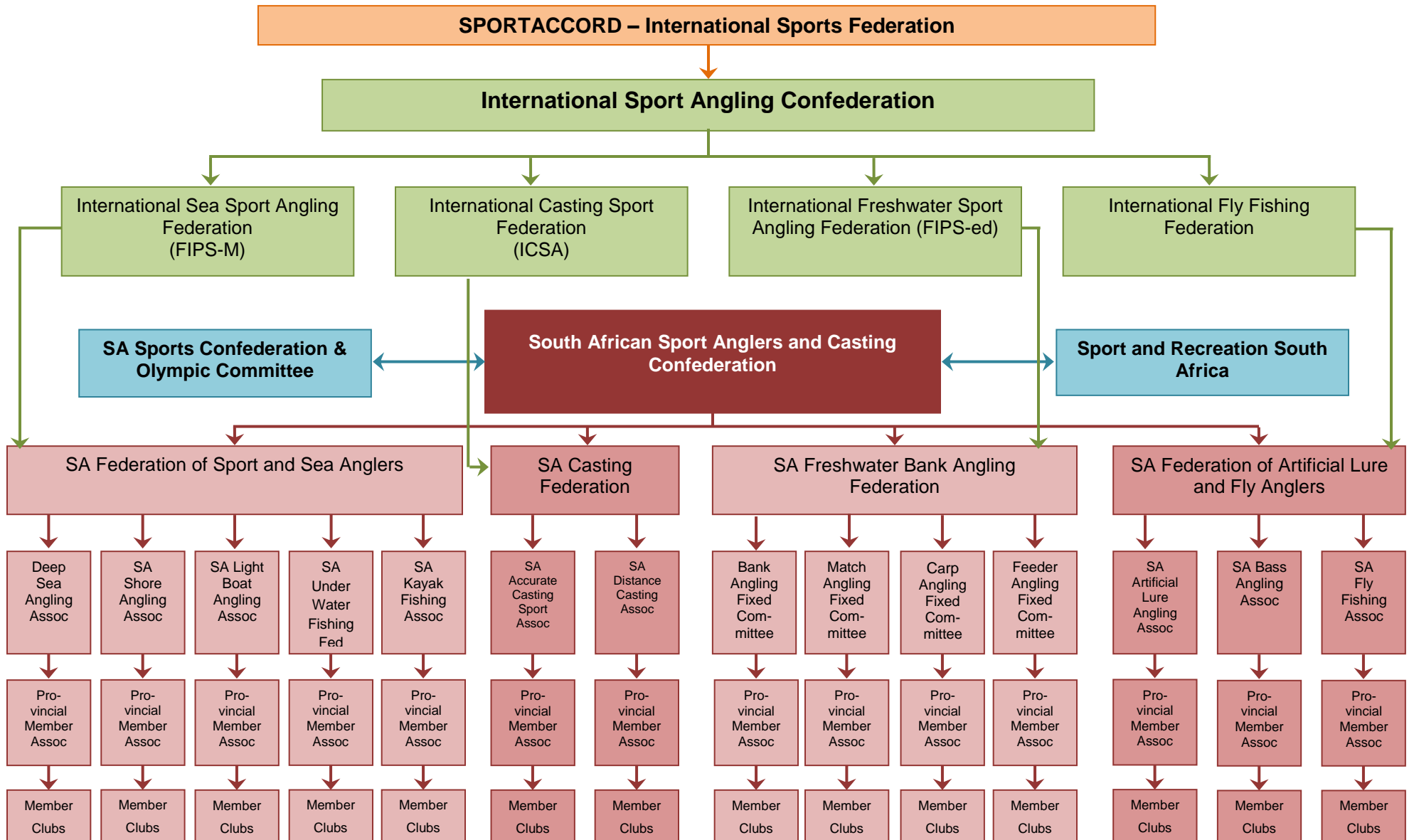
# ANNEXURE 2: ORGANISATION STRUCTURE OF SPORT IN SOUTH AFRICA

## South African sport Angling and Casting Confederation Organisation structure of Sport in South Africa



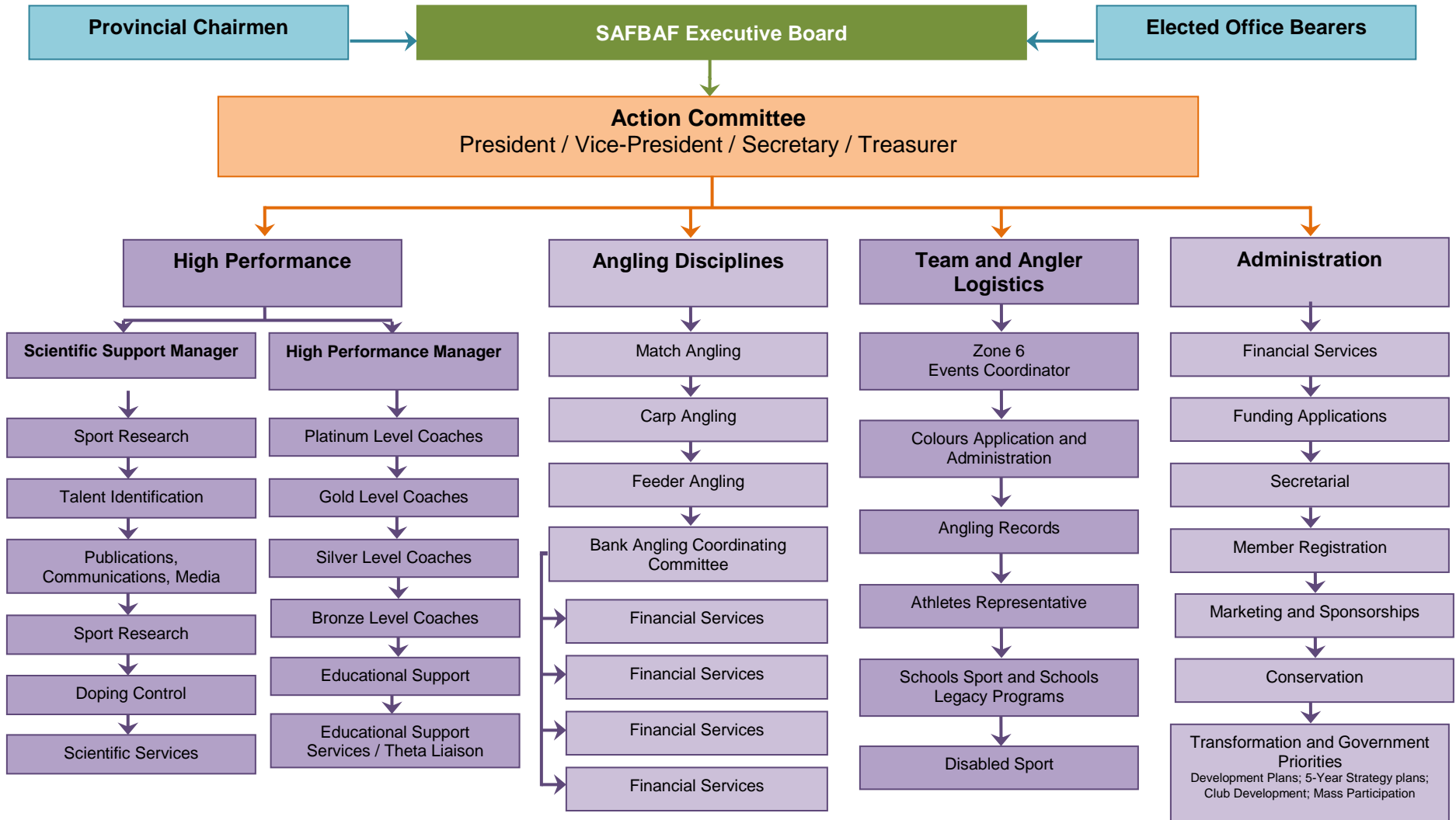
# ANNEXURE 3: ORGANISATION STRUCTURE OF ORGANISED ANGLING IN SOUTH AFRICA

## South African Sport Anglers and Casting Confederation Organisation Structure of Organised Angling in South Africa



# ANNEXURE 4: SAFBAF STRUCTURE

## SAFBAF Structure after the full implementation of the High Performance Program



## ANNEXURE 5: CROSS-TABULATIONS

### Cross-tabulation for Question 1.4 vs. Question 4.3.8:

			Q4N3N8		Total
			1	2	
Q1N4_recode	1	Count	8	17	25
		% within Q1N4_recode	32.0%	68.0%	100.0%
	2	Count	70	49	119
		% within Q1N4_recode	58.8%	41.2%	100.0%
	3	Count	1	9	10
		% within Q1N4_recode	10.0%	90.0%	100.0%
	4 Rest	Count	3	6	9
		% within Q1N4_recode	33.3%	66.7%	100.0%
Total		Count	82	81	163
		% within Q1N4_recode	50.3%	49.7%	100.0%

#### Chi-Square Tests

	Value	df	p-value
Pearson Chi-Square	14.340	3	.002
Likelihood Ratio	15.414	3	.001
Linear-by-Linear Association	.353	1	.553
N of Valid Cases	163		

#### Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.297	.002
	Cramer's V	.297	.002
N of Valid Cases		163	

### Cross-tabulation for Question 3.5.1 vs. Question 2.5.6:

			Q2N5N6		Total
			1	2	
Q3N5N1	1	Count	45	32	77
		% within Q3N5N1	58.4%	41.6%	100.0%
	2	Count	29	60	89
		% within Q3N5N1	32.6%	67.4%	100.0%
Total		Count	74	92	166
		% within Q3N5N1	44.6%	55.4%	100.0%

#### Chi-Square Tests

	Value	Df	p-value
Pearson Chi-Square	11.172	1	.001
Likelihood Ratio	11.277	1	.001
Linear-by-Linear Association	11.105	1	.001
N of Valid Cases	166		

#### Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.259	.001
	Cramer's V	.259	.001
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.1 vs. Question 2.5.7:**

			Q2N5N7		Total
			1	2	
Q3N5N1	1	Count	50	27	77
		% within Q3N5N1	64.9%	35.1%	100.0%
	2	Count	34	55	89
		% within Q3N5N1	38.2%	61.8%	100.0%
Total		Count	84	82	166
		% within Q3N5N1	50.6%	49.4%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	11.803	1	.001		
Likelihood Ratio	11.954	1	.001		
Linear-by-Linear Association	11.732	1	.001		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.267	.001
	Cramer's V	.267	.001
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.2 vs. Question 2.5.6:**

			Q2N5N6		Total
			1	2	
Q3N5N2	1	Count	36	22	58
		% within Q3N5N2	62.1%	37.9%	100.0%
	2	Count	38	70	108
		% within Q3N5N2	35.2%	64.8%	100.0%
Total		Count	74	92	166
		% within Q3N5N2	44.6%	55.4%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	11.039	1	.001		
Likelihood Ratio	11.083	1	.001		
Linear-by-Linear Association	10.972	1	.001		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.258	.001
	Cramer's V	.258	.001
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.4 vs. Question 2.5.1:**

			Q2N5N1		Total
			1	2	
Q3N5N4	1	Count	68	51	119
		% within Q3N5N4	57.1%	42.9%	100.0%
	2	Count	13	33	46
		% within Q3N5N4	28.3%	71.7%	100.0%
Total		Count	81	84	165
		% within Q3N5N4	49.1%	50.9%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	11.073	1	.001		
Likelihood Ratio	11.375	1	.001		
Linear-by-Linear Association	11.006	1	.001		
N of Valid Cases	165				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.259	.001
	Cramer's V	.259	.001
N of Valid Cases		165	

**Cross-tabulation for Question 3.5.4 vs. Question 2.5.3:**

			Q2N5N3		Total
			1	2	
Q3N5N4	1	Count	67	52	119
		% within Q3N5N4	56.3%	43.7%	100.0%
	2	Count	7	40	47
		% within Q3N5N4	14.9%	85.1%	100.0%
Total		Count	74	92	166
		% within Q3N5N4	44.6%	55.4%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	23.384	1	.000		
Likelihood Ratio	25.535	1	.000		
Linear-by-Linear Association	23.243	1	.000		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.375	.000
	Cramer's V	.375	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.4 vs. Question 2.5.4:**

			Q2N5N4		Total
			1	2	
Q3N5N4	1	Count	94	25	119
		% within Q3N5N4	79.0%	21.0%	100.0%
	2	Count	24	23	47
		% within Q3N5N4	51.1%	48.9%	100.0%
Total		Count	118	48	166
		% within Q3N5N4	71.1%	28.9%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	12.785	1	.000		
Likelihood Ratio	12.180	1	.000		
Linear-by-Linear Association	12.708	1	.000		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.278	.000
	Cramer's V	.278	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.4 vs. Question 2.5.5:**

			Q2N5N5		Total
			1	2	
Q3N5N4	1	Count	66	53	119
		% within Q3N5N4	55.5%	44.5%	100.0%
	2	Count	12	35	47
		% within Q3N5N4	25.5%	74.5%	100.0%
Total		Count	78	88	166
		% within Q3N5N4	47.0%	53.0%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	12.117	1	.000		
Likelihood Ratio	12.574	1	.000		
Linear-by-Linear Association	12.044	1	.001		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.270	.000
	Cramer's V	.270	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.4 vs. Question 2.5.6:**

			Q2N5N6		Total
			1	2	
Q3N5N4	1	Count	66	53	119
		% within Q3N5N4	55.5%	44.5%	100.0%
	2	Count	8	39	47
		% within Q3N5N4	17.0%	83.0%	100.0%
Total	Count	74	92	166	
	% within Q3N5N4	44.6%	55.4%	100.0%	

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	20.152	1	.000		
Likelihood Ratio	21.738	1	.000		
Linear-by-Linear Association	20.031	1	.000		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.348	.000
	Cramer's V	.348	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.4 vs. Question 2.5.7:**

			Q2N5N7		Total
			1	2	
Q3N5N4	1	Count	72	47	119
		% within Q3N5N4	60.5%	39.5%	100.0%
	2	Count	12	35	47
		% within Q3N5N4	25.5%	74.5%	100.0%
Total	Count	84	82	166	
	% within Q3N5N4	50.6%	49.4%	100.0%	

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	16.486	1	.000		
Likelihood Ratio	17.021	1	.000		
Linear-by-Linear Association	16.386	1	.000		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.315	.000
	Cramer's V	.315	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.6 vs. Question 2.5.3:**

			Q2N5N3		Total
			1	2	
Q3N5N6	1	Count	47	30	77
		% within Q3N5N6	61.0%	39.0%	100.0%
	2	Count	27	62	89
		% within Q3N5N6	30.3%	69.7%	100.0%
Total		Count	74	92	166
		% within Q3N5N6	44.6%	55.4%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	15.751	1	.000		
Likelihood Ratio	15.971	1	.000		
Linear-by-Linear Association	15.656	1	.000		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.308	.000
	Cramer's V	.308	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.6 vs. Question 2.5.5:**

			Q2N5N5		Total
			1	2	
Q3N5N6	1	Count	52	25	77
		% within Q3N5N6	67.5%	32.5%	100.0%
	2	Count	26	63	89
		% within Q3N5N6	29.2%	70.8%	100.0%
Total		Count	78	88	166
		% within Q3N5N6	47.0%	53.0%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	24.335	1	.000		
Likelihood Ratio	24.928	1	.000		
Linear-by-Linear Association	24.189	1	.000		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.383	.000
	Cramer's V	.383	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.6 vs. Question 2.5.6:**

			Q2N5N6		Total
			1	2	
Q3N5N6	1	Count	45	32	77
		% within Q3N5N6	58.4%	41.6%	100.0%
	2	Count	29	60	89
		% within Q3N5N6	32.6%	67.4%	100.0%
Total		Count	74	92	166
		% within Q3N5N6	44.6%	55.4%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	11.172	1	.001		
Likelihood Ratio	11.277	1	.001		
Linear-by-Linear Association	11.105	1	.001		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.259	.001
	Cramer's V	.259	.001
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.6 vs. Question 2.5.8:**

			Q2N5N8		Total
			1	2	
Q3N5N6	1	Count	61	16	77
		% within Q3N5N6	79.2%	20.8%	100.0%
	2	Count	42	47	89
		% within Q3N5N6	47.2%	52.8%	100.0%
Total		Count	103	63	166
		% within Q3N5N6	62.0%	38.0%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	17.985	1	.000		
Likelihood Ratio	18.595	1	.000		
Linear-by-Linear Association	17.877	1	.000		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.329	.000
	Cramer's V	.329	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.8 vs. Question 2.5.2:**

			Q2N5N2		Total
			1	2	
Q3N5N8	1	Count	73	39	112
		% within Q3N5N8	65.2%	34.8%	100.0%
	2	Count	19	35	54
		% within Q3N5N8	35.2%	64.8%	100.0%
Total		Count	92	74	166
		% within Q3N5N8	55.4%	44.6%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	13.266	1	.000		
Likelihood Ratio	13.343	1	.000		
Linear-by-Linear Association	13.186	1	.000		
N of Valid Cases	166				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.283	.000
	Cramer's V	.283	.000
N of Valid Cases		166	

**Cross-tabulation for Question 3.5.9 vs. Question 2.5.3:**

			Q2N5N3		Total
			1	2	
Q3N5N9	1	Count	46	10	56
		% within Q3N5N9	82.1%	17.9%	100.0%
	2	Count	26	77	103
		% within Q3N5N9	25.2%	74.8%	100.0%
Total		Count	72	87	159
		% within Q3N5N9	45.3%	54.7%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	47.402	1	.000		
Likelihood Ratio	50.064	1	.000		
Linear-by-Linear Association	47.104	1	.000		
N of Valid Cases	159				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.546	.000
	Cramer's V	.546	.000
N of Valid Cases		159	

**Cross-tabulation for Question 3.5.9 vs. Question 2.5.6:**

			Q2N5N6		Total
			1	2	
Q3N5N9	1	Count	38	18	56
		% within Q3N5N9	67.9%	32.1%	100.0%
	2	Count	33	70	103
		% within Q3N5N9	32.0%	68.0%	100.0%
Total		Count	71	88	159
		% within Q3N5N9	44.7%	55.3%	100.0%

**Chi-Square Tests**

	Value	df	p-value		
Pearson Chi-Square	18.832	1	.000		
Likelihood Ratio	19.075	1	.000		
Linear-by-Linear Association	18.713	1	.000		
N of Valid Cases	159				

**Symmetric Measures**

		Value	Approx. Sig.
Nominal by Nominal	Phi	.344	.000
	Cramer's V	.344	.000
N of Valid Cases		159	

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I hereby declare that I text-edited the mini-dissertation, *An analysis of selected stakeholder dynamics in the South African recreational freshwater angling sector*, by JJS VAN ZYL.



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