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Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks

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Definition of Terms

Balance of payments	**A systematic representation of all transactions between South Africa and the rest of the world during a particular period**
Constant prices	Valuing an economic indicator in terms of the prices prevailing in a specific base year. In this way, the effect of price increases is eliminated, allowing for comparisons in real or volume terms only
Current prices	Valuing an indicator (e.g. GDP) in terms of the prices prevailing during the period for which the indicator is estimated
Direct employment	Employment on fishing vessels and supporting activities
Fiscus	The name of the personal treasury of the emperors of Rome. A Latin word meaning 'basket', in modern-day terms it refers to the public or government chest
GDP	Gross Domestic Product. The total value of all final goods and services (value added) produced in a country in a specific period
Indirect employment	Employment in the sectors involved in the processing and marketing of fish products
Nominal value	Current prices
PDI	Previously disadvantaged individual
Real value	Constant prices
Value added	The difference between the value of goods produced and the cost of materials and supplies used in producing them. Value added comprises wages, interest, and profit components

Preamble

Following a number of meetings between Marine and Coastal Management (MCM) authority, Programme for Land and Agrarian Studies (PLAAS) and JAYMAT Enviro Solutions (JAYMAT) early in 2007, it was decided that a project on socio-economic indicators be initiated. Taking advantage of the funding framework from Norway and South Africa (NORSA), funding was made available to conduct the study over a two-year period in 2008 and 2009 (project title: 'Development of Socio-economic Indicators for Fisheries Management in South Africa'). This paper is based on a reports from this project. It is an output of objective 1 of the project which is 'To understand the socio-economic contribution of fisheries to South Africa's economy and legal, policy, and management context within which the three main South African fisheries sectors (commercial, small-scale/subsistence, and recreational) operate'. The report has been compiled through desktop review of existing publications (technical reports, accredited journal articles/book chapters and grey literature from MCM and other concerned organisations), data and information. The report also includes a review of socio-economic metadata available that could be used for fisheries management.

Introduction

The Marine Living Resources Act (No. 18, 1998) establishes as an objective the utilisation of marine living resources to achieve, inter alia 'economic growth, human resource development, capacity building within fisheries and mariculture branches, [and] employment creation'. Fisheries policy is founded on two fundamental principles: 1) that fisheries resources belong to all of South Africa's people, and 2) that these resources should be utilised on a sustainable basis so that both present and future generations may benefit from them. The Act, and subsequent amendments, permits the extension of rights to undertake commercial or subsistence fishing, engage in mariculture, or operate a fish-processing establishment.

As in most other fishery areas in the world, South Africa's management authorities face a growing need for the incorporation of socio-economic information in the management of fisheries. Social and economic contexts vary by fishery and, therefore, policy and management regimes differ among the sectors. There is a need to clearly understand the different contributions to the social and economic well-being of the fisheries so that appropriate management objectives and priorities may be developed.

Taking the above into consideration, it thus becomes obvious that managing commercial, small-scale and subsistence and recreational fishers; the environment; meeting seafood consumer expectations; and developing appropriate political responses, will require carefully planned social and economic research in addition to the more traditional biological research.

Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks

The purpose of this paper is to contribute to our understanding of the socio-economic contribution of fisheries to South Africa's economy and legal, policy, and management context within which the three main South African fisheries sectors (commercial, small-scale/subsistence, and recreational) operate'.

The review was undertaken using the current knowledge of the legal, policy, and management frameworks within the three main South African fisheries sectors (large scale, small-scale/subsistence, and recreational) as well as the available socio-economic information in South Africa and elsewhere through desktop reviews of secondary material.

The paper has been divided into the following sections:

1. An Introduction to the study and its purpose (preceding section)
2. South African Fisheries Legislative, Policy, and Management Framework
3. Socio-economic Contribution of South African Fisheries
4. Socio-economic data sources
5. Conclusions

South African fisheries legislative, policy and management framework

The Republic of South Africa's marine fisheries, as well as fishing activities by South African vessels beyond domestic waters, are governed by the Marine Living Resources Act (MLRA) No. 18 of 1998 (Republic of South Africa, 1998), amended as Marine Living Resources Amendment Act (MLRAA), No. 68 of 2000[1] (Republic of South Africa, 2000). The MLAR superseded the Sea Fisheries Act (No. 12, 1988) and Amendments (No. 98 of 1990, No. 57 of 1992, and No. 74 of 1995), even though a number of sections of the old Act remain in force, including: 1) the provision that MCM may charge a levy on fish and fish products and certain other marine resources; 2) the imposition of restrictions on the harvesting of aquatic plants and shells; 3) penalties and fines associated with the harvesting of fisheries resources; and 4) a number of other regulatory provisions.

Under the MLRA (the 'Act'), the General Regulations promulgated in Government Gazette 19025 of September 1998 operationalised the Act. Republic of South Africa Constitution Act No. 108 of 1996[2] (Republic of South Africa, 1996) defines marine resources as a national rather than provincial competence. The purpose of the MLRAA (the introduction) is stated as an 'Act to provide for the conservation of the marine ecosystem, the long-term

[1] The MLRA No. 18 of 1998 was amended by the Marine Living Resources Amendment Act 2000 (Act No. 68 of 2000) and is in the process of being revised for further amendment.
[2] Section 44(1)(a)(ii), Schedule 4 of the Constitution of the Republic of South Africa (Act No. 108 of 1996)

sustainable utilisation of marine living resources and the orderly access to exploitation, utilisation and protection of certain marine living resources; and for these purposes to provide for the exercise of control over marine living resources in a fair and equitable manner to the benefit of all the citizens of South Africa; and to provide for matters connected therewith'. Section 2 of the MLRAA outlines the Act's objectives and principles as being:

- The need to achieve optimum utilisation and ecologically sustainable development of marine living resources;

- the need to conserve marine living resources for both present and future generations;

- the need to apply precautionary approaches in respect of the management and development of marine living resources;

- the need to utilise marine living resources to achieve economic growth, human resource development, capacity building within fisheries and mariculture branches, and employment creation and sound ecological balance consistent with the development objectives of the national government;

- the need to protect the ecosystem as whole, including species which are not targeted for exploitation;

- the need to preserve marine biodiversity;

- the need to minimise marine pollution;

- the need to achieve to the extent practicable a broad and accountable participation in the decision-making processes provided for in this Act;

- any relevant obligation of the national government of the Republic in terms of any international agreement or applicable rule of international law; and

- the need to restructure the fishing industry to address historical imbalances and to achieve equity within all branches of the fishing industry

Chapter 3 of the MLRAA specifically deals with the management of marine living resources. In this context, the Minister of Environmental Affairs and Tourism (the 'Minister') determines the total allowable catch (TAC), the total applied effort (TAE), or a combination of the two, and allocates portions thereof to subsistence, recreational, local commercial and foreign fishing annually.[3] At the same time, section 24 empowers the Minister to reduce the portions of the allocated TAC or TAE for environmental, conservation or emergency reasons. The Minister can also determine and declare that the allocation for a given year shall be nil (section 14(5)). Chapter 4 of the MLRAA provides for the declaration of marine protected areas (MPAs), where fishing might be prohibited,[4] while Chapter 5 deals with prohibited fishing methods, possession of prohibited gear, interference with another person's fishing gear, use of drift nets without the Minister's approval, need for Minister's approval for the use of fishing aggregating devices and stowage of fishing gear on board foreign vessels that do not have a fishing permit while within South Africa's waters. Chapter 6 of the MLRAA is

[3] Section 14(2) of the MLRAA

[4] Section 43(2) of the MLRAA

dedicated to law enforcement and specifies the various powers of Fishery Control Officers for enforcing the MLRAA, ranging from powers to order vessels to stop for inspection, boarding and searching vessels to make examinations and enquiries as to whether any provisions of the MLRAA have been contravened, seizing property and vessels used in contravention of any provisions of the MLRAA, and arresting persons who contravene the Act. Section 50 of the same chapter (6) provides for the appointment of observers who can accompany vessels to exercise scientific, compliance, monitoring and other functions determined by the minister (section 50 (4))

The Minister may also: make regulations prescribing marine fisheries management and conservation measures (for example, minimum mesh sizes, other gear specifications, minimum takable species sizes, closed seasons, closed areas, prohibited methods of fishing or gears, and limiting entry into specific fisheries); establish MPAs and pass measures as to whether these could be no-take zones or whether some amount of fishing can be allowed; establish measures for the protection of specified species; make regulations regarding the import, export, trade in, distribution and marketing of various fish and fish products.[5]

The MLRAA confers powers on the Minister. The administration of any provision of the MLRAA and powers of the Minister (excluding powers to make regulations) may be delegated to the Director-General or an officer of the Department of Environmental Affairs and Tourism,[6] the executive authority of a province[7] (e.g. as has happened with KwaZulu-Natal), presumably as well as to other lower spheres of government (e.g. local

[5] Section 77 of the MLRAA

[6] Section 79(b) of the MLRAA

[7] Section 78 of the MLRAA

government). These include powers of granting permits (under section 13), granting of commercial fishing rights (under section 18), cancellation, revocation or suspension of fishing rights/permits (under section 28), granting and cancellation of exemptions (under section 81), and permitting experiments and scientific investigations (under section 83).

Commercial fishing

South Africa's commercial fishing comprises 19 sectors. Commercial fishing rights can be granted to South African nationals for a period not exceeding 15 years.[8] Fishing rights are 'leased' by the state and are to be understood not as 'property rights', but as 'statutory permission to harvest a marine resource for a specified period of time, at the end of which the right reverts back to the Minister (Department of Environmental Affairs and Tourism (DEAT), 2005). Since the rights are leased, the cancellation or revocation of a right does not constitute the expropriation of a property right as expounded under section 25 of the Constitution or the Expropriation Act of 1975 (ibid.). The Minister can therefore revoke, suspend, cancel or reduce the size of the right in the interest of the promotion, protection or sustainable utilisation of a particular resource.[9] Rights are awarded as a proportion of the TAC or TAE allocated to the respective right holder rather than as a fixed quantum. It also means, therefore, that allocations are adjusted in accordance with increases or decreases in the TAC or TAE (Sauer et al., 2003).

Sections 21 and 22 of the MLRAA stipulate that a right is granted to a specific person and may only be leased, divided or transferred with the Minister's approval. The General Policy on allocation of Commercial Fishing Rights

[8] Section 18(6) of the MLRAA

[9] Section 28 of the MLRAA

(DEAT, 2005) provides for the transferability of commercial fishing rights, subject to the consent of the Minister, upon the death, dissolution, liquidation or sequestration of the right holder. Transfer of rights can also be in order to promote the consolidation of the number of right holders or effort in a fishery, in order to promote economic efficiency (ibid.). The bottom line is that such transfers or consolidations should not undermine transformation, thus the requirement for permission of the Minister for any change in status of a fishing right. In order to promote orderly and legally binding transfers and/or consolidations of commercial fishing rights, DEAT is developing policy to that effect.[10]

Subsistence and limited commercial fishing

For the first time in South African history, the MLRA recognised subsistence fishers as a legitimate category of fishers (Witbooi, 2002; Harris et al., 2002; Subsistence Fisheries Task Group, 2000). Rights to undertake subsistence fishing can thus be granted to South African nationals in terms of section 18(4). In order to exercise such rights, a permit has to be obtained in terms of section 13 of the MLRA Act. Section 19 of the Act makes provision for the formal identification of fishing communities and subsistence fishers, as well as for the declaration of coastal zones for the exclusive use by subsistence fishers. Despite the foregoing, only a few subsistence fishing rights had been issued by the end of 2004, with the government preferring to grant exemptions under section 81 of the MLRAA (Sowman, 2006; Witbooi, 2006). Also, no exclusive subsistence fishing areas have been established (Sowman, 2006). The lack of clarity regarding rights allocation procedures and the government's reluctance to issue subsistence fishing rights caused frustration among fishers, resulting in an increase in illegal fishing (Isaacs, 2006)

[10] Government Gazette No. 30574 (Draft Policy for the Transfer of Commercial Fishing Rights: December 2007)

Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks

Following recommendations of the Subsistence Fisheries Task Group in 2000 (Subsistence Fisheries Task Group, 2000) a 'limited' commercial fishing sector was recognised by means of regulations as a new subcategory within the commercial sector to accommodate artisanal fishers who fish for sale rather than subsistence (Witbooi, 2006). From 2001, limited commercial rights are awarded to small-scale commercial fishers

In 2005, the Department appointed consultants (JAYMAT Enviro Solutions) to draft a new Subsistence Fisheries Policy. Although a draft policy on Subsistence and Small-scale Fisheries Policy was submitted by the consultants after eighteen months following public comments, [11] there was dissatisfaction from civil society about the draft Policy and perceived inadequate consultation during the drafting process. A Small-scale Fisheries National Summit was held in Port Elizabeth from 1 to 2 November 2007 to kick-start a consultative drafting process. Following the summit a National Joint Task Team comprised of representatives from all stakeholders[12] was elected to facilitate the process of developing a new Small-scale Fisheries Policy. Of note is the suggestion to drop the term/category 'subsistence' from legislation and instead use the term 'Small-scale Fisheries' that would cover all the categories that are conventionally[13] referred to as 'subsistence', 'traditional' or 'artisanal'. It is suggested that the new Small-scale Fisheries Policy should be guided by the following objectives: [14]

[11] http://www.deat.gov.za/Branches/MarineCoastal/AreasWork/subsistencefishing

[12] The task team comprises representatives from National Government, Provincial Governments, fishing communities in each of the four coastal provinces, Artisanal Fishers Association, Masifundise and Coastal Links, South African United Fishers Front, Fishers Engine of South Africa, and the West Coast Rock Lobster Association.

[13] www.oceansatlas.org/worldfisheries and aquaculture/html/tech/capture/typesoffi/small_scale.htm

[14] Masifundise and Coastal Links. 2008. Policy inputs for the development of the new Small-scale Fisheries Policy for the near-shore in South Africa. Cape Town.

- To give formal, legal recognition and protection to all traditional small-scale fishers of South Africa
- To ensure social and economic sustainability of the small-scale fishing sector
- To protect traditional livelihoods and enhance the food security and social development of the small-scale fishing sector
- To ensure environmental sustainability of the Marine and Coastal environments
- To ensure fishers' participation in policy development and resource management
- The National Summit agreed that MCM and the Task Team should ensure that a draft Small-scale Fisheries Policy had to be finalised by 31 March 2008 for public comments. As of August 2008, the draft policy had not been finalised for public comments

Recreational fishing

An estimated one million women, men and children (above the age of 12) fish recreationally, mainly for lobster, linefish or a host of other species in South Africa.[15] Recreational fishing is regulated through a permit system. Permits can be bought at the Post Office. Recreational fishers are limited to bag limits of fish per day. In addition, recreational fishing is limited to certain times of the fishing season. To protect stocks during breeding periods, certain areas have been declared closed areas. Recreational fishing

[15] http://www.deat.gov.za/areas of work/recreational fishing

permits are not transferable, and furthermore fish caught under a recreational fishing permit may not be sold, bartered or traded.[16] The Department has published a Recreational Fishing pamphlet which gives guidance on the number and species of fish that a permit holder may catch and where [and where and when?] the fish may be caught (DEAT, 2007). The pamphlets are available from any Marine and Coastal Management Fishery Control Office, Post Office or from the Customer Services Centre.

Fisheries management

For management purposes, South Africa uses six main types of management controls, namely TACs, TAE (i.e. limiting the number of individuals or vessels), indirect measures comprising seasonal closures and closed areas (particularly MPAs), and gear mesh size and gear size restrictions (Branch and Clark, 2006). The Chief Directorate: Fisheries and Coastal Management is primarily responsible for execution of the management function through the administration of fishing rights, permits, exemptions and licenses.

The Chief Directorate: Fisheries and Coastal Compliance is responsible for compliance with fisheries laws. In order to improve performance of its functions, the Directorate had been restructured and re-equipped since 1999. This involved several actions, as follows: a specialised investigation unit had been established to focus on serious crimes and offences; the Hermanus Environmental Court,[17] primarily to try abalone-related offences, was put in place; state-of–the-art inshore and offshore environmental patrol vessels had been purchased and commissioned; vessel monitoring systems had been developed and commissioned; observer programmes had been instituted; regional and international cooperation had been fostered to improve

[16] Section 20 of the MLRAA

[17] The court has since been closed down.

surveillance and law enforcement; public education programmes had been formulated and implemented; formal and informal partnerships between the Department of Environmental Affairs and Tourism's: branch Marine and Coastal Management (DEAT:MCM) and other government departments had been introduced to conduct joint investigations and implement special operations; and steps had been taken to tackle corruption within MCM (Hauck and Kroese, 2006). MCM has also attempted to provide incentives for voluntary compliance through creating a greater sense of ownership of marine resources and legitimacy of management among fishers through initiatives such as co-management (Hauck and Sowman, 2003), and delegation of management authority to provincial or local government levels (Hauck and Kroese, 2006). In addition, section 8(1) of the MLRAA provides for recognition of industrial bodies or interest groups representing rights holders. In this context Management Working Groups and Scientific Working Groups have been established in most commercial fishing sectors. These provide fora between DEAT:MCM and associations and groups representing rights holders and interest groups. The main purpose of Management Working Groups is to make management recommendations, including sectoral management plans, permit conditions, closed seasons, restricted areas, compliance and vessel restrictions (DEAT, 2005). The Department also expects to share biological and scientific research obligations with other stakeholders within the Scientific Working Groups.

From 2002 to 2005, 4-year medium-term commercial fishing rights were granted while long-term commercial fishing rights were granted for periods of 8 up to 15 years in the various sectors from 2006.[18] The General Policy (DEAT, 2005) outlined five core principles that guided the allocation of

[18] Exception was made for Oysters and White Mussels where rights would continue to be granted annually as these fisheries were still in the early stages of development and therefore required close monitoring (DEAT, 2005).

commercial fishing rights, which also gave effect and complemented the objectives of the MLRAA under section 2. These were: transformation, biological considerations, ecological considerations, socio-economic considerations, economic efficiency considerations and performance under medium-term rights and potential to perform under long-term rights.

Coastal management

With respect to coastal management, the provisions of the MLRAA are complemented by the White Paper for Sustainable Coastal Development in South Africa (DEAT, 2000), which applies to coastal waters as well as the coastline and coastlands, and 'aims to achieve sustainable coastal development through a dedicated and integrated coastal management approach (ibid.). Although the White Paper is an influential national policy document, it is yet to be promulgated into legislation (Witbooi, 2006) though the bill (the Integrated Coastal Management Bill[19]) is currently in Parliament. It has been adopted by the National Assembly and is currently (August 2008) before the National Council of Provinces who are still deliberating on it. Regarding the various species, coastal management actions comprise TACs; limiting TAE; closed seasons and seasonal restrictions; closed areas; area restrictions and reserves; gear restrictions such as minimum mesh sizes; bag and size limitations; restrictions not to land females in berry; logbook record requirements; and monitoring and inspection of landings.[20] The Minister is committed to declaring 20 per cent of the coastline into Marine Protected Areas (DEAT, 2005), as per agreement at the World Parks Congress of 2004 held in Durban that stipulated that countries must protect at least 20 per cent of their marine area from fishing

[19] http://www.environment.gov.za/docs/Document

[20] FAO, 'Information on Fisheries Management in the Republic of South Africa', available online at http://www.fao.org/fi/fcp/en/ZAF/body.htm (2001)

by 2015. Following the promulgation of the MLRA, Marine Protected Areas have expanded to 9.1 per cent of the coastline as no-take zones, and 12.3 per cent as limited-take MPAs.[21]

Other related legislation

A number of legislation and policies apply to the management of marine living resources, as summarised below:

The National Environmental Management Act (NEMA). 1998. This Act aims to provide for cooperative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for coordinating environmental functions exercised by organs of state, etc.

White Paper for Sustainable Coastal Development in South Africa. DEAT, 2000. This applies to coastal waters as well as the coastline and coastlands, and 'aims to achieve sustainable coastal development through a dedicated and integrated coastal management approach'. Although the White Paper is an influential national policy document, it is yet to be promulgated into legislation though the bill that will turn it into law (the **Integrated Coastal Management Bill**) is currently in Parliament.

The Biodiversity Act. 2004. To provide within the framework of the National Environmental Act, 1998, for the management and conservation of South Africa's biodiversity, the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting of

[21] http://www.incofish.org/countryprofile/southAfrica

genetic material derived from indigenous biological resources, and for the establishment and functions of a South African National Biodiversity Institute.

Regional fisheries bodies and international agreements

South Africa is a member of several regional fisheries management organisations whose objective is the management and conservation of shared fish stocks. These are:

- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR);
- Commission for the Conservation of Southern Bluefin Tunas (CCSBT);
- International Commission for the Conservation of Atlantic Tunas (ICCAT);
- Indian Ocean Tuna Commission (IOTC);
- South Atlantic Fisheries Organisation (SAFO);
- Southwest Indian Ocean Fisheries Commission (SWIOFC); and
- International Whaling Commission (IWC).

Socio-economic contribution of South African fisheries

The focus of this section of the paper is an assessment of the economic aspects related to the various components of marine resources as highlighted by the Acts, namely: contribution of fisheries to economic output, skills development and employment, and the impact of fines and penalties. Illegal, unregulated and unreported (IUU) fishing has also received

much attention in the literature lately, and the economic impact of this is also reviewed. Other socio-economic indicators are also assessed, such as commodity trade growth and food security.

Contribution of South African fisheries

Domestic input

The share of agriculture, forestry and fishing in the coastal economies has historically been fairly low, ranging between 3 and 6 per cent in 1995 (Table 1). Its contribution fell in the Eastern Cape, Western Cape and KwaZulu-Natal between 1995 and 2005, but grew in the Northern Cape. In spite of this low contribution to provincial GDP, coastal primary sector production (excluding mining) is nonetheless an important contributor to the overall primary sector economy (excluding mining), with a share of just over 60 per cent in 2005 (Table 1). In addition, the coastal economies are an important backbone of the national GDP, contributing just over 41 per cent of GDP in 2005. This contribution has remained fairly stable between 1995 and 2005.

Table 1 : Contribution of the coastal economy to GDP

Province	Percentage	
	1995	2005
Share of the primary sector (excluding mining) in provincial GDP		
Western Cape	6.0	3.8
Eastern Cape	3.1	1.7
Northern Cape	5.3	6.9
KwaZulu-Natal	5.7	3.9
Total share of primary sector (excluding mining) in coastal economies	**5.3**	**3.6**
Share of coastal to national primary sector GDP (excluding mining)	**63.1**	**60.4**
Share of coastal economies in national GDP		
Western Cape	14.6	14.7
Eastern Cape	8.3	7.9
Northern Cape	2.3	2.2
KwaZulu-Natal	16.8	16.3
Total	**41.9**	**41.1**

Source: Based on Stats SA, 2006.

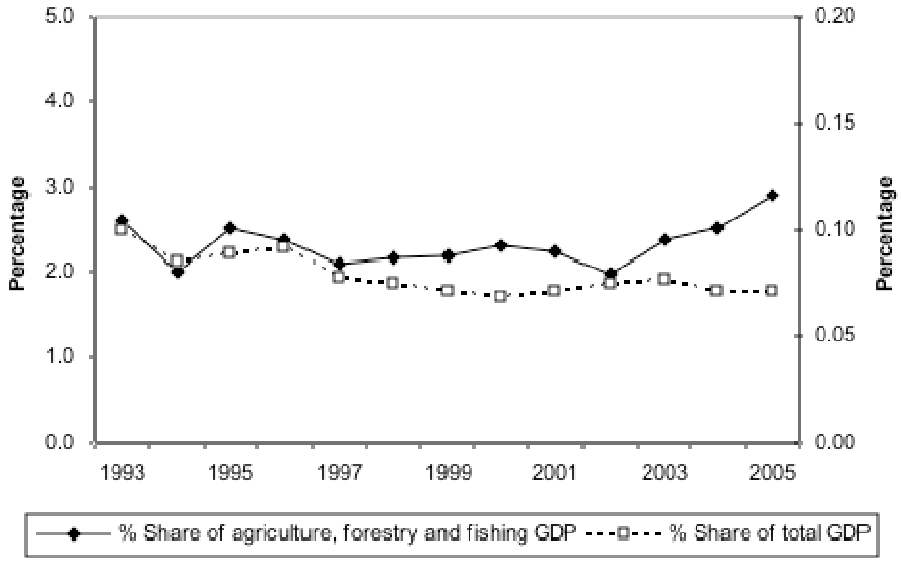
In 2005 the primary sector component of fishing contributed just over R1 billion to the South African economy in current prices (see Appendix A.1). This is approximately 3 per cent of non-mining primary sector GDP and 5 per cent of the coastal economies GDP. Although the contribution of fishing to the national economy fell from about 0.1 per cent to 0.07 per cent between 1993 and 2005 (Figure 1), the contribution of fishing to non-mining primary sector GDP has remained fairly stable and has in fact grown between 2002 and 2005.

The fishing industry experienced negative growth in real terms between 1994 and 1999, but recovered between 2000 and 2005 to show positive growth. Growth rates in the fishing sector steadily improved between 1997 and 2003.

While fishing's share of primary sector GDP (excluding mining) has improved, this is on the back of poor performance in the agricultural sector in general in recent years. Agriculture, forestry and fishing GDP has actually declined in

nominal terms between 2002 and 2005 (Figure 2), but in real terms this trend is actually reversed, with steady growth in the sector between 1996 and 2005 (Figure 3). In 2006 agriculture, forestry and fishing value added declined in real terms by nearly 8 per cent (latest Reserve Bank figures). This was mainly due to declines in production of field crops. The sector has recovered slightly in 2007, measuring a real growth of 0.3 per cent.

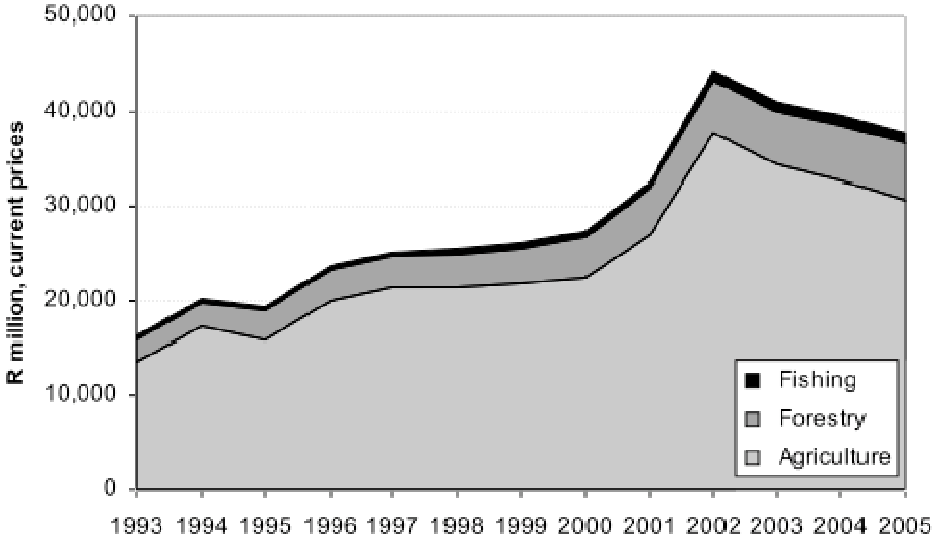
Figure 1 : Contribution of the fishing industry to GDP



The left-hand axis contains the scale for share of agriculture, forestry and fishing GDP, and the right-hand axis the scale for share of total GDP.

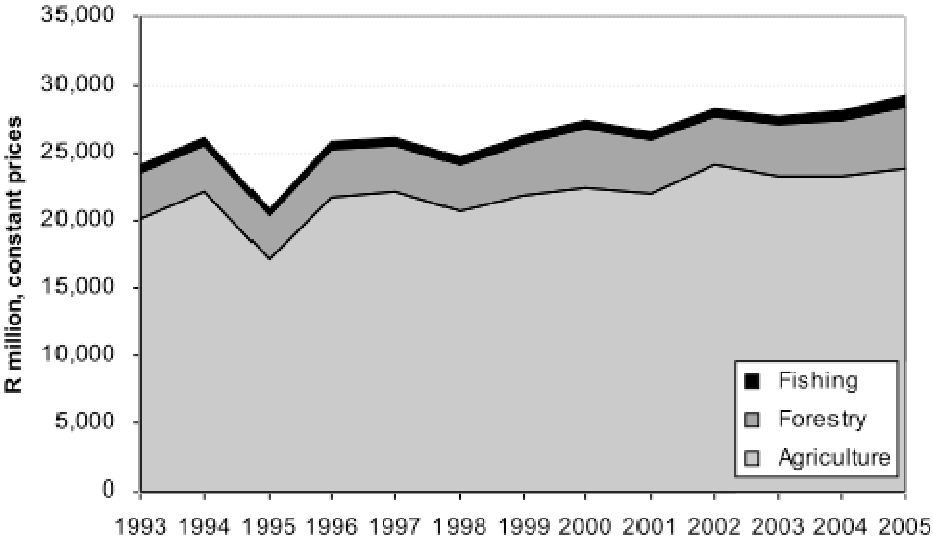
Source: Based on Stats SA, 2006.

Figure 2 : GDP by primary sector activity (excluding mining), 1993 - 2005, current 2000 prices



Source: Based on Stats SA, 2006.

Figure 3 : GDP by primary sector activity (excluding mining), 1993 - 2005, constant prices



Source: Based on Stats SA, 2006.

Provincial profile

Northern Cape

Many fish species such as hake, snoek, pilchards and anchovies are caught in fishing waters off the Northern Cape, but the bulk of these are landed in Western Cape fishing harbours (NCPG, 2004). As a result, less than 1 per cent of South Africa's TAC is landed in the Northern Cape. The main reasons for this include lack of local infrastructure, distance to market, and the relative low volumes of landings making substantial capital investments in processing industries not viable.

West Coast rock lobster, although a high value export commodity, has not been fully exploited in the Northern Cape. The TAC allocated to the Northern Cape has only been fully landed twice in a ten-year period.

Western Cape

It has been estimated that the Western Cape accounts for almost 90 per cent of the South African fishing industry (Karaan and Rossouw, 2004). Furthermore, 95 per cent of deep-sea and inshore hake, South Africa's most important commercial species, are landed in the Western Cape. Fish and seafood products comprised almost 6 per cent of total exports in the Western Cape (Table 2).

Table 2 : Major Western Cape fishing exports, 2007

Products	Export value (R million)	Share of fish exports	Main trading partner
Other fish fillets	591.3	21.3%	Australia
Fish fresh or chilled, whole	339.6	12.2%	Spain
Rock lobster and other sea crayfish, not frozen	278.3	10.0%	Hong Kong
Rock lobster and other sea crayfish, frozen	249.1	9.0%	United States
Cuttlefish and squid, frozen, dried, salted or in brine	224.3	8.1%	Spain
Other fishing exports	1093.9	39.4%	
Total Fish and Seafood Exports	**2 776.5**	**100.0%**	**Spain**
Total WC Exports	**47 987.6**	**5.8%**	**United Kingdom**

Source: Wesgro, personal communication, 2008

Fish and seafood exports, while growing at just under 3 per cent per annum over the past five years (Table 3), have not kept pace with the overall growth in exports in the Western Cape, which has been growing at 7.45 per cent per annum. The share of fishing in total Western Cape exports has therefore declined. More than 60 per cent of fishing exports in the Western Cape are derived from the top five products (by HS code, Table 2).

Table 3 : Fast growing Western Cape exports

Products	Export value (R million)	Annual Growth (2003–2007)	Leading market
Crustaceans prepared or preserved	6.5	518.37%	Hong Kong
Fish, fresh or chilled – tunas, skipjack or stripe-bellied bonito	6.3	199.30%	United States
Fish livers and roes, fresh or chilled	2.7	150.62%	Japan
Mackerel, fresh or chilled, whole	2.5	68.91%	Japan
Octopus, frozen, dried, salted or in brine	9.2	61.37%	Italy
Total Fish and Seafood Exports		**2.84%**	
Total Exports		**7.45%**	

Source: Wesgro, personal communication, 2008

Main exports include fish fillets and lobster products. Sectors that have shown the most growth over the past five years include crustaceans, tuna, skipjack, bonito, mackerel and octopus (Table 3). European countries, most

notably Spain, are the Western Cape's main export market for fish products, while the United States is the leading market for lobster products. South East Asian countries are the markets where most of the strongest export growth has been experienced in the past five years.

Eastern Cape

There are approximately 39 species of marine resources harvested along the inshore region of the Eastern Cape. A study of the utilisation of marine resources in the Eastern Cape (Britz et al., 2001) found that most of the resources in the inshore and estuarine zones were heavily utilised and that there was limited potential for further expansion. Marine resources in these environments are mainly exploited by recreational and subsistence fishers. The commercial exploitation of marine resources in the Eastern Cape is dominated by the squid fishery, which produced more than half the total value of commercially exploited species in 1998 (Table 4). Eighty-six per cent of all landings from this fishery occurs in the Eastern Cape. Pelagics such as anchovy, pilchard and various bait species are also commercially important. Approximately a third of south coast rock lobster are also landed in the Eastern Cape.

Table 4 : Total landed value of commercial fishing in the Eastern Cape province, 1998

Species	% of SA catch	Value (Rands million)
Squid	86.0	109.2
Hake	7.08	2.2
Long-line hake	23.0	10.0
Sole	4.12	0.4
Horse mackerel	7.82	2.3
Pelagic species		
Anchovy	11.4	
Pilchard	11.8	
Bait A	32.1	
Bait B	10.0	
Total value pelagics		57.0
South coast rock lobster	30.74	15.9
Abalone (legal)	0.4	0.6
Commercial linefish	16.3	2.7
TOTAL VALUE		**200.3**

Source: Britz et al., 2001

Most of the Eastern Cape coastline is not well suited to mariculture due to high exposure to wave action and sandy beaches which make pump ashore aquaculture unfeasible. However, Nelson Mandela Bay and several estuaries are feasible for mariculture. Oyster and abalone production are the major growth industries.

Kwa-Zulu Natal

Although the proportion of landed catch originating from commercial fisheries in this province is low, line fishing by recreational anglers is substantial. Recently, marine and coastal management, along with KZN wildlife, adopted measures to formalise subsistence fishing in this province. In 2006 the total catch of the KwaZulu-Natal prawn fishery was about 275 tonnes (Fishing Industry Handbook, 2007). The fishery consists of

approximately 20 per cent target species, 10 per cent retained by-catch, and 70 per cent discarded by-catch (DEAT, 2005).

Food Security

The volatility in the domestic cereal production is cause for concern. For example, the WRI reports that South Africa had a variation in cereal production between 1992 and 2001 of 24.2 per cent. This is compared with an average of 6.5 per cent for sub-Saharan Africa and 3.5 per cent for the World (Earthtrends, 2003). South Africa is highly dependent on cereal crops for food production: more than 50 per cent of calories and proteins are derived from this source (Table 5).

Table 5 : Food balance sheet for South Africa, 2003

	Food/capita/ year (kg)	%	Calories/capita/ day	Proteins/capita/ day (g)	Fat/capita/ day (g)
			As percentage of total		
Cereals (excluding beer)	182.68	36.6	53.0	53.1	14.1
Other vegetal products	255	51.0	34.0	10.8	51.1
Animal products (excluding fish)	54.62	10.9	12.5	33.2	34.1
Fish, freshwater	0.08	0.0	0.0	0.0	0.0
Fish, seafood	7.42	1.5	0.5	2.9	0.7
Total		**100.0**	**100.0**	**100.0**	**100.0**
			As percentage of total seafood		
Demersal fish	1.53	20.6	10.7	13.9	5.5
Pelagic fish	5.19	69.9	84.4	80.3	92.7
Marine fish, other	0.09	1.2	1.3	1.4	1.8
Crustaceans	0.13	1.8	1.1	1.3	0.0
Cephalopods	0.12	1.6	1.7	2.2	0.0
Molluscs, other	0.36	4.9	0.8	0.9	0.0
Total		**100.0**	**100.0**	**100.0**	**100.0**

Source: Based on FAOSTAT, 2008

On average only 7.42 kg of fish is consumed locally per person in a year (or 20 g per person per day). In spite of this, seafood has a much higher relative contribution to protein consumed, amounting to almost 3 per cent in 2003. Marine fish has a proportionately lower share of fat compared with other animal and vegetal products. Pelagic fish are the most important fish species consumed in the local market, accounting for more than 80 per cent of the protein and a higher proportion of the calories.protein and a higher proportion of the calories.

Employment

Total employment in the fishing sector has been estimated in the Rhodes University Economic and Sectoral Study at almost 28 000 (Table 6). This includes direct employment on fishing vessels of just under 17 000 and indirect employment in the processing industry of almost 11 000. Both the primary and secondary sectors both have strong representation from previously disadvantaged individuals (PDIs), but this is highest in the processing sector, which at the time of the study was estimated at 95 per cent. The Western Cape employs the majority of fishing workers: 71 per cent of the employment and 72 per cent of the income originates from this province (Table 7).

Table 6 : Employment and earnings in the fishing industry

	Quantity	Percentage black
Direct employment, number	16 854	85.1
Indirect employment, number	10 876	95.2
Total employment, number	**27 730**	**89.1**
Direct earnings, R million	644.3	75
Indirect earnings, R million	348.1	87.2
Total earnings, R million	**992.4**	**79.5**

Source: Based on FAOSTAT, 2008

Table 7 : Share of income and employment in the fishing industry

Region	% Income	% Employment	Average income
Northern Cape	0.5%	0.8%	R21 517
Western Cape	71.8%	71.0%	R35 473
Eastern Cape	11.0%	11.6%	R33 095
KwaZulu-Natal	1.9%	1.9%	R35 762
Unspecified	14.8%	14.7%	R35 193
TOTAL FISHING INDUSTRY	100.0%	100.0%	R35 227

Source: Based on FAOSTAT, 2008

Eastern Cape is the next highest with 12 per cent of the employment and 11 per cent of the income. Average earnings from fishing are highest in KwaZulu-Natal and lowest in the Northern Cape.

The skills levels in the fishing industry are higher than many primary sector jobs. The majority of those employed in the primary sector (including onshore support) are in the skilled or semi-skilled category, with almost 21 per cent of those falling into this sector skilled and 71 per cent semi-skilled (Table 8). In the secondary and tertiary sector, the majority of those employed are semi-skilled (68.5 per cent) or unskilled (22 per cent). In all groupings in both the primary and secondary sectors, the majority of those employed are black, with the exception of the professional/managerial grouping, where a slightly higher percentage employed in the secondary sector are white.

Table 8 : Skills level

		Primary	%	Secondary	%
Professional/managerial	Black	218	1.3	160	1.5
	White	200	1.2	184	1.7
	TOTAL	**418**	**2.5**	**344**	**3.2**
Skilled	Black	2 279	13.5	193	1.8
	White	1 237	7.3	91	0.8
	TOTAL	**3 516**	**20.9**	**284**	**2.6**
Middle services	Black	155	0.9	328	3.0
	White	92	0.5	97	0.9
	TOTAL	**247**	**1.5**	**425**	**3.9**
Semi-skilled	Black	11 068	65.7	7331	67.4
	White	954	5.7	115	1.1
	TOTAL	**12 022**	**71.3**	**7 446**	**68.5**
Unskilled	Black	624	3.7	2343	21.5
	White	26	0.2	34	0.3
	TOTAL	**650**	**3.9**	**2 377**	**21.9**

Source: Based on FAOSTAT, 2008

Balance of trade

The top five fish importers account for more than 50 per cent of total imports (Table 9). Japan and the USA on their own import at least 30 per cent of total fishery imports. South Africa ranks 46th in terms of imports, and 37th in terms of exports. Exports from South Africa are less than 1 per cent of the total world exports, by value.

Between 1990 and 2002 South Africa's fishery export volumes grew by almost 9 per cent per annum, both in terms of quantity and value (Table 10). At the same time, overall import quantities declined by almost 14 per cent. However, between 2002 and 2006 this trend was reversed. Imports quantities grew on average by 16.4 per cent per annum, and in value terms this was much higher. This recent growth in imports partially reflects increased popularity of fish products, as well as the increasingly short supply of traditional fish products such as hake and linefish on domestic markets. In

spite of this trend, exports are still more than double imports, both in value terms as well as by quantity (Table 10).

Table 9 : Share of world trade in fishery commodoties by value, 2005

Imports			Exports		
Rank	**Country**	**% of world**	**Rank**	**Country**	**% of world**
1	Japan	17.7	1	China	9.6
2	USA	14.7	2	Norway	6.2
3	Spain	6.9	3	Thailand	5.7
4	France	5.6	4	USA	5.4
5	Italy	5.2	5	Denmark	4.7
	Top five	**50.1**		**Top five**	**31.6**
46	South Africa	0.2	37	South Africa	0.6

Source: FAOSTAT, 2008

Table 10 : South African fish trade statistics, 1990 and 2006

	1990	2006	% Change 1990-2002	% Change 2002-2006
Export Quantity, tonnes	60,362	142,551	8.9	-4.1
Export Value, Thousand US dollars[1]	117,393	406,069	8.8	6.0
Import Quantity, tonnes	212,240	64,854	-13.9	16.4
Import Value, Thousand US dollars[1]	130,815	152,952	-7.8	32.7
Ratio exports to import quantity (Percent)	28.4	219.8	26.5	-17.6
Ratio exports to import value (Percent)	89.7	265.5	18.0	-20.1

[1] The rand/dollar exchange rate was 6.77 in 2006 and 2.58 in 1990, according to the IMF.

Source: Based on FAO Fish stat plus

Impact on the Fiscus

In the 2006/7 financial year, MCM received a total of around R185 million from non-governmental sources. This comprised application and harbour fees (3.2 per cent), levies on fish products (29.5 per cent), licences and permits (17.2 per cent), fines and confiscations (32.2 per cent), and other sources of funds including donor funds (17.9 per cent). In the same financial year the taxpayer (via the Department of Environmental Affairs and Tourism) contributed around R325 million to Marine and Coastal Management. Approximately half of this was the provision of financial assistance to the Marine Living Resources Fund and the other half was through other transfers, for example remuneration of employees administering the fund and financial assistance to the Antarctic programme. The net tax liability of the Department was therefore in the order of R140 million in 2006/7. This was up from around R115 million in the 2005/6 financial year, a 22 per cent change year on year.

Comparisons with other countries

Namibia

Namibia's fisheries are primarily managed through the setting of a total allowable catch (TAC), and the allocation of quotas to rights holders. This is supplemented by controls on by-catch species, as well as gear restrictions and fishing areas. Production fell by 9 per cent between 2005 and 2006 (Table 11). The decline was largely due to reductions in the TAC for hake and horse mackerel as well as contractions in the pelagic fishery. Even with the fall in production, fishing's contribution to GDP, at 6.5 per cent in 2004, is substantially higher than South Africa's share. In 2004, 51 per cent of fishing value added was attributable to Namibia, compared with 33 per cent for

South Africa and only 16 per cent to Mozambique (Figure 4). Namibia has increased its share in fisheries value added since 1998. The fishing industry employs 14 000 people on vessels, and indirectly in the processing factories. The Namibianisation policy appears to be successful, with 65 per cent of workers deployed on vessels originating from that country.

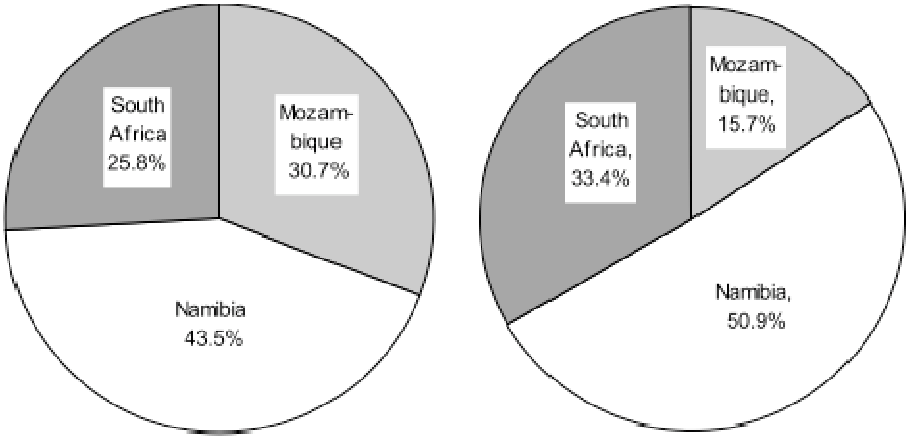
Table 11 : Key fishery economic indicators, Nambia

	Amount
Fishery production (2006, tonnes)	504 382
Percentage change, 2005–2006	-9.0
Contribution to GDP, 2004	6.5%
Contribution to GDP, 2003	7.8%
Direct employment	7 350
Indirect employment	6 650

Source: Fishing industry handbook, 2007

Mariculture is still relatively modest in Namibia. Commercial mariculture is mainly based around oyster production, with six firms employing 85 people in total. Oyster production is estimated at 600 tonnes per annum, worth N$12 million. Seaweed and abalone are also cultivated, employing 50 and 15 people respectively.

Figure 4 : Share of fishing value added, 1998 - 2004



Source: Based on United Nations Statistics Division, 2008

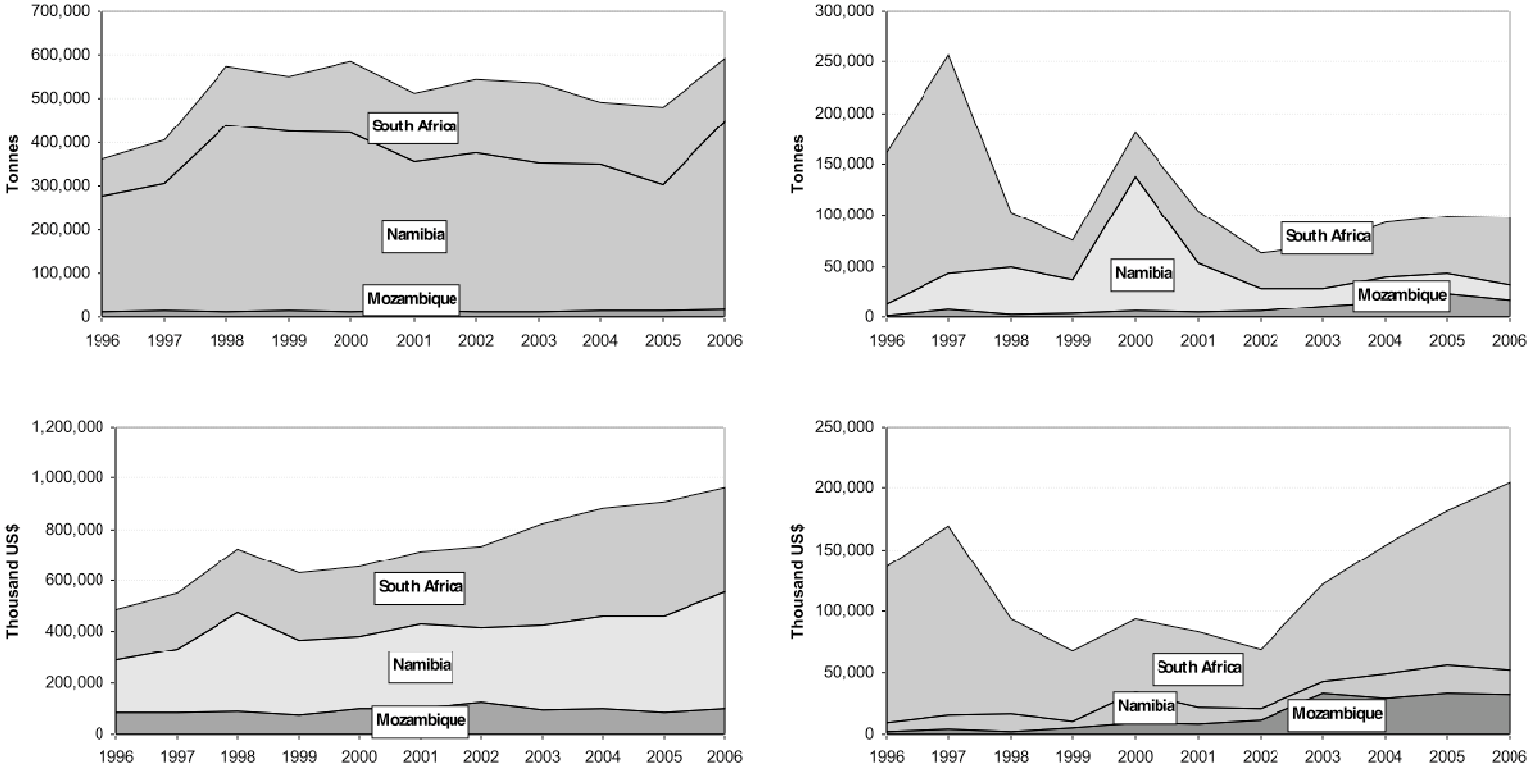
Compared with South Africa and Mozambique, Namibia has had the lion's share of overall export volumes, and this has remained fairly constant over the preceding decade (Figure 5). In terms of value, however, South African fish exports are fairly comparable. In terms of imports, however, a different picture is given. Namibia's share of import volumes grew markedly from 1996 to 2000, but thereafter it has declined relative to South Africa. In terms of import value, on the other hand, South Africa dominates its neighbours.

Angola

Angola's main fisheries resources include pelagic species such as horse mackerel, sadinellas, and tunas, demersal species such as Sparidae, Scianidae and Merllucidae, which are mainly caught by trawl or gillnet, and crustaceans such as shrimp and crab. The demersal and pelagic species occur along the entire stretch of the Angolan coastline, and the crustaceans mainly occur in the centre and southern regions. A variety of gear is used for fishing, including trawl, purse seine and longlining.

The marine capture fisheries sector comprises an industrial component and an artisanal component. The industrial sector employs around 11 000 people (2004 figures). Landings in this sector have reduced dramatically in recent times, mainly due to overexploitation and changes in hydrological conditions. Employment in the artisanal sector is almost double that of the industrial sector, with 20 500 fishers involved. Aquaculture is in its infancy and mainly revolves around freshwater resources such as tilapia.

Figure 5 : Share of trade flows, 1996 – 2006
Top left figure: export volumes. Top right figure: export values.
Bottom left figure: import volumes. Bottom right figure: Import values



Source: Based on FAO Fishstat Plus

Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks

Unlike in many other parts of the world, the primary sector contribution to the economy has been growing. In 2006 fishing and agriculture's contribution to GDP was 21.1 per cent, up from 15.6 per cent in 2005. Together with the oil industry, these two sectors make up more than 70 per cent of Angola's total GDP. Only 5 per cent of total fish landings are exported. High-quality frozen fish and lobsters from the artisanal sector are important exports, as well as prawns.

Mozambique

Marine fisheries resources in Mozambique are mostly located on two major shelves, the Sofala bank in the centre and the Delagoa bight in the south. The most important marine resources include: 1) crustaceans such as prawns, shrimp, crayfish, lobsters and crabs; 2) marine finfish such as grouper, snapper, emperor and sea bream; and 3) cephalopods and molluscs such as squid, octopus, sea cucumbers and bivalves. Marine fisheries account for more than 90 per cent of total fish production. Eighty per cent of marine resources are caught by artisanal fishers. Fishing contributed 4 per cent to GDP in 2006 (Table 12). The FAO estimates that direct employment in fisheries is 90 000, although government sources suggest that this is a lot higher.

Table 12 : Key fisheries economic indicators, Mozambique

	Amount
Fishery production (tonnes)	NA
Gross value of fisheries output 2005, million US$	80.0
Contribution to GDP (2006)	4.0%
Direct employment (including aquaculture)	90 000
Indirect employment	n/a
Value of fisheries imports, 2006, million US$	31.8
Value of fisheries exports, 2006, million US$	96.7

Source: FAO, 2007

As was the case for Namibia, the mariculture industry in Mozambique is still developing, although freshwater aquaculture has been around since the 1950s. The main marine species farmed include black tiger prawn, Indian white prawn, pink prawn, and bivalves (oysters). Seaweed farming is an important employer, involving 5 400 people, of which 65 per cent are women. The production of seaweed in 2003 was 523 tonnes.

The value of Mozambique's exports is much higher than its share in export volumes, compared with South Africa and Namibia (Figure 5). Its share, in terms of volume and value, has grown between 1996 and 2006.

The fishing sector

Commercial fisheries

In 2005, almost 800 000 tonnes of marine resources were caught in and around South African waters.[22] Of that, just over 740 000 tonnes were actually landed. The total wholesale value of production amounted to 4.9 billion in 2005 (excluding mariculture).

Demersal trawl

The demersal trawl sector is by far the most valuable fishery sector commercially, with inshore and deep-sea fishery accounting for almost 50 per cent of the total value of fishery production in 2005, excluding mariculture (Table 13). In value terms the sector generates production to the value of R2.5 billion (wholesale). The most important species caught are the

[22] Much of the background information for this section comes from Sauer et al. (2003b) and FAO (2005), while the data on catch and value of production is from the Fishing Industry Handbook (2007). Employment figures in the sector tables come from Sauer et al. (2003a).

cape hakes, Merluccius paradoxus (deep-water hake) and M. capensis (shallow-water hake), while sole is the most valuable species per unit mass in the inshore fishery. Hake alone accounts for approximately 50 per cent of all fish consumed in South Africa at present, although this is becoming increasingly difficult to source. In 2005 the offshore and inshore trawl fishery accounted for almost a quarter of the total fisheries catch, excluding mariculture (Table 13). Approximately 30 per cent of this is discarded. It is also an important earner of foreign exchange. The fishery is highly capital intensive, with the market value of the deep-sea and inshore fleet worth more than R800 million, and the replacement value much higher.

Direct employment in the hake fishery is 3 347 people (Table 13). Total employment in the inshore and offshore hake fishery is estimated at 8 838, excluding distribution but including shore-based processing, marketing and management (Sauer et al., 2003b). This is based on a survey return of approximately 80 per cent, so actual employment is likely to be higher. There is a shore-based to sea-going ratio in the fishery of 3:1, which is much higher than the FAO standard for international trawl fisheries of 1:1.

Table 13 : Socio Socioeconomic data: demersal trawl

	Amount
Catch (2005, tonnes)	198 910
Percentage of total catch (excluding mariculture)	24.9
Value of production (2005, R'000)	2 471 078
Percentage of total value (excluding mariculture)	50.2
Direct employment (2000)	3347
Indirect employment (2000)	n/a

Source: Fishing industry handbook, 2007 & Sauer et al 2003a

Pelagic fishery

The pelagic fishery is characterised by short-lived species, and is noted for high variations in annual Total Allowable Catch (TAC). The main target species are anchovy (*Engraulis capensis*), pilchard (*Sardinops ocellatus*), round herring (*Engraulis whiteheadi*), juvenile horse mackerel, and lanternfish. Ninety per cent of pilchard landings are canned for human consumption, and 10 per cent packed whole either as bait or for human consumption. Anchovy and round herring landings are used mainly for the manufacture of fishmeal.

The pelagic fishery is the largest in terms of volumes caught, with total catch in 2005 just under 565 000 tonnes, accounting for more than 70 per cent of total catch (Table 14). Total value of production was R1.15 billion, or almost a quarter of total value from commercial fishing.

Table 14 : Socioeconomic data: pelagic

	Amount
Catch (2005, tonnes)	564 050
Percentage of total catch (excluding mariculture)	70.6
Value of production (2005, R'000)	1 148 850
Percentage of total value (excluding mariculture)	23.3
Direct employment (2000)	800
Indirect employment (2000)	3 684

Source: Fishing industry handbook, 2007 & Sauer et al 2003a

The employment figures reported in Table 14, taken from Volume 1 of the Economic and Sectoral Study (Sauer, 2003a), are probably an understatement because Volume 2 (Sauer, 2003b) estimates that total full-time employment is 5 275 individuals, of which around 700 are fishermen. This is based on survey data from 85 per cent of vessels active in the pelagic fishery, and 21 processing/packing facilities. In addition to full-time employment, the fishery also provides employment for 2 500 seasonal workers, and 2 400 jobs via support services. The pelagic fishery supports around 65 to 58 purse-seine

vessels, more than 40 bait packing facilities, six canning factories and eight fishmeal plants. The purchase of purse-seine nets and maintenance of nets is a significant cost factor for the industry. A new anchovy net can cost upwards of R1.5 million and annual repair costs up to R800 000 (2000 Rands). The cost of replacing a vessel ranges from R2.4 million up to around R30 million.

Rock lobster

The rock lobster fishery is based on two species: a limited fishery on the south coast taking Palinurus gilchristi, and the second on the west coast targeting Jasus lalandi. The south coast rock lobster is a deep-water species caught by longlines trap setting by large freezer vessels. The west coast rock lobster, on the other hand, is a shallow-water species and is usually caught inshore by traps and hoopnets deployed from small vessels.

Rock lobster is a high value species: while only accounting for 0.4 per cent of total catch, its wholesale value of production is just over 9 per cent (Table 15). The south coast fishery has a sea-going complement of around 400 individuals, with an additional 100 land-based processing and administrative personnel. The west coast fishery consists of 1 300 full-time and seasonal employees in the catching segment. There are approximately 19 factories employing over 2 800 individuals.

Table 15 : Socioeconomic data: rock lobster

	Amount
Catch (2005, tonnes)	3 367
Percentage of total catch (excluding mariculture)	0.4
Value of production (2005, R'000)	452 675
Percentage of total value (excluding mariculture)	9.2
Direct employment (2000)	1 793
Indirect employment (2000)	1 326

Source: Fishing industry handbook, 2007 & Sauer et al 2003a

Linefish

South Africa's line fisheries have three major components: hake handline fishery; tuna fishery; and general recreational and commercial line fishery. The recreational line fishery is discussed in greater detail in a subsequent section. Linefish have not been sustainably harvested in the past: of the top 27 targeted linefish species, 18 have been classified as collapsed, one as overexploited, six as optimally exploited and only two under-exploited (Atkinson and Clark, 2005). In order to bring about an improvement in linefisheries, a Linefish Management Protocol (LMP) was developed in 1999. As part of this protocol, drastic reductions in commercial linefish effort and stringent bag limits for recreational fishers were introduced. New linefish policies were also gazetted in 2005.

Table 16 : Socioeconomic data: linefish

	Amount
Catch (2005, tonnes)	17 756
Percentage of total catch (excluding mariculture)	2.2
Value of production (2005, R'000)	423 720
Percentage of total value (excluding mariculture)	8.6
Direct employment (2000)	3 133
Indirect employment (2000)	718

Source: Fishing industry handbook, 2007 & Sauer et al 2003a

Commercial catches of linefish amounted to just under 18 000 tonnes in 2005 (Table 16). This was down from 24 103 in 2000. Linefishing is still a valuable fishery commercially, with 8.6 per cent of total fishery production (excluding mariculture) due to this sector.

Longline

Tuna, shark and swordfish longlining is an emerging sector in South Africa. While much of this has been fished by foreign vessels in the past, in 2004

rights to fish tuna and swordfish were issued to South African rights holders. Many of these rights have since been fished by foreign rights holders in joint ventures with South African rights holders. The experimental hake longlining fishery was established in 1994, but has since shown signs of depletion. Just under 9 000 tonnes was landed in South Africa in 2005, or 1.1 per cent of total catch (Table 17). This amounted to R302.3 million worth of wholesale production, which is 6.1 per cent of the total value.

Table 17 : Socioeconomic data: longline

	Amount
Catch (2005, tonnes)	8 984
Percentage of total catch (excluding mariculture)	1.1
Value of production (2005, R'000)	302 271
Percentage of total value (excluding mariculture)	6.1
Direct employment (2000)	1 516
Indirect employment (2000)	n/a

Source: Fishing industry handbook, 2007 & Sauer et al 2003a

Other

Other commercial catches recorded in 2005 include the crustacean trawl revolving around the KwaZulu-Natal prawn fishery, abalone (which is currently closed), seaweed, oysters, and miscellaneous nets, but excludes mariculture. Catches in these fisheries amounted to just under 1 per cent of total, or 2.5 per cent of total value (Table 18).

Table 18 : Socioeconomic data: other catches

	Amount
Catch (2005, tonnes)	5 594
Percentage of total catch (excluding mariculture)	0.7
Value of production (2005, R'000)	125 141
Percentage of total value (excluding mariculture)	2.5
Direct employment (2000)	6 265
Indirect employment (2000)	n/a

Source: Fishing industry handbook, 2007 & Sauer et al 2003a

Recent developments

A number of changes have occurred in the commercial fisheries sector in recent years. The first is the decline in catches in the abalone sector from 228 tonnes in 2005 to zero for the current year. This has an important although unquantified impact on the estimated 300 commercial divers/legal entities and five abalone-processing factories that were operating in this sector.

Another important development is the decline in landings in a number of fisheries. For example, the landings of small pelagics, averaging over 500 000 tonnes for 2001–2005, declined to just under 400 000 tonnes in 2006, despite a combined TAC of 627 000 tonnes. Hake TAC has also been declining and stood at 150 000 tonnes in 2006, down from 158 000 in 2005. Sole is under-caught compared with TAC and landings have declined over the past few years. West coast rock lobster TAC was set at 3 527 tonnes in 2004/5, but has subsequently decreased to 2 857 tonnes in 2006/7. A further reduction of 10 per cent was recommended for the 2007/8 season.

A number of new fisheries have also emerged in recent years. One of these is the experimental octopus (Octopus vulgaris) fishery, where 15 permits were issued to commercial operators in 2004. As of 2007 MCM were also undertaking experimental fishing for the whelk (Bullia laevissima) and the three-spotted swimming crab (Ovalipes trimaculatus).

Mariculture

Production

Global demand for fishery products continues to grow, and with most capture fisheries at or near production limits, aquaculture production is expected to play an increasingly important role in fishery supply. In 2004, total global fishery production reached 140 million tonnes, with 32.4 per cent of that coming from aquaculture (FAO, 2006). In South Africa, aquaculture production has only increased marginally between 2003 and 2006. Most of this has been due to increases in freshwater production, with marine production actually declining by 4.4 percent over this period (Table 19). Abalone production is by far the most important sector in volume terms, producing 833 tonnes in 2006, an annual growth of 17.4 per cent. In value terms oyster production has seen the greatest growth, although this is mainly due to strong growth in prices rather than due to increases in the volume of production, which has actually declined between 2003 and 2006.

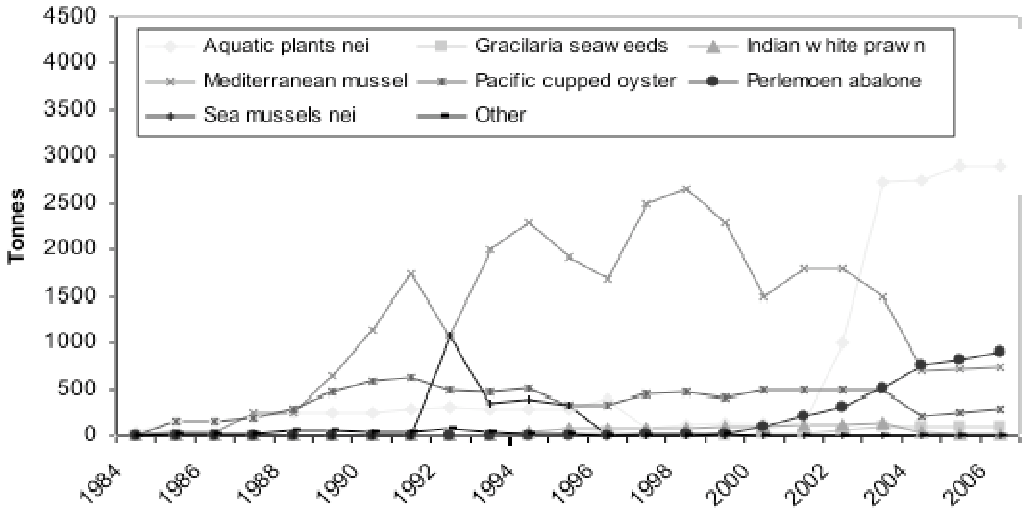
Table 19 : Aquaculture production data, 2003 and 2006

	Quantity (Tonnes)			Value (Million R)		
	2003	**2006**	**Ave % change**	**2003**	**2006**	**Ave % change**
Abalone	515	833	17.4	134	178	10.0
Oysters	250	202	-6.9	2	8	71.0
Mussels	900	542	-15.6	5	5	-2.7
Prawns	130	0	-100.0	12	0	-100.0
Finfish	10	0	-100.0	0	0	-100.0
Total, marine	**1 805**	**1 577**	**-4.4**	**153**	**191**	**7.7**
Freshwater	1 680	1 987	5.8	-	19	-
Totals	**3 485**	**3 564**	**0.7**	153	**210**	**-**

Source: Based on Shipton and Britz, 2007

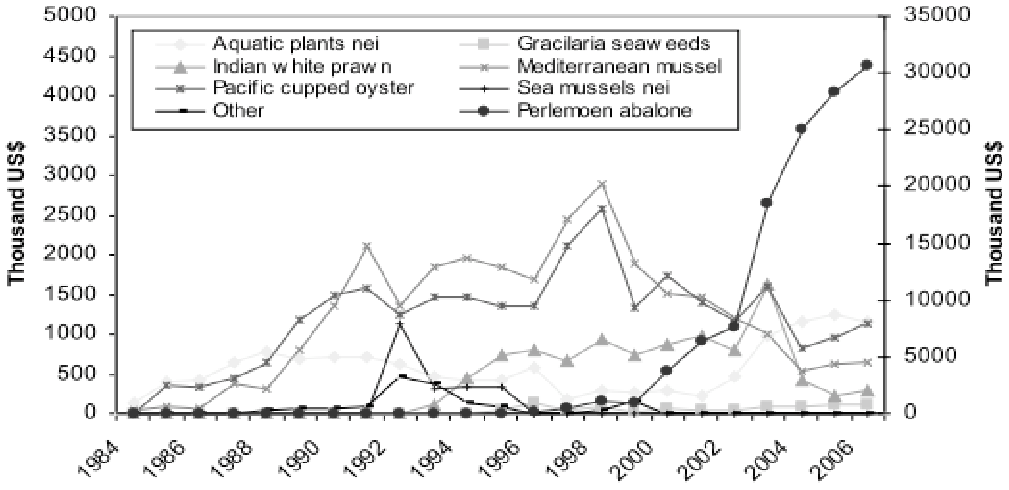
Total mariculture production was R191 million in 2006, an average growth of 7.7 per cent per annum in value terms over the preceding three years. In 2005, mariculture was 3 per cent of the total wholesale value of fishery production (Fishing Industry Handbook, 2007). Apart from the shellfish, crustaceans and finfish discussed above, seaweed and other aquatic plants are also important in mariculture production in volume terms in South Africa (Figure 6), and in value terms also account for an important component of production (Figure 7).

Figure 6 : Mariculture production, 1984–2006



Source: FAO Fishstat Plus

Figure 7 : Value of mariculture production, 1984 – 2006



Source: FAO Fishstat Plus

Employment

A total of 810 people are employed in the mariculture industry (Table 20). Of that, 83 per cent are involved with abalone production and 5 per cent with oyster and prawn production, making up more than 90 per cent of total employment.

Table 20 : Employment in the South African mariculture industry in 2006

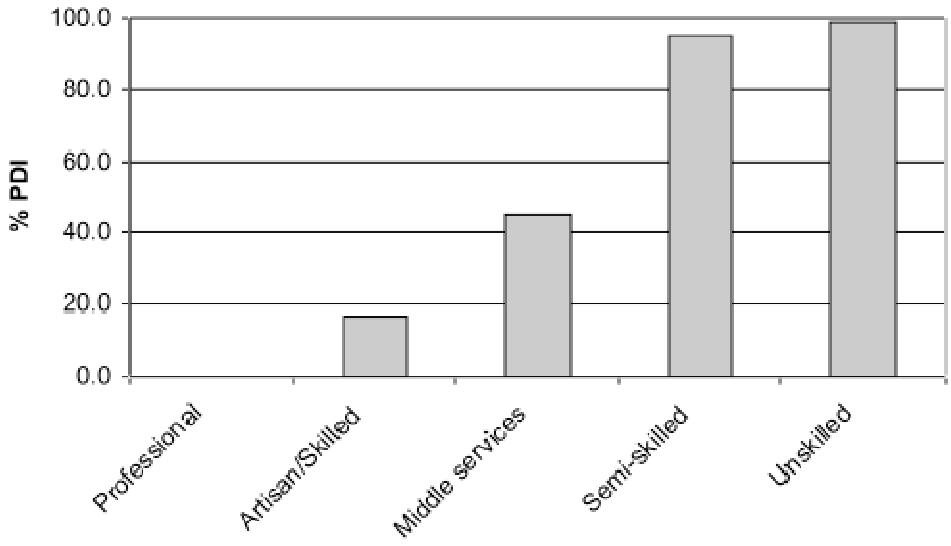
Operation	Total (2006)	% of Total	% Black	% Prof-essional	% Artisan/ Skilled	% Middle services	% Semi-skilled	% Un-skilled
Abalone	670	82.7	82.3	7.7	2.9	11.5	15.8	62.2
Oyster	40	4.9	87.1	11.4	0.0	1.5	11.4	75.8
Mussel	23	2.8	88.2	5.9	0.0	5.9	11.8	76.5
Seaweed	13	1.6	72.7	9.1	0.0	18.2	0.0	72.7
Finfish	20	2.5	100.0	0.0	0.0	0.0	0.0	100.0
Prawns	40	4.9	n/a	10.2	23.5	3.1	23.5	39.8
Total [1]	810			**8.7**	**5.2**	**8.3**	**15.6**	**62.2**

[1] Total includes 4 people employed in scallops operations

Source: Sauer et al., 2003b for skills base ratios and Britz, 2007 for employment figures.

Previously disadvantaged individuals make up between 80 and 90 per cent of workforce in most cases, with the exception of seaweed farming. Nine per cent of those involved in the industry are professional, 5 per cent artisan, 8 per cent middle services, 16 per cent semi-skilled and 62 per cent unskilled. The industry creates jobs mainly in the semi-skilled and unskilled category. The bulk of the PDIs are also employed in this capacity, with over 90 per cent of employees in these categories coming from previously disadvantaged circumstances (Figure 8). More than 45 per cent of the workforce in middle services is also black, and just under 20 per cent are artisans or skilled.

Figure 8 : Percentage previously disadvantaged individuals (PDIs) in each skills base, 2000



Source: Sauer et al., 2003b

Imports and exports

Some products, such as abalone, are cultivated almost exclusively for the export market, mainly to Far East countries such as China, Hong Kong, and Japan. South African abalone is regarded as a premium product, fetching higher prices than other competing countries. It is estimated that South Africa supplies 21 per cent of the global market for farmed abalone (Shipton and Britz, 2007). Both oysters and mussels have benefited from buoyant local demand. South Africa is a net importer of mussels, as only 45 per cent of consumption in South Africa is produced locally (Karaan and Rossouw, 2004). In many cases, bureaucracy and lack of institutional capacity limit the ability of local producers to penetrate export markets.

Recreational fisheries

Linefish

A national survey of recreational anglers was conducted from 1994 to 1996 to evaluate socio-economic aspects of the main sectors participating in the linefishery (Griffiths and Lamberth, 2002). While this survey was extensive, it excluded the Transkei region and estuaries. A subsequent report by Lamberth and Turpie (2003) attempted to estimate the value of estuaries in South African fisheries. The initial survey by Griffiths and Lamberth estimated that the total economic value of the South African linefishery was R2.2 billion, of which 82 per cent could be attributable to the recreational linefishery.

Lamberth and Turpie's estimate of inshore marine fisheries amounts to R2.4 billion (1997 prices), and also includes commercial boats (R386 million) and commercial seine and gillnets (R20 million). Using the data, they extracted

the estuarine component, which was estimated to be R469 million for recreational shore anglers, R0.36 million for recreational boat anglers and R0.36 million for recreational spearfishers. Assuming that the figures quoted by Lamberth and Turpie include the estimates for estuaries, we can deduct the estuarine component from each of the recreational fisheries (shore, boat and spear) to estimate the value net of the estuarine component. The total value, excluding commercial, is estimated at just over R2 billion in 1997 prices (Table 21). The majority of the value is derived from shore angling (68 per cent), followed by estuarine (23 per cent), boat-based fishing (6 per cent) and spear fishing (3 per cent).

Table 21 : Economic data for estuarine, shore, boat and spear recreational fishers

	Estuarine anglers	Shore anglers	Boat-based	Spear fishers	Total[1]	Total (1995)[2]
Participants, 1994–1996[1]	72 000	412 000	12 054	7 000	503 054	750 000
Annual catch, tonnes[1]	n/a	2 836	1 460	214	4 510	17 000 min
Annual catch, tonnes[3]		3 173	1 283	123	4 579	
Employment[1]	n/a	99 180	7 680		106 860	
Economic value, R million[1, 2]	n/a	1 653	128		1 781	750
Economic value, 1997, R million[3]	470	1 383	128	54	2 035	

1 Griffiths and Lamberth, 2002.
2 RSA, 1997
3 Lamberth and Turpie, 2003

More than 131 000 were reportedly employed (including commercial), and estimates of the number of participants in the recreational component range between 500 000 and 750 000 (Table 21), although some estimates put this figure as high as one million. Estimates of total catch exhibit quite large variations and should be treated with caution. For example, catches from the 1994 survey suggest catches are in the region of 4 500 tonnes, while the White Paper on Marine Fisheries Policy (RSA, 1997) estimates that high value species alone account for more than 17 000 tonnes. Possibly the latter estimates include the commercial boat anglers, which are reported by Griffiths and Lamberth at 16 671 tonnes.

Rock lobster

Recreational fisheries exist for the West Coast rock lobster (Jasus lalandi) and East Coast rock lobster (Panulirus homarus). However, the South Coast species is excluded from the recreational sector because of its deep-water nature. The share of West Coast lobster TAC attributable to the recreational sector is relatively small compared with the commercial sector. The East Coast and West Coast recreational fishers are regulated by a closed season, minimum size restrictions, daily bag limits and gear restrictions. The West Coast fishery is also governed by closed areas, where fishing, collection or disturbing the species is completely prohibited.

Shellfish and bait organisms

While the recreational abalone sector is currently closed, a number of other shellfish and bait organisms are harvested by the recreational sector. Some of the economic effects of harvesting these organisms are felt indirectly on other fisheries such as the linefishery sector. Socio-economic considerations for these resources are discussed in the next section in relation to subsistence users.

Subsistence fisheries

It is estimated that more than 250 000 people are dependent on subsistence fishing in South Africa (Table 22).

Table 22 : Subsistence food production by activity

Activity	Users and dependents	Percentage of total users	Value (R million)	Percentage of total value
Linefishing	**204 000**	80.7	13.0	81.2
Inter-tidal collecting	**30 600**	12.1	1.9	11.9
Beach and seine nets	**18 177**	7.2	1.1	6.9
Total	**252 777**	**100.0**	**16.0**	**100.0**

Source: DEAT, 2000

The total value of subsistence activities is around R16 million. More than 80 per cent (in terms of users and value) is derived from linefishing activities, followed by intertidal collecting and beach and seine net fishing.

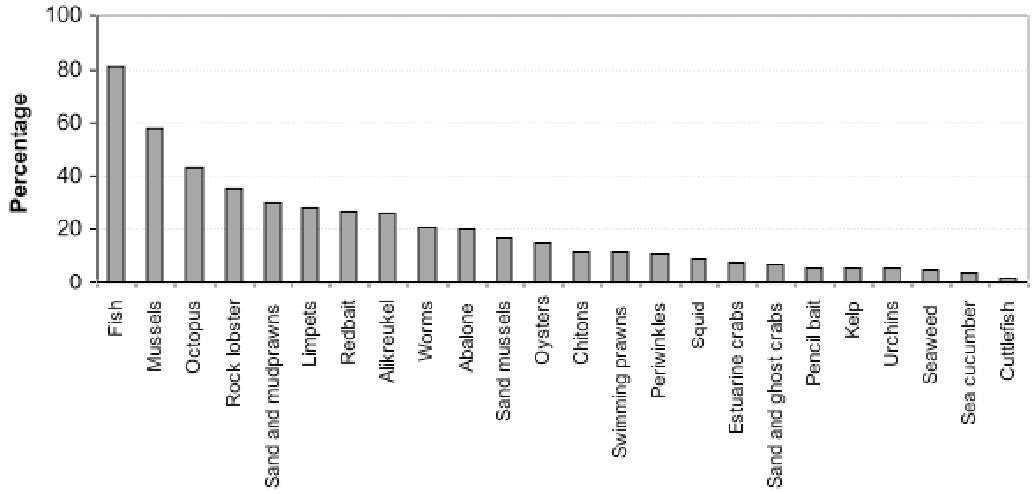
Clark et al. (2002) estimate that almost 30 000 people could be considered subsistence fishers. Most reside on the East Coast of South Africa, with more than 75 per cent in the southern KwaZulu-Natal and the former Transkei areas. Intertidal and subtidal fishing accounted for most of the fishing on the East Coast, whereas the West Coast was dominated by near-shore harvesting from boats. A study of socio-economic characteristics of subsistence fishers (Branch et al., 2002) found that most of the poor fishing households were situated in the KwaZulu-Natal and East Coast regions, with 20 and 35 per cent of households in each of the respective regions falling in the 'ultra-poor' category. Food insecurity, measured by the number of households spending more than 60 per cent of their income on food, was also highest in these regions: 46 per cent of households falling into this category in KwaZulu-Natal and 78 per cent on the East Coast.

Most commonly harvested resources include commercial species such as fish (81 per cent of households reported catching), rock lobsters (35 per cent) and abalone (20 per cent) (Figure 9). These resources were most commonly sold. Other harvested resources included bait organisms such as sand prawn (30 per cent), worms (21 per cent of households catching) and red bait (27 per cent), which were used primarily as bait, with the exception of red bait which was consumed on the East Coast.

Intertidal rocky shore invertebrates such as mussels (with 58 per cent of households catching), limpets (28 per cent), winkles, oysters (15 per cent) and octopus (43 per cent) were most commonly consumed. Estuarine and sandy

beach invertebrates such as estuarine crabs (8 per cent using) and sandy beach crabs were most commonly eaten or sold, while sand mussels, harvested by 17 per cent of households in the West and South, were most frequently used as bait but also for consumption.

Table 23 : Proportion of subsistence households harvesting marine resources



Source: Branch et al., 2002

Impact of illegal fishing

The economic impact of illegal fishing in South Africa is likely to be significant. The EU estimate that the global illegal trade in fish and fish products is between US$4.3 and US$14.4 billion annually (Diffey & Barnes, 2008). A recent study of illegal, unreported and unregulated fishing (IUU) by MRAG (2005) states that the total IUU value for sub-Saharan Africa is US$1 billion. However, this excludes an estimate for South Africa. Table 23 provides a summary of examples of recorded incidents of IUU fishing in South Africa between 1999 and 2005.

The scale of illegal abalone harvesting ranges between 1 000 (Table 23) and 2 000 (Britz, 2007) tonnes. It is estimated that arrests account for only 20 per cent of the illegal harvest. Given that legal abalone mariculture production was just less than 1 000 tonnes in 2006, the opportunity cost of the illegal trade to this industry could be as much as R360 million in 2006 values. Apart from abalone, the main fisheries subject to economic impacts from illegal fishing include the inshore and offshore demersal fisheries, inshore pelagic fisheries and the crustacean fisheries. It has been estimated that approximately 80 per cent of trade in Patagonian toothfish is illegal (Karen Sack, Antarctic & Southern Ocean Coalition). Since much of the highly vulnerable sedentary species are commonly landed on South African shores (MRAG & CAPFISH, 2008), the adverse economic impact is predicted to be indirect.

Table 24 : Incidents of illegal, unregulated and unreported fishing in South Africa

Species	Period	Type of IUU	IUU flag states	IUU catch (tonnes, annual)	Estimated value of IUU (Million US$)
Mixed	2004	Illegal (poaching sold to China)	China (allegedly)	300 per vessel	
Abalone	2002	Domestic poaching	South Africa	850	29.75 (2 per cent of legal)
Abalone	2003	Illegal (poaching)	None reported	1 000	350
Abalone	2000–2003	Illegal (poaching/smuggling)	Canada	90 (between 2000 and 2003)	2
Abalone	2005	Illegal (poaching)	China	14 (not annual)	1.2
Rock lobster (also hake)	May–June 2001	Illegal (caught and smuggled – fish trafficking scheme)	None reported	None reported	0.46 (Hake 1.8)
King mackerel, giant guitarfish, plus shark fins	2004	Illegal (poaching)	Indonesia, Taiwan	50 (king mackerel)	
Roughy, alfonsino, oreos, beryx	1999–2002	Unregulated	Russia, New Zealand among others	2 000	16

Source: MRAG, 2005

Non-consumptive uses

Promotion of non-consumptive marine resource use can stimulate interest in South Africa's coastal resources and promote conservation of resources. It is also an important tourism revenue generator. Two major industries have developed in recent years: the whale-watching industry, largely based around the Hermanus area in the Overberg region of the Western Cape, and shark cage-diving. An economic assessment of boat-based whale-watching reported in DEAT (2006) indicates that the industry generates around R45 million in tourism expenditure and contributes approximately R37 million to the country's GDP each year. Important species frequenting the shores of South Africa include the southern right (Eubaleana australis), humpback (Megaptera novaeangliae), and Bryde's (Balaenoptera edenii) whales. The number of permits issued for shark cage-diving and boat-based whale-watching has increased in recent years, suggesting that this is a growing industry.

Socio-economic data sources

Although the ecology and biology of fisheries systems are understood more fully, fisheries management agencies are faced with a dearth of information on the social and economic aspects of captured marine fisheries. In certain cases, the information is collected routinely without having any purpose in mind for it. Often, if the information exists, it is hardly used at all. In reviewing the existing socio-economic data, we reviewed the fisheries data already available within two organisations: (a) Marine and Coastal Management, and (b) Statistics South Africa. Specifically, the socio-economic data reviewed was for the hake fishery, West Coast rock lobster, recreational fishery and the small-scale to recreational fishery. We have not attempted to

analyse the data but merely created a metadata. The challenge for the future is going to be access to the data as there are stringent rules for data access within the two organisations. The current data provides a basis for the development of a fisheries socio-economic database. Perhaps new data could be collected as part of the current project as a form of improving on the existing data. In terms of resource-specific information, there is currently no socio-economic data for the recreational fishery and this is where much of the data collection work could be undertaken for this project.

Marine and coastal management

Marine and Coastal Management does not currently direct any specific effort for the collection of fisheries socio-economic data. They do, however, have a number of fisheries management processes which, by their nature, yield some socio-economic data. These fisheries socio-economic data yielding processes are:

- Fishing rights allocations process;
- Fishing permits (catch, export, transport, fish processing) process;
- Catch returns management process; and
- Fishing levies and fees calculation

For all the above, there is a distinct questionnaire/form designed by MCM and returned by the fishing companies. Some of the returns are able to provide specific economic or social data. As an example, the rights allocation process requires the applicant fishing company to provide information on ownership status (gender and race), current rand value of the fishing vessel, number of people employed by a company, etc. Thus, by reviewing all the information from the four processes we are able to make a statement regarding the availability of fisheries socio-economic information available

within MCM. Over and above the four processes, fish selling prices are collected from time to time by MCM.

Statistics South Africa

Statistics South Africa collects fisheries data as part of the agricultural census. The Statistics South Africa labour force survey can only provide aggregated fisheries data (i.e. for the whole industry), as it is a sample survey (i.e. there is no guarantee of the sample size to estimate the parameters of the fisheries sub-sectors, hence its data is only meaningful at a fishery industry level of aggregation). Labour force (employment) data (by sub-sector) for the sustainable development indicators can be obtained from the I&J Fishery Industry Handbook.

Production data from MCM is used in the calculation of the Gross Domestic Product (see P0441-Gross Domestic Product methodological notes). Financial statistics data is based on data published in the MCM website. For example, the Annual Financial Statistics do ask questions about the TAC and other asset financial data (ships, boats, and other equipment), which is reconcilable to the MCM data. Fisheries management sustainable development indicators make use of data from the National Treasury (or GCIS Cabinet Statements) and Department of Trade and Industry (DTI). The System of Economic and Environmental Accounts data from Statistics South Africa (National Accounts) make use of data from the DEAT (environmental levy), Department of Justice (fines), and Department of Water Affairs. Real estate sustainable development indicators make use of data from the Surveyor General. Other sustainable development socio-economic data are obtained from the Income and Expenditure Surveys. The pricing of physical

products in a sustainable development framework make use of Consumer Price Index data from Statistics South Africa.

Available data

Table 25 : Fisheries economic and social data available from MCM following interviews

RESOURCE	AVAILABLE DATA	PERIOD	SOURCE
OFFSHORE HAKE	Grant of right fee (once off	1995	Saasa Peeha 021 402 3255
	Fees		Saasa Peeha 021 402 3255
	Levies		Saasa Peeha 021 402 3255
	Catch statistics (mass)	2000–2007	Clifford Matlakala 021 402 3255
	Wholesale prices	2000–2007	Clifford Matlakala 021 402 3255
	Landed sale price	2000–2007	Clifford Matlakala 021 402 3255
	Employment figures	2000–2007	Clifford Matlakala 021 402 3255
	Shareholding structures	2005–2008	Msimelela Mdledle/Raymond Scott
	Application fees	2005	Msimelela Mdledle/Raymond Scott
	Investment records (bouts, factories, vehicles, etc)	2005	Msimelela Mdledle/Raymond Scott
	Annual/Seasonal permit fees	2005–2008	Odwa Dubula 021 402 3680
	Number of active vessels	2005–2008	Odwa Dubula 021 402 3680
	Global TAC	2005–2008	Odwa Dubula 021 402 3680
	Individual TAC	2005–2008	Odwa Dubula 021 402 3680
	Crew numbers (individual global)	2005–2008	Odwa Dubula 021 402 3680
	Vessel ownership	2005–2008	Odwa Dubula 021 402 3680
	Number/Types of processing facilities	2005–2008	Odwa Dubula 021 402 3680
	Name/Number of consignees	2005–2008	Odwa Dubula 021 402 3680
	Types of export products	2005–2008	Odwa Dubula 021 402 3680
	Mass exported	2005–2008	Odwa Dubula 021 402 3680

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RESOURCE	AVAILABLE DATA	PERIOD	SOURCE
	Geographical distribution of right holders	2005–2008	Odwa Dubula 021 402 3680
	Permit fees (catch fee, export fee, transport fee, processing)	2005–2008	Odwa Dubula 021 402 3680
	Levies	2005–2008	Odwa Dubula 021 402 3680
	Catch statistics (mass)	2000–2007	Clifford Matlakala 021 402 3255
	Wholesale prices	2000–2007	Clifford Matlakala 021 402 3255
	Landed sale price	2000–2007	Clifford Matlakala 021 402 3255
	Employment figures	2000–2007	Clifford Matlakala 021 402 3255
	Shareholding structures	2005–2008	Msimelela Mdledle/Raymond Scott
	Application fees	2005	Msimelela Mdledle/Raymond Scott
	Investment record (bouts, factories, vehicles, etc)	2005	Msimelela Mdledle/Raymond Scott
	Annual/Seasonal permit fees	2005–2008	Odwa Dubula 021 402 3680
	Number of active vessels	2005–2008	Odwa Dubula 021 402 3680
	Global TAC	2005–2008	Odwa Dubula 021 402 3680
	[why is the highlighted section repeated? Delete? Or should there be a Resource heading?]		
WC ROCK LOBSTER	Catch statistics (mass)	2000–2007	Clifford Matlakala 021 402 3255
	Wholesale prices	2000–2007	Clifford Matlakala 021 402 3255
	Landed sale price	2000–2007	Clifford Matlakala 021 402 3255
	Employment figures	2000–2007	Clifford Matlakala 021 402 3255
	Shareholding structures	2005–2008	Msimelela Mdledle/Raymond Scott
	Application fees	2005	Msimelela Mdledle/Raymond Scott
	Investment record (bouts, factories, vehicles, etc)	2005	Msimelela Mdledle/Raymond Scott
	Annual/Seasonal permit fees	2005–2008	Saasa Peeha 021 402 3680

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RESOURCE	AVAILABLE DATA	PERIOD	SOURCE
	Number of active vessels	2005–2008	Odwa Dubula 021 402 3680
	Global TAC	2005–2008	Odwa Dubula 021 402 3680
	Individual TAC	2005–2008	Odwa Dubula 021 402 3680
	Crew numbers (individual global)	2005–2008	Odwa Dubula 021 402 3680
	Vessel ownership	2005–2008	Odwa Dubula 021 402 3680
	Number/Types of processing facilities	2005–2008	Odwa Dubula 021 402 3680
	Name/Number of consignees	2005–2008	Odwa Dubula 021 402 3680
	Types of export products	2005–2008	Odwa Dubula 021 402 3680
	Mass exported	2005–2008	Odwa Dubula 021 402 3680
	Geographical distribution of right holders	2005–2008	Odwa Dubula 021 402 3680
	Permit fees (catch fee, export fee, transport fee, processing)	2005–2008	Odwa Dubula 021 402 3680
	Levies	2005–2008	Odwa Dubula 021 402 3680
SMALL-SCALE TO SUBSISTENCE			
	Buying prices (price paid to permit holders) – only for Lobster and Oyster	2007–2008	MCM/Sandile Sibiya 021 402 3344
	Catch records (intertidal resources), weight and numbers per species	2007–2008	MCM/Sandile Sibiya 021 402 3344
	Number of fish processing establishments	2007–2008	MCM/Sandile Sibiya 021 402 3344
	Expert destination	2007–2008	MCM/Sandile Sibiya 021 402 3344
	Exported mass	2007–2008	MCM/Sandile Sibiya 021 402 3344
	Fishing times (start and end of daily fishing times) per permit holder	2007–2008	MCM/Sandile Sibiya 021 402 3344
	Fees (transport permit fee, fish processing fee, export fee)	2007–2008	MCM/Sandile Sibiya 021 402 3344
	Number of exemption holders/fishers per resource	2005–20008	MCM/Sandile Sibiya 021 402 3344
	Age and gender composition of right holders	2005–2008	MCM/Sandile Sibiya 021 402 3344
	Geographical spread of right holders per village	2005–2008	MCM/Sandile Sibiya 021 402 3344
	Shareholding structure of the buying companies	2005–2008	MCM/Sandile Sibiya 021 402 3344

RESOURCE	AVAILABLE DATA	PERIOD	SOURCE
	Number of fishers contracted to buyer	2005–2008	MCM/Sandile Sibiya 021 402 3344
RECREATIONAL FISHERIES			

Table 26 : Data identified through Statistics South Africa and web-based searches

DATA	DEFINITION	DATA SOURCE
Employment (part-time and full-time)	The number of people employed in the harvesting/processing of the resource	Up to 2000, Rhodes University, Economic and Sectoral Study of the South African Fishing Industry; 2003, Fishing Industry Handbook: South Africa, Namibia and Mozambique (35th edition), George Warman Publications, Cape Town; 2009 [is this year correct?] onwards, Agricultural Census, Statistics South Africa
Processing facilities	Number of factories used in processing	MCM website. Status of Marine Living Resources 2006-07
Rights holders	The number of fishing permits/right holders	MCM website. Status of Marine Living Resources 2006-07
Catches/Landings	The total caught for a particular year in tonnes	MCM website. Status of Marine Living Resources 2006-07
Contribution of output to GDP	Total industrial output as a % of Annual Gross Domestic Product	P0441-Gross Domestic Product. Statistics South Africa
Abalone stocks	Abalone biomass	MCM website
Abalone exploitation	Abalone TAC	MCM website
Regulatory environment for the protection of the resource	Efficiency of the Acts in enforcing regulation	MCM website, Justice Department
Industrial output (economic)	Total industrial output	P0441-Gross Domestic Product, Statistics South Africa
Salaries/remuneration of employees	Compensation of employees for the industry	P0441-Gross Domestic Product, Statistics South Africa
Environmental degradation (or residuals)	Pollution generated by processing plants	MCM environmental impact assessments, DTI company activity impact assessments, Global Environmental Outlook (GEO) database
Environmental expenditures	Expenditure for repairs to the environment	MCM levy, fines, SEEA, Statistics South Africa

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DATA	DEFINITION	DATA SOURCE
Environmental degradation (or residuals)	Non-target by-catch species	MCM
Poverty alleviation	Local economic development-related activities in the sector	National Treasury, budgetary allocations to MCM
Contribution to the Regional GDP	Regional output as % of Regional GDP	P0441-Gross Domestic Product, Statistics South Africa
Investments	Market replacement Value Depreciation Fleet age composition	MCM website
Exports	Export/Harvest value	MCM website
Subsidies	Tax rebates Grants	MCM, Department of Trade and Industry, Statistics South Africa
Harvest	Landing By-catch	MCM website
Harvest capacity	GT (decked vessels) Number of boats (undecked vessels) Total effort	MCM website
Harvest value	Total deflated value of catches/landings (landed price)	P0441-Gross Domestic Product, CPI, Statistics South Africa, MCM website
Contribution to poverty alleviation	SMME employment SMMEs as % of total Number of Businesses	Financial Statistics, Methodology and Standards, Statistics South Africa, CIPRO, DTI
Weight Apparent Consumption	Gross consumption of abalone fishing products per inhabitant expressed as weight of consumed fish per inhabitant	MCM, P0441-Gross Domestic Product, Statistics South Africa
Value Apparent Consumption	Gross consumption of abalone fishing products per inhabitant expressed as expense per inhabitant	MCM, P0441-Gross Domestic Product, Income and Expenditure Survey, Statistics South Africa
Fish (Abalone) Commercial Balance	Whether exports or imports of fishing products are higher	MCM, P0441-Gross Domestic Product, Income and Expenditure Survey, Statistics South Africa
Fish (Abalone) Coverage Rate	Rate of apparent consumption covered by the national production	MCM, P0441-Gross Domestic Product, Income and Expenditure Survey, Statistics South Africa
Extraversion Rate	What extent the abalone sector of a country depends upon foreign trade, both for imports and exports	MCM, P0441-Gross Domestic Product, Income and Expenditure Survey, Statistics South Africa
Net returns	(profit + rent) or gross profit/value added Net return/investment, value of entitlements	P0441-Gross Domestic Product, Statistics South Africa, MCM website
Working Waterfront property values	Value of property in waterfront used for abalone fisheries activities	MCM, Geography, Statistics South Africa, Office of the Surveyor General
Related industrial sector	Eco-tourism	MCM, P0441-Gross Domestic Product, Statistics South Africa

Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks

DATA	DEFINITION	DATA SOURCE
% communities (EAs) designated urban	Surface area of urban vs rural settlements	Geography, Statistics South Africa
Abalone contribution to the GNP	Importance of fishing production in the GNP	P0441-GDP, Statistics South Africa, MCM website
Ratio Harvesting Value	The importance of abalone fishing in comparison to aquaculture in terms of income	P0441-GDP, Statistics South Africa, MCM website
Ratio Harvesting Weight	The importance of abalone fishing in comparison to aquaculture in terms of production weight	P0441-GDP, Statistics South Africa, MCM website
Vessel Physical Productivity	The average production of each vessel in terms of weight of landings	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Capacity Physical Productivity	The average production in terms of weights of landings for each capacity unit (GT) of the vessels	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Power Physical Productivity	The average production in terms of weight of landings for each power unit (HP) of the vessels	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Per vessel fishing time Physical Productivity	The average production in terms of weight of landings for each full fishing time. Is possible select the unit of fishing time (hour or day)	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Man Physical Productivity	The average production in terms of weight of landings for each man employed	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Vessel Productivity	The average production in terms of market value in the first sale for each vessel	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Capacity productivity	The average production in terms of market value in the first sale for each capacity unit installed (GT) in the vessels	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Power productivity	The average production in terms of market value in the first sale for each power unit (HP) of the vessels	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Per Vessel Hour productivity	The average production in terms of market value in the first sale for each fishing hour	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Man Productivity	The average production in terms of value in the first sale for each man used	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Average Wage	Indicates the average salary obtained by each man employed	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Employment per segment	Indicates the employment in a specific segment of vessels	Limited MCM data, detailed LFS, QES data, Financial Statistics, Statistics South Africa
Landing prices	(LP) represents the average market price of landings	CPI, P0441 Gross Domestic Product, Statistics South Africa

Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks

DATA	DEFINITION	DATA SOURCE
Capital employed	A measure of the value of Vessel, Licence, Quota, etc. would provide information of the relative position of the industry. Values above a discounted sum of the returns they could provide would be an indication of an unsustainable industry	MCM, Financial Statistics, Statistics South Africa
Opportunity	The yields that the owner could obtain should he invest his capital	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Capital Investments	% of change in capital employed over time – normally a year. It indicates the future expectations of the enterprises. Often difficult to measure empirically in other ways than using the capital employed at two different points in time and subtracting them from one another	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Cost	Money in National Debt instead of investing in his business. This means that the owner is relinquishing that potential income. There is a profit in its economic sense when the yields of the invested capital surpass the opportunity cost	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Gross Profit	Indicates the total profits obtained by the whole of the vessel owners, once the operating costs have been deducted	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Net Profit	Profitability – would provide a direct comparison with returns available elsewhere in the economy. The total earnings obtained by the whole of the owners, once the depreciation cost has been deducted	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Profit Rate	Indicates the percent ratio of yearly net profits plus the opportunity cost in relation with the investment. It should be borne in mind that this figure does not include the additional earnings obtained by the owner as an employee in artisanal fisheries	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website

Socio-economic contribution of South African fisheries and their current legal, policy and management frameworks

DATA	DEFINITION	DATA SOURCE
Contribution to the margin	Output minus variable costs is a short run indicator of the incentive for the enterprise to carry on. Given the problem of sunken capital in fisheries (capital written off in the books but still capable of producing output) this is an important indicator to assist in assessing whether schemes to reduce capacity will be effective. With low liabilities and low opportunity costs of labour and capital the incentive to carry on in the long run is determined by this indicator	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Return on Capital	(Net profit plus interest payments relative to capital employed) – provides a simple and direct comparison of the opportunity cost of capital	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Capacity Utilisation	Calculation would require distinction between long run and short run, and knowledge about the state of the fish stocks as to whether they are overexploited or not. In the short run the measure disregards fish stock effects	P0441-GDP, CPI, Financial Statistics, Statistics South Africa, MCM website
Ratio Fish Employment	Ratio of employment created by industry	QES, LFS, Statistics South Africa
Effort (mainly at fishery level)	No of vessels; Fishing time (rights exercise registers) Amount of gear used Employment Fisher hours (financial year)	Limited MCM data

Summary and conclusions

Since 1994, South Africa has promulgated much new legislation and revised the old legislation to bring it in line with the new political dispensation and its international agreements and obligations. These are largely in aid of an integrated approach to management of marine and coastal resources in order to achieve sustainable utilisation for the socio-economic benefit of its citizens in a transforming society. While most of these are progressive, care must be taken that they in total and unison achieve preservation of marine and coastal resources so that these can continue to benefit future generations of South Africans.

In spite of a relatively small contribution to national Gross Domestic Product (GDP), the South African fishing and aquaculture industry plays an important role in the social and economic fabric of the country. While capture fisheries production is stabilising or declining, local demand for fish products is increasing and so has the value of imports and local aquaculture production. The industry, although not employing a huge workforce, nonetheless makes an important contribution to PDI employment and skills empowerment. In addition, the value of capital assets such as vessels and fishing equipment is also significant. With volatile agricultural and commodity markets it is expected that South African fisheries products are likely to continue to contribute to the food security needs of the South African population, as well as generate important foreign exchange earnings in the future.

There is some socio-economic data already available within Marine and Coastal Management and Statistics South Africa. This paper has pointed to types and sources of such data rather than attempting to analyse the data by

merely creating a metadata. The challenge in future is the access to the data as there are stringent rules for obtaining such data within the two organisations. What is promising is that the current available data could provide the basis for developing a database of fisheries socio-economic data. This project could pilot the collection of socio-economic data to improve on and substantiate the existing data. In terms of resource-specific information, there is currently no socio-economic data for the recreational fishery and this is where much of the data work is going to be for this project.

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Appendices

A. Gross domestic product

Table 1A : Annual gross domestic product by industry, 1993 to 2005, current prices

Industry	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Agriculture, forestry and fishing	16 284	20 252	19 317	23 721	25 140	25 434	26 179	27 451	32 588	44 179	40 889	39 432	37 625
Agriculture	13 579	17 216	15 863	19 922	21 366	21 349	21 750	22 412	27 005	37 705	34 353	32 705	30 577
Forestry	2 280	2 628	2 967	3 238	3 244	3 531	3 853	4 406	4 853	5 600	5 564	5 735	5 958
Fishing	424	408	487	562	530	554	576	633	730	874	972	992	1 090
Mining and quarrying	30 052	32 111	34 830	38 768	40 524	45 879	52 173	63 391	77 214	92 113	84 258	89 290	100 515
Primary industries	**46 335**	**52 363**	**54 147**	**62 489**	**65 664**	**71 313**	**78 353**	**90 842**	**109 802**	**136 292**	**125 147**	**128 722**	**138 139**
Secondary industries	**108 890**	**121 840**	**139 362**	**150 360**	**164 362**	**171 311**	**178 475**	**203 010**	**222 346**	**259 770**	**276 915**	**296 583**	**319 728**
Tertiary industries	**235 616**	**265 942**	**306 844**	**352 627**	**397 142**	**432 250**	**482 046**	**544 366**	**596 067**	**667 739**	**741 617**	**828 547**	**910 654**
All industries at basic prices	**390 841**	**440 145**	**500 353**	**565 475**	**627 168**	**674 874**	**738 874**	**838 218**	**928 216**	**1 063 801**	**1 143 679**	**1 253 852**	**1 368 522**
Taxes on products	41 611	48 374	53 644	58 119	63 419	74 473	80 528	87 816	96 363	109 660	121 070	147 449	176 140
Less: Subsidies on products	6 321	6 400	5 482	5 635	4 856	6 923	5 718	3 886	4 571	4 762	4 056	3 144	5 409
GDP at market prices	**426 131**	**482 119**	**548 515**	**617 959**	**685 731**	**742 424**	**813 684**	**922 148**	**1 020 008**	**1 168 699**	**1 260 693**	**1 398 157**	**1 539 253**

Source: Stats SA, 2006

Table A2: Annual gross domestic product by industry

Industry	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Agriculture, forestry and fishing	24 141	26 040	20 850	25 850	26 069	24 686	26 213	27 450	26 558	28 292	27 700	28 083	29 232
Agriculture	20 132	22 136	17 122	21 709	22 156	20 721	21 778	22 411	22 008	24 146	23 272	23 292	23 756
Forestry	3 380	3 379	3 202	3 528	3 364	3 427	3 858	4 406	3 955	3 586	3769	4 084	4 629
Fishing	629	525	526	612	550	538	577	633	595	560	658	707	847
Mining and quarrying	66 331	66 636	64 568	64 034	65 100	65 011	64 116	63 391	63 325	63 927	66 502	67 363	68 987
Primary industries	**90 472**	**92 676**	**85 418**	**89 884**	**91 170**	**89 697**	**90 329**	**90 841**	**89 883**	**92 219**	**94 202**	**95 447**	**98 219**
Secondary industries	**167 081**	**172 179**	**181 870**	**186 452**	**191 920**	**188 802**	**189 261**	**203 010**	**208 241**	**214 893**	**214 609**	**225 862**	**238 511**
Tertiary industries	**430 137**	**442 287**	**461 113**	**480 683**	**493 308**	**503 329**	**523 118**	**544 366**	**564 130**	**587 593**	**614 156**	**645 897**	**680 019**
All industries at basic prices	**687 689**	**707 142**	**728 401**	**757 019**	**776 398**	**781 828**	**802 708**	**838 218**	**862 254**	**894 706**	**922 966**	**967 206**	**1 016 750**
Taxes on products	73 311	77 541	81 244	85 205	87 716	86 763	86 376	87 816	89 119	91 564	94 078	99 047	103 838
Less: Subsidies on products	2 918	3 061	3 316	3 467	3 599	3 623	3 719	3 886	3 999	4 148	4 281	4 484	4 713
GDP at market prices	**758 082**	**781 622**	**806 328**	**838 757**	**860 515**	**864 968**	**885 365**	**922 148**	**947 374**	**982 122**	**1 012 763**	**1 061 769**	**1 115 875**

Source: Own calculations based on Stats SA

B. Employment figures (Source: Sauer et al., 2003a)

Table B1: Primary fishing sector

	Total	Black	White
Shark Longline	172	149	23
Hake Longline	977	878	99
Pelagic	800	544	256
Toothfish	152	81	71
Hake Handline	982	764	218
Abalone	1 384	1 252	132
Linefish	3 133	2 475	658
Tuna Baitboat	1 600	1 355	245
Tuna Longline	367	293	74
Deep-sea Hake	2 774	2 511	263
Inshore Hake	573	535	38
Squid	2 004	1 797	207
WC Rock Lobster	1 575	1 367	208
SC Rock Lobster	218	214	4
Prawn Trawl	142	129	13
TOTAL	16 853	14 344	2 509

Table B2: Primary fishing sector

	Total	Black	White
Shark Longline	6 234 000	5 184 000	1 050 000
Hake Longline	37 578 000	30 882 000	6 696 000
Pelagic	67 170 000	38 400 000	28 770 000
Toothfish	9 240 000	4 806 000	4 434 000
Hake Handline	30 150 000	20 436 000	9 714 000
Abalone	37 290 000	30 324 000	6 966 000
Linefish	69 522 000	48 450 000	21 072 000
Tuna Baitboat	43 524 000	33 606 000	9 918 000
Tuna Longline	17 844 000	11 100 000	6 744 000
Deep-Sea Hake	173 586 000	143 652 000	29 934 000
Inshore Hake	19 518 000	16 494 000	3 024 000
Squid	71 358 000	54 684 000	16 674 000
WC Rock Lobster	43 638 000	32 154 000	11 484 000
SC Rock Lobster	9 654 000	8 934 000	720 000
Prawn Trawl	7 998 000	5 898 000	2 100 000
TOTAL	644 304 000	485 004 000	159 300 000

Table B3: Secondary and tertiary fishing sector employment (numbers) by race

Secondary	Factory	Total	Black	White
Shark	5	120	105	15
Hake	22	4 798	4 582	216
Pelagic	11	3 684	3 576	108
Abalone	3	60	54	6
Linefish	20	718	641	77
Squid	5	114	104	10
Rock Lobster	11	1 326	1 262	64
Prawns	1	56	31	25
TOTAL	78	10 876	10 355	521

Table B4. Secondary and tertiary fishing sector total employment income (in Rand) by race

SECONDARY	Factory	Total	Black	White
Shark	5	2 808 000	2 106 000	702 000
Hake	22	204 096 000	180 930 000	23 166 000
Pelagic	11	84 864 000	76 638 000	8 226 000
Abalone	3	2 496 000	1 884 000	612 000
Linefish	20	10 008 000	6 276 000	3 732 000
Squid	5	2 064 000	1 758 000	306 000
Rock Lobster	11	38 244 000	32 736 000	5 508 000
Prawns	1	3 516 000	1 134 000	2 382 000
TOTAL	78	348 096 000	303 462 000	44 634 000

C. Commodity trade in marine resources, 1990–2006 (Source: FAO Fishstat Plus)

Table C1: Angola

	Export Quantity (Tonnes)	Export Value (Thousand US$)	Import Quantity (Tonnes)	Import Value (Thousand US$)
1990	1 044	3 490	63 263	53 400
1991	1 224	4 830	5 289	19 050
1992	1 456	5 657	4 980	17 700
1993	2 279	4 932	4 043	13 400
1994	2 221	7 165	2 708	8 489
1995	2 883	5 768	3 420	9 735
1996	1 358	3 922	3 224	10 668
1997	3 680	9 273	3 941	14 435
1998	5 790	11 618	2 640	12 052
1999	5 307	10 043	5 130	14 524
2000	5 427	10 839	8 014	16 336
2001	14 250	21 411	7 815	17 942
2002	13 741	28 181	8 818	18 125
2003	7 103	8 874	11 931	20 342
2004	7 859	11 945	20 090	32 225
2005	7 531	16 840	14 451	33 185
2006	6 837	16 972	25 055	61 547

Table C2: Mozambique

	Export Quantity (Tonnes)	Export Value (Thousand US$)	Import Quantity (Tonnes)	Import Value (Thousand US$)
1990	6 336	50 629	6 966	9 635
1991	7 841	63 240	7 544	11 140
1992	8 610	66 453	4 600	10 500
1993	8 699	70 802	4 790	10 266
1994	9 708	68 763	2 044	2 249
1995	9 671	65 110	1 995	2 023
1996	10 435	86 343	1 651	1 623
1997	13 162	84 315	7 588	3 919
1998	12 424	91 256	2 270	2 483
1999	15 795	74 998	3 400	4 758
2000	10 925	99 889	6 363	9 403
2001	15 002	99 716	4 567	8 559
2002	12 565	122 840	6 693	10 992

2003	11 141	96 018	11 422	33 391
2004	13 442	100 469	14 973	28 918
2005	14 998	85 036	23 700	33 561
2006	16 570	96 698	17 783	31781

Table C3: Namibia

	Export Quantity	**Export Value**	**Import Quantity**	**Import Value**
	(Tonnes)	**(Thousand US$)**	**(Tonnes)**	**(Thousand US$)**
1990	n/a	n/a	n/a	n/a
1991	n/a	n/a	n/a	n/a
1992	236 940	54 496	n/a	n/a
1993	263 100	57 882	n/a	n/a
1994	320 804	313 053	n/a	n/a
1995	308 583	329 621	n/a	n/a
1996	266 783	198 906	11 658	7 605
1997	293 877	247 829	35 788	11 419
1998	427 647	386 023	47 874	13 615
1999	408 677	291 992	34 393	5 984
2000	411 198	283 931	130 948	24 214
2001	342 132	330 327	48 138	13 132
2002	363 830	291 749	21 307	9 375
2003	341 711	332 362	16 723	9 423
2004	335 287	362 484	24 530	19 732
2005	287 797	376 924	19 232	22 063
2006	431 174	458 531	14 717	20 204

Table C4: South Africa

	Export Quantity	**Export Value**	**Import Quantity**	**Import Value**
	(Tonnes)	**(Thousand US$)**	**(Tonnes)**	**(Thousand US$)**
1990	60 362	117 393	212 240	130 815
1991	73 870	154 559	225 839	141 433
1992	150 568	181 239	177 440	115 443
1993	122 671	199 030	140 417	90 197
1994	176 798	256 182	275 967	134 784
1995	95 913	242 284	324 569	155 406
1996	85 420	201 620	148 324	126 823
1997	99 156	219 699	213 522	153 643
1998	133 410	246 968	52 742	77 547
1999	126 001	261 846	38 056	57 597

2000	162 359	272 550	44 221	60 296
2001	155 941	284 536	51 655	61 788
2002	168 678	321 485	35 310	49 262
2003	183 462	395 004	42 655	78 606
2004	142 601	419 420	53 743	104 911
2005	177 045	444 585	56 176	126 648
2006	142 551	406 069	64 854	152 952