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**UNIVERSITY OF CAPE TOWN**

**SCHOOL OF ECONOMICS**

**An assessment of policy responses to the collapse of the West Coast  
rock lobster stock off Doringbaai**

**A mini dissertation in partial fulfilment of the requirements for the**

**Degree of**

**Masters Programme in Economics by Coursework and Dissertation**

**by**

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**February 2007**

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University of Cape Town

## 1. Introduction

In many of the small communities of South Africa's West Coast, the economic driver has traditionally been the fishing industry. Employment opportunities were largely located either on board the vessels or in a fish-processing factory which in some smaller centres was a monopsonistic employer. The last two decades have seen this system under threat. Fish stocks have declined and fish populations have move southward, while the fishing industry has been restructured to meet BEE imperatives, meaning that old established firms found their quotas even further decreased. To cut costs, fishing companies shed jobs and in extreme cases shut down their smaller operations. As they left the smaller centres they took with them their managerial skills, as well as capital and employment. The fishermen and women in these towns, have found it difficult to fill the vacuum, lacking as they do, organisation, access to credit, administrative and marketing skills, and above all critical information related to the process of issuing fishing rights (Isaacs, 2006, 57), (Arnason & Kashorte, 2006, 48).

The decline of the West Coast fisheries was latterly accompanied by the extension of the permit process; access to the resource being restructured initially in a 'medium term' and then in a long term rights application process. Those fishermen who were unsuccessful in acquiring access rights were trapped in a cycle of poverty and increasingly forced to fish illegally or 'poach' to survive.

The decline of the stock means that there are no simple answers to the problem, I argue however, that it would be beneficial for the South African Government to embark on a co-management programme with these fishing communities. In the first half of the paper I outline what co-management is, its benefits and some disadvantages, and what is needed for a co-management programme to be successful. I then investigate whether co-management would be an appropriate policy for the fishing community of Doringbaai, a small centre that has been particularly hard hit by the decline of the West Coast Rock Lobster stock and the closure of the Oceana Rock Lobster processing plant.

## 1.1 Background

The immediate need in Doringbaai is for jobs: people need to provide for their families. The dominant constraint is that the fish stocks are in a state of collapse and need time to be rebuilt, while stability in the industry must also be maintained. The reality of life in an area with few alternative sources of employment is that personal discount rates are high and time horizons accordingly short. In blunt terms, faced by a choice between restored stocks in the future and food on the table today, the future is bound to loose.

The Department of Marine and Coastal Management (MCM) describes its objectives in terms of 'equity, efficiency and ecology'. Theory suggests that one way to achieve these three objectives would be for Government to align subsistence fishermen's incentive structure with the rest of the industry. If this does not occur, and if subsistence fishermen are forced to comply with rules, structures and goals that are created for commercial fishermen, they will have little incentive to comply with the institutions, especially when these institutions do not address their socio-economic needs (Hooper & Lynch, 2006). Unsurprisingly, when subsistence fishermen are excluded from the fishing industry, they tend to support the poachers rather than MCM, which further jeopardises sustainability and economic stability (van Sittert et al., 2006, 109).

Recurring themes in both the local literature and in discussions with the community members themselves are that subsistence fishermen have little formal education, have limited access to capital and have very few employment options. Another common thread is the call for greater community participation in the design of policies and programmes before their implementation; the belief being that this would both improve the policies and increase public compliance with them. Accordingly, I conclude the paper by recommending that any steps taken by MCM need to use a bottom-up approach, i.e. they should involve the community in the decision making process. This means that the communities and stakeholders need to be consulted, and community leaders be given a chance to assist with the setting of the agenda or policy.

This paper is necessarily discursive. It is based on a limited local literature and discussions with researchers in the field, personnel at Marine and Coastal Management, and fishermen in Cape Town. It also draws heavily on a week spent in Doringbaai engaging with stakeholders and attending key meetings between members of the Doringbaai community and Oceana. I must also acknowledge the assistance of the former deputy director general of MCM, Mr Horst Kleinschmidt. Unfortunately, there is little official data available on this topic, and that which is available is not currently accessible as a result of quota appeals pending.

## **2. What is co-management?**

Co-management can be understood as an agreement between government and various stakeholders, concerning management of a resource whereby responsibility for the management of the resource is shared between them. In the case of South Africa, MCM would develop a partnership with the relevant stakeholders (the local residents and resource users) and then negotiate their respective functions, rights and responsibilities with regard to the area (Carlsson & Berkes, 2005, 66).

The function of co-management is to facilitate a partnership for state and non-state actors, to provide incentives for local resource users to use the resources in a sustainable manner and also, it is a tool in which the responsibilities and power is shared in a manner that conserves the resource in question (Hara, 2003, 20).

The first assumption of co-management is that the resource will benefit if the local people have a stake in the conservation and management of the resource and the second assumption is that a partnership is formed between the state and non-state actors, which includes the local resource users (Hara, 2003, 20). To these should be added a third: co-management requires a sedentary stock. If the community is to be given a property right to the local resource, then that resource should spend its commercially valuable lifespan in the area controlled by the community. Fugitive stocks such as pelagic fish (pilchard, anchovy, tuna etc) are by their nature unsuited to this form of control.

There are degrees of co-management arrangements. These range from government centralised systems in which community members are merely consulted before policies are put in place, to fully devolved systems in which the community self-governs its access to the resource and the government plays a minor role in management (Pomeroy & Berkes, 1997, 466), (Kuperan, Mustapha, Abdullah, Pomeroy, Genio, Salamanca, 1998 , 1) , (Carlsson & Berkes, 2005, 66).

There is no standard co-management structure that can be applied to every situation. Within the spectrum described above there are five standard types of co-management structure, the most appropriate for a given area having to be determined on a case-by-case basis. They are classified into groups according to the extent of the responsibilities devolved, the degree of power sharing and the roles that government and fishers play:

- Instructive: Government holds all the power and responsibilities. Government relay s information to the fishermen on the decisions that are being made.
- Consultative: Government consults with fishers, but ultimately the decisions are made by the government.
- Cooperative: in this arrangement, government and fishers are equal partners with respect to the decision-making.
- Advisory: Fishers advise the government on decisions that need to be taken and the government endorses these decisions.
- Informative: the government has delegated the decision-making authority to fisher groups who are responsible for informing government of the decisions made (Pomeroy & Ahmed, 2006, 13).

Importantly in a local context, government has a role in the coordination of scientific and stock estimation data. Even where local fishermen argue that they are best able to assess local stocks, the State remains best suited to providing a bigger picture of stock conditions and expectations. South Africa has a history of fisheries associations (including one for Rock Lobster) and there is a private research sector, but the State remains the dominant provider of research services.

There is no co-management structure that can be directly copied from one area to another because each community has its unique characteristics. Rather, a basic structure is used and adjusted to the needs and characteristics of the area. Which structure is initially used is negotiated between government and the community members, but the government always plays the more decisive role. The key to co-management is the negotiation and agreement between the state and non-state actors concerning the sharing of power and allocating responsibilities (Pomeroy & Ahmed, 2006, 14).

Co-management should be conceptualised as a process rather than an end result. The devolution of authority means that co-management is more flexible than centralised management. By design, it is able to adapt to the local circumstances of the community. As Jentoft, McCay & Wilson(1998) comment, co-management is not a fixed thing. It is an evolving process guided by a set of institutional principles (Jentoft et al, 1998, 434). In an earlier paper, Jentoft & McCay (1995) noted that fisheries management systems evolved gradually and were not the product of some grand design (Jentoft & McCay, 1995, 236). The same principles should thus be applied to co-management systems, where the initial structure is put in place and as the need arises, is changed and adjusted gradually. A co-management structure can evolve from being instructive to consultative, and if needed, eventually evolve to an informative co-management structure. Evolution will occur as fishers build their capacity and their knowledge, and as the trust between government and the community members is strengthened.

## **2.1 Co-management and Property rights**

The literature identifies four analytical property rights regimes for common pool resources. The first is Open Access or non-property where there is a complete absence of property rights. The second is Common property where the resource is used and controlled by an identifiable community or group. The third treatment is State property where the government controls and manages the resource and it determines who has access to the resource and how much of the resource can be used. The last treatment of property rights is Private property where an individual or a

company holds the rights to the resource (Pomeroy & Ahmed, 2006, 17), (Hara, 2003, 16) & (Pomeroy & Berkes, 1997, 467).

Co-management is a structure that is positioned between state property and communal property. The problem faced by local resource users is how to act collectively so that free-riding, corruption and rent seeking are kept to a minimum. Fishers need to allocate resources in a manner that is equitable and economically efficient among users and they need to develop or change the incentives so that the resource is used in a sustainable manner (Pomeroy & Ahmed, 2006, 18).

Incentives can be changed by giving resource-users more responsibility for regulatory functions. If users are given more responsibilities, they are more likely to act responsibly and to comply with the regulations that they have helped to develop (Jentoft et al, 1998, 426). When the institutional setting changes, the actions of the resource users will also change, especially in small fishing communities where the social network is more integrative than in large, urban settings. For the institutional setting to change, it is implicitly assumed that rules are developed so that fishers are informed as to which actions and outcomes are permissible (Pomeroy & Ahmed, 2006, 19). The rules thus provide stability for the community because they will automatically know what should be monitored and enforced and that transgressors will be punished.

## **2.2 Why might co-management be a better alternative?**

The top-down centralised approach has not prevented the over exploitation of marine stocks. Opponents of top down decision-making insist that this management style has been proven ineffective in the promotion of long-term stability. They also argue that top down management approaches have generally ignored the needs of the resources users, rather focusing on economic and more recently, resource objectives.

Part of the reason for the lack of stability is that resource users and stakeholders have been excluded from the decision making process which led to a lack of buy-in by user groups, low levels of compliance, and ineffective controls on exploitation (Hanna,

10/05/06), (Hauck & Sweijid, 1999, 1029), & (Nielson, Degnbol, Viswanathan, Ahmed, Hara, Abdullah, 2004, 153).

It is also argued that the top-down approach has led to the lack of legitimacy of the system (Jentoft, 2000, 142) & (van Sittert et al, 2006, 105) If those who have been denied access rights feel that the process lacks legitimacy, as is the case with South Africa's artisanal<sup>1</sup> fishing communities, fishers will continue to contravene the regulations. Importantly, even those who accept the system's legitimacy will be likely to contravene its regulations - the system will lose its credibility throughout the fishing fraternity since an attitude of "if they can do it, why can't we", will be adopted (Hersoug & Holm, 2000, 231). In the case of an already depleted resource this could totally destabilise the industry.

### **2.3 Benefits of Co-management:**

Co-management is considered a more democratic governance system because there is more involvement from the resource's stakeholders. It also implies that these parties' opinions matter and are considered in the decision-making process. Not only are non-state actors included in the decision making process, but they also incur some responsibilities that are usually held by the state only. The involvement of non-state actors in the management of the resource will lead to greater community buy-in, acceptance and voluntary compliance compared to the top-down, centralised approach (Nielson et al, 2004, 153) , (Jentoft, 2000, 57) & (Alpizar, 2005, 2).

A further advantage is the view (commonly stated at public meetings attended by fishermen) that local resource users have in depth knowledge of the area in which they extract the resource. Sharing this with the State should add to the overall level of knowledge available to both the scientific modellers and the resource users. The rules and management of the resource will be better suited and more effective than the top-down approach since it includes local knowledge and information inputs. There is

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<sup>1</sup> Note that the term artisanal is not recognized in South African maritime policy. Artisanal fishers are classified as either subsistence fishermen or Limited Commercial Sector.

thus a sharing of responsibility, power and knowledge among parties (Pomeroy & Berkes, 1997, 467) & (Jentoft et al, 1998, 434).

The initial stages of co-management structures are time consuming and expensive due to the intensive consultation between state and non-state actors and local institutions need to be built up. If the co-management arrangement is appropriately designed, including the local community and resource users there are likely to be savings that offer a practical benefit to the State (Hannah, 10/05/06), (Alpizar, 2005, 2). In the local context, it could cut costs of Government's policing and monitoring functions at a time when MCM is under increasing pressure to perform while facing severe resource constraints. (Hara, 2003, 31)

Because co-management involves the local users in the process of setting the rules of the management of the resource, sharing the power and responsibility of monitoring the resource, the legitimacy of government is strengthened and compliance and commitment to the programme among resource users are also enhanced (Jentoft et al, 1998, 423) & (Alpizar, 2005, 2).

Pomeroy and Ahmed (2006) list additional advantages of a co-management programme: a more transparent, accountable and autonomous management system; a system more economical than centralised management, requiring less to be spent on management and administration in the long-run; improved stewardship of aquatic and coastal resources and management; management is accountable to local areas so fishing communities can devise solutions that are more appropriate to local conditions; fishers view the resource as a long-term asset rather than discount its future returns and so use the resource in a more sustainable manner; stakeholders are brought together so there's a holistic understanding of the resource; standards are enforced more effectively by communities than by bureaucracies can; social conflict is minimised because the community has a common goal to work towards (Pomeroy & Ahmed, 2006, 22-23).

## 2.4 Disadvantages of co-management

The workability of Co-management clearly depends on the nature of the local community. Strong, cohesive and stable communities are key to successful co-management. Unfortunately, ideal communities, i.e. social groups that possess shared beliefs, stable membership, the expectation of continuing interaction and a pattern of relations that are direct and multiplex, rarely exist (Jentoft, 2000, 58).

Communities aren't guaranteed to be homogenous; there are different interest groups and so a community does not function as a cohesive unit. There are differences, divisions, conflicts and inequities within communities. Power is not distributed equally in a community, and there may not be strong linkages between community members (Kapoor, 2001, 275) & (Pomeroy & Ahmed, 2006, 16).

It has been argued that in some South African fishing centres geographic co-existence does not automatically imply a sense of community. Van Sittert (2003, 210) in particular argues identifying fishing communities in South Africa is not always a practical task. He contends that the fishing communities that do exist, especially along the West Coast, were artificially engineered around fish processing plants in the early 1900s at a time when free housing, food and alcohol were exchanged for labour. Against this view it should be remembered that much time has passed since the establishment of these plants, and that while towns such as St Helena Bay may be fractured, in small centres like Doringbaai linkages have been fostered by shared adversity. Practices such as food sharing<sup>2</sup> are still conspicuous and social networks, being smaller, are also stronger.

The main argument against co-management is that free-riding exists and fishermen cannot be trusted to control their fishing effort (Jentoft et al, 1998, 424) & (Acheson, Stockwell & Wilson, 2000, 53). There is a concern that co-management programmes are being established at a faster pace than research on factors that influence their failure or success (Alpizar, 2005, 2).

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<sup>2</sup> A portion of a catch is typically sold and portion kept for home consumption. Fishermen with a good catch may share out a portion of their 'keep' with families that had a poorer take or who face some other problem.

Pomeroy & Ahmed (2006) provide a comprehensive list of disadvantages to co-management regimes: co-management is not the solution for every fishing community.

- Communities may not be willing or able to take on the responsibility of co-management;
- appropriate institutions may not exist within the community to initiate or sustain co-management efforts;
- there are high transaction costs in the short-run. Costs include time, financial costs, and human resources to establish co-management.
- The incentives to engage in co-management may not exist for individuals or for the community itself;
- the risks involved in changing fisheries management strategies may be too high for some communities and fishers;
- the costs may outweigh the expected benefits to participate in co-management strategies;
- there may be insufficient political will to support co-management programmes;
- government officials may not want to share power;
- the community may not have the capacity to be an effective and equitable governing institution;
- actions by user groups outside the immediate community may undermine or destroy the management activities undertaken by the community;
- particular local resource characteristics may make it difficult for the community to manage the resource;
- the need to develop a consensus from a wide range of interests may lengthen the decision-making process and result in a weaker, compromised measures, there may be a shift in "power bases" that are not in the best interest of all partners;
- individuals may feel that there are more appropriate alternatives available; the power-sharing may be distorted and used in a corrupt manner (Pomeroy & Ahmed, 2006, 23-24).

Implementing a co-management regime does not guarantee that it will prove to be a success. The management structure needs to be designed so that it succeeds (Nielson et al, 2004, 158), (Alpizar, 2005, 4) & (Jentoft, 2000, 59).

To improve co-management's chances of succeeding, the government needs to play a supporting role (Acheson et al, 2000, 60). It can do this by assigning and clearly specifying property rights to a community. Without property rights, the community will have no assurance of legitimate participation (Hannah, 10/05/06). Property rights must be developed so that communities are assured that government or private parties will not appropriate the communal resources. The community may stop believing that co-management can work because of the uncertainty surrounding the property rights (Kapoor, 2001, 276). If community members are unsure as to where they stand, they will not believe that they own the co-management process and thus community buy-in and voluntary compliance will be jeopardised.

The co-management structure should also have a legal basis, as found in Norway and Japan, the only two documented cases of a successful partnership. Government also needs to devolve some of its power (Pomeroy & Berkes, 1997, 468). The government must allow the community to participate in the setting of the agenda and have a role in the decision-making (Jentoft, 2000, 57).

## **2.5 Lessons learnt from South African Examples**

Hauck & Sowman (2001) analyse nine different co-management initiatives in South Africa and draw ten lessons from the experiences. Co-management is in the infant stages in South Africa. The programmes are in diverse sectors, do not pertain to the fishery sector exclusively and vary in terms of how long they have been in operation. The shortest co-management initiative was three months (Pondoland Forestry) and the longest was between twenty and twenty-five years (Hake industry-government initiative) (Hauck & Sowman, 2001, 177).

The ten lessons learnt:

1. Resource users need to secure access rights.

Where co-management was used to replace poaching, the first priority was to secure access rights so that users have a sense of ownership by having 'priority access' to the resource (Hauck & Sowman, 2001, 178).

2. There is a lack of commitment on the part of government.

Government needs to devolve more power and play a more supportive role to fishing communities. The roles and responsibilities of the state and non-state actors must be negotiated. Government should be wary of dictating who does what as it can be misconstrued that the status quo of centralised management will remain. Since co-management is a process, the roles and responsibilities of the stakeholders can evolve (Hauck & Sowman, 2001, 183).

3. Communities and government officials lack the capacity to implement co-management initiatives.

There is room for government officials to learn how to change their management style from an autocratic to a more democratic and supportive role. Capacity building on the part of communities will empower the community and it will enhance the participatory process of co-management, as it would be more involved and meaningful (Hauck & Sowman, 2001, 180).

4. Problem of local representation: Change and Accountability

In some cases, there was local representation but the representatives failed to involve the community in the decision-making process. They also failed to relay important information to community stakeholders. Community stakeholders have insufficient capacity to fulfil certain responsibilities and also become weary of attending so many meetings (Hauck & Sowman, 2001, 180).

5. Objectives differ across and between stakeholders

Stakeholders had different objectives both across co-management projects and within a project. In some cases not all of the non-state actors supported the project. State and non-state stakeholders had different objectives (e.g. St. Lucia

gillnetting project). It is therefore imperative that objectives are aligned from the onset of the project (Hauck & Sowman, 2001, 180).

6. Need to consider alternative economic opportunities

Resource users must look at alternatives to harvest use of the resource, such as tourism, especially where the resource is overexploited. To guide their decision, stakeholders need to consider what strengths and weaknesses their towns have in terms of marketable assets.

7. Enforcement and compliance is important

With the allocation of access rights through co-management programmes, resource users were harvesting resources that were historically denied to them. Rules pertaining to the harvesting of resources therefore need to be negotiated between the state and non-state actors. Trust and voluntary compliance between stakeholders will be built if the rules are negotiated, rather than scientists and fishery compliance officers telling resource users what they can and cannot do. Ultimately, when deciding what the rules are the power will rest in the hands of government (Hauck & Sowman, 2001, 180).

8. Funding is unreliable and resources in the preliminary stages are underestimated

Co-management projects have been shut down because there was a lack of funding (e.g. Kleinmond Inshore Fishery was terminated after nine months). The amount of time, financial and human resources (before decisions are negotiated) are underestimated and therefore not accurately taken into consideration (Hauck & Sowman, 2001, 182).

9. Communities need a long-term champion

One or two key individuals, who have been there from the start of the project, are needed to provide support, motivation, encouragement and information to the community (Hauck & Sowman, 2001, 182).

10. To maintain co-management projects, the projects need to be monitored and evaluated

Where resource harvesting takes place, it is essential that catches are monitored and recorded so that sustainable use and management can be developed. Local knowledge plays a role in the monitoring of the resource, as locals may be able to explain previous resource usage and data. The co-management project should also be monitored so that it can be tweaked as it is developed (Hauck & Sowman, 2001, 180).

### **3. Doringbaai: the case study**

On Wednesday, 7<sup>th</sup> February 2007, Oceana staff came to Doringbaai to strip the equipment from the factory they had under lease from the State. The community protested by blockading the trucks, burning tyres and venting their anger at the staff of Oceana. The police eventually calmed the protestors and a meeting was held the following week between community members, Oceana and Marine and Coastal Management (MCM).

In the 2005 round of applications for long-term Cluster C access rights, the fishermen and some community members applied for quotas. None of the fishermen were successful in their application for long-term rights! The reason given by MCM was that they were not historically involved in the fishing industry. By historical involvement, MCM does not mean that the applicants did not fish, but that they had been unsuccessful in earlier (2002) medium-term allocation process and thus had not invested in the fishing industry. There are however four quota holders that share a limited commercial quota with other members elsewhere and have a processing agreement with Lusitania, another company in Cape Town.

Officials from MCM went to Doringbaai to investigate the discrepancy and interviewed the applicants. The interviews were conducted to find those who would have qualified prior to 2001. MCM needed to intervene so as not to have a system that 'blindly' allocated rights without referring to the locality and histories of the applicants.<sup>3</sup> The initial allocation of access rights without looking at the context and

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<sup>3</sup> Kleinschmidt pers. com. March 2006

the social background of the applicants was the initial point of failure. As a result, applicants who should not have received access rights, received them in the medium-term, while the “real” fishermen were excluded from the medium-term process, and ultimately therefore from the long-term process because they did not fit the statistical criteria of the rights allocation package.

Eventually 11 (25%) out of the 44 original applicants were successful. These fishermen received a quota allocation of 750 kg's. The officials discovered on their visit that fishermen were poor and because they had no other employment opportunities in the town, fishermen bought recreational permits and then illegally sold the WCRL that they caught.

In a study that looked at the growth potential of towns in the Western Cape, van der Merwe (2004), identified towns that were growth nodes. Doringbaai was not identified as one of these towns; indeed the nearest growth node to Doringbaai was Vredendal, 65 kilometres to the South. He also comments that without an increase in job opportunities which constitute a town's economic base, there can be no growth (van der Merwe, 2004, 13). This is especially true of Doringbaai whose internal economy rests unstably on a single industry.

### **3.1 Background information to Doringbaai**

According to the 1996 Census Data,<sup>4</sup> 5 per cent of the population in Doringbaai are African, 90,3 per cent are of coloured descent and 4,2 per cent of the population belongs to the white race group.

The immediately post-apartheid village of Doringbaai described in the 1993 HSRC report<sup>5</sup> is in some respects little different to the present fishing town. There have been

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<sup>4</sup> The data used is from the HSRC Report (1993), Census 1996 and the West Coast Poverty Alleviation Strategy that uses Census 2001 data. The data is used to provide a general overview of Doringbaai and is not used for comparison purposes. I am able to do this because the medium-term rights allocation only occurred in 2002. The major difference between 1996 and 2000 was that the Unemployment rates increased from 20,4% to 53,4% respectively; it was thereafter that the medium term rights allocation process provided the major shock to the local economy.

some improvements and some deterioration in the quality of the lives of its inhabitants. In 1993 there was no doctor available in the town except when the mobile clinic made its rounds on a Wednesday morning. There was no public transport, such as taxis, available and it was expensive to travel to the surrounding towns. There was also no preschool though some unemployed ladies acted as kindergarten teachers and tutored the children in preparation for primary school. The houses were provided by Oceana. Some houses lacked internal plumbing; the homes were not electrified. A lack of recreational facilities for the youth was described as contributing to crime. Doringbaai's roads were gravel and were muddy when it rained. The problems that the inhabitants faced were similar to those at present, in particular the season for WCRL was only four months long and there were few other fish to be caught out of season (HSRC report, 1993, 99). The factory supplemented their household income by processing and cleaning vegetables in the 'off-season'.

There are very few employment options available to the folk of Doringbaai, with 54,3 per cent of the population being unemployed; this is much higher than the national average. The main reason for the high unemployment rate is that the factory that supported the town is no longer in existence. The 54,3 per cent is actually an underestimate: being from the census 2001 data it does not take into account the closure of the factory in mid-2006.

Liebrandt, Poswell, Naidoo, Welch & Woolard (2004) uses the upper poverty line of R250 per month. Using the Census 2001 data, I calculate that 61,8 per cent of the inhabitants in Doringbaai fall within the poverty band. The Census 2001 uses income bands, and the lowest two income bands are no income and R1 – R400 per month. My calculation is therefore biased upward; however, it does provide a startling figure and highlights the severity of poverty in Doringbaai.

Most of the coloured people in Doringbaai have little formal education: 10 per cent of the coloured population had no schooling, 26 per cent had grade six and 3 per cent

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<sup>5</sup> Referenced as Schutte, De W. 1993. 'n Ontleding van die ontwikkelingspotensiaal van geselekteerde vissersgemeenskappe aan die Wes- en Suidkus /

had grade twelve. 14,3 per cent of the African population had no schooling, 19,3 had grade six while 4,8 per cent had grade twelve. Looking at the white race group, 40 per cent had grade twelve education level (Census 1996). Even though the education levels of the inhabitants are relatively low, the immediate need is not education, but rather, employment generation in the town since there are people in Doringbaai who have grade twelve, but are currently unemployed.

The typical household in the Matzikama Municipal areas (of which Doringbaai is a ward) has a monthly income ranging from R601 to R1500, households spend an average of R1818.15, with no income being saved. The average household was estimated to be incurring a monthly debt of R832 (West Coast Poverty Alleviation Strategy, 2006).

One of the strategies used by those that do not receive an income is to apply for grants. These grants are the only source of income that households receive. 73 inhabitants receive an Old Age pension, 50 people received a Disability grant, 8 people received a Foster Care grant, 1 person received care dependency grant, and 124 inhabitants receive a Child Support grant (West Coast Poverty Alleviation Strategy, 2006). This does not indicate how many people are supported by the grants. Interviews in the town suggested that the grants generally support a household of five people.

The mobile clinic that serves Doringbaai is only open on a Monday and a Wednesday from 9:00 until 12:00. The doctor is available on a Wednesday. For urgent medical attention at other times families need to pay R200 to get to the nearest doctor. There are two registered nurses and one assistant nurse in Doringbaai. Since there is no permanent clinic in Doringbaai they commute to work in Vredendal.

### **3.1.1 Access to Telephones**

In Doringbaai, 13,6 per cent of the population has access to a telephone in their dwellings and have access to a cell phone, 30,3 per cent of the population has access to a landline only, 9,6 per cent only own a cell phone, while 27,5 per cent have access

to a telephone at a neighbour and 18,9 per cent can access telecommunications via a nearby public phone (West Coast Poverty Alleviation Strategy, 2006).

### **3.1.2 Access to electricity, water and sanitation and refuse disposal**

81,6 per cent of the Doringbaai population have access to piped water inside their dwellings, while 17,8 per cent have piped water inside their yards. 100 per cent of the population in Doringbaai has access to electricity. 95 per cent of households in Doringbaai have access to a flush toilet (connected to sewerage system), 1,1 per cent have access to a flush toilet (with a septic tank) and 1,1 per cent have access to a pit latrine with ventilation (West Coast Poverty Alleviation Strategy, 2006). All the households in Doringbaai have access to refuse disposal service (Census, 1996). There are large containers that stand on an unused area in Doringbaai which hold the refuse. The municipality collects this refuse when the containers are full. If one compares this to 1993, one can see that in terms of basic service delivery, the inhabitants are living in a more dignified manner but in terms of employment opportunities, the inhabitants are worse off.

The local economy and infrastructure that drives Doringbaai consists of a boat repair company, one grocery stores, one general dealer, three mobile shops, three liquor stores, one pub/sports bar (while I was there it was still unlicensed), one restaurant (fully licensed), two accommodation places (1 Bed and Breakfast, the other self catering accommodation), one petrol pump, one Post agency, one mobile clinic, one library, one Police Station, one fishing control office, one Primary School , One Pre-School, a Multi-Purpose Resource Center, one fully functional Fish Processing factory (It hasn't been used to its full capacity because the Oceana's quota has been reduced), a sports field and a community hall. There is no harbour in Doringbaai, but there is a dilapidated slipway that was supposed to be fixed.

The closest SMME (Small and Medium Enterprise) development center is in Vredenburg which is too far to travel to as very few people in Doringbaai own transport and there are high costs associated with travelling to outside towns (as an example, if people want to travel to Vredendal, it would cost R200 per trip.) The

Multi-Purpose Resource Center is used as: a soup kitchen; people can have their CV compiled for a fee of R10; there is supposed to be internet access there but the computers are not functioning. There have also been numerous other projects that have been launched by the MPRC. Unfortunately, none of them have been sustainable because of a lack of capital, or there is no market for the products that they have made (e.g. needlework project).

There are no banks or ATM's because there is too little money circulating in Doringbaai. The service was stopped by ABSA. If one needed money and were without private transport, a fare of R200 is paid to get to the nearest bank. On average, people travel to Vredendal twice a month to do their shopping.

#### **4. Methodology**

To assess the potential for co-management<sup>6</sup> of the Rock Lobster stock off Doringbaai we first have to establish what the nature and extent of the market for the WCRL, secondly to find out how the current system operates and lastly to establish the community's perceptions about compliance.

For co-management to work, the fishermen need to comply with the rules agreed upon and they need to understand what would happen if they do not fish in a sustainable manner.

One of the conditions for co-management to work is that the area needs to be a closed system i.e. the people in the community needs to feel secure that no other person will be able to use their resource.

If the resource is used unsustainably, the result would be catastrophic. One way in which they would use the resource unsustainably would be if they had outside employment options or if they could pack up and move to another town where they could repeat the cycle.

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<sup>6</sup>Co-management is the policy option that will be assessed in Doringbaai.

When a co-management system is in place, the members in the community cannot aspire to anything more in the short run than the current system offers. Increased effort would upset the balance of the co-management system and increase the likelihood that other fishermen would default.<sup>7</sup> This is a critical feature. Unlike manufacturing or service industries where increased effort translates into increased benefits and where demand is the dominant constraint, in a fishery the resource is the constraint. One person can benefit by increasing effort, but if all replicate this increase, all will lose.

Although stock constraints are central, market conditions determine prices and therefore incomes of fishermen. Consequently the market needs to be unravelled. Who are the buyers and sellers, what drives the going price and what factors cause it to change? In addition to these questions one needs to know if fishermen benefit through better prices when selling to individuals, i.e. to households, to tourists or to restaurant managers from outside Doringbaai.

#### 4.1 Interviews

Whilst in Doringbaai, I interviewed seven community members, seven community leaders, four successful quota applicants and seven unsuccessful applicants. I also interviewed law enforcement officers of Doringbaai.<sup>8</sup>

The interviews were semi-structured, following a preset series of questions, but allowing deviation for discussion. The interviews often lasted two to three hours per respondent and were conducted in Afrikaans. Other interviews took the form of 'chats', speaking to people informally, when they saw me walking in the street and were curious to find out why I was in Doringbaai (especially since it was not during the holiday season). These informal chats provided additional insights into the

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<sup>7</sup> Interview with Lance van Sittert, July 2006

<sup>8</sup> A community member is any person that resides in Doringbaai, a community leader is someone that holds a position of authority or leadership such as a principal, a political leader, the manager of the factory. A successful quota holder is an applicant that has been applied for a long-term quota (limited commercial or Cluster C quota) while a unsuccessful quota applicant is a person that was unsuccessful in their application for a long-term quota (limited commercial or Cluster C quota).

community. The questionnaire<sup>9</sup> is loosely based on previous work, by the Subsistence Fisheries Task Group (SFTG) (1999) and by Anchor Consultants (1999)<sup>10</sup>. I also received input from various researchers in the field.

In a community with powerful under-currents of local politics it is important not to align oneself with a particular group as this would risk alienation from the broader community. This strategy is also a pre-requisite for interview objectivity; consequently interviews were held unaccompanied by any local community leader.

## **5. Key findings and challenges**

### **5.1 The market system**

#### **5.1.1 The product and price**

The fishermen in Doringbaai primarily catch West Coast Rock Lobster (WCRL – *Jasus lalandii*) and Hottentot (*Pachymetopon blochii*), a line fish. Hottentot are sold in bunches of three while WCRL are sold individually. A crew pools its catch together and then splits the money equally. The percentage that is taken home varies from fisherman to fisherman and from day to day.

Factors that influence the price of Hottentot and WCRL are: the supply of fish, the physical size of the fish and whether the fishermen have transport to travel to other towns. The price for Hottentot ranges from R35 to R50 and the price of WCRL which is sold off a recreational permit vary from R15 to R50 per crayfish. Fishermen fetch higher prices when there is a limited supply of fish, the size of the fish is large and

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<sup>9</sup> The questionnaire used is attached as Appendix E.

<sup>10</sup> Referenced as

Russell, E., 1999. A socio-economic and resource-management profile of subsistence fishers in South Africa : draft report / Pretoria : Dept. of Environmental Affairs and Tourism, Subsistence Fisheries Task Group. and Clark, B. M., 1999. Subsistence fisheries programme. [South Africa] : Anchor Environmental Consultants respectively.

when they have transport to travel to nearby towns. The individual quota holders have a marketing agreement with various firms and do not sell their catch along the road side or to the community while those with limited commercial quotas catch the WCRL in Area 7 (from Saldanha Bay to Hout Bay) and Area 8 (from Hout Bay to East of Cape Hangklip).

Over time the range of factors driving the price of Rock Lobster are more varied. An industry representative<sup>11</sup> suggested that in the years between 2000 and 2006 the major drivers had included the exchange rate (most lobster is exported so the rise in the Rand from R12 to the US\$ to R6 to the US\$ effectively halved the amount processors were receiving), the cost of air transport and its availability (the events of 11/9/2001 affected this sharply), demand in the Far East (which is largely seasonal, also took a sharp knock when the SARS outbreak affected social dining-out in China) and the timing of seasons and extent of catches in Australia, New Zealand, Chile and Argentina, where competing products are harvested.<sup>12</sup> Semi-commercial small scale fishermen are generally unaware of these issues and often regarded the marked fluctuations in dockside prices with hostility and suspicion.

### **5.1.2 The Buyers and Sellers**

The fishermen sell their catch among the community members, along the road during the holiday season, and to the tourists visiting Doringbaai. Most of the people that buy from the fishermen are either housewives or tourists. Since the new regulations have come into being, the fishermen are unable to sell their catch openly and the tourists cannot find the fishermen as easily as they have in the past. The furthest a field that the fishermen sell their catch is in Lutzville and Vredendal. Other places that the fishermen sell their catch are Strandfontein, Paapendorp, Luderits and Ebenezer which are quite close to Doringbaai.

Interestingly from a co-management perspective, a number of interviewees suggested that when fishermen that poached in the past receive quota, they stop poaching and

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<sup>11</sup> Peter Foley, West Coast Rock Lobster Association, 2006.

respect the law because they could lose their (more valuable) permit if caught. Legitimacy effectively raises the opportunity cost of illegal activities.

Part of the market system is looking at all the entry and exit points of a place and also how accessible it is to the rest of the world. Doringbaai is isolated from urban areas, with the closest urban center being Vredendal which is approximately 50 km away from Doringbaai. There are only two access points into Doringbaai from Cape Town. The one that is used by locals is a shorter, but a riskier route because it is a private road owned by Spoornet and it is a gravel road. There have been some fatal motor vehicle accidents along the road because it is made of gravel, and is treacherous to drive at night and when it has rained. The longer, more picturesque route is through the N7 where you drive through all the surrounding towns. There are no airports or airfields near Doringbaai so exporting the crayfish via air is not an option. The closest train station<sup>13</sup> is Lutzville where there is a direct line to Saldanha Bay.

## **5.2. The Current System**

It is commonly believed that fishermen use the recreational permit to catch WCRL and Hottentot and then sell the catch illegally. This was not the case, as most of the people in Doringbaai cannot afford to pay R65 per permit. A trip to the post agency to get their records on users of permits showed that 90% of permit holders were holiday makers. The reality is that many holiday makers strike agreements with fishermen. The holiday makers “give” their recreational permits to the fishermen and in exchange the fishermen give the holidaymaker 50% of their catch, using the remainder to generate income to and pay for any additional costs incurred (such as petrol used to power the boats etc.).

The recreational permit is valid for one year from the purchase date, only one individual can use it at a time, i.e. each crew member needs their own permit, and there is a daily catch limit on each recreational permit issued. With a WCRL recreational permit, one is allowed to catch 4 lobsters per day and the body of the lobster has to be 75mm in length. Fishermen may not catch females and they may not

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<sup>13</sup> The railway station is used for commercial purposes only.

catch males with a soft shell. The season for WCRL is from September to April. The bait recreational permit is a complement to the Hottentot linefish recreational permit and is required to collect mussels from the coastline. This allows one to catch 10 Hottentot fish and ten mussels though fishermen argue that ten mussels are insufficient to catch ten Hottentot.

### **5.2.1 Fishing Gear Used to catch WCRL and Hottentot**

The fishermen in Doringbaai use hoop nets to catch WCRL and hand lines to catch Hottentot. There are a total of ten dinghies in Doringbaai that the fishermen share amongst themselves. On a good fishing day, only thirty to forty fishermen can go out to sea since there are only ten dinghies in Doringbaai which can take up to four people. Because the fishermen use dinghies, they are only allowed out one nautical sea mile. If they are caught further than this point or if they do not have life jackets aboard, they are fined by the fisheries compliance officer.

There are no cold storage facilities that the fishermen can use beside their own freezers. In the past, the fishermen were allowed to keep their catch in Oceana's cold storage unit at no cost to themselves, but this facility is no longer available.

### **5.2.2 Getting around limitations**

Fishermen get around catch limitations by high grading their catch. High grading is practiced throughout the fishing industry and is therefore not a problem specific to Doringbaai. Since there is a daily limit for each permit, when fishermen find that the size of their catch is small, they keep it just in case they don't catch any other lobsters. Even when they have caught their catch limit for the day, the fishermen continue to fish in the hope that they will catch larger fish. Should they do so, they throw the smaller size catch back into the ocean because if they are caught with more than their limit, it means that the fisheries compliance officer will fine them and confiscate their catch. The smaller lobster or fish returned to the ocean are often dead already. Fish mortality is therefore greater than fish landings. It is common to hear fishermen say

that it is the law that is forcing them to become criminals. Their reasoning is that if the policy were more aligned with their needs and constraints, there wouldn't be a need for them to evade the rules and regulations. This practice could be circumvented if MCM gave the fishers in Doringbaai a concession, and instead of having a daily bag limit, gave a weight limit for the season. In this way, a fisherman bringing a small fish or lobster aboard has an incentive to return it immediately.

### **5.2.3 Fines**

When the fishermen are caught with more fish than the limit allows, they are fined and their catch is confiscated. The fines that the fishermen incur when they are caught fishing are quite high relative to the income that they receive. Fishermen receive a spot fine of R200 per WCRL and R10 per Hottentot if they are caught breaking the rules. The fish are also confiscated.

Fishermen sell their fish to support their families. Fishermen cannot live off fish alone. They need to be able to pay for basic necessities such as electricity, food and shelter by selling fish. As explained earlier, there aren't many employment opportunities in Doringbaai and thus fishermen and the town in general rely on the ocean to support them.

Fishermen who cannot pay their fines are jailed. The jail sentence depends on the severity of the fine. When the fishermen are sent to jail, the family lose the head of the household and breadwinner and so cannot make ends meet. Fishermen cannot afford to pay the fine because they are unemployed so they return to the ocean to catch more fish or WCRL. They sell their catch not to only in a bid to support their family, but also to pay the fines.

## **5.3 Perceptions of the community**

To maintain the anonymity of the respondents, I group them into stakeholder status of community members, community leaders (includes law enforcement officers),

successful quota applicants, and unsuccessful applicants. For this section, I group the perceptions of the community according to the stakeholder group that they belong to.

### 5.3.1 Compliance

Barring the law enforcement officers interviewed, the perception amongst community leaders, community members and fishermen was that it was acceptable to poach. In the eyes of the people in Doringbaai, the system<sup>14</sup> has lost its legitimacy.

Jentoft (2000) argues that legality is not a sufficient condition for a legitimate fisheries management regime. Even though the management system may pass the legal test, if it cannot be defended on grounds of social justice then it will in all likelihood be challenged (Jentoft, 2000, 142). An example is the South African fisheries management, which is managed centrally, whereby the traditional fishers feel that they have been unfairly excluded from the access rights as they had to compete directly with new black entrants, who have had no historical involvement in the fishing industry (van Sittert et al, 2006, 105). When a particular group feels excluded from a process then the legitimacy of that process is questioned and non-compliance on the part of the resource users is, more often than not, a consequence.

Even though fishermen are caught and fined for selling their catch, this does not deter them. Although the fisheries compliance officers are sympathetic towards the broader community and the challenges it faces, and understand that fishermen rely on the ocean to provide for their families, they also realise that they have a mandate to protect the marine resources from being overexploited. The fisheries compliance officers also say that the fishermen will not be able to control their effort and thus active law enforcement should take place.

The community members and the fishermen, both quota holders and non-quota holders alike, feel that the fisheries compliance officers are too strict and should relax some of the rules. They also concur that even though the fishermen are aware of the rules, they have no other choice but to sell their catch illegally. Both groups of

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<sup>14</sup> The system that is being referred to is the manner in which the fishing rights were allocated to the fishermen in the medium and long term allocation rights allocation process.

stakeholders say that the law makes them into criminals because they do not have any option but to sell their catch since there are no other employment opportunities available and that fishing is the only marketable skill that they have. Additionally, they say that law enforcement officers in other areas are not as strict as in Doringbaai and the rules are not enforced uniformly.

Community leaders are also sympathetic towards the fishermen because they know what conditions the people live in. There is not enough food and parents are unable to provide for their children. They say that the ruling that people are not allowed to sell their catch if they have a recreational permit is fair to community leaders because they are able to provide for their families, but for unemployed fishermen, the rules are unfair. One community leader noted that the fishermen didn't poach on a large scale because they were too scared of the consequences.

The groups agree that if there were more employment opportunities and if fishermen had access to a more stable income, there would be no need to poach. At the moment however, the only way that their families will survive is if they sell their catch.

### **5.3.2 The Process of the allocation of access rights (medium and long-term access rights)**

There was a unanimous agreement among respondents that the allocation of access rights did not occur in a fair and equitable manner.

A commonly expressed view is that, "The "right" people often didn't get a quota, but rather "policemen, teachers and principals, people who have never fished a day in their life", received a quota, while fishermen did not receive a quota". It doesn't matter that the long-term process occurred in a just and fair manner, when the process leading up to it didn't occur in such a manner.

### **5.3.3 Conflict within the community**

The respondents identified two reasons why the community was not as cohesive as it could be. The first reason was the quota allocation itself: some of the members in the community received quota allocation while others did not. This has increased income inequality in Doringbaai - in the past, where everyone had worked at the factory, everyone was earning money and most households had roughly similar incomes. The increase in unemployment and the cut in permits has created real disparities between the few families that still have steady income and the many that have none. There were also tales of people who were friends and were no longer on speaking terms. The situation has since calmed down, and people are more amicable toward each other.

The reason why there was friction between quota holders and non-quota holders was because there was no differentiating factor between the two groups. Community members could not understand why some people received a quota allocation while other community members did not, especially since they came out of similar circumstances. Those that didn't receive quota also felt that the quota holders should have ploughed some of their money back into the community and shared their wealth with those that were struggling.

The second reason is that there is an underlying racial tension in the community. This seems rooted in access to wealth rather than in naïve racial prejudices. Most of the remaining businesses are owned by the white population in Doringbaai; the wealth portfolio and consequently the racial divide of the town has not changed dramatically since the demise of apartheid.

### **5.3.4 Perception of the health of the marine resource**

All of the respondents that were interviewed thought that the Hottentot stock was relatively stable and were not concerned about it.

## 6.2 Stock Constraints: Zone B (Doringbaai to Elandsbaai (Area 3 &

Area 4))

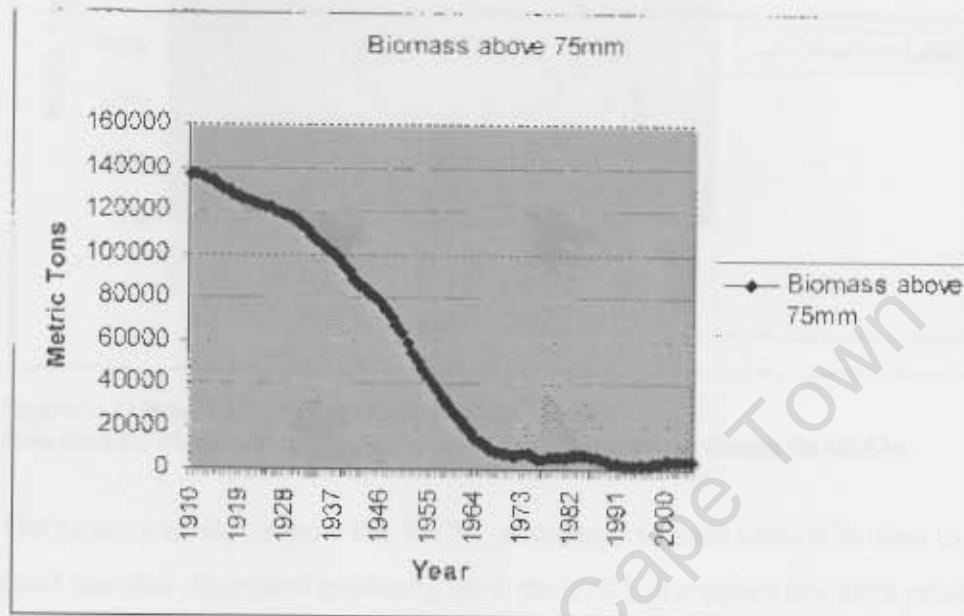
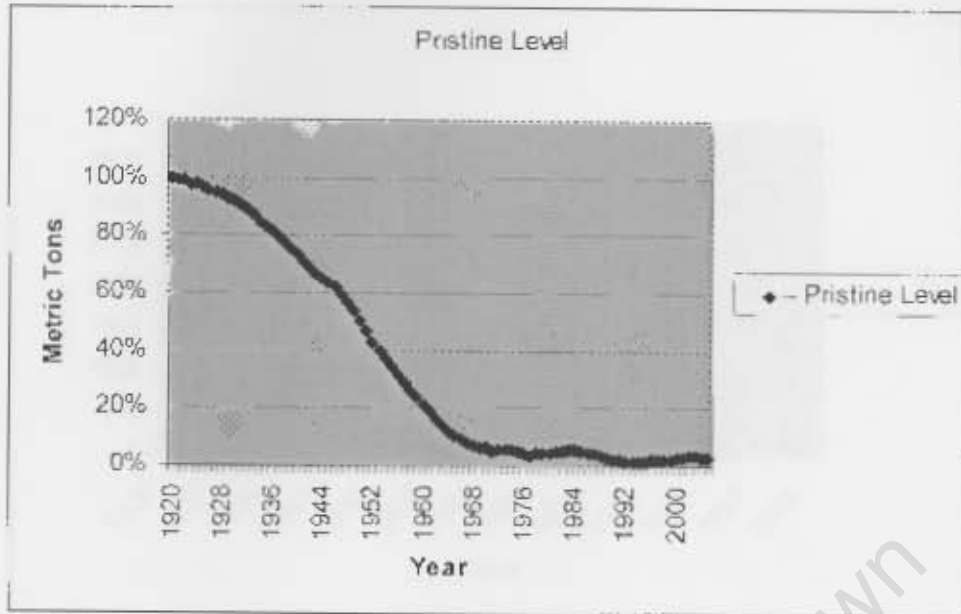


Figure 1: Overall biomass of WCRL (1910 - 2005) Zone B

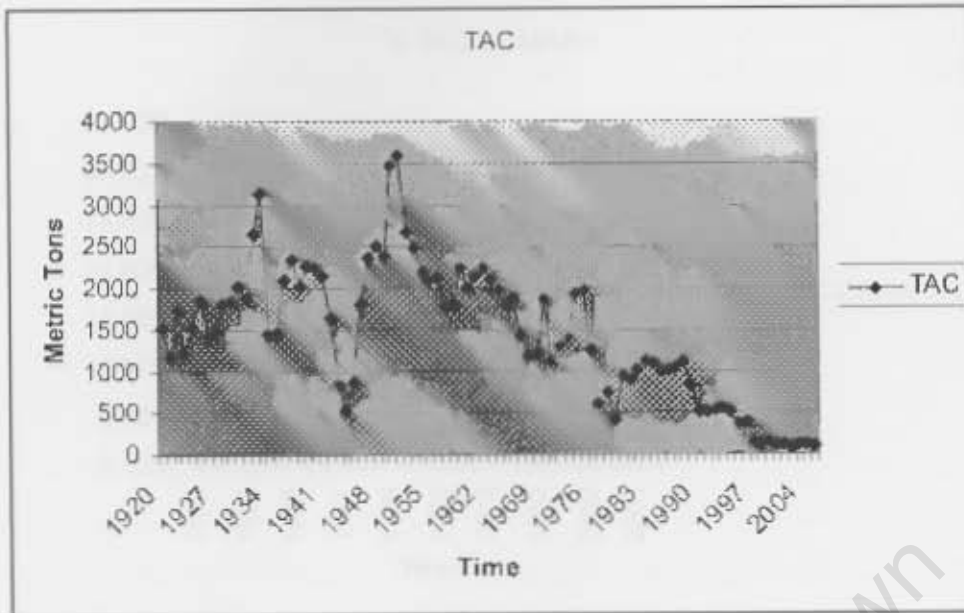
Data Source: Marine Resource Assessment and Management Group (MARAM)

The biomass of the WCRL is the portion of the resource that can be legally harvested. The data range is from 1910 to 2005/06 season. From the graph it is evident that the WCRL stock has been decreasing gradually until 1973 when it just plummeted and did not recover. This could be explained by over harvesting and over capitalisation in the WCRL industry that took place during that era.



**Figure 2: Pristine Level WCRL Zone B (1920 – 2005)**  
**Data Source: Marine Resource Assessment and Management Group (MARAM)**

The pristine level, i.e. how the WCRL compared to each section in time to its original level has also decreased gradually until the 1973. It reached the 10% pristine level in 1965 and has since then decreased to 3% of its pristine level in the 2005/06 WCRL Season. This means that for every 100 of the original WCRL, only three exist in Zone B.



**Figure 3: Commercial Catch/TAC Allocation (1920 - 2005) Zone B**  
**Data Source: Marine Resource Assessment and Management Group (MARAM)**

The graph above shows the Commercial Catch of WCRL for the period 1920 to 2005/06. It is evident from the graph that whenever the WCRL stock took a "dip", it increased and recovered within a few years. This phenomenon took place up until 1976. In a bid to control the harvesting of WCRL, a TAC was introduced in 1979. From the graph one can see that commercial catches were less erratic than previous years. After harvesting at 500MT between the period 1990 and 1994, the WCRL decreased sharply to 152 MT in 1997. In a bid to recover the stock, MCM has only allocated 108 MT to the WCRL industry in Zone B.

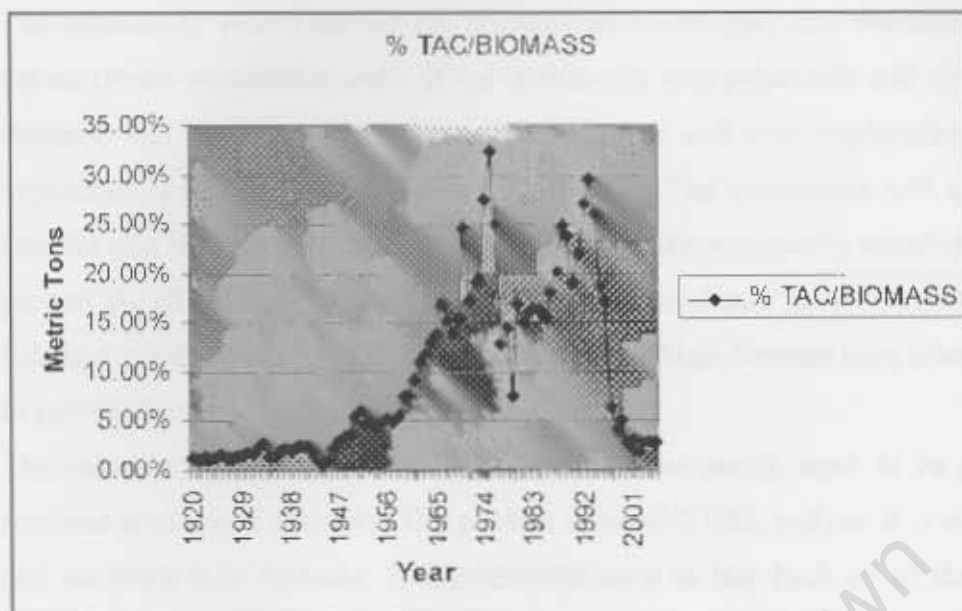


Figure 4: % TAC/Biomass WCRI (1920 - 2005) Zone B  
Data Source: Marine Resource Assessment and Management Group (MARAM)

The Graph above shows the percentage of commercial catch compared to the biomass of the WCRI in Zone B. One can see that between the period of 1962 and 1996, the %TAC/BIOMASS fluctuated between 10% and 17%, and peaking in 1975 at 32% of the biomass. In a bid to recover the WCRI stock in Zone B, MCM has only allocated between 2,7% and 2,85% between the period of 2000 and 2005/06.

## 7. What factors can contribute to a successful Co-management programme being implemented in Doringbaai?

Co-management can be practically implemented in Doringbaai by assigning Territorial Use Rights in Fisheries (TURF's) to the community members. TURFS assign rights to individuals and/or groups to fish in certain locations, generally based on long-standing tradition. This system holds the potential to provide relatively stable socially-supported fishery management as the system uses local knowledge to solve some of the systems problems<sup>16</sup> (Charles, 2001).

<sup>16</sup> For more information on TURF systems, please consult Charles, A (2001). *Chapter 6: Use rights and responsible fisheries: limiting access and harvesting through rights-based management*, [www.fao.org/docrep/005/v3427e/v3427e08.htm#bm08.4.1](http://www.fao.org/docrep/005/v3427e/v3427e08.htm#bm08.4.1) accessed on the 20/05/2007.

The community would harvest the resource as a monopoly and therefore harvest at the maximum sustainable yield. If the community acts cohesively and rationally, the resource will be managed in an optimal manner and over exploitation and over capitalisation in the industry will not take place. The community will not act as a rational unit if their discount rates are high i.e. if the community members value the present use of the resource more than they value the future use of the resource. Poor fishing communities are typically characterised by high discount rates since they need to provide for their family now.

The resource is rich and communities do not necessarily need to be poor if the resource is managed properly. The pristine level of WCRL in Zone B is currently 3% and therefore it is depleted. If Government were to buy back all of the quotas of WCRL and prohibit any harvesting of WCRL along the West Coast of South Africa for five years, i.e. from 2007 to 2011, it has been shown that the biomass of WCRL would increase by 167%.<sup>17</sup> For this to be successfully implemented, i.e. so that poaching does not occur, it is important that alternative employment is created for the artisanal fishermen that rely on WCRL as a means to income. The Government could employ these fishermen in a short-term public works programme. Importantly the demand for public works programme is increasing ahead of the demand generated in the region with respect to the 2010 Soccer World Cup.

Once the five years have been completed, Government could then give fishing communities that fulfil certain criteria, TURFs. TURFs and not individual rights should be assigned because individual rights are leased and are not privately owned. There is no guarantee that the user of the individual right will be allocated a right in the future and therefore there is no incentive to invest in the resource. TURFs on the other hand could potentially ensure sustained cooperation among community members because there are repeated interactions. Since community members reside in the area, the interaction is viewed as long-term and over-exploitation in the short-term is unlikely to occur. Cheating and free riding are less likely to occur, especially in a small community like Doringbaai, because the social network is small and everyone

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can observe each other's interaction and behaviour patterns. If a person is caught cheating, the rest of the community could punish him by excluding him from further interactions.

It has been suggested that the recreational take of the community be given to the community as a community quota. This implies that there will not be a need to increase the TAC of WCRL. There are This will not work for two reasons. The first being that tourism is an alternative source for income to small communities such as Doringbaai, as it provides employment to community members that do not work in the fishing industry. Recreational fishers is one of the activities that are offered by the community. Redistributing the recreational allocation to the community would therefore have negative consequences on the tourist industry that small towns often depend on.

Secondly, Marine and Coastal Management would be wary of implementing this system. I suggested this system to one of the officials at Marine and Coastal Management, and he explained that giving the community the recreational allocation would be regressing to the system before the limited commercial sector was introduced.

The state and the community would manage the resource together. Scientists would provide the community with information regarding the stock levels. Additionally, the scientists would advise the community to as to the level of harvest. The community would then choose what the next best step would be and a portion of the profit made would go into a public pot. The money collected would be used to reinvest into the WCRL resource.

This type of programme could only work in Doringbaai if the social network is strengthened. The immediate need in Doringbaai is for employment opportunities. For the long-term however, the community needs to invest in its social development, i.e. to build its skill base. There are currently no employment opportunities to absorb those that have completed their education. This has a negative effect on the youth because it means that they have nothing to aspire to, and so do not see the objective of completing their education. Since many of the parents are unemployed, they do not have the money to send their children to high school. In the past, Oceana employed

these learners. Additionally, primary school learners are also leaving school. The situation in Doringbaai is therefore very sad because there is going to be a generation of young adults that do not have education.

The success of the programme therefore rests on the social cohesion of the community. From my short stay in Doringbaai, I could see that although the older community members had a strong sense of self and community pride, it was lacking in the younger generation because they had no role models and they did not see a bright future for themselves. The community leaders are trying to start projects to inspire the youth, but with limited funding and poverty surrounding them, it is no easy task.

The television plays a great role in the lives of the youth as it leaves a residue of discontent since they want to aspire to more than what they have, but they lack the tools to do so.

The literature shows that there are numerous benefits as well as drawbacks to the co-management regime. Importantly, it cannot be used as a panacea to cure all ills of the modern day fisheries management system. Rather, it needs to be researched, well thought out and stakeholders need to be involved in the implementation of this system so that a system that is applicable to the area can be born. The reason why co-management works is because it is created for specific instances and therefore no standard model of co-management exists or can be applied homogeneously.

There is no easy answer, but I firmly believe that if the community of Doringbaai was given the opportunity, they would be able to make a success of the co-management programme. This however needs to occur in conjunction with an employment-creating strategy, because without this, fishermen will continue to rely on the ocean to support their families. When policy makers are drawing up the policies, they need to understand that they are not dealing with rational, self-interested human beings as taught in the textbooks. Rather, these fishermen are poor; they lack marketable skills, access to credit and critical information so a policy that may work on paper and which may work as an academic exercise may very well not work in the fishermen's

world where he faces many constraints that cannot be captured by models, formulas, and statistics.

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## Appendix A

**Statistics South Africa**  
**Education - South Africa by Province and Municipality**  
**Table 1**  
**Employment status by Population group**  
**for Person weighted, Doringbaai**

	Black African	Coloured	White	Total
Employed	15	168	18	201
Unemployed	15	212	6	233
Scholar or student	3	49	-	52
Home-maker or housewife	3	62	9	74
Pensioner or retired person/to old to work	3	27	-	30
Unable to work due to illness or disability	-	42	-	42
Seasonal worker not working presently	-	63	-	63
Does not choose to work	3	15	-	18
Could not find work	-	9	-	9
Not applicable (younger than 15 and older than 65)	21	384	15	420
<b>Total</b>	<b>63</b>	<b>1030</b>	<b>48</b>	<b>1141</b>

**Table 1 Employment Status by Population Group, Doringbaai**  
**Source: Census 1996**

## Appendix B

**Statistics South Africa**  
**Education - South Africa by Province and Municipality**  
**Table 1**  
**Highest educational level by Population group**  
**for Person weighted, Doringbaai**

	Black African	Coloured	White	Total
No schooling	9	94	0	103
Grade 1/sub A (completed or in process)	0	45	0	45
Grade 2/sub B	0	24	3	27
Grade 3/standard 1	3	35	0	38
Grade 4/standard 2	6	49	0	55
Grade 5/standard 3	3	43	3	49
Grade 6/standard 4	3	68	0	71
Grade 7/standard 5	3	112	3	118
Grade 8/standard 6/form 1	12	240	0	252
Grade 9/standard 7/form 2	6	76	0	82
Grade 10/standard 8/form 3/NTC I	15	56	9	80
Grade 11/standard 9/form 4/NTC II	0	30	3	33
Grade 12/standard 10/form 5/matric./NTC III	3	27	18	48
Certificate with less than grade 12	0	0	0	0
Diploma with less than grade 12	0	0	0	0
Certificate with grade 12	0	9	0	9
Diploma with grade 12	0	15	6	21
Bachelor's degree	0	0	0	0
<b>Total</b>	<b>63</b>	<b>925</b>	<b>45</b>	<b>1033</b>

**Table 2 Education Levels, Doringbaai**  
**Source: Census 1996**

## Appendix C

**Statistics South Africa**  
**Welfare - South Africa by Province and Municipality**  
**Table 1**  
**Employment status by Individual monthly income**  
**for Person weighted, Doringbaai**

	No income	R1 - R400	R401 - R800	R801 - R1 600	R1 601 - R3 200	R3 201 - R6 400	R6 401 - R12 800	R12 801 or more	Total
Employed	6	6	57	66	36	27	6	-	204
Unemployed	224	-	3	6	-	3	-	-	236
Scholar or student	49	-	-	-	-	-	-	-	49
Home-maker or Pensioner or retired person/to old to work	75	-	-	3	-	-	-	-	78
Unable to work due to illness or disability	3	-	18	-	3	-	-	-	24
Seasonal worker not working presently	18	-	24	-	-	-	-	-	42
Does not choose to work	33	9	12	9	-	-	-	-	63
Could not find work	9	-	-	-	-	3	-	-	12
	15	-	-	-	-	-	-	-	15
<b>Total</b>	<b>432</b>	<b>15</b>	<b>114</b>	<b>84</b>	<b>39</b>	<b>33</b>	<b>6</b>	<b>0</b>	<b>723</b>

Table 3 Employment Status by Individual monthly income

Source: Census 2001

## Appendix D

**Statistics South Africa**  
**Welfare - South Africa by Province and Municipality**  
**Table 1**  
**Employment status by Population group**  
**for Person weighted, Doringbaai**

	Black African	Coloured	Indian or Asian	White	Total
Employed	9	174	-	21	204
Unemployed	3	215	-	18	236
Scholar or student	3	46	-	-	49
Home-maker or	6	72	-	-	78
Pensioner or retired					
person/to old to work	3	18	-	3	24
Unable to work due to					
illness or disability	-	42	-	-	42
Seasonal worker not					
working presently	3	57	-	3	63
Does not choose to	3	9	-	-	12
Could not find work	-	15	-	-	15
Not applicable (younger					
than 15 and older than	24	379	-	15	418
<b>Total</b>	<b>54</b>	<b>1028</b>	<b>-</b>	<b>60</b>	<b>1142</b>

**Table 4 Employment Status by Population Group**  
**Source: Census 2001**

## Appendix E: Survey Form

### 1. Background Information:

Name:

Date of Birth

Level of Schooling (last grade/std. completed):

Gender:

How long have you lived in this community?

Employment status: Employed or unemployed

Sector Employed

How many people are there in your household?

a) Dependents .....

b) income earners .....

How much does your household spend monthly?

What proportion of your household income is spent on:

	Proportion of Income
Water/ Electricity/municipal charges	
Schooling	
Food	
Rent	
Transport	
Savings	
Other Please specify:	

If you applied for a quota/s: Why do you think that you did/did not get it?

Does any of your immediate family own a quota? How are you related?

Do you own a recreational permit?

For which resource?

Do you sell the catch caught with a permit?

How much of your working time is spent on other forms of employment?

indicate the proportion of this time in full time/seasonal/sporadic work

Full time	Seasonal	Sporadic
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Do you receive any state grants?

Specify (e.g. State pension, Private pension, UIF)

Do you rely mainly on fishing for your livelihood?

What other sources of income or ways of providing food do you have?

None	Local Employment	Migrancy	Agriculture	Tourism	Local Trade	Other (describe)
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How healthy do think the rock lobster and fish resources are in the waters off Doringbaai? (give as a % of what you have heard there was here thirty years ago – number and size are both important)

a) rock lobster

b) fish

2. Market/Current System (interlinked)

Supply Side:

How long have you been fishing?

How many years has your family been involved in fishing?

Where do you fish?

How far do you live from where you fish?

How many kilometres of coastline do you use?

What is the furthest that you go out?

Where do you go out?

How often do you fish per week?

Do you fish alone or in a crew?

How do you split the catch among a crew?

Does everyone in the community use the same system?

Approximately how much do you catch (per person) per day?

a) rock lobster in Season:

out of Season:

b) other fish in season:

out of season:

Approximately how many days per year do you go out?

What do you fish for?

How do you fish? trek net, boat seine net, hoop trap, hand-line, other?

what proportion of fishers in Doringbaai use boats?

what proportion of boats are motorised?

What percentage of your catch do you sell?

How much of the fish do you use for your own consumption?

When do you fish?

Through out the year	Spring	Summer	Autumn	Winter
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What happens when there is bad weather? How does this affect your fishing?

Investment in the industry:

Do you own:

Asset		Value (Rands)
Bakkie		
Boat (motorised?)		
Refrigeration		
Other specify		

What capital resources do you work with? Have you ever needed to take out a business loan?

Are there any local cold storage facilities? Do local people have access to these? What is the charge?

Frigeration/ Freezer		Number	Size	How Far?	Local access?		Charge?	
Y	N				Y	N	Y	N

Demand Side

Where do the fishers sell their fish?

Within the community	nearby (less than 20 km from the point of harvest)	or far away (greater than 20km)
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Who are the buyers?		Proportion of buyers	Distance travelled to buy resource
Housewives			
Holiday makers			
Restaurant Owners			
Factory Owners			
Middle man			
Other (specify)			

Price

What products do you sell?

What factors influence the price? (Weather, demand, season)

When do you receive the highest price?

And the lowest price?

### 3. Perceptions of Compliance and the Community

Community:

Is there conflict in the community?

Have there been any problems with recreational, commercial fishers or fishers from other areas? What kind of problems did you encounter?

Recreational: Y/N

Type of problem:

Commercial Fishers: Y/N

Type of problem:

Fishers from other areas: Y/N

Type of problem:

Are there different groups within the community? Y/N

Who are they?

Who works together?

Is there conflict between the people that received the quota and those that didn't receive a quota?

Who are the leaders within the community?

Who holds the power within the community? (those with money, those that received the quota)

Are there large income differentials within the community? Y/N

Compliance:

Do fishers            a) know the regulations  
                              b) keep the regulations?

Do you think that the rules are fair?

Elab:

What happens to the people who break the rules for harvesting the fish and other resources?

Is this a major deterrent?

Elab:

Is there an established relationship between MCM and the fishers?

Is there active law enforcement in the area?

Is it effective?

If no, why is it not effective? (Too few people, corruption, conflict with the community, other)

Who enforces the rules?

What do you think are the key problems with the management of the fishing industry?