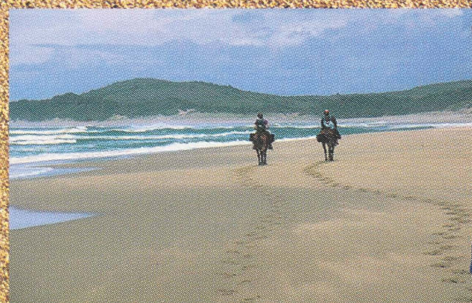


COASTAL AND FISHERIES CO-MANAGEMENT IN SOUTH AFRICA

# WAVES OF CHANGE



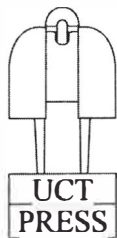
EDITORS: MARIA HAUCK & MERLE SOWMAN



# WAVES OF *Change*

Coastal and Fisheries  
Co-management in Southern Africa

Editors  
Maria Hauck  
Merle Sowman



University of Cape Town Press



## **Waves of Change**

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## FOREWORD

Southern Africa straddles three great oceans, the Atlantic, Indian and Southern Oceans, all of which contain a marvelous diversity of ecosystems ranging from tropical coral reefs to cool-water kelp forests. The shores of southern Africa are particularly rich in biodiversity and contain a remarkable 15 per cent of the total numbers of coastal marine species known worldwide. Many of these species represent harvestable resources that sustain the livelihoods of coastal communities and provide nutrition to millions of people. Unfortunately, there are disturbing downward trends in the sustainability of some marine stocks and urgent action is necessary if we are to conserve the biodiversity which forms the basis for this important economic resource.

Worldwide, there has been a growing trend to implement models whereby the management of natural resources along coastlines is undertaken cooperatively by directly involving local user groups. Promoting communication, participation and coordination in order to facilitate shared responsibility for natural resource management are central tenets of The Green Trust philosophy, which is why we have supported the implementation of key models in South Africa. Indeed, South Africa has made important steps toward enabling partnership arrangements, particularly with respect to policy changes and in creating a legal environment where equity, sustainability and user involvement in decision making and management are key principles. A number of test cases along the South African coast have already been implemented and the tenets of co-management explored and analysed.

It is apparent from the case studies dealt with in this important book, that policies and legislation are ineffective unless supported by real action and genuine commitment on the part of government, local user groups and stakeholders. It is our hope that the lessons documented in this book will help to galvanise and cement that commitment, and that a more equitable and responsible management of our coastal resources will ensure that this valuable biological resource is utilised sustainably, allowing for improved livelihoods and poverty alleviation. Undoubtedly, further models of coastal and fisheries co-management which are relevant to the South African context need to be developed.

Dr Rob Little  
The Green Trust

The Green Trust is an associated trust of WWF-South Africa (the local arm of one of the world's largest conservation organisations) made possible by Nedbank (a major South African bank).



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# Introduction

*Maria Hauck and Merle Sowman*



A local fisher with part of his catch at the Olifants River estuary.

*Photograph Merle Sowman*



Worldwide, the focus of managing natural resources has shifted from a centralised, top-down, resource-based approach to a more holistic, systems-orientated and people-centred approach (Cincin-Sain and Knecht 1998, Hale *et al.* 1998, Jentoft *et al.* 1998, Pomeroy 2001, Raakjær Nielsen and Vedsmand 1999). The adoption of participatory and inclusive resource management has come about due to an improved understanding of the complex interactions and inter-dependencies that exist between natural and socio-economic systems. In addition, there is a growing realisation that the long-term sustainable use and management of resources is ultimately dependent on managing human impact in a manner that is broadly supported. Consequently, the disciplinary focus of resource management, certainly from a research perspective, has expanded to include economics, social sciences and government and administration. Furthermore, over the past two decades much attention has been given to exploring and experimenting with various alternative approaches to managing natural resources, particularly those that involve resource users in management and decision making (Baland and Platteau 1996, Berkes *et al.* 2001, Fanning 2000, Hulme and Muphree 1999, IIED 1994, Muphree 1991, Pomeroy and Williams 1994, Pomeroy and Berkes 1997).

There are similar trends in the coastal and fisheries arena, particularly in the fields of integrated coastal management, coastal area management and commercial, small-scale and subsistence fisheries management (Baland and Platteau 1996, Berkes *et al.* 2001, Cincin-Sain and Knecht 1998, Hale *et al.* 1998, Jentoft and McCay 1995, Meinzen-Dick *et al.* 2001, Pomeroy and Williams 1994, Sen and Raakjær Nielsen 1996, Sorensen 1997). Ongoing over-exploitation of fisheries resources, degradation of coastal areas and conflicts amongst coastal resource users have prompted calls for innovative and improved approaches to managing coastal and fisheries resources that address issues of social equity, economic efficiency and ecological sustainability in an integrated way. There are now numerous examples in the literature that suggest that centralised and highly regulated approaches to coastal and fisheries management are not working (Berkes *et al.* 2001, Jentoft *et al.* 1998, Pomeroy 2001, Raakjær Nielsen and Vedsmand 1999). Such management systems are generally considered to be highly inappropriate, particularly in the developing world, due to the down-scaling of government departments, limited financial resources and restricted human capacity to manage coastal and fisheries resources over vast areas, limited knowledge of local conditions on the part of the state, and increased demand from the public to be involved in decisions affecting their livelihoods (Balland and Platteau 1996, Berkes *et al.* 2001, Fanning 2000, Meinzen-Dick *et al.* 2001, Pitcher *et al.* 1998, Pomeroy and Williams 1994).

Over the past twenty years, calls for greater public participation and resource user involvement in management decisions have been articulated at

various global gatherings (e.g. United Nations Conference on Environment and Development in 1992) and incorporated into international agendas and agreements (Brundtland Report 1987, United Nations 1993). Governments worldwide have responded to these calls by amending policies and legislation relevant to natural resource management and seeking alternative approaches to coastal and fisheries management which involve users in decision making and implementation.

These management approaches range from those where management authority and responsibility are devolved to local level institutions, to those where various partnership arrangements between government, resource users and other stakeholders are put in place to ensure joint resource management. There is also an exploration and revitalisation of traditional systems of resource management and the development of management systems based on these traditional values and knowledge (COFAD 2001, Doulman 1993, Harkes 1999). Central to these management regimes are the principles of decentralisation, devolution and participation of resource users in management decisions (Berkes *et al.* 2001, Fanning 2000, Katerere 2000, Meinzen-Dick *et al.* 2001, Pomeroy and Berkes 1997).

One management approach, which is seen to offer possibilities and promise in the coastal and fisheries arena, is co-management. The term 'co-management' refers to a paradigm shift in natural resource management that supports the participation of resource users in decision making and management (Baland and Platteau 1996, Jentoft *et al.* 1998, Jentoft 1989, Noble 2000, Pinkerton 1989, Pomeroy and Williams 1994). Broadly speaking, co-management covers a variety of partnership arrangements between government, resource users and other stakeholders in which responsibilities and decision-making powers are shared in order to manage a resource (Berkes *et al.* 1991, Pomeroy 1998). Co-management is an alternative management strategy that merges the interests of government (to achieve efficiency and sustainability) with those of local communities (concerns for self-governance and active participation) (Jentoft 1989, Pomeroy 1998).

Although co-management arrangements have been implemented all over the world, and have been studied for a number of years, no single model of co-management has emerged (McCay and Jentoft 1996, Pinkerton and Weinstein 1995). This is because of the different local conditions, historical circumstances, the needs and demands that exist within communities as well as the diversity of governance arrangements that exist. Consequently, a variety of partnership arrangements exist which are characterised by various degrees of responsibility and power-sharing between the stakeholders. These range 'from those in which the fishers [or other resource users] are consulted by the government before regulations are introduced to those in which the fishers [or other resource users] design, implement and enforce rules with advice from



the government' (Pomeroy and Williams 1994, p. 7). This range of partnership arrangements is now commonly referred to as the *co-management spectrum or continuum* (Berkes 1994, Pomeroy and Berkes 1997, Sen and Raakjær Nielsen 1996, see Hara Chapter 2, Figure 2.2).

Although some authors refer to co-management as those arrangements in which power sharing is considered equal (Jentoft and McCay 1995), others define the term more widely to include the different management arrangements outlined on the spectrum (Pomeroy and Berkes 1997, Sen and Raakjær Nielsen 1996). We have taken the latter position and recognise that the degree of power sharing and the configuration of management responsibilities will be influenced by a number of factors. These may include the extent of political support for user involvement, whether legislative provisions exist or not, as well as the capacity, skills and resources of respective partners (Hara 1999, Pomeroy 1998). Although a prescribed model cannot be developed (McCay and Jentoft 1996, Pomeroy and Williams 1994), the key objective of co-management is to develop a strategy of collaborative decision making that leads to agreement on decision-making processes, management roles and responsibilities.

There exists a significant body of literature on co-management of coastal and fisheries resources, including lessons learned from both past and contemporary programmes experimenting with co-management (e.g. Hara and Raakjær Nielsen 2002, Horemans and Jallow 1998, Normann *et al.* 1998, Pomeroy and Carlos 1997, Pomeroy *et al.* 2001), and also consisting of several individual case studies from across the world. Much has been learned about the conditions under which co-management is likely to flourish, and the political and legal framework that is needed to support such an approach. While there is optimism in the literature on the rationale and benefits of co-management, the application of the co-management model in different contexts across countries and even within countries has had varying degrees of success (Berkes *et al.* 2001, Normann *et al.* 1998, Pomeroy and Carlos 1997, Pomeroy *et al.* 2001, Sen and Raakjær Nielsen 1996). Researchers, resource managers and policy makers are not yet in a position to make definitive statements about the viability and durability of co-management as a preferred approach to managing coastal and fisheries resources (Hara 2001), although there does seem to be a broad consensus regarding the conditions under which co-management is likely to succeed (Agrawal 2001, Baland and Platteau 1996, Berkes *et al.* 2001, Foltz *et al.* 1996, Hutton and Pitcher 1998, Pinkerton 1994, Pinkerton and Weinstein 1995, Pollnac 1998, Pomeroy 1995, Pomeroy 1999, Pomeroy *et al.* 2001). However, the study of co-management, both in terms of its evolution and implementation in various national contexts, continues to provide insights and information that contribute to the theoretical development of the field. The question of the suitability and viability of developing and implementing co-management arrangements in the coastal and fisheries arena in South Africa is the subject of this book.

The transition to a participatory democracy in South Africa in 1994 resulted in the transformation of government institutions and an extensive process of legislative reform. In all sectors, including the management of coastal and fisheries resources, new policies and legislation have been introduced and a process of seeking alternative approaches to governance has been initiated. Influenced by global debates and trends, key policies and laws governing natural resource management in South Africa have included principles of equity, participation, social justice, stewardship, sustainability and accountability. At a policy level, new approaches that move away from a 'command-and-control' style of management to those which foster participation, cooperation and joint responsibility for national resource management are being advocated (Glavovic 2000, Hauck and Sowman 2001, Urquhart 2001). The establishment of appropriate institutional arrangements and the decentralisation and devolution of decision-making powers to give effect to these policy pronouncements is now urgently required.

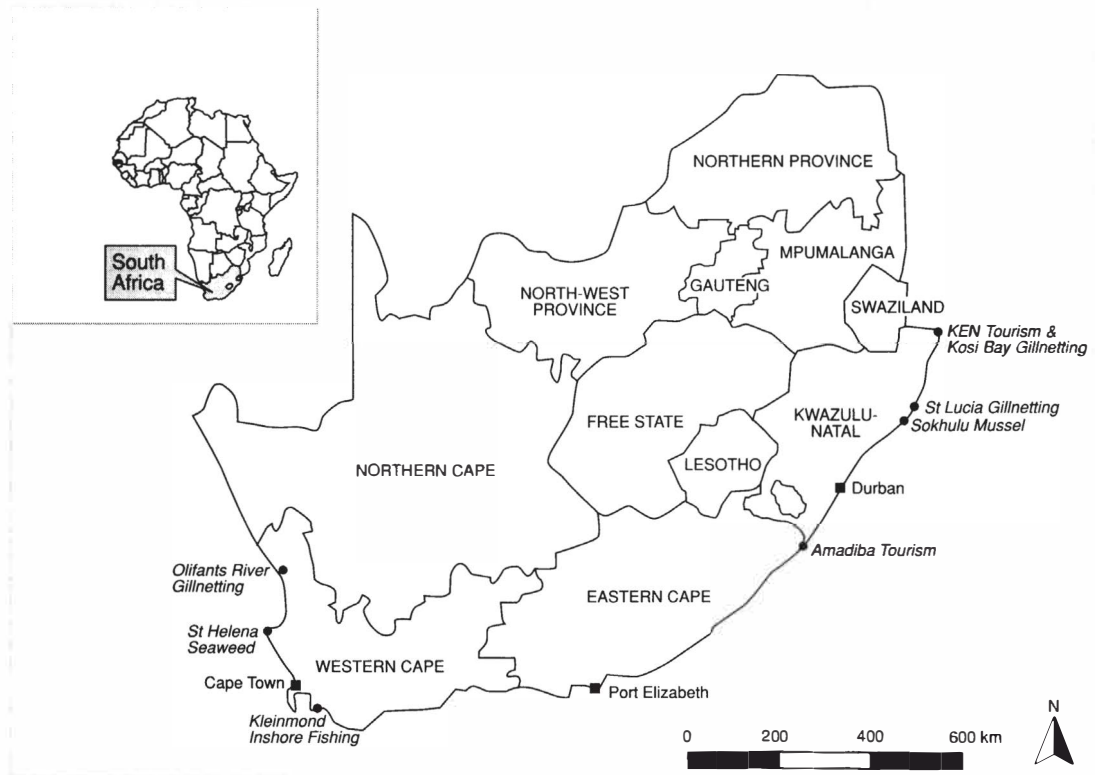
A number of initiatives have been identified in South Africa that are exploring and experimenting with various partnership arrangements to manage coastal and fisheries resources. Although the policy environment is broadly favourable to co-management, key questions that continue to face specifically South African policy makers, resource managers and user groups are: (1) Under what conditions is co-management likely to succeed?, (2) What are the primary benefits (positive outcomes) of adopting a co-management approach?, (3) What are the principle challenges to pursuing such an approach?, and (4) Can co-management be seriously considered as a viable and promising approach for coastal and fisheries management in a democratic post-apartheid South Africa? This book seeks to answer these questions by drawing on the information and insights gleaned from nine selected coastal and fisheries co-management case studies in South Africa. The analysis is cast against the socio-political history of South Africa and the policy and legislative framework governing natural resource management now and in the past.

## THE CASE STUDY APPROACH

A major component of this book has been the documentation and analysis of nine coastal and fisheries co-management case studies in South Africa. The case study approach was utilised as a means of qualitatively investigating cases where co-management initiatives have been explored and/or implemented. Not only do case studies provide insight into specific situations, but they are also an important method for analysing the integrity of theoretical frameworks (Bryman 1988, Jentoft 1999). Thus, the case studies were initially chosen to represent South Africa geographically and to provide a diversity of co-management arrangements with respect to the different sectors (fisheries,

mariculture, tourism) and different stages in the co-management process (including planning, implementation and evaluation). However, an initial review revealed that relatively few South African examples of co-management existed that involved coastal and fisheries resources. Indeed, all but one of the co-management case studies that were known in South Africa were incorporated into this study, despite some of these projects still being in the preliminary stages of planning and implementation. Figure 1.1 provides a brief overview of the location of each case study reviewed.

Figure 1.1 Location of case studies



The case studies were prepared by different researchers, most of whom were actively involved in research or facilitation activities associated with the cases. To facilitate this comparative analysis, a research framework was developed (adapted from Raakjær Nielsen *et al.* 1996, ICLARM and IFM 1998) to guide the authors in the preparation of their case study reports. The use of a common research framework allowed information to be collected and analysed in a standardised and systematic format, common themes and general trends to be identified, and findings and key lessons to be compared and contrasted. The research framework also enabled some form of comparison of characteristics, phenomena, processes and outcomes across the case studies.

All nine cases were subject to external (peer) review by individuals with knowledge of the projects, and each case study site was visited by the editors



of the book. A workshop comprising case study authors was held to discuss findings and explore lessons learned, and case study authors were asked to provide their opinions on the outcomes of the co-management initiative by responding to a questionnaire survey. The systematic analysis of the case histories, review of the co-management literature, input received at the workshop, as well as the feedback obtained from the 'outcomes' questionnaire, all informed the final analysis.

The value of examining these nine case studies is that while it may not be possible to quantitatively compare the cases or draw categorical conclusions about the success of co-management, the findings can be used to expand on and confirm existing theories and hypotheses about co-management (Jentoft 1999) and its applicability to the South African context. Furthermore, the synthesis of all the information emanating from these case studies will certainly enhance our understanding of the status of co-management in South Africa, identify under what conditions it is likely to succeed, the range of outcomes associated with its implementation and the areas of greatest challenge. This enhanced understanding should provide some guidance on the viability of implementing co-management in South Africa.

## SCOPE AND STRUCTURE OF THE BOOK

The overall aim of this book is to examine and assess the viability of co-management as an alternative approach to coastal and fisheries resource management in South Africa by analysing co-management case studies at various stages of development. A secondary objective is to provide policy makers, resource managers and researchers with information on the concept and practical application of co-management with respect to its principles, policies and legislative environment, conditions, challenges, outcomes and evaluation approaches. A further objective is to provide detail and texture to the co-management paradigm by carefully scrutinising co-management practice in nine South African case studies. Although the book focuses mainly on the status and application of co-management in the South African context, it compares these general findings with those appearing in the international literature.

This book comprises 13 chapters, nine of which are devoted to detailed descriptions and analyses of coastal and fisheries co-management case studies in South Africa. Chapter 2 examines the concepts and theoretical underpinnings that are fundamental to the co-management paradigm. Since co-management is ultimately concerned with improving natural resource management and securing broad sustainability, an examination of the debates surrounding common property resources and regimes is also provided.

Chapter 3 examines the policy and legal framework governing coastal and fisheries resource management in South Africa, providing both an historical

perspective and examination of more recent policy developments. Particular emphasis is given to examining the policy and legislative provisions that advocate and support co-management approaches.

Chapters 4 to 12 provide detailed descriptions and analyses of the nine selected case studies. The case studies were written by a diverse group of people with different disciplinary perspectives, approaches to co-management, and possible interests. This diversity has influenced the interpretation and analysis of the information gathered during the research process and has provided a variety of insights into the problems and successes of co-management in South Africa. The case studies are geographically diverse and cover a variety of coastal resources, user characteristics and institutional contexts. In addition, the case studies outline a number of different management arrangements in which co-management has been attempted, or is being explored or implemented. These range from consultative (Chapter 5) to cooperative (Chapter 4) to more strongly community-based (Chapter 7) projects. The case studies also represent different stages of the co-management process, including planning, implementation and evaluation. However, co-management is a dynamic process and the type and stage of the arrangement will gradually evolve as circumstances change and develop. It is important to emphasise that few examples exist where co-management arrangements are in fact established and functioning successfully. Nevertheless, although the nine case studies are diverse and in varying stages of planning and implementation, broad themes and important lessons learned have emerged to provide the basis upon which the comparative analysis is undertaken.

The final chapter, Chapter 13, provides an overview and critical analysis of co-management in South Africa based on the findings and lessons learned from the case studies presented in Chapters 4 to 12. The analysis is cast against the background of the socio-political history of the country and the policy and legislative framework governing natural resource management – topics that provide essential context for this analysis. It provides a brief overview of the status and characteristics of co-management in South Africa, highlights key issues emerging from the case studies, discusses factors that inhibit wider application of the co-management model and identifies conditions that are considered necessary for co-management to be successfully implemented in the South African context. The conditions identified as ‘key’ in South Africa are then compared with conditions found to be ‘critical’ or of ‘high importance’ for successful co-management elsewhere. Those unique to the South African context are discussed in detail. Finally, Chapter 13 highlights some of the outcomes, both positive and negative, of local co-management efforts to date.

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# Co-management of Natural Resources: Theory and the Attendant Assumptions

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Siphiso Keswa from EKZN Wildlife checks gillnet fishers at Mduku, St Lucia.

*Photograph Bruce Mann*

## INTRODUCTION

Despite the advances made in natural resource management science since the 1950s marked by ground breaking concepts such as ‘Common Property Theory’ (Gordon 1954, Scott 1955) and the ‘Tragedy of the Commons’ (Hardin 1968), the general degradation of natural resources in most areas of the world has continued more or less unabated. Resource managers find that they are still struggling to find ways to remove the incentive for destructive competition due to the ‘common property’ nature of natural resources. Centralised management of natural resources by the state alone has been identified as one of the major contributing factors to problems of natural resource management (Baland and Platteau 1996, Pomeroy 1994). Apart from increasing ineffectiveness, sole state management has generally become too costly for the state. At the same time, it is thought that purely local level management might also prove to be ineffective in the complex modern world of multiple stakeholders (Hersoug and Rånes 1997). In the last decade therefore, interest has turned to models and management strategies based on involvement of resource users in management, commonly called ‘co-management’. The reasoning behind initiatives involving users is that by engaging them in management, users will act more responsibly towards the long-term goal of sustainability (Hersoug and Rånes 1997). In other words, by being partly responsible for the management of ‘their own resources’ the need for costly control, monitoring and surveillance can be substantially reduced.

What is co-management? What are the theoretical basis and assumptions underlying this management paradigm that seems to raise so much hope and optimism for achieving the conservation and sustainable use of natural resources? This chapter reviews the theory and assumptions underpinning the concept of co-management. Hersoug and Rånes (1997) point out that while the practical interest in co-management is largely motivated by the aim of achieving improved resource management, the theoretical starting point has been the debate over the concept of ‘common property resources’.

## COMMON (COMMUNAL) PROPERTY RESOURCES

The use of the term ‘common property’ has always been controversial. According to Berkes and Farver (1989) this stems from philosophical differences between the traditionalists<sup>1</sup> and economists. The view of the economists is that property is either private or it belongs to the state. According to this perspective resources that cannot be appropriated by private individuals or the state are called ‘common property resources’. This means that the resource is not owned by anyone and is considered to be a free good. In contrast, the traditionalist perspective recognises the possibility that a resource can be owned

collectively by a defined group of people. The latter view implies that potential users who are not members of a group of co-equal owners can be excluded. According to Ciriacy-Wantrup and Bishop (1975), the concept of common property has no meaning without this feature. The distinction between the economists' and traditionalists' views is crucially important with regard to Hardin's (1968) 'Tragedy of the Commons' model. Hardin's model leads to the conclusion that resources should be either privatised or controlled by central government to ensure sustainable use. He depicts the solution as mutual coercion that is commonly agreed to; he makes no mention of the possibility of communal management. The traditionalist view has received increased acceptance only in the last decade with the more widespread acceptance of community-based management as a new paradigm in resource management.

The definition of common property resources generally accepted in the literature is that these are *a class of resources for which exclusion is difficult and joint use involves subtractability* (Berkes 1989, Fortman and Bruce 1988, Oakerson 1986, Ostrom 1986). Exclusion means that control of access to users is problematic or costly while subtractability means that each user's exploitation of the resource results in less being available to other users. According to Feeny *et al.* (1990), subtractability is the source of the potential divergence between individual and collective rationality. Feeny (1994) points out that this definition of a common property resource implies two major classes of management issues. Firstly, the need to regulate access to the resource to handle the exclusion problem and secondly, the level of exploitation among authorised users must be regulated to deal with the subtractability problem. A successful management regime will have to address these two fundamental problems.

### Property rights

Property rights are a key consideration in understanding any situation involving common property resources. They assign benefit streams derived from the utilisation of a resource (Bromley 1989). Property rights comprise a bundle of characteristics: exclusivity, transferability, inheritability, alienability and enforcement mechanisms (Alchian and Demsetz 1973, Hallowell 1943, Schlager and Ostrom 1992). Also, property rights define the uses that are legitimately viewed as being exclusive and designate who enjoy these exclusive rights. Thus property rights grant entitlements regarding *resource use* and prescribe *rules* under which these entitlements are exercised. According to Bromley (1989), property rights entail *rights* for those holding them and *duties* for all others to respect the rights. Such entitlements therefore depend upon a socially organised structure of 'institutional arrangements' that should include mechanisms for defining and enforcing the rights (Hallowell 1943, Taylor 1987).



## Property rights regimes?

Berkes and Farver (1989) and Bromley (1989, 1991) have suggested that one solution to the impasse over the use of the term ‘common property’ is to distinguish between the resource and the regime in question. The distinction between the resource itself and the property rights regime under which it is held is important as a particular resource can be held under more than one regime (Bromley 1991, Ostrom 1986).<sup>2</sup> Four ideal analytic types of property rights regimes are distinguished. They are non-property (also commonly referred to as open access), communal property, private property, and state property (Berkes 1989, Bromley 1991, Feeny *et al.* 1990, see Table 2.1).

Table 2.1 *Idealised types of property rights regimes relevant to common pool resources*

Property regime	Characteristics of and assumptions about the regime
Non-property ( <i>res nullius</i> )	Free-for-all; resource use rights are left unassigned, are neither exclusive nor transferable; individuals have <i>privilege &amp; rights</i> with respect to use rates but no responsibility for maintenance of the asset.
Common property ( <i>res communes</i> )	Use rights for the resource are controlled by an identifiable management group (‘owners’) & non-members have a <i>duty</i> to abide by exclusion; individual members of the management group (the co-owners) have both <i>rights &amp; duties</i> with respect to use rates and maintenance of the resource. Within the co-owners, rights to the resource are unlikely to be either exclusive or transferable; they are often rights of equal access & use; each person has a private right to the use of a resource once captured or taken but only a communal right to the same resource before it is taken.
State property ( <i>res publicae</i> )	Ownership and management is held by the nation state or crown on behalf of its citizens; rights are held exclusively by government that has to determine use/access rules & level of exploitation. Individuals have a <i>duty</i> to observe use/access rules determined by the controlling agency.
Private property ( <i>res privatae</i> )	An individual (or household) is assigned the <i>rights</i> to undertake socially acceptable uses & has a <i>duty</i> to refrain from socially unacceptable uses; others (‘non-owners’) have a <i>duty</i> to respect exclusion from the resource; usually private property rights are recognised by the state, are exclusive and also transferable.

Property rights regimes are supposed to perform certain functions with reference to a particular resource in a specific context. These functions include limiting use, coordinating users, and responding to changing environmental

conditions. Furthermore, it is essential to distinguish *de jure* property rights from those that are *de facto*. Feeny (1994) points out that many common property resources are classified as state property (their *de jure* designation) although in practice access is left unregulated and the resource is held in open-access (*de facto* common property).

## BASIS FOR CONVENTIONAL MANAGEMENT MODELS

Three models, namely the *Tragedy of the Commons*, *Prisoner's Dilemma Game* and *Rational Choice Theory*, are commonly used to explain why natural resources are exploited to the point of endangering the long-term biological and economic viability of the resource.

The Tragedy of the Commons theory (Hardin 1968) argues that all resources held in common will inevitably suffer over-exploitation and degradation. This conclusion is partly inferred from an appreciation of two particular implications of subtractability: first, users of a resource will collectively be better off if they all exercise restraint, and second, any given individual, however, will better his or her personal position by cheating on the collective agreement. The logic of the argument in the Tragedy of the Commons theory is that only private owners or the state can manage resources successfully. Implicitly, Hardin's argument is that these incentives will be absent or weak in the other regimes.

The Prisoner's Dilemma Game (Wade 1987) is one of several analytical models used in Game Theory (Brox 1986, Runge 1981). The main use of 'games' is to study problems of collective action (Knudsen 1995). When two or more actors share a resource, their choices and behaviour can be modelled as games and used to predict the outcomes of decision-making dilemmas. In this model, participants lack information about each other's choice, cannot communicate and only have two choices: to either cooperate or defect. But the outcome of one player's decision affects the result of the other's decision. Two lessons are derived from the Prisoners Dilemma Game: Firstly, the tendency to defect is stronger than the desire to cooperate and if possible people will try to maximise their own benefit by transferring costs to others. In Game Theory this is termed 'free-riding' (Runge 1984). Secondly, the main fascination of the Prisoner's Dilemma Game lies in the paradox that individually rational strategies may lead to collectively irrational outcomes.

One of the central problems in social theory is the divergence between individual and collective rationality. Olson (1965) challenges group theory's optimism that individuals with common interests will voluntarily act so as to try to further those interests. Olson argues that unless the number of individuals is quite small, or unless there is coercion or some other way to make individuals act in their common interests, 'rational self-interested individuals

will not act to achieve their common or group interests' (Olson 1965, p. 2). His argument is based on the premise that if one cannot be excluded from benefiting from a collective good once the good has been produced, then one has no incentive to contribute voluntarily to the provision of that good. This argument forms the basis for Rational Choice Theory.

These three models have defined the way resource managers view the difficulties that individuals face when attempting to achieve collective action. At the heart of each model is the free-rider problem; that is, whenever one person cannot be excluded from the benefits that others provide, each person is motivated not to contribute to the joint effort, but rather to 'free-ride' on the efforts of others. The three models are useful for explaining how, under certain conditions, perfectly rational individuals can produce outcomes that are not 'rational' when viewed from the perspective of all those involved (Ostrom 1990).

What is evident from the policy prescriptions arising from the models is the call for an external agent or authority to regulate the resource or parcel out its use. In this regard, two approaches have generally been advocated: public control (central government management) or privatisation of the resource (Hardin 1978, Bajema 1991). However, evidence indicates that success in the regulation of resource use is not universally associated with any particular type of property rights regime. Communal property, private property and government property have all been associated with success and failure (Baland and Platteau 1996). In addition, such prescriptions tend to over-estimate the national government's ability to manage natural resources and often fail to consider the experiences and capabilities of local management systems (Hviding and Jul Larsen 1995, Kuperan and Abdullah 1994, Pomeroy 1995). Feeny *et al.* (1990) further argue that the predictions of the Tragedy of the Commons theory are based in part on the confusion of assuming that 'common property' is synonymous with 'open access'.<sup>3</sup>

## A SHIFT IN APPROACH TO RESOURCE MANAGEMENT

The increasing evidence of failure of state-centric resource management models and schemes has fuelled interest in alternative arrangements that could improve the efficacy of management regimes. Models and schemes based on the involvement of users are increasingly seen as providing the most promising alternative.

Feeny *et al.* (1990) suggest that the new interest in communal property arrangements is also related to the resurgence of interest in grass-roots democracy, public participation, and local level planning. State regimes in which government officials exercise exclusive decision-making powers have been falling into disfavour. The so-called Bruntland Report (1987), World Bank's 1992 World Development Report<sup>4</sup> and the increasing advocacy for greater



public involvement in decisions about the environment in the west (Lawry 1994)<sup>5</sup> have further enhanced this paradigm shift.

These developments have made it even more tempting to look to cooperative regimes whereby authorities consult, cooperate or even delegate important management decision-making policies and responsibilities to user groups. As Symes (1997) points out, the search for solutions to ineffective management regimes has shifted away from the content of management policy and the selection of the most appropriate regulatory mechanisms, to the reform of the institutional frameworks within which policies are articulated and implemented and, in particular, to the re-alignment of relationships between the regulators and the resource users. Hersoug and Rånes (1997) postulate that it is only a short step to advocating co-management, as is increasingly occurring following extensive empirical evidence that Community-Based Natural Resource Management (CBNRM) regimes can work and succeed under specific conditions (as shown by authors such as Ostrom 1990). In most developing countries, user participation is also being introduced as one of the conditionalities for development aid (Hara 2001).

## CO-MANAGEMENT

In the last decade, co-management has been increasingly embraced as an exciting new concept full of promise and possibilities. But what is co-management? What are the underlying assumptions that justify the optimism about this new concept and the perceived potential of this management paradigm?

### What is co-management?

Co-management is a type of collaborative institutional and organisational arrangement between government, user groups and stakeholders for effective management of a defined resource. It is one of a range of user-based management systems, the other most common ones being Community-Based Management (CBM),<sup>6</sup> Customary Marine Tenure (CMT)<sup>7</sup> and Community Participation (CP).<sup>8</sup> A number of terms are used interchangeably to refer to co-management. Some of these are cooperative management, collaborative management, joint management, participatory management and multi-stakeholder management.

According to Sagdahl (1992), the concept of co-management is widely used but poorly defined. Berkes (1997) points out that in general, scholars have been reluctant to commit themselves to a single definition of co-management. McCay and Acheson (1987, p. 32), in referring to community-based initiatives, state that 'co-management signifies a political claim (by local people) to the right to share management power and responsibility with the

state.’ Berkes *et al.* (1991, p. 12) suggest that co-management is ‘the sharing of power and responsibility between the government and local resource users’. West and Brechin (1991, p. 25) refer to co-management as being ‘the substantial sharing of protected areas management responsibility and authority among government officials and local people’. Borrini-Feyerabend (1996, p. 12) defines co-management as ‘a situation in which some or all of the relevant stakeholders in a protected area are involved in a substantial way in management activities’. Jentoft (2000, p. 528) defines co-management as ‘a collaborative and participatory process of regulatory decision making between representatives of user groups, government agencies and research institutions.’ Perhaps the most comprehensive definition of co-management is the one adopted by the World Conservation Congress: ‘a partnership in which government agencies, local communities and resource users, non-governmental organisations and other stakeholders share, as appropriate to each context, the authority and responsibility for the management of a specific territory or a set of resources’ (as quoted in Berkes 1997, p. 5).

The general functions of co-management can be identified as the encouragement of partnerships, the provision of local incentives for sustainable use of resources and the sharing of power and responsibility for conservation. As a management approach, co-management is a compromise between government concerns for efficient resource utilisation and protection, on the one hand, and resource users’ concerns for equal opportunities, self-determination and self-control, on the other (Pomeroy *et al.* 2001). The co-management solution makes two assumptions: firstly, that local people must have a stake in conservation and management, and secondly, that the formation of partnerships between government agencies and resource users is essential. Co-management theory advocates a shift away from autocratic and paternalistic modes of management to modes that rely on the joint effort of government agencies and users. Ideally, co-management gives user groups real influence, in the sense that their practical knowledge makes a difference in the decision-making process. At best, co-management should lead to management by consensus.

Thus co-management involves two main functional ingredients: consultation between the central administration agency and user groups over the content of the management strategy, and the delegation of specified management functions to user group organisations. According to Jentoft and McCay (1995), co-management is a special example of the delegation process where ‘self-governance’ within a legal framework established by government is a basic principle, and power is shared between user groups and government. Co-management goes beyond mere consultation, in that the delegated institution, embodying user group interests, not only has a direct role in joint decision making but also has the authority to make and implement regulatory decisions in specified areas of responsibility (Hersoug and Rånes 1997).

Jentoft (2000) emphasises that the key aspect of co-management is a mutual agreement regarding *power-sharing*. He further notes that 'co-management is formal, has a charter, it specifies mandates, membership and procedures for election, for representation, provision of knowledge, how and when to have meetings. Co-management also means that there exist rules for deliberation, voting, reporting and the like' (Jentoft 2000, p. 529). Without these features, co-management is symbolic, not real. While the above definitions seem to be in line with the general trends of co-management, Symes (1997) has argued that co-management should be seen as an equal partnership. Viewed in this context, Symes postulates that it is important that the autonomy of both the state and the delegated institution, in their respective areas of responsibility, is fully recognised and respected by both parties. Co-management must therefore be built on a foundation of mutual respect and trust.

As a domain of analysis, the co-management concept can be considered an advance in research into property rights, in that it further examines the interactions between local communities and regulatory regimes and also raises questions about the universal validity of the Tragedy of the Commons paradigm (Kuperan and Abdullah 1994). The documentation of cases showing the existence of informal property rights, territorial use rights and informal contracting for the management of common pool resources (Bromley 1992, McCay and Acheson 1987, McKean 1992, Ostrom 1990, Pomeroy *et al.* 2001) indicates that self-interested individuals can work out arrangements among themselves to manage a common pool resource for their overall benefit under certain specific conditions. In this sense, privatisation or state regulation may not always be essential for the management of common pool resources.

### Why co-management?

Three arguments have been used to justify the increasing adoption of co-management:

1. concerned interests ought to be heard;
2. information from users could result in the improvement of management decisions; and
3. co-management could ensure the legitimacy of the management system, thereby reducing 'transaction costs'.

Another major reason for the increasing reference to co-management as an alternative resource management regime is what McCay (1993, 1995) and Knudsen (1995) refer to as *revisionism*. In the last 15 years, researchers have provided empirical case study evidence of successful local and communal management in attempts to refute and revise Hardin's (1968) thesis.<sup>9</sup> These authors (Berkes 1989, Bromley 1992, McCay and Acheson 1987, McKean 1992, Ostrom 1990) have asserted that the Tragedy of the Commons is not a



universally applicable outcome for all resource situations. They have also demonstrated that case studies around the world show that community-based management was practised in the past and remains a viable option. In this sense, privatisation or state regulation should not be the only solutions considered to problems of managing common pool resources.

Apart from these arguments, there is growing recognition – among managers, researchers and politicians – that no management scheme will work unless it enjoys the support of those whose behaviour it is intended to influence. As a result, legitimacy and compliance have gradually become key concepts in resource management, sometimes surpassing efficiency and conservation as conspicuous catchwords in debates on management policy (Feldt 1990, Jentoft 1993). ‘Legitimacy, in this sense, has to do with compliance with decisions that conform to, or approximate, the values, standards and expectations of those affected’ (Beetham 1991, p. 11). Evidence tends to show that if users willingly accept the regulations as appropriate and consistent with their existing values, the regulatory agency and the scheme will gain legitimacy with the users (Kuperan and Abdullah 1994). Regulatory agencies and schemes that have widespread legitimacy among users face a much-reduced problem of non-compliance with the regulations.

Jentoft (1993) suggests that the legitimacy of a regulatory scheme is related to at least four general hypotheses. These are summarised below:

1. *Content of the regulations*: the more that regulations concur with the way users themselves define their problems, the greater will be their legitimacy.
2. *Distributional effects*: the more equitably restrictions are imposed, the more likely that regulations will be regarded as legitimate.
3. *Making of the regulations*: the more users are involved in the formulation of regulations and included in the decision-making process, the stronger the perception of the legitimacy of the regulatory process.
4. *Implementation of the regulations*: the more directly involved users are in enforcing the regulations, the more the regulations will be accepted as legitimate.

In the first two hypotheses, the content and quality of the regulations are the focal points. The last two hypotheses concern the organisation of the decision-making process. Social scientists group these into two forms of legitimacy: ‘content legitimacy’ and ‘procedural legitimacy’ (Jentoft 1993). Both content and procedure are important if there is a desire to promote the legitimacy of the regulations. It can be said that a regulatory system that hinges only on content is more vulnerable and more exposed to sabotage by users than one that also relies on procedure.

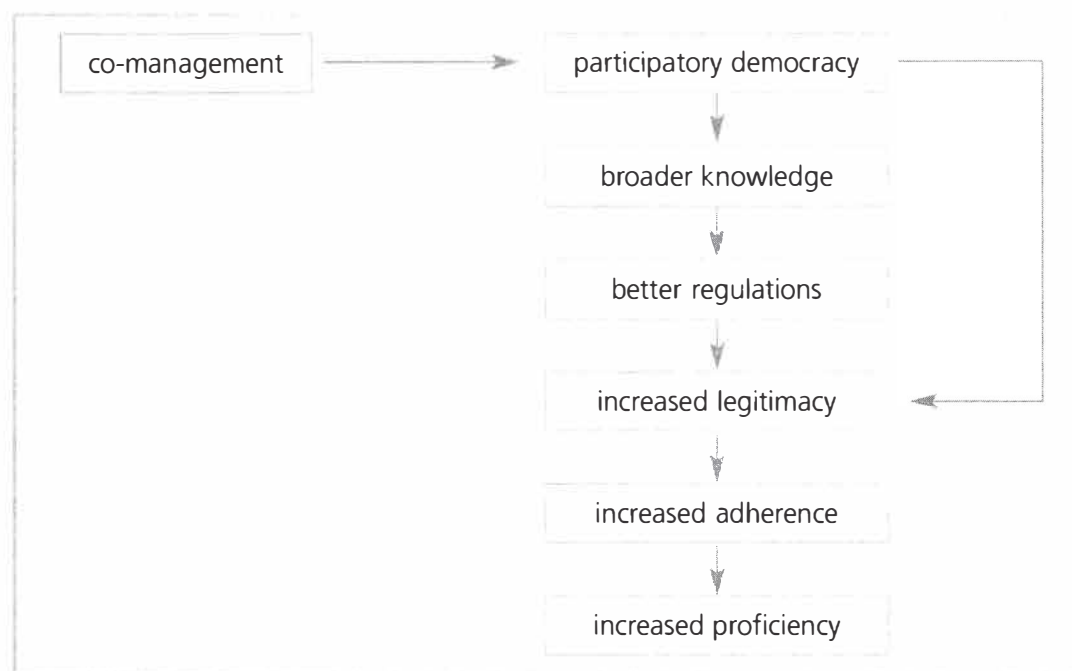
Regarding the costs of enforcement, regulations introduced against the users’ will and without their direct involvement will be extremely difficult and

costly to enforce. It is in these areas of securing both procedural and content legitimacy that co-management shows promise of being a better resource management approach than sole state management and also demonstrates the additional promise of cost effectiveness.

What are the benefits of co-management?

The postulated implications of an ideal co-management arrangement (see Figure 2.1) are that it will result in participatory and consultative democracy, thereby broadening the amount of knowledge that will influence decisions. This should lead to better regulations while in effect increasing the legitimacy of the regulatory system. Better regulations and increased legitimacy should ultimately result in greater adherence to regulations, thereby resulting in a more proficient system and an efficient management regime. While the classic case studies of successful community-based management, as documented in volumes such as Bromley (1992), McCay and Acheson (1987) and McKean (1992), are powerfully used to argue against Hardin's (1968) thesis and have in effect revolutionised the theory of natural resource management by pushing it towards co-management, it must be cautioned that the benefits stated above are *expected* or *anticipated* benefits. It is in this context that Baland and Platteau (1996) argue that there have to date been very few cases of successful co-management regimes (especially those producing sustainable resource management) around the world.

Figure 2.1 *The ideal implications of co-management*

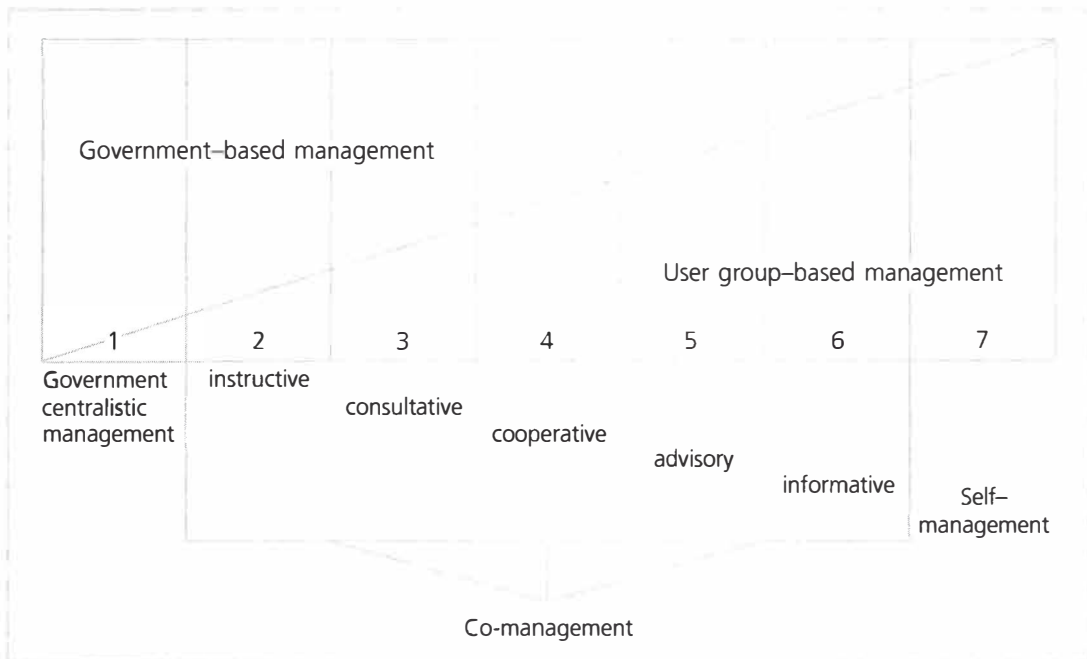


Source: Adapted from Jentoft and Mikalsen 1994, p. 289.

### The type and degree of participation

In most instances, the state holds both the power and the responsibility for the management of public resources. Assuming that regulatory authority is in the hands of government and that government wants to move from this centralised system to a co-management arrangement, power and responsibility will have to be devolved to user groups. Absolute state control represents the top-down model that resembles Arnstein's (1969) 'ladder of public participation', originally proposed as a way of assessing the level of citizen participation in city planning. In rare instances users might manage a resource on their own, but in most instances users want legal recognition and assistance from government to manage 'their' resources in a partnership-type arrangement. Thus, the range of types and possibilities for user-state interaction can vary from total state management to total user management, with various forms of co-management arrangements in the middle (see Figure 2.2, Berkes 1994, Berkes *et al.* 1991, Hersoug and Rånes 1997, McCay 1995, Pomeroy 1995, Sen and Raakjær Nielsen 1996). What type of control and how much responsibility to delegate to user groups will depend on the *capabilities* of the user groups. In addition, it will also depend on the *willingness* of government to delegate responsibility and authority for the various specific management functions.

Figure 2.2 A typology of co-management arrangements



Source: Adapted from Sen and Raakjær Nielsen (1996), Hersoug and Rånes (1997).

It is important, though, not to view the state as a neutral bureaucracy that operates rationally in making agreements for the devolution of management

functions or for the sharing of power (Pinkerton 1994). Government may be motivated to introduce co-management due to issues that have less to do with positive management outcomes and more to do with the desire to introduce self-control among users. For example, the centralised establishment of co-management relationships could be an attempt to resolve conflict amongst users. In many instances governments introduce co-management as a response to increasing problems of resource over-exploitation and the increasing conflicts among users that result from such declines in resource availability.

Hersoug and Rånes (1997) point out that the typology shown above gives too simplified a picture of a model that is in practice much more complex because of the whole range of different options it presents. In reality, the formulation of co-management arrangements deals with several intricate issues and processes such as deciding where to locate the partnership on the co-management continuum, the scope of issues that the co-management arrangement will address, and user group-stakeholder representation.

When deciding whether or not to delegate or devolve responsibility to user communities, a simple principle is that the weaker the rural communities or groups in one or several of the functions drawn up for sharing in the partnership (mainly in relation to their ability to take over responsibilities), the fewer should be the responsibilities ceded to them by the state in a co-management arrangement (Mikalsen 1998). If there are doubts about the ability of user groups to regulate local common pool resources, sequential co-management designs could be experimented with to test the users' ability. Furthermore, if there is strong suspicion that local groups or communities are under the sway of particular powerful interests ready to sacrifice environmental considerations for short-term economic or political objectives, then less control of environmental outcomes ought to be surrendered to these groups or communities.

### When is co-management feasible?

As Knudsen (1995, p. 4), quoting McGranahan (1991, p. 1285), points out: 'Advocates of reinvigorated common property institutions must show not only that common property regimes were effective in the past but that they can be effective in future.' Assuming that co-management is desirable, there is a need for it, and the devolution of management responsibility is possible and feasible, Berkes (1997) suggests four key questions that need to be posed and answered in the affirmative for successful co-management:

1. Are there appropriate institutions, both local and governmental?
2. Is there trust between the actors?
3. Is there legal protection of local rights?
4. Are there economic incentives for local communities to conserve the resource?



Understanding and investigating these issues and other possible key conditions is vital for successful co-management in any situation.

Another important question is whether empirical case studies of co-management can be used to investigate the conditions under which co-management becomes feasible. Documentation of thriving local level management case studies (for example Bromley 1992, McCay and Acheson 1987, McKean 1992, Ostrom 1990, Pomeroy *et al.* 2001, Wade 1988) has resulted in wide consensus on the fact that community-level management of common pool resources (CPR) may only work adequately under a limited range of conditions. There is also general agreement on the nature of a large number of such conditions. Baland and Platteau (1996, p. 289) state that most authors have emphasised the following conditions: 'The user groups must be small, live close to the CPR, and be free to set access and management rules in their own way; the CPRs must be clearly defined and people must have a high level of dependence on them; rules as well as techniques of calculation and control must be simple and fair; there must be well-established schemes of punishment and these work best when they are graduated to fit the offence; cost of monitoring must not be too high; well-known and low-cost conflict-resolution mechanisms must be available; crucial decisions must be taken publicly; and some record keeping and accountability must be provided for'. Beyond this general consensus, there are some areas in which there seems to be less agreement among researchers. These include the problem of economic incentives, the twin issues of group size and homogeneity, the rationale and characteristics of sanction systems, and the role of tradition in self-rule (Baland and Platteau 1996).

Apart from these key factors, Pinkerton (1994) points out that external factors and forces beyond the control of local user communities may overwhelm the ability of user groups to participate in such regimes. For example, industrial development or integration into the global economy may happen too rapidly for local users to learn resource limits and how to harvest in keeping with such limits. Also, population growth may occur too rapidly for local groups to learn how to exclude outsiders effectively as would be required under such regimes. Success will also depend on whether users are aware of and in agreement with the objectives being pursued and the benefits they will gain from restricted and careful use of the resource in question. Given the often-manifest deep-rooted culture of distrust that characterises relationships between the state and local resource users, building trust between the two partners will also be of absolute importance.

Mikalsen (1998) suggests that where representation of users under co-management is not feasible (such as when users are not organised), or perhaps not even desirable (as when the number of legitimate participants is too large to be accommodated within representative structures), keeping affected

groups at arms length may be the only way to secure broad support for programmes and decisions.

### Coastal area co-management – a special case

Management of coastal areas and resources presents specific problems due to their special characteristics. For a start, the number of user groups and stakeholders is usually large. For example, in the fishing sector alone there are fishers, fish processors and fish-farmers. The coastal environment is also attractive for tourist developers, marine transporters, oil and service industries and the military. Moreover, there are environmental groups concerned with conservation issues. In addition, there is the public that makes use of the coast for recreational purposes. Formally, there might be government and research institutions at different levels, all with separate interests, responsibilities and ambitions in the coastal zone. Apart from the users, the management issues are usually numerous and complex adding to the enormity of the management task. Coastal areas are thus characterised by the heterogeneity of users with uneven powers, conflicting interests, unequal bargaining powers and different stakeholder values and rationalities. Such numerous variables are likely to make deliberation more cumbersome, participant democracy more difficult to achieve in practice and consensus on issues more rare. In such contexts of heterogeneity, informal organisations might not provide sufficient guarantees, predictability and order for all concerned. This is where the need for co-management is likely to be greatest, as it would increase the political legitimacy of decisions and the management regime (Jentoft 2000). The key, as Steins (1999) points out, is the ability of co-management to facilitate a process of communicative action. Cicin-Sain and Knecht (1998) highlight the critical importance of including coastal users at the outset of any planning process.

### LOCAL ORGANISATIONS FOR CO-MANAGEMENT

The adoption of co-management as a management strategy can principally take one of two forms: either the integration of existing local management systems into the formal organisational arrangements or the building of new institutions afresh for the new strategy. Two types of existing local management systems, which could be used for co-management, are usually found to exist. These can be based on either traditional (territorial) organisations that have an extensive history or existing functional organisations such as local user group associations or fora. The form that the introduction of co-management takes appears to depend largely on historical factors.

## Integration

Where local traditional or customary systems are in existence, governments have the choice of either recognising them and integrating them into government structures or refusing to recognise their existence. There is a growing realisation that existing or former customary systems represent valuable institutions that may, and often should be, reintegrated into the formal system or revamped. In situations such as those that usually exist in developing countries, where the level of power and authority of governments is generally weak, the ability of the state to govern rural areas might depend on the type of alliances it can establish and maintain with institutions at the local level (Hviding and Jul Larsen 1995). In some cases, functional organisations such as cooperatives may be in existence. These can be integrated into the management scheme with members of the cooperatives representing the interests of the user community.

## Building institutions afresh

Where local systems have been destroyed, lapsed or not existed at all, governments frequently attempt to facilitate the building of local institutions for co-management arrangements. Such organisations can be either territorially defined or functionally based. When organising user groups for co-management, the issues that have to be addressed are similar to those within the theory of democracy and raise the classic questions of ‘representation’ (who ought to be a member of the democracy?) and ‘scale’ (at what level should participation of user groups take place?). Thus one of the greatest challenges is balancing these two aspects of the democratic process (Mikalsen 1998). Mikalsen points out that a prerequisite for successful co-management seems to be a relatively simple organisational structure incorporating strong, widely-respected and fully representative user group organisations. Co-management organisations cannot therefore afford to be too large, yet the alienation of particular groups risks the erosion of co-management’s greatest benefit – the legitimacy of the system and its outputs (Mikalsen 1998).

The issue of scale raises the question of where the locus of user participation should be: local, regional or national? The general principle is that user participation should take place where management decisions are made. The solution to this might be inherent to democracy, in that participatory democracy only works in small settings. The larger the organisation, the more difficult it is to maintain a democratic process based on direct involvement. With increasing scale, organisations must rely more on *aggregation* rather than *integration* in the decision-making process.

### Vested interests

Management regimes that involve user groups are vulnerable to the political pressure and power of vested interests. However, some level of vestedness, through participation in the process, may be essential to the legitimacy and effectiveness of the system (Mikalsen 1998). Ultimately, resource users control to what extent a management system will or will not work, almost no matter how much government spends on administration and policing (Jentoft 1993). It is the behaviour of users that is regulated, and they are the ones who can cheat and break the rules. Hence, if users cannot live with the regulatory decisions it will hardly matter what other interests might think or find satisfactory.

### Subsidiarity

Subsidiarity is a normative principle for institutional design that proclaims that decisions affecting people's lives should be taken at the lowest level of social organisation (Jentoft and Mikalsen 1994). Co-management should be seen as a way of adopting the subsidiarity principle in resource management. In application of this principle, the question to ask is whether or not it is more effective and necessary to centralise the responsibility for a particular management function. The relevant authority has to prove that there is a need for centralisation. That is, higher authority has the obligation to exhaust the possibilities of realising co-management by strengthening the capacity of the lower-level institutions to retain or acquire management responsibilities. Another aspect of subsidiarity is the idea of local autonomy. Local-level institutions should not be fully controlled by higher authorities, thereby acting as mere agents of their decisions. In this sense, subsidiarity means delegation of authority rather than decentralisation. Thus the proper implementation of subsidiarity not only pertains to the nature of the task at hand, but also to the nature of the prevailing organisations and to what extent they are equipped for taking up delegated duties. Jentoft (2000) suggests that apart from efficiency, equity and transaction costs, subsidiarity should be used as a yardstick for empirically measuring progress towards co-management.

## CONCLUSION

Although there is evidence that forms of co-management have been practised for some time in certain countries such as Japan (Yamamoto and Short 1992) and Norway (Hersoug and Rånes 1997, Jentoft 1989, McCay and Acheson 1987), it is only in the last decade or so that the idea has gained ascendancy as a serious alternative to other models of resource management. Even in the West, there is no real evidence as yet that co-management is more viable than the other management models. In most countries where it is being practised, co-



management is still at the trial and experimental stage. It is important here to reflect on Baland and Platteau's (1996, p. 351) conclusions derived from their review of classic co-management case studies: 'Unfortunately, there is presently no conclusive evidence that user communities can be 'the solution' to problems of resource depletion and ecological destruction, even within a co-management framework, and that the best documented case illustrating such an approach, that of the Japanese fisheries, only shows that user communities can be made effective partners for resource management in specific circumstances'.<sup>10</sup>

There are several reasons to be cautious about the unguarded adoption of co-management, especially in developing countries such as those in southern Africa. These are summarised below:

- User participation in the management process increases in difficulty as resource scarcity increases. Thus in order to make a positive contribution to resource management, user participation should be incorporated into the management process before resource conditions decline to a state of scarcity. In most instances, co-management is introduced when the resources are already in decline (Hara 1996). The main objective then becomes the recovery of the resource, requiring reduction in the rate of exploitation. In conditions of rural poverty, with few alternative economic activities (circumstances such as those experienced by most rural communities in southern Africa), co-management alone will not provide solutions to the problems of over-exploitation. The ability of the larger economy to take the pressure off the resource by providing alternative sources of livelihood becomes closely linked to the recovery of the resource and consequently to the success of the whole management strategy;
- The actions of common pool resource users are embedded in larger social systems that include market economies. Users are increasingly exposed to market and economic forces that greatly influence their behaviour and decision making (McCay and Jentoft 1996). The commercialisation and monetarisation of formerly local and mainly subsistence economies or systems of reciprocal exchange and barter, often leads to the breakdown of traditional management systems through the weakening or total collapse of traditional moral authority (Ruddle 1993, p. 1). In this regard, co-management could be viewed as a yearning for those 'good old times' of traditional morality, a stage in history that most rural communities will never return to again;
- While open access and other configurations of property rights regimes may be the main causes of resource degradation, rapid population growth, technological advances, corruption and other patterns of behaviour can also be contributing factors towards over-exploitation (McCay and Jentoft 1996). It is doubtful whether co-management alone can overcome these problems;

- It must be realised that the introduction of co-management-type arrangements can be time consuming and expensive, especially in the initial stages when there is the need for intensive consultation and the building of local institutions. However, given the decreasing capacity of government, together with increasing resource constraints, involvement of local resource users in appropriately designed co-management arrangements may be a viable alternative;
- The introduction of co-management is a type of institutional reform. North (1990) suggests that successful institutional change often occurs along the lines of marginal adjustments to existing institutions rather than radical innovations or total reorganisation. In addition, institutional reform takes time. The point here is that the use of existing local institutions and long-term financial support for the shift to co-management are important factors if the new regime is to take root. In developing countries co-management is frequently introduced through donor-funded projects with limited budgets and narrow time frames. This scenario represents a major problem for the success of introducing co-management as a long-term alternative form of management.

The spirit of experimentation and institutional innovation that accompanies all attempts at implementing co-management is probably the most promising sign of hope for improved conservation of the earth's resources for future generations. Limited success, at best, and failure, at worst, should be accepted as the inevitable price to pay for the discovery of more effective ways of tackling the extremely complex problem of sustainable resource use (Baland and Platteau 1996). As Hanna *et al.* (1995) point out, there are enough potential efficiency gains from user participation to warrant its serious and continued consideration in resource management systems. In any case, if users are not involved in planning and implementation of the management regime they are likely to be involved later – often through destructive acts of non-compliance (Jentoft 1993).

## NOTES

- 1 'Traditionalist' as used here denotes practices that demonstrate historical continuity among a group of people.
- 2 In fact Bromley (1991, p. 2) has suggested that the term 'Common Property Resources' be abandoned for the more correct term 'Common Pool Resources'.
- 3 This implies that common property and open access are also analytically distinct because the very concept of common property supposes the existence of a well-defined group, the members of which are allowed to *interact strategically* with one another. In other words, the agents no longer think that the final outcome is independent of their own individual decisions, as is the case under open access. They actually expect that their action will induce a particular reaction from the other agents and thereby influence the collective result.

- 4 The main theme in the two reports is that communities should have greater access and control over decisions affecting their resources, but in cooperation with government (World Bank 1992).
- 5 For environmental activists in the West, government could not be completely trusted to act responsibly on environmental issues on its own. Whereas centralisation of management functions had earlier been justified on the basis that users needed a hegemonic outside agency for sustainable exploitation of natural resources, the public consensus in the West turned this thesis on its head, insisting that government needed to be controlled and monitored in order to ensure that decisions were in the public interest.
- 6 CBM has only recently gained currency, mainly in debates about ways of decentralising resource management responsibilities through seeking the active involvement of local user communities. Employed most often by development agents, CBM is used to refer to initiatives by the state to accomplish resource management objectives through encouraging and facilitating the participation of rural communities (Hviding and Jul Larsen 1995).
- 7 CMT refers to historical institutions that derive their tenancy from customary law and practice. They are based on forms of territorial division of coastal space and have been prevalent in the Pacific area. A notable feature of these systems is that they are multi-purpose in nature and they are not usually tied solely to fisheries. However, either intentionally or unintentionally, CMT systems tend to have a bearing on management of aquatic resources. Hviding (1989) has used CMT as a more inclusive term in preference to the narrow definitions connotated by concepts such as 'traditional fishing rights' and 'Territorial Use Rights in Fisheries' (TURF).
- 8 Hviding and Jul Larsen (1995) point out that Community Participation is a development terminology referring to the integration of CMT or other existing traditional management systems into national management policy and law.
- 9 The first major forum that brought together researchers with this common research agenda was a workshop on common property management in 1985 (McCay and Acheson 1987). Other volumes, which also deal with this revisionist critique, include Berkes (1989), Bromley (1992), and McKean (1992).
- 10 Baland and Platteau (1996) point out that today there are disquieting signs that even a well-conceived scheme of co-management may become seriously stressed as market opportunities expand and cause intensive commercial exploitation of resources.

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# Co-management of Coastal and Fisheries Resources in South Africa: Policy and Legislative Framework

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Conducting research with EKZN Wildlife and local fishers at St Lucia.

*Photograph Chanan Weiss*



## INTRODUCTION<sup>1</sup>

The transition to participatory democracy in South Africa has been accompanied by the promulgation of a plethora of policies and legislation relevant to natural resource management. Influenced by global debates and trends, as well as a highly politicised citizenry, principles of equity, social justice, participation, environmental sustainability, accountability and transparency, have found their way into the various policy agendas. However, the extent to which these progressive policy pronouncements have been institutionalised and implemented is limited, largely due to inadequate mechanisms for implementation and a lack of institutional capacity.

This chapter begins by providing an historical perspective on the legal framework governing coastal and fisheries resources prior to 1994. We then examine recent policy and legislative developments in the coastal and fisheries arena with particular attention given to the provisions in the legislation that support and facilitate co-management approaches.

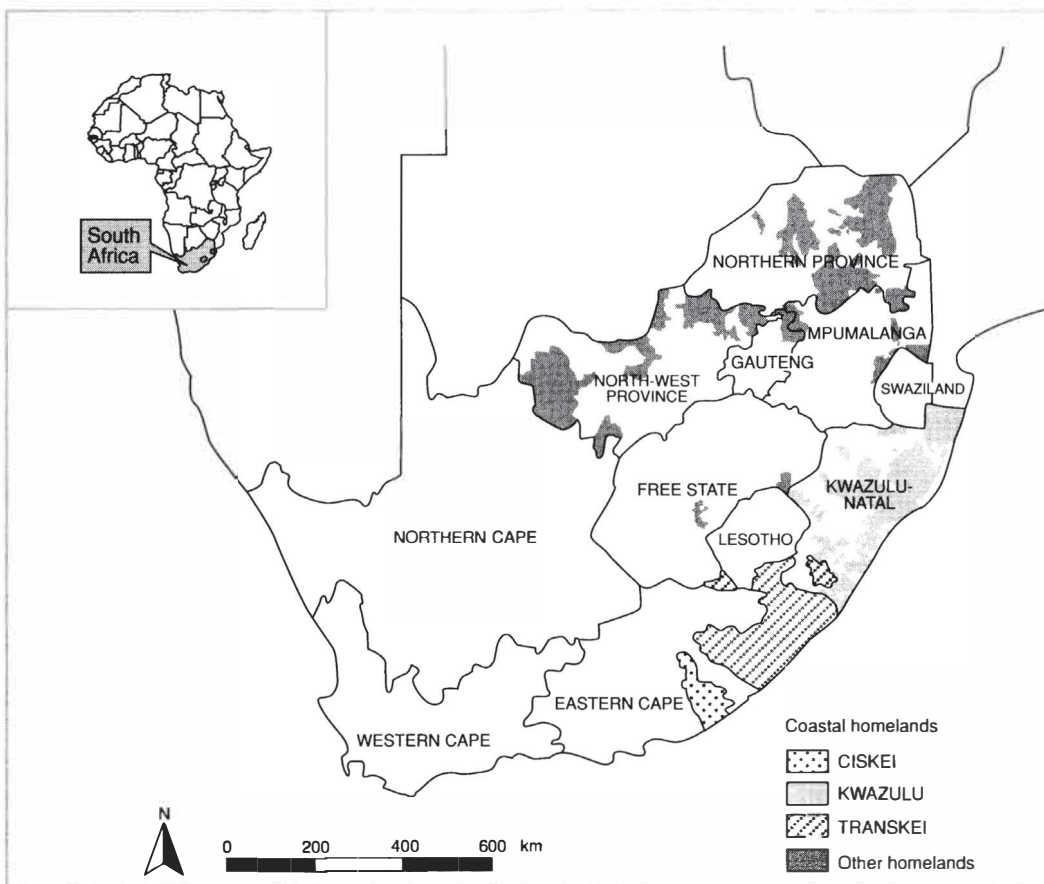
## AN HISTORICAL PERSPECTIVE

Before examining the strategies employed for managing coastal and fisheries resources in South Africa, it is necessary to consider the political history that has framed previous patterns of resource use and property rights regimes in the country (Hasler 1998). With 45 years of apartheid and more than 300 years of colonial rule, it is inevitable that natural resource management in South Africa has been marked by injustice and left with a legacy of inequality. The various policies and laws of the colonial era and apartheid regimes, in particular the Black Land Act of 1913, the Development Trust and Land Act of 1936, the Coloured Labour Preference Policy of 1954, the Group Areas Act of 1951, as well as the 'homelands' policy<sup>2</sup> effectively denied the majority of black South African citizens access to and ownership of vast stretches of South Africa's coastline and resources, and forced them to reside in designated regions in urban areas and the 'homelands'. Even in the 'homelands', covering 13 per cent of the total land area of South Africa (see Figure 3.1), there was no provision for freehold tenure. Various forms of indigenous communal tenure were administered by traditional authorities, although the State retained title to these lands (Turner and Meer 2001).

Access to marine (fisheries) resources was governed by various national laws and focused mainly on the control of commercial activities and later, on recreational fishing. Prior to 1994, subsistence fishers had no legal rights of access to marine living resources and were not recognised as a distinct and legitimate group in the legislation governing fisheries management. Yet, historical evidence suggests that subsistence fishers have been harvesting

coastal and marine resources along the South African coast for many thousands of years (Clark *et al.* 2002). These fishers are believed to have been exploiting intertidal resources along the west coast for at least 50 000 years, and along the east and south coasts for far longer (Clark *et al.* 2002). Historically, harvesting of marine resources by these fishers was considered legitimate only when their catches fell within stipulated bag or size limits or their activities complied with the provisions governing recreational fishers. However, harvesting of many marine species required a permit or other forms of authorisation where harvesting levels exceeded stipulated limits.

Figure 3.1 Location of 'homelands' in South Africa prior to 1993



Note: The Interim Constitution of 1993 established nine new provinces, which incorporated the former Transkei and Ciskei as part of the Eastern Cape province, while KwaZulu and the old province of Natal were assimilated into the province of KwaZulu-Natal.

Access to and regulation of commercial fisheries resources were governed by various Sea Fisheries Acts (Act 10 of 1940, Act 58 of 1973 and Act 12 of 1988), which empowered the Minister to determine the Total Allowable Catch (TAC) for the various sectors of the industry on advice from the Fisheries

Advisory Council (in terms of the 1973 Sea Fisheries Act) and later the Sea Fishery Advisory Committee (Sea Fishery Act 1988). Management of estuaries, lagoons and inland waters was handled at different times by both the national and provincial authorities, and although various regulations existed to limit exploitation and reduce effort, access to these resources was not legally restricted to a particular category of fishers. However, due to a lack of information and communication, and relatively low levels of education, rural communities were frequently not aware of the regulatory framework governing resources in coastal rural areas nor did they possess the means to obtain the necessary permits (Hauck *et al.* 2002).

Despite the provisions in the Sea Shore Act of 1935, which invested ownership of the sea and seashore in the State President for the benefit of the people of South Africa, access to the sea and seashore has been, and remains, restricted. Although the purpose of this legislation was to provide access to coastal resources for all South African citizens, the apartheid legislation listed above as well as the laws governing planning and development along the coast (for example the former provincial Township Ordinances and the Reservation of Separate Amenities Act of 1953), effectively prevented the poor and black sectors of the population from gaining access to the seashore since land adjacent to the seashore was mainly under private or state ownership.

Much of the land in the former 'homeland' areas was held under some form of communal tenure and the allocation of use rights and management of terrestrial and coastal resources was largely the responsibility of the traditional authorities (Shackleton *et al.* 1998, Turner and Meer 2001). Various forms of indigenous communal tenure were administered through traditional authorities, many of whom were co-opted or corrupted into furthering the aims of the apartheid government (Turner and Meer 2001). The dislocation of people and the social engineering that occurred during the apartheid era disrupted traditional practices and eroded customary law and traditional systems of governance. Although the state retained title to all land under traditional or communal tenure and magistrates were responsible for issuing Permits to Occupy (PTO) land, in practice traditional leaders approved applications to 'own' land without the magistrate's approval. Increasingly traditional authorities were viewed as agents of the state (Shackleton *et al.* 1998, Turner and Meer 2001). This *ad hoc* and corrupt system of land allocation and management frequently resulted in inappropriate coastal development, the decline in productive land and the loss of access to natural resources important to sustaining livelihoods (Sowman and Wynberg 2002).

A highly complex regulatory framework existed in the former 'homeland' areas, with traditional and informal rules applying as well as rules and regulations flowing from other South African national and provincial legislation. For example, law enforcement was undertaken by tribal police or

rangers appointed by the state, who patrolled the communal areas and arrested and fined so-called offenders (Shackleton *et al.* 1998). Strained relationships between resource users, traditional authorities and conservation officials persist today and are exacerbated by overlapping legislation, and unclear administrative responsibilities (Glazewski and Sowman 1998).

With regard to management of protected areas in South Africa, access to and utilisation of resources within these areas by local communities was severely restricted. In fact, during colonial rule and the apartheid era, protected areas were frequently proclaimed at great cost to local inhabitants who were often forcibly removed from their land or denied access to resources that were traditionally and historically harvested (Glazewski 2000, Turner and Meer 2001, Wynberg 2002). Examples of such forced removals in coastal areas include the communities living in the St Lucia area, Mkambati and the Dwesa-Cwebe coastal reserves (Kepe 1997, Wynberg and Kepe 1999).

Furthermore, the policies and practices of apartheid systematically and effectively excluded all 'black' ethnic groups from full access to the various economic activities associated with the fishing industry (Hersoug and Holm 2000). The distribution of marine resources was heavily skewed in favour of the white large-scale operators over the 'black', small-scale fishers (Hersoug 2002, Hersoug and Holm 2000, Payne and Cochrane 1995). This was still evident in 1994, when only 0.75 per cent of the sum of the commercial TAC of all species was allocated to 'black' ethnic groups. In addition, of the 2 700 registered commercial fishing boats in South Africa, only seven per cent were owned by 'blacks' (Small Business Sector 1996). The quota distribution of the TAC was also dominated by a small number of large companies that had access to the vast majority of resources (Hersoug 2002, Hersoug and Holm 2000, Martin and Raakjær Nielsen 1998). These inequalities were recognised in the fisheries White Paper (White Paper on Marine Fisheries Policy for South Africa 1997, p. 17), which stated that the commercial sector displays 'an overwhelming quota-holder dominance by the formerly advantaged sector of the population. This is on its own merit strong testimony of previous unequal opportunity and likewise a strong argument for broadening future participation'.

One of the major barriers to gaining access to the commercial fisheries was access to capital and equipment. The discriminatory policies and practices of the past meant that it was difficult for 'black' South Africans to obtain financial support in the form of loans or credit. This effectively excluded the majority of fishers from gaining access to a portion of the TAC. Consequently, participation in the fishing industry remained in the hands of the wealthy, reinforcing the government's policies of curtailing the ownership rights of 'blacks' to natural resources (Martin and Raakjær Nielsen 1998).

Although it is clear that fisheries have been monopolised by one sector of the population, it has also been acknowledged that management of some of the



most important fish stocks in South Africa (such as hake) has been largely successful (Hersoug and Holm 2000, Wynberg 2001, see also Chapter 9). Trends in the demersal and pelagic catches over the past ten years show that total landings of fish have been fairly consistent in these sectors, suggesting that these stocks have been sustainably harvested (Payne 2000, Wynberg 2001). In addition, the commercial fishing sector has provided employment for thousands of people, many from disadvantaged communities. Currently, the industry provides direct employment for approximately 27 000 people, and generates income for a further 100 000 (DEAT 2001). Furthermore, important co-management arrangements have been established between large industry and government over the past several decades. Sea Management Committees, and later INSEFs (Industry-Sea Fisheries Forums) were established to exchange information and facilitate discussion between established industry and government (Hutton and Pitcher 1998, see also Chapter 9). The formation of these structures was initiated by the Sea Fishery Act of 1988, which stated that the Minister could recognise and empower any industrial body or interest group to advise and make recommendations to government. In some circumstances these associations played an active role in management and often 'had an input greater than mere consultation' (Hutton and Pitcher 1998, p. 479). In a recent analysis of a management liaison committee between government and the hake industry, the important role that such a partnership has had on resource management and information sharing has been highlighted (see Chapter 9).

Historically, however, access to marine resources for non-commercial fisheries was usually obtained on an informal basis since the regulatory systems were often fragmented and complex. Fisheries legislation, particularly national laws, was largely concerned with the regulation of commercial fishing (Sea Fisheries Act 1940, Sea Fisheries Act 1973, Sea Fishery Act 1988), although provisions existed for recreational fishers to gain access to resources mainly through a permit system. Failure to provide a legislative framework for the exploitation of coastal and marine resources by subsistence users and other non-commercial fishers led to a number of problems (Branch *et al.* 2002a and b, Clark *et al.* 2002, Harris *et al.* 2002a). Three key problems that emerged from this ineffective legislation are outlined below.

First, non-commercial fishers *were* recognised to some extent in both national and provincial legislation through regulations that referred to those people who fished for their 'own use' (Sea Fisheries Act 1973 and Sea Fishery Act 1988), 'personal use' (Natal Coastal Fishing Conservation Ordinance of 1958) or 'non-commercial purposes' (Natal Nature Conservation Ordinance of 1974). While 'fisher' is not defined in the Cape Nature Conservation Ordinance of 1965, the provisions set out in chapter IV of the Ordinance that deals with restrictions on fishing activities appear to apply to all types of

fishers. In addition, in some circumstances licences were *not* required for fishing if fishers did not exceed certain limits outlined in the regulations. For example, licences were not required if fishers harvested within the ambit of specified size restrictions, closed seasons, bag limits and in accordance with clearly defined methods of fishing (Sea Fishery Act 1988). However, in some cases regulations were species-specific and permits were required for all fishers (such as abalone and rock lobster (Sea Fishery Act 1988) and oysters and mussels (Natal Coastal Fishing Conservation Ordinance 1958)).

The provincial ordinances also stipulated a number of conditions under which licences were required to harvest resources, although some exceptions were outlined. A key problem with many of the regulations was that the terms 'personal use', 'own use' and 'non-commercial purposes' were not defined and different categories of fishers, such as 'subsistence' and 'recreational', were not distinguished. As a result, subsistence fishers often fell under the regulations designed and intended for recreational fishers (such as bag limits in the 1992 and 1997 amended Regulations of the Sea Fishery Act 1988), which prohibited the sale of catches. Furthermore, the prohibition of certain fishing methods, or equipment, to catch fish could have directly impacted on the harvesting techniques of subsistence fishers (as outlined in the national Sea Fisheries Acts and the Cape and Natal Provincial Conservation Ordinances). For example, the Cape Fishing Ordinance of 1920 prohibited certain methods of catching fish that included fish kraals, sacking, wicker and cane.

As a result, while national and provincial legislation acknowledged non-commercial fishers, the specific provisions seemed to apply to recreational fishers only. Failure to recognise subsistence fishers as a legal category of fishers meant that these fishers were often arrested or fined for harvesting resources without the necessary permits or for contravening specific provisions (size limits, bag limits and methods of fishing). Examples are evident in Chapters 4 (Sokhulu Mussel), 5 (St Lucia Gillnetting), 6 (Kosi Bay Gillnetting), 7 (Amadiba Tourism) and 12 (Olifants River Gillnetting). However, the extent to which the legal provisions were enforced differed among the government departments responsible for resource management and in some instances, such as the Eastern Cape (which included the former 'homelands' of Ciskei and Transkei), administrative capacity was very low (Glazewski and Sowman 1998) and little control was exerted on resource users. In addition, recent research on subsistence fishers in South Africa indicates that many fishers were often not aware of the regulations, nor of the procedures to follow in order to obtain permits (Hauck *et al.* 2002). Communication between the authorities and rural communities was limited and animosity often existed between these groups. Furthermore, those who *were* aware of the regulations often perceived them to be unfair, and a strong

sentiment emerged that subsistence fishers should not be regulated in the same way as recreational fishers (Hauck *et al.* 2002). Therefore, many fishers continued to harvest resources informally, sometimes being arrested or fined. A specific management system that adequately recognised the differences between commercial and non-commercial fishers did not exist, and consequently management of non-commercial fishers was *ad hoc*, inconsistent and grossly unfair.

A second problem that is apparent from a review of past fisheries management policies and legislation relates to the administrative confusion that surrounded the management of estuaries.<sup>3</sup> Regulation of fishing in estuaries was complex and both provincial and national government were responsible for aspects of estuarine management from 1940 (when the national Sea Fisheries Act of 1940 was implemented) until 1992 (when the Act was no longer applicable to estuaries through an Amendment to the 1988 Sea Fishery Act).<sup>4</sup> In 1995, however, control of estuaries became a national concern through the promulgation of the Sea Fishery Amendment Act of 1995, in which the definition of ‘sea’ changed to include tidal rivers and lagoons. This shift in management responsibility was supported by the Constitution of the Republic of South Africa Act of 1996, which rendered marine resources a matter of exclusive national competence (Schedule 4, Part A), and by the 1998 Marine Living Resources Act (MLRA), which is applicable to all ‘South African waters’, a term which is defined to include tidal lagoons and rivers within its ambit. Thus, responsibility for the management of estuaries was the sole function of the provincial administrations between the years 1992 and 1995. However, in the Cape Province and in the ‘homelands’, for example, certain provisions that placed the management of estuaries under provincial or ‘homeland’ administration were in place prior to 1992. Administrative responsibilities for estuaries were confusing and in some cases the legislation referred to the administration from the high-water mark (seawards) as a national responsibility and from the low water mark as a provincial concern (e.g. 1972 Proclamation issued under the 1965 Cape Nature Conservation Ordinance). In some instances, there was a clear overlap of the various legislative provisions relevant to estuaries, and determination of the level of government that was responsible for regulating fishing in estuaries was far from obvious.

For example, the transfer of administrative responsibility for estuaries from national to provincial government in 1992 and then back to national government in 1995 had practical implications for management in the Cape Province and KwaZulu-Natal. In Chapter 12, Sowman discusses the impact of this transition in management authority on the institutional arrangements developed for managing the Olifants River harder fishery on the Cape west coast. While administrative procedures within national government were being

established to manage estuaries around the country between 1995 and 1998, the Cape provincial conservation authority was left in a state of uncertainty regarding its management responsibilities and powers. During this period, permits for fishing in estuaries were still being allocated in terms of provincial nature conservation legislation, and the Cape Department of Nature Conservation was engaging with fishers in the Olifants River estuary to establish a system of co-management. This process collapsed when fishing in estuaries reverted to national control (see Chapter 12). This transition resulted in different government personnel being involved in estuarine management and in most cases national authorities did not have the capacity to closely interact with fishers on the ground.

Such confusion, and its negative impact on emerging co-management arrangements, was also evident in KwaZulu-Natal, where the provincial conservation department had sole responsibility over the management of fishing in Natal estuaries (and coastal waters) in terms of the national Sea Fisheries Acts of 1940, 1973 and 1988. Management of fishing in Natal was thus regulated through provincial fishing and conservation Ordinances until the enactment of the 1996 Constitution. This change in management responsibility, which ultimately took place after the 1998 MLRA was promulgated, also had a significant impact on institutional arrangements and co-management initiatives in the province (as discussed in Chapters 4 and 6). The enhanced coastal and fisheries management capacity evident in KwaZulu-Natal today is largely attributed to the experience gained by the provincial authorities during this period of delegated authority (Witbooi 2002).

Finally, the third area of confusion in past fisheries legislation pertains to fisheries management in the 'homelands'.<sup>5</sup> The power of the 'homeland' governments to pass their own legislation was derived from the Self-governing Territories Constitution Act of 1971,<sup>6</sup> which included matters of 'fish and game preservation'. The Act stipulated that the powers of chiefs, headmen and tribal authorities would remain in force until varied or withdrawn by the legislative assembly or other competent authority. It is possibly in terms of this provision that 'traditional' permission to fish may have continued to be granted in coastal 'homeland' areas. Legislation relevant to KwaZulu, Ciskei and Transkei originally referred to the management of all inland waters, including estuaries. However, in 1987 in Ciskei<sup>7</sup> and in 1994 in both Transkei<sup>8</sup> and KwaZulu,<sup>9</sup> certain South African legislation was repealed and the 'homeland' Acts referred to provisions that regulated fish in both inland waters and the sea. Although coastal fishing was regulated by the 'homelands' authorities after these dates, there was still confusion and overlap with national legislation with respect to the management of estuaries.

The Acts in each of the 'homelands' stipulated specific fishing regulations including closed seasons, size restrictions, bag limits and licensing conditions.



However, unique to these Acts were specific provisions that exempted certain groups from complying with the regulations. In KwaZulu and Ciskei this included 'any tribe in any specified area whatsoever' (KwaZulu Nature Conservation Act 1975, Ciskei Nature Conservation Act 1976), and in the Transkei included 'owners' of inland waters (Transkei Nature Conservation Act 1971). However, neither 'tribe' nor 'owners' was defined. These provisions have resulted in an extremely confused situation regarding the powers and authority of traditional authorities in relation to the legislation promulgated since the democratic election in 1994.

Although the relevant KwaZulu Acts were repealed by the KwaZulu-Natal Nature Conservation Management Act of 1997, the Ciskei and Transkei Acts are still applicable in those areas of the Eastern Cape Province which were formerly part of the Ciskei and Transkei. This has had serious implications for fisheries management in these areas as both traditional and provincial conservation authorities take on administrative responsibilities for managing these resources. Consequently, there has been considerable confusion on the ground and ineffective regulation (Glazewski and Sowman 1998, Bürgener *et al.* 2001). Unfortunately, South Africa's new Constitution (1996) has failed to properly define the powers and roles of traditional leaders and does not outline their decision-making powers relative to other government institutions (Sowman and Wynberg 2002).

Prior to the publication of the White Paper for Sustainable Coastal Development in South Africa (2000) there was no coherent and integrated policy framework for the sustainable use, development and management of coastal areas and resources. Management of coastal resources and areas such as forests, agricultural lands, water resources, conservation areas and aesthetic resources was governed by a suite of sectoral legislation and there was little coordination amongst government departments responsible for different aspects of coastal management. It was only in the mid- to late 1980's that the importance of adopting an integrated approach to coastal management was recognised and various guideline documents to promote such an approach were published (Council for the Environment 1989 and 1991, Sowman 1993). However, despite these initiatives, coastal management was regarded as the responsibility of the coastal management office within the national Department of Environmental Affairs and Tourism (DEAT), and sectoral departments continued to execute their functions in coastal areas without embracing the coastal management principles and guidelines outlined by the Council for the Environment.

Various reviews of the situation reveal major obstacles to adopting a more integrated and proactive approach to coastal management in South Africa. These include: a lack of coordination amongst different government departments charged with coastal management responsibilities, inadequate

financial resources, staff shortages, a lack of skills and a general lack of awareness of the value of the coast and the role it could play in promoting sustainable development (Glavovic 2000, Heydorn *et al.* 1992, Sowman 1993).

## POLICY AND LEGISLATIVE DEVELOPMENTS

Following the democratic elections of 1994, South Africa has witnessed the development and implementation of a number of new policies and legislation. Although a time of transition and transformation, frustration has been evident in many communities as the inequalities of the past have been highlighted. The fisheries sector has been no exception, and demands for formal access to marine and coastal resources (*The Weekly Mail*, 16–22 July 1993, *Weekend Argus*, 12–13 November 1994, Informal Fisheries Sector 1995) have been central to the various policy formulation processes subsequent to 1994. The new democratic government has responded with a number of policy initiatives that aim to introduce new strategies and alternative management approaches to address former injustices and their legacy of inequality (Glavovic 2000, Hatchard and Slinn 1995, Wynberg 2001).

Equitable access to natural resources, sustainable use of natural resources, access to information and involvement of the public in decisions and management are key principles embraced in the 1996 Constitution. These principles are enshrined in many of the new policies and legislation relevant to natural resource management, including the White Paper on Marine Fisheries Policy for South Africa (1997), the White Paper for the Conservation and Sustainable Use of South Africa's Biological Diversity (1997), the Marine Living Resources Act (1998), the National Water Act (1998), the National Environmental Management Act (1998), the National Forests Act (1998), as well as the White Paper for Sustainable Coastal Development in South Africa (2000). All of these documents stress the importance of involving local communities in resource management decisions and advocate the development of partnerships between relevant environmental conservation authorities, local resource users and other stakeholders.

The important role of local governance in natural resource management has dominated policy discussions with several policies promoting partnership arrangements between resource users and relevant government agencies for resource management (Isaacs and Mohamed 2000). This approach is evident in the Participatory Forest Management strategies of the Department of Forestry (National Forests Act 1998) and the catchment management agencies established in terms of section seven of the National Water Act (1998), which require the involvement of user groups in all aspects of resource management and decision making.

In order to facilitate the involvement of local resource users in Participatory Forest Management (PFM) activities and projects, a Community Facilitation Fund has been established to provide financial support to local communities, forest users and other local stakeholders. Monetary input is designed to enable them to participate actively in all aspects of the forestry industry and its management (DWAF/DANCED 2002). Currently, several PFM forums are being established, especially in coastal areas along the east coast (former Transkei area). The Forestry Act goes further and makes provision for communities who wish to engage in community forestry to enter into agreements with the Minister. To date, no formal agreements have been signed although a few are likely to be concluded by the end of 2002.

At a provincial level, the province of KwaZulu-Natal has introduced Local Conservation Boards which include representatives from local communities and user groups to promote local decision making and shared planning and management responsibility of nature conservation within protected areas in the province (KwaZulu-Natal Nature Conservation Management Act 1997). In addition, KwaZulu-Natal has been pivotal in exploring fisheries co-management arrangements, and these partnership arrangements have been identified as a key management strategy in the implementation of subsistence fisheries in the province (EKZN Wildlife 2001). Although significant progress has been made with respect to the formation of local co-management structures in KwaZulu-Natal, the allocation of subsistence fishing rights in terms of the Implementation Plan has not yet taken place.

The 1998 National Environmental Management Act (NEMA) provides the over-arching legislative framework for environmental governance in South Africa. This extremely progressive piece of environmental legislation translates the environmental rights and principles, contained in the Constitution, into legal provisions and identifies procedures and mechanisms for giving effect to these principles. The central features of NEMA are:

- Improved decision making through application and incorporation of a set of principles by all organs of state;
- Cooperative governance and partnerships (both horizontally and vertically);
- Inclusion of civil society in environmental governance, through the creation of Environmental Management Cooperation Agreements, the liberalisation of *locus standi* (introduced in the Constitution), and active participation of the public in the Environmental Assessment process;
- Provision of conciliatory procedures and conflict resolution mechanisms to address and solve environmental conflicts; and
- Reinforcement of the Constitutional environmental rights, in particular the duty of care provision, which places responsibility on all citizens to prevent environmental damage.

Of particular relevance to co-management are the provisions within NEMA advocating the establishment of partnerships and cooperation agreements for the management of natural resources. This is embodied in the provision dealing with Environmental Management Cooperation Agreements, which emphasises the importance of sharing roles and responsibilities between resource users, government and other stakeholders. NEMA thus provides the legal vehicle for formalising co-management or partnership arrangements. Various partnership projects are exploring methods to utilise this provision to give legal status to co-management arrangements (see for example The Amadiba Tourism project – Chapter 7). As mentioned above, the Act identifies a set of principles to which all organs of state are bound. These principles include: equitable access to environmental resources, with special measures for previously disadvantaged persons; participation of all interested and affected parties in environmental governance, with appropriate capacity building that ensures equitable participation; decisions must take into account the ‘interests, needs and values’ of all interested and affected parties; and decisions must be open and transparent and access to information must be freely provided. Increasingly, as the South African public becomes aware of these provisions, administrative decisions which fail to comply with NEMA’s principles are being challenged either through the conciliatory provisions contained in NEMA or through court action (*pers comm.* J. Beaumont, DEAT, 2002).

In general, these principles have been incorporated into the development of South Africa’s new fisheries and coastal policies. In fisheries, the promise of the new government was ‘the upliftment of impoverished coastal communities through improved access to marine resources’ (ANC 1994, p. 104). During the policy development process a special Access Rights Technical Committee (ARTC) was appointed to investigate access rights options for fisheries in South Africa. This committee recognised that ‘with political changes there are expectations that access rights should be broadened, particularly to redistribute access to those people previously denied rights because of political considerations’ (ARTC 1996, p. 5). Addressing inequity and broadening access to living marine resources was thus emphasised in the White Paper on Marine Fisheries Policy for South Africa (1997). A key objective was to develop a fair system of allocating access rights, particularly to those who were previously denied such access. Some of these principles were carried through to the MLRA (1998), which is founded on three pillars: sustainability, equity and stability. In addition to ensuring the long-term sustainable use of marine living resources, the Act also seeks to promote equitable access to marine living resources, transform the fishing industry and promote socio-economic benefits for coastal communities. Consequently, and unlike its predecessors, the MLRA gives attention to the management of inshore and coastal



resources, as apposed to the traditional emphasis on the offshore industrial fisheries (Britz *et al.* 2001).

Further, both the White Paper and MLRA formally recognise subsistence fishers as a unique category that requires effective management within the fishing sector. Provisions within the MLRA provide opportunities for subsistence fishers to apply for a legal right to undertake fishing activities along the South African coast. In terms of section 19 of the MLRA, the Minister may establish an area or zone where subsistence fishers may fish and may declare a specified community to be a subsistence fishing community. This section also gives the Minister the power to prohibit other activities in such designated fishing areas. While these provisions imply that greater rights can be conferred on local resource users, there are to date no designated subsistence fishing areas or communities (*pers comm.* A. Boyd, Marine and Coastal Management, 2002). These provisions are in line with the recommendations of the ARTC (1996) that envisaged the creation of 'user zones' along the coast for certain types of fishing activities or sectors. Applications to declare subsistence fishing areas are currently being prepared for certain communities in KwaZulu-Natal.

In view of the government's limited understanding of the subsistence fishery sector in South Africa, a Subsistence Fisheries Task Group (SFTG) was appointed in 1999 to advise on the future management of this new fisheries sector. Numerous studies were undertaken to better understand the socio-economic circumstances of these fishers, determine an appropriate definition of 'subsistence fisher', identify resources currently harvested by this group of fishers as well as assess the status of resources along the coast for potential subsistence use (Branch *et al.* 2002a and b, Clark *et al.* 2002, Cockroft *et al.* 2002, Harris *et al.* 2002a, Hauck *et al.* 2002). A key activity of the SFTG was to make recommendations regarding the future management of this sector (Harris *et al.* 2002b). However, despite the development of a comprehensive set of recommendations for the management of subsistence fisheries, Marine and Coastal Management (MCM) has been slow to put in place the necessary institutional structures and administrative procedures to implement the recommendations. To date, no subsistence permits have been issued in terms of the subsistence fisheries implementation plan which was based on the recommendations flowing from the SFTG activities and investigations (Harris *et al.* 2002b).

An intensive public participation process was embarked upon during the development of the new fisheries policy for South Africa (Martin and Raakjær Nielsen 1998). Although fraught with difficulties (Hersoug 2002), this policy process reflected the government's commitment to promoting public participation and incorporating the views and concerns of a wide diversity of stakeholders. Participation of resource users and relevant stakeholders in

fisheries management was also highlighted in the fisheries White Paper and the MLRA, emphasising the need for consultation and for broad and accountable participation in decision-making processes. In order to give substance to these directives, organisational structures will need to be developed (or modified) and procedures put in place to broaden participation of fishers, in particular subsistence and small-scale commercial fishers in decision making (Branch *et al.* 2002b, Harris *et al.* 2002b).

Of particular relevance to South African co-management efforts in the coastal and fisheries arena are the recommendations of the ARTC regarding 'implementation of 'co-management' in experimental areas in order to evaluate its effectiveness as a management strategy' (ARTC 1996, pp. 54–55). The importance of co-management is also emphasised by government fisheries scientists who noted the importance of 'consultation and joint decision making ... with all interest groups' (Payne and Cochrane 1995, p. 12). However, relatively little progress was made in including these recommendations in the final legislation. In fact the MLRA does not explicitly endorse the co-management model (Witbooi 2002). Although consultation between large industry and government has been in place for several decades (Hutton and Pitcher 1998, Hutton *et al.* 2002, see also Chapter 9), the exclusion of less organised, and often informal fishers or groups in management activities and decisions, is an issue of concern.

Although significant progress has been made with respect to incorporating principles of equity, participation and transformation into the legislative framework governing marine living resources, implementation of these policy objectives and legislative provisions has been fraught with problems. The absence of a detailed plan for the re-allocation of fishery rights, the lack of institutional capacity and skills to manage the transformation process and implement the provisions of the Act has resulted in ongoing litigation, controversy and lowering of morale within MCM (Britz *et al.* 2001, Wynberg 2001). Furthermore the excessive attention given to developing legally robust permit application and allocation procedures for the commercial sector has resulted in neglect of the newly recognised subsistence fisheries sector. Despite the fact that the SFTG presented its recommendations on the future management of subsistence fisheries in South Africa to MCM in January 2000, implementation of the recommendations has been delayed due to a lack of capacity and resources. However, the recent establishment of the Subsistence Fisheries Management Unit and appointment of staff to assist with implementation of the Business Plan is a positive step towards addressing the needs of this historically neglected and marginalised sector of the South African fisheries.

Since 1994, significant progress has been made with respect to promoting sustainable use and development of coastal areas and resources through

adopting an integrated, coordinated and participatory approach to coastal management (Britz *et al.* 2001, Glavovic 2000, Wynberg 2001). An extensive process of public participation and specialist analysis culminated in the publication of the White Paper for Sustainable Coastal Development in South Africa in 2000. The White Paper introduces a major shift in thinking about coastal management in South Africa. It stresses the importance of recognising the value of the coast, and emphasises the significance of maintaining the diversity and productivity of coastal ecosystems since these resources and systems provide the foundation for economic and social development. It advocates a people-centered, rather than a rule-based approach to coastal management and introduces a new facilitatory style of management that involves cooperation and integration across disciplines, sectors and interests. The White Paper highlights the importance of improved access to coastal resources and advocates community involvement in the management of local coastal resources. A key goal of the White Paper is the promotion of partnerships between the state, the private sector and civil society in order to foster co-responsibility for coastal resources and areas. In this regard, the White Paper recognises the need to adopt management approaches that are participatory and cooperative. Devolution of management responsibility from national to provincial and from provincial to local levels, which includes involvement of all stakeholders, is seen as crucial to achieving effective and sustainable coastal development. Further, the importance of capacity building and empowerment of all stakeholders to ensure effective participation in coastal planning and management is stressed.

By highlighting the economic value of the coast and the role it can play in alleviating poverty and building the economy, political support for achieving the goals set out in the White Paper has increased and significant funding from both national government and donor agencies has been received. At present, a National Coastal Management Bill is being drafted, and its promulgation will give legal effect to these progressive policy proposals and should contribute to addressing problems of fragmentation and poor coordination which have plagued coastal management efforts in the past.

## INSTITUTIONS RESPONSIBLE FOR FISHERIES AND COASTAL MANAGEMENT

It is important to provide a brief description of the authorities involved in various aspects of managing fisheries and coastal resources. This is particularly necessary in order to identify prospective partners for the development of co-management arrangements. Institutional arrangements for coastal and fisheries resources in South Africa, however, are complex and unclear, leading in many circumstances to confusing administration on the ground. This is

exacerbated by an aspect of the 1996 Constitution which identifies marine resources as an exclusive national competence, but the environment, nature conservation (excluding national parks, national botanical gardens and marine resources) and tourism are identified as areas of concurrent competency between national and provincial governments. The Chief Directorate of MCM within the national DEAT is the government authority primarily responsible for the management of coastal and living marine resources in South Africa. However, although it is clear that DEAT is responsible for the management of marine resources, other aspects of coastal management are jointly handled by a number of different national and provincial departments. Furthermore, local government and traditional authorities have an important role to play in managing coastal resources and areas. Since 1994, local government has been given broader environmental responsibilities, including those of environmental stewardship and promoting social and economic development. Furthermore, all local authorities are required to develop Integrated Development Plans (IDPs) in terms of the recently released Municipal Systems Act (2000). These IDPs are now the decisive planning tool in South Africa guiding development planning in all local authorities. Integration of coastal principles and issues into these IDPs presents both a significant opportunity and challenge to the implementation of the Coastal White Paper. Building capacity and developing skills at government level in the field of Integrated Coastal Management is an urgent requirement to ensure implementation of the policies articulated in the Coastal White Paper.

From a national perspective, DEAT has substantial control over the management of marine living resources and is responsible for setting TACs for different resources, determining access rights and promulgating regulations relevant to the control of distinct resources. The management of coastal resources, on the other hand, is more complex and involves a number of different national departments. For example, coastal resources such as forests and water are administered by the Department of Water Affairs and Forestry, minerals are administered by the Department of Minerals and Energy, land reform by the Department of Land Affairs and agriculture by the Department of Agriculture.

Development of coastal land is mostly governed by various Provincial Planning and Development Acts (formerly Township Ordinances) but decisions regarding land development are usually made at the local authority level. While there are certain environmental safeguards in the legislation such as the recently promulgated Environmental Impact Assessment regulations (in terms of the Environmental Conservation Act of 1989) there are in our opinion three major obstacles to the achievement of sustainable coastal development.

The most serious of these arises from an historical system of land zoning that grants owners of land development rights which may not be removed



without compensation. These zoning rights were granted before there was an adequate understanding of the sensitivity of coastal resources and systems and has frequently resulted in inappropriate development in, and restricted access to, coastal environments. The second issue concerns the unclear land tenure and resource rights situation in the former 'homeland' areas and the lack of clarity regarding the powers and responsibilities of traditional authorities. The third major problem is the limited understanding and capacity of politicians and local authority officials when it comes to the value of coastal areas and resources and their tendency to support coastal development because of the short-term economic gains. The new coastal policy, which emphasises the economic value of coastal areas and resources and calls for alternative approaches to the management of these resources, will only be effective if the aforementioned problems are addressed.

Development of structures on the seaward side of the high water mark, such as harbours, breakwaters and floating jetties, is the responsibility of other government departments such as the Department of Transport and Public Works. Thus, while DEAT has an extremely progressive coastal policy and calls for a fundamentally different approach to the management of coastal resources and areas, their legislative powers are extremely limited.

Another major shortcoming in institutional arrangements governing coastal and fisheries resources is the fact that management of fisheries resources is handled separately from any other economic activity impacting on the coast. Even within MCM, there are inconsistencies and relatively little communication between the divisions responsible for coastal management and living marine resources. However, the recent establishment of the Subsistence Fisheries Management Unit within MCM provides an opportunity for greater coordination and integration within the department.

## CONCLUSION

The political context in South Africa has changed dramatically over the past decade and a vast array of policies and laws has been developed for the 'new' South Africa which aim to promote equity, public participation, sustainable use of resources, local governance, partnership arrangements and accountability in natural resource management (Britz *et al.* 2001, Glavovic 2000, Hutton and Pitcher 1998, Isaacs and Mohamed 2000, Sowman and Wynberg 2002, Wynberg 2001).

Although significant progress has been made in terms of incorporating principles and provisions into legislation that addresses past inequities, institutional deficiencies, as well as inappropriate management approaches and practices, implementation of these provisions has been less successful, particularly in the fisheries arena. Much effort and time has gone into

involving all sectors of society in the new policy formulation processes governing coastal and fisheries resources and incorporating their views and concerns. However, implementation of the legislative requirements to give effect to provisions demanding greater public involvement in day-to-day resource management and decision making is proving to be far more complex. This fundamental change in approach to management of coastal and marine resources also requires a shift in thinking, attitude and behaviour of officials responsible for implementing policy and the law. These changes do not occur overnight.

Progress has been made on several fronts, new local level management structures have been established, fora to exchange views have been created, mechanisms to enhance capacity and foster integration across sectors have been implemented and partnership arrangements, both formal and informal, have been and are being formed. In KwaZulu-Natal, significant progress has been made in establishing co-management structures and encouraging collaborative partnerships between provincial conservation departments, local users, and other stakeholders.

However, due to the complexity of the institutional arrangements governing coastal and marine resources, the limited power and status of the department charged with overall coastal and fisheries management and the lack of human and institutional capacity amongst government authorities as well as local resource users, a shift towards genuine co-management is likely to take some time. There can be no doubt that an extremely supportive and enabling policy and legislative environment exists to give effect to co-management ideals and principles in the South African context. What is now urgently needed is the full support and commitment from government to investigate the viability and suitability of such cooperative management arrangements in test cases along the coast.

## NOTES

- 1 All policies and legislation referenced in this chapter will be listed at the end of the chapter.
- 2 The 'homelands' policy was an instrument of the apartheid government whereby 'black' Africans were forced to move and become citizens of designated rural 'homelands' areas. The Bantu Authorities Act (1951) and the Bantu Self-Government Act (1959) provided for the establishment and development of 'homelands' in South Africa between 1950 and 1954.
- 3 The term 'estuary' was not always used in the legislation, but management of estuaries was encapsulated in the definition of 'sea', which often included 'tidal rivers', 'tidal lagoons' or more generally, 'tidal waters' (see, for example, the National Sea Fisheries legislation and Natal and Cape Provincial Conservation Ordinances).
- 4 An exception to this was Natal province, in which management of estuaries in this province was solely a provincial responsibility until the enactment of the 1996 Constitution. The 1940, 1973 and 1988 Sea Fisheries Acts specifically excluded estuaries along the coast of Natal from the ambit of national administration.

- 5 These include two 'independent' coastal 'homelands' – Transkei (granted 'independence' in 1976) and Ciskei (granted 'independence' in 1981) as well as the 'self-governing' national state of KwaZulu (which was formerly part of the province of Natal since 1897). See Figure 3.1.
- 6 Also known as the 'Bantu Homelands Constitution Act'.
- 7 Ciskei Nature Conservation Act of 1987.
- 8 Transkei Decree (Environmental Conservation) of 1992.
- 9 KwaZulu Nature Conservation Act of 1992.

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## Policies and Legislation

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- Black Land Act 27 of 1913
- Cape Fishing Ordinance 30 of 1920
- Cape Nature Conservation Ordinance 26 of 1965
- Ciskei Nature Conservation Act 7 of 1976
- Ciskei Nature Conservation Act 10 of 1987
- Coloured Labour Preference Policy of 1954
- Constitution of the Republic of South Africa Act 108 of 1996
- Development Trust and Land Act 18 of 1936
- Environmental Conservation Act 73 of 1989
- Group Areas Act 41 of 1951
- KwaZulu Nature Conservation Act 8 of 1975
- KwaZulu Nature Conservation Act 29 of 1992
- KwaZulu-Natal Nature Conservation Management Act 9 of 1997
- Marine Living Resources Act 18 of 1998
- Municipal Systems Act 32 of 2000
- Natal Coastal Fishing Conservation Ordinance 19 of 1958

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National Environmental Management Act 107 of 1998  
National Forests Act 84 of 1998  
National Water Act 36 of 1998  
Reservation of Separate Amenities Act 49 of 1953  
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Sea Fishery Amendment Act 74 of 1995  
Sea Shore Act 21 of 1935  
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Diversity of 1997  
White Paper on Sustainable Coastal Development in South Africa of 2000



# The Sokhulu Subsistence Mussel-Harvesting Project: Co-management in Action

*Jean Harris, George Branch, Christian Sibiya  
and Catherine Bill*



Visits by the Sokhulu joint committee to other communities in KwaZulu-Natal and the Transkei who depend on intertidal resources, have allowed ideas and problems to be shared, information to be gained and networks to be established.

*Photograph Jean Harris*



## REASON FOR INITIATING THE CO-MANAGEMENT PROJECT

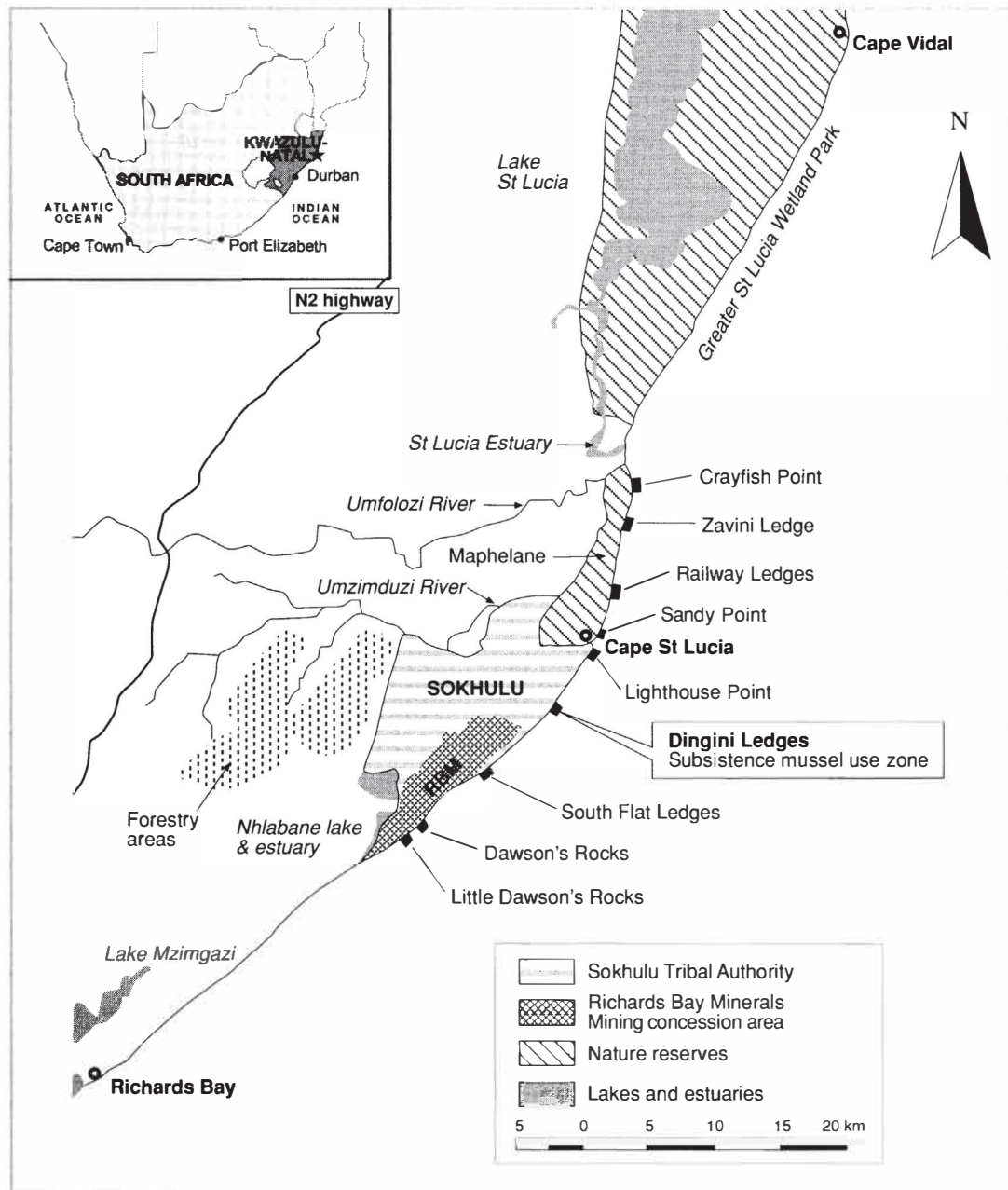
Mussels (*Perna perna*) are heavily exploited along the east coast of South Africa by both recreational and subsistence gatherers (Tomalin and Kyle 1998). Subsistence harvesting of intertidal invertebrates in South Africa has often been shown to deplete stocks and can substantially alter biological community structure (Branch 1975, Dye *et al.* 1994 and 1997, Griffiths and Branch 1997, Hockey and Bosman 1986, Kyle *et al.* 1997, Lasiak 1992, Lasiak and Dye 1989, Siegfried *et al.* 1985, Sink 2001). Comparable effects have been recorded elsewhere (e.g. Durán and Castilla 1989, Keough *et al.* 1993, Sala *et al.* 1998, Castilla 1999). The history of harvesting in South Africa is, however, unique in that it extends back at least 100 000 years (Voigt 1975, Thackeray 1988).

Prior to the promulgation of the Marine Living Resources Act (MLRA) in 1998 (DEAT 1998), mussel utilisation in KwaZulu-Natal was controlled by a licence and bag-limit system, and by specification of implement type. Traditional methods and quantities of mussel harvesting by subsistence gatherers were illegal under this legislation and were prevented by active law enforcement by the provincial conservation authority, the Natal Parks Board (NPB) (subsequently amalgamated with the KwaZulu Department of Nature Conservation to form the KwaZulu-Natal Nature Conservation Services, which was renamed as Ezemvelo KwaZulu-Natal Wildlife, or EKZN Wildlife). Nevertheless, large-scale illegal harvesting of mussels by subsistence gatherers occurred at night along certain areas of the coast, and conflict existed between subsistence gatherers and licensed recreational gatherers, and between harvesters and the authorities. Specifically, in the early 1990s stripping of mussels from the rocks was reported along the shores alongside the Maphelane Nature Reserve, and violent clashes occurred between law enforcement staff and poachers from the nearby Sokhulu community (see Figure 4.1 for localities).

The Sokhulu mussel co-management project was initiated in June 1995 to address these problems. It was launched with a fourfold purpose: first, to investigate the extent and impact of subsistence harvesting on the coast between Maphelane Nature Reserve and Richards Bay; second, to provide subsistence gatherers with legal access to a traditional resource; third, to assess sustainable levels of subsistence harvesting; and finally, to facilitate co-management of the mussel stocks by the subsistence gatherers and the management authority. At inception, an integral part of the project was the intention to implement participatory experimental harvesting so as to achieve: (1) the development of a sustainable system of subsistence harvesting, and (2) an increase in the capability of members of the fishing community to participate in management decisions. Although the project focused on use of

an intertidal resource at one locality, the results have wide application and have since stimulated similar initiatives in other areas of KwaZulu-Natal province (involving intertidal gatherers in the Maputaland Marine Reserve (notably the Enkovekeni community) and four other areas (Nonoti, Mgababa, Umfazazane and Port Edward), as well as subsistence line-fishers in no less than seven rural communities to date).

Figure 4.1 Map showing the locality of the site of the Sokhulu Mussel Project and adjacent environs, in northern KwaZulu-Natal



## HISTORY OF HARVESTING

Historical information about the use of intertidal resources by the Sokhulu community was obtained from questionnaires conducted door-to-door amongst 98 households. Additionally, a workshop in which approximately 30 harvesters participated was held using Participatory Rural Appraisal (PRA) techniques, which provide a structured mechanism for illiterate people to document local or indigenous information (Pretty *et al.* 1995, Wilson and Harris 1996).

The questionnaire survey provided insights into the dependence of the community on mussel harvesting, patterns of collecting activities, population demographics and indigenous wisdom about resource management and mussel ecology. During the workshop, collectors described the rocky shores traditionally harvested by their community, which spanned 20–30 kilometres (km) of coast between St Lucia estuary mouth and Njokanjane (south of Dingini) (see Figure 4.1). Traditionally the collectors used a rotational system of harvesting, moving from site to site as mussels became depleted. Some sites lay fallow for a number of years. The Sokhulu community's persistent use of the coast is confirmed by large mussel middens at many of the intertidal rock reefs, as well as strong cultural ties with the coastal dune forests where there are old burial sites within the Maphelane Nature Reserve. Archaeological shell middens in the region extend back 2 000 years (Horwitz *et al.* 1991), many associated with Iron Age settlements (Hall 1987).

A 'time-line' of resource utilisation was also constructed as part of the ongoing research project. This elucidates important events and milestones (see Figure 4.2). Harvesting of mussels by the Sokhulu community has occurred for as long as living memory, and the oldest women remember their grandmothers harvesting. In the past, harvesters used cues for the time when harvesting was optimal, for example when the Msintsi tree (*Erythrina lysistemon*) flowers in autumn mussels are good and fat (coinciding with the period of swollen gonad tissue prior to spawning). Closed seasons were observed, although the timing of the closed period seemed unclear among current harvesters. In addition, and historically, community harvesters advocated and practiced strip removal of mussels from areas prone to sand inundation, justifying this on the grounds that the sand would anyway remove the mussels. The traditional harvesting system persisted until the early 1980s. After that, vigilante harassment by 'white' fishers and foresters began, an activity that was associated in the minds of the harvesters with the establishment of Maphelane Nature Reserve in 1984.

The traditional phase was replaced by a period of illicit harvesting once provincial legislation was introduced and actively enforced in the 1980s, requiring the purchase of a permit, a bag limit of 50 mussels per day and specifying that the tool used should equate to a screwdriver with a blade width not exceeding 20 millimetres (mm). The bag limit was too small to meet the

Figure 4.2 Time-line of the management climate, harvesting system, activities and interventions used in mussel harvesting

<b>Management climate</b>	<b>Harvesting system</b>
No restrictions	Traditional harvesting methods – <i>sharpened stick used</i> – <i>rotational harvesting system</i> – <i>by women</i>
Forestry develops; first vigilante actions against harvesters	<b>1933</b>
Maphelane Nature Reserve established	<b>1984</b>
Provincial legislation introduced & enforced, limiting methods & amounts	Illegal harvesting – <i>use of panga &amp; spades</i> – <i>nocturnal</i> – <i>mainly by men</i>
Recreational permit required	
Arrests	Many cease harvesting
<b>Co-management project starts</b>	<b>1995</b>
Subsistence harvesting permitted, Provincial legislation	<b>1996</b>
Experiment on tool use	Switch to screwdriver Experimental quota granted
Experiment to determine sustainable fishing intensity	Legal harvesting commences – <i>mainly by women</i>
Monitoring of stocks & offtake <i>Appointment of community monitors</i>	
New Marine Living Resources Act promulgated – <i>recognises subsistence fishers formally for first time</i>	<b>1998</b>
	<b>1999</b> Experiment ends, sustainable fishing intensity established & implemented, including: – <i>reduction of quota by mutual agreement</i> – <i>closed season of 2 months introduced at insistence of fishers</i>
Co-management project funding ends	<b>2000</b>
Responsibility for co-management arrangement assumed by provincial authority	Mussel reseedling of areas denuded experimentally – <i>minimised bycatch &amp; provides settlement substrate</i>
Formal initiation of alternative livelihoods project to reduce dependence on resource	<b>2001</b> Application for national permit under MLRA prepared – <i>project provides model for implementation of intertidal subsistence fisheries in KwaZulu-Natal</i>



needs of the subsistence harvesters, and their activities became covert. A number of ‘mussel factories’ were active in the dunes. Sokhulu harvesters came down to the beach at night, stripped mussels off the rocks using spades and bush-knives (‘pangas’), built a fire in the nearby dune forest and cooked the mussels in drums. Large-scale stripping using spades was reported, as harvesters attempted to gather mussels rapidly to elude arrest. This resulted in unsustainable strip harvesting and conflict with the NPB, whose law enforcement officers actively sought out and ambushed people at these ‘factories’. Of the households interviewed in the questionnaire survey, 42 per cent knew someone who had gone to jail for mussel harvesting. Many households that had previously harvested mussels ceased doing so during this phase of active policing. Consequently, only the oldest women had memories of the traditional techniques of harvesting or had themselves harvested in their lifetime. When legal harvesting began at the start of the co-management project in 1995, collecting was a novel activity for the young women.

The co-management project began by providing subsistence fishers with legal access to approximately two km of rock ledges at Dingini. An exclusive subsistence mussel-use zone (henceforth termed the ‘subsistence zone’) was established at Dingini in 1995 (see Figure 4.1). This area was chosen following a survey of mussel stocks between Maphelane and Richards Bay, consultation with Sokhulu harvesters as to their preferred ledges and discussions with recreational harvesters. A specific institutional structure was established to oversee harvesting of mussels: the Sokhulu Buhlebemvelo (‘beautiful nature’) Joint Mussel Management Committee (hereafter referred to as the joint committee or simply the committee). This committee was issued a subsistence collecting permit by the KwaZulu-Natal provincial Fisheries Licensing Board from 1996 to 1998. Thereafter licences have been issued by arrangement with Marine and Coastal Management (MCM), which is responsible for national implementation of the MLRA (Harris *et al.* 2002a and b). At the outset, the committee appointed community monitors to regulate the harvesting.

The project thus introduced a new system of mussel use by demarcating a fixed zone for harvesting (approximately two km out of an original total of 30 km). This departed significantly from the pattern of traditional harvesting, which was rotational and sporadic by area.

## GEOGRAPHY AND DEMOGRAPHICS

The Sokhulu Tribal Authority lies on the north coast of KwaZulu-Natal between St Lucia and Richards Bay, immediately to the southwest of the Maphelane Nature Reserve, which forms part of the recently proclaimed Greater St Lucia Wetland Park World Heritage Site (see Figure 4.1). Thus, the harvesting areas traditionally used by the Sokhulu community fall partly

within the World Heritage Site and partly outside of it to the south. Dingini, the 'subsistence zone' allocated to Sokhulu, lies five km to the south of Maphelane Nature Reserve.

## IMPLEMENTATION OF CO-MANAGEMENT

### Getting started

Intertidal mussel research alongside the Maphelane Nature Reserve (see Figure 4.1) began in 1994, initially focusing on recreational harvesting and aspects of the biology of mussels. This area was chosen because the NPB Officer-in-Charge had voiced concern about declining mussel stocks. It soon became clear that subsistence harvesters based at Sokhulu were illegally utilising the resource and effecting large-scale stripping of mussels stocks. In addition, there was overt conflict between the NPB (the provincial conservation authority) and the Sokhulu community, with law enforcement resulting in arrests and even injuries. The management staff felt that this situation could not persist and that the Sokhulu community should be approached in an attempt to try to find a solution.

To address these problems, The Green Trust, World Wide Fund for Nature (WWF-SA), generously agreed to fund the project for five-and-a-half years from mid-1995, and the Mazda Wildlife Fund provided a 4x4 vehicle. As an initial step, the project coordinator met with the *Nkosi* (the local Chief) of the Sokhulu Tribal Authority (the traditional local government), accompanied by a NPB staff member from Maphelane Nature Reserve who was also a member of the Sokhulu community. At this meeting the *Nkosi* agreed to assemble all harvesters to discuss the matter. The resultant community meeting was well attended by both the harvesters and the conservation authority. The approach taken by the NPB was for the Officer-in-Charge of Maphelane Nature Reserve to stand before the harvesters (some of whom he had recently arrested and who had injured him in a stoning incident) and, with 'cap in hand', express his unhappiness with the situation and communicate his desire to find an effective way of working together with Sokhulu to address the problems. He also indicated NPB's intention of providing legal access to mussels for the Sokhulu community. Despite being somewhat incredulous about the motives of the conservation authority, the community agreed to form a joint committee. The *Nkosi* endorsed the concept. Some of the first activities were aimed at sharing information and generating an understanding between the conservation staff and the Sokhulu harvesters, and included holding a workshop using PRA techniques, conducting household questionnaires, and undertaking a beach visit to jointly look at potential subsistence collecting sites. The first few meetings of the committee were facilitated by an independent person, but once the initial mistrust and conflict was overcome, external facilitation proved unnecessary.

## Incentives to participate

From the conservation authority's perspective, co-management had the potential to: (a) address unsustainable harvesting practices; (b) improve relationships with the community by providing them with access to the resource; (c) reduce poaching; and (d) diminish the need for law enforcement which was costly, difficult and a losing battle.

Through the project, the harvesters at Sokhulu stood to gain: (a) legal access to the natural resource; (b) an injection of funds, resources, training courses and logistical support; (c) access to information about policy and legislative developments; (d) participation in decision-making processes affecting resource use; (e) beneficial spin-offs including development and capacity-building opportunities, literacy-training and trips to other areas; and (f) employment as resource monitors. In the early stages of the project, perhaps the most important incentive for the subsistence harvesters to participate and cooperate was the opportunity to gain legal access to the mussels. Many expressed their happiness at being able to collect without fear of arrest, even if the quantities allowed were small. As an 80-year-old woman said to journalist Sue Derwent on the first day of legal harvesting at Dingini: 'Today is a big day. I eat mussels for the first time in many, many years. As a young girl, I used to collect mussels with my grandmother. Then came the restrictions. So after my mother-in-law was arrested and we had to sell the cow to get her from jail, we didn't get mussels anymore. I was worried that I would never eat a mussel again before I died. Now we work with Jean to see [look after] the mussels, and I will be happy when I die' (*The Weekly Mail & Guardian*, 5–11 July 1996).

## Objectives of stakeholders

The key objectives of the project are listed below:

1. To determine availability of mussel stocks between Maphelane Nature Reserve and Richards Bay;
2. To establish the pattern of mussel harvesting by subsistence gatherers in this area, and determine the dependence of local communities on mussels as a food resource;
3. To foster communication and cooperation between mussel gatherers in local communities, recreational gatherers and the regional management authority, with the goal of achieving effective and equitable management of mussel stocks. The ultimate goal was to develop and facilitate a system of co-management;
4. To investigate experimentally, in cooperation with mussel gatherers, methods of harvesting that maximise yields, yet prevent over-exploitation of the mussel beds and loss of biodiversity on rocky shores.

From a research perspective, the objectives were as follows:

1. To provide a test-case model for co-management of subsistence mussel use;
2. To determine sustainable levels of mussel use by subsistence fishers;
3. To assess impacts of subsistence harvesting on the biological community structure of rocky shores.

The objectives of the Sokhulu community were not explicitly defined at the outset of the project, but were related to:

1. Gaining legal access to the resource (which was related more to regaining a 'right' than the desire to actually harvest, since many of the harvesters who originally applied for permits never actually used them);
2. Obtaining food for their families;
3. Becoming informed about policies and legislation that affect their lives.

## NATURE OF THE CO-MANAGEMENT PARTNERS

The joint committee was specifically established to deal with intertidal mussel use. During the funded research project, the committee comprised Sokhulu harvesters (mostly women), conservation authority (now EKZN Wildlife) staff and researchers from the University of Cape Town, and was supported by the co-management project team. Although not partners in the co-management arrangement, recreational harvesters who frequented the area were stakeholders in the process, and were consulted and informed about the process and its outcomes. The joint committee continues to function, primarily consisting of harvesters (most of whom are women) and conservation authority staff.

### The Sokhulu harvesters

The Sokhulu Tribal Authority area is divided into eight different sections termed 'wards'. Intertidal harvesters reside in six of these wards namely: Hlanzeni, Manzamyama, Ntongonya, Thukweni, Hoyinyoka and Malaleni. The traditional Zulu leader and head of the Sokhulu Tribal Authority, *Nkosi* (Chief) Mthiyane, lives in Hlanzeni, which is the oldest and core ward, and meetings were held at the Tribal Authority Courthouse there. *Indunas* or headmen (who are similar to councillors) provide traditional leadership in each of the wards and form the Council, which is presided over by the *Nkosi*. Some political conflict existed between the wards at the start of the project, but was resolved by an independently facilitated peace process during 1995.

Sokhulu is an impoverished community with poor infrastructure (bad roads, borehole water points, no electricity and, until recently, no telephones). Richards Bay Minerals is a major employer and has funded a school and clinic



in the area. The nearest economic centre, Richards Bay, is one-and-a-half hours drive away by bus, so most employees work on a migrant basis.

The 1996 South African population census indicated that there were 1 440 households and 10 957 people resident in Sokhulu. The project's questionnaire survey indicated that about ten adults and two children lived in each household. Three hundred Sokhulu households applied for mussel harvesting permits in 1995 (i.e. approximately 25 per cent of the total). The harvesters were a fairly homogenous group. Almost all were women (99 per cent) and fell under the leadership of one *Nkosi*. There were differences in poverty levels and infrastructure among the wards as well as religious differences that influenced the scheduling of meetings. Generally, these conditions and factors still apply to the Sokhulu community.

### The management authority

EKZN Wildlife is a parastatal provincial conservation agency answerable to the Minister of the Department of Agriculture and Environmental Affairs in KwaZulu-Natal. Its mission is 'to conserve and manage the ecosystems and natural processes within and without the parks of KwaZulu-Natal in such a manner that they maintain their indigenous character and diversity of life'. EKZN Wildlife has been given responsibility for applying aspects of the MLRA, and managing subsistence fisheries, in KwaZulu-Natal (EKZN Wildlife 2001).

The provincial conservation authority at the time, the Natal Parks Board (NPB), initiated the Sokhulu project and managed it in its first few years of existence and, after its amalgamation with the KwaZulu-Natal Department of Nature Conservation to form the KwaZulu-Natal Nature Conservation Services (subsequently renamed Ezemvelo KwaZulu-Natal Wildlife (EKZN Wildlife)), continued to do so for the duration of the project. The project coordinator was employed by the conservation authority and supervised the two full-time project staff members who were employed through the University of Cape Town. The participation of the conservation authority was multi-disciplinary, involving: (1) field management staff mainly engaged in compliance and management decisions, (2) community conservation staff who assisted with facilitation and training, and (3) ecological advice staff who provided scientific support.

### The project team

For the duration of the funded five-and-a-half years, the project team included a project leader (an ecologist), a project coordinator (an ecologist who devoted approximately 25 per cent of her time to the initiative), and a full-time research assistant (with biological and environmental expertise). A marine

resource ecologist was contracted to develop the fisheries model. Four community resource monitors were employed with project funds. An essential component of the team was a full-time community liaison officer, who had skills in facilitation and translation.

Training and capacity building – integral parts of the project – were funded by The Green Trust and provided by the Sea World Education Centre (basic fisheries management), the Wildlife Society (basic ecology) and by the provincial conservation authority (literacy, computing, basic administration and finance, and committee functioning).

The positions of project leader, coordinator and external facilitator were held by single individuals for the duration of the research project (1995 to 2000). Importantly, this provided continuity. The positions of community liaison officer and research assistant changed hands a number of times. Despite concerns that this discontinuity would cause problems, it in fact allowed flexibility and the introduction of new skills. During the funded five-and-a-half year period, the turnover of community monitors was considerable, with a total of eight individuals being employed in the four full-time posts. This is viewed as a positive aspect in that the project provided a stepping-stone for youths who had few prospects or no previous work experience; three of the monitors are now in formal employment within conservation, and one is currently attending university.

## THE NATURAL RESOURCE

### Resources characteristics

As already mentioned, a single species was the focus of the co-management project: the intertidal brown mussel, *Perna perna*. For the Sokhulu community, access to the rocky ledges on the seashore where the mussels occur is by foot through the dune forests, and the average walking time of harvesters is about two hours one-way from Hlanzeni (the nearest Sokhulu ward).

Mussels are sessile (attached to the rocks). They are ‘free spawners’, releasing eggs and sperm into the water in which fertilisation occurs. The resultant microscopic larvae are planktonic for about a week and may be widely dispersed (McQuaid and Phillips 2000) before they settle on the shore and metamorphose into miniature versions of the adults. Larval supply, dispersal and settlement powerfully influence the abundance of juvenile mussels that can contribute to the harvestable adult population (recruitment). Growth is rapid, and mussels reach sexual maturity and a harvestable size within one to two years (Berry 1978, Berry and Schleyer 1983). The rate of settlement of larvae depends largely on the presence of adult mussel clumps as a settlement substratum (Harris *et al.* 1998). Recovery is slow after stripping

of mussel beds (Dye *et al.* 1997, Lambert and Steinke 1986). It follows, then, that effective management of the resource requires the closure of some areas to harvesting in order to protect adult stock, and control of the method of collecting so as to avoid elimination of mussel beds. Twice during the project the Sokhulu members on the joint committee requested that the mussel beds be closed for a three-month period because of a perception that the mussels were being over-exploited.

The Sokhulu harvesters do not have a history of harvesting organisms other than mussels for food from the rocky shores. This contrasts with the activities of intertidal subsistence harvesters further north in Maputaland, and further south in the former Transkei, where a wide range of invertebrates is collected, including mussels, red-bait, limpets, sea urchins, whelks, octopus and chitons (Kyle *et al.* 1997, Lasiak 1992). Sokhulu harvesters have, however, expressed the desire to harvest a few other species, particularly the east coast rock lobster, *Panilurus homarus*. Meetings with traditional healers (*nyangas*) at Sokhulu revealed that they target a long list of species for medicinal purposes, albeit in relatively small quantities. The Sokhulu community also catches linefish from the seashore and estuary, and engages in estuarine gillnetting, but the people fishing in these ways are different from those who harvest mussels. This means that more than one committee is required to represent the diverse interests of the different resource users.

### Dependence on resource for food and/or livelihood

Rigorous data on the dependence of people in Sokhulu on the mussel resource have not been collected. However, the household surveys using door-to-door questionnaires indicated that mussels were mainly eaten and that only the surplus was sold. The dependence of some households on mussels may be illustrated by the arrest of one of the joint committee members with her two small children at 02h00 in the dunes where she was cooking mussels illegally collected from an area outside the subsistence zone. This occurred during a period in which the subsistence zone was closed to collecting by the committee, and she therefore had no means of gaining legal access to mussels at that time. Interestingly, following a hearing conducted by the joint committee, she was not expelled from the committee, nor was her permit withdrawn. The grounds for this decision were that she had collected in a recreational area (thus not compromising the subsistence zone), she was a valued committee member, and her dire personal economic and domestic situation provided extenuating circumstances.

Research revealed that most of the mussels were consumed by the families of the harvesters, but some were sold locally and informally to neighbours. These mussels were cooked, shelled and sold by the can. About four cans were

obtained per 20 kilogram (kg) bag of mussels collected, and in 1995 the selling price was about R2 (US\$0.20) per tin. Thus, the resource had a low commercial value and there was greater gain from its consumption than its sale. The household interviews suggested that mussels were seen as a quality food, improving health and being good food for children.

We are confident that mussel use and consumption remains largely the same as it was in the mid-1990s. There is a clear local demand for mussels since illicit activities and poaching (albeit reduced) still continue outside the subsistence zone and the harvesters have reported that illegally gathered mussels are intermittently sold in Sokhulu.

## THE CO-MANAGEMENT INSTITUTIONAL FRAMEWORK

### Legislative arrangements

The legal status of the Sokhulu co-management arrangement is currently unresolved, given that recommended management structures for subsistence fisheries have not yet been formally implemented under the MLRA (see Harris *et al.* 2002a and b). No legal agreement has been entered into between EKZN Wildlife and the community with regard to the joint committee and its formal roles, but a constitution has been drawn up and amended a number of times. Detailed minutes are kept of every meeting. Until the end of 1999, the joint committee was afforded a legal right to issue and manage individual mussel permits via a licence given to the chairperson of the joint committee. This annual licence was issued by the provincial KwaZulu-Natal Fisheries Licensing Board in terms of the provincial Nature Conservation Ordinance. The MLRA promulgated in 1998 replaced provincial legislation for marine fisheries, and resulted in the dissolution of the Fisheries Licensing Board in 1999. Since then, and pending implementation of national permits in terms of the MLRA, harvesting has continued in accordance with an interim extension of the provincial licence issued in 1998.

### Institutional structures

The main leadership structure of Sokhulu is the Council of the Tribal Authority (TA) headed by the *Nkosi* and supported by the *indunas*. In addition, there is a Sokhulu Development Committee with which the joint committee has a loose and somewhat uneasy relationship. The harvesters are not directly represented on the TA council or the Development Committee. The *Nkosi* allows the joint committee to operate independently, but insists that all meetings be held at the courthouse in Hlanzeni, that he be informed of each meeting by the Chairperson and that he and the Clerk of the Court receive all minutes. At present, the joint committee: (1) provides a forum for



communication between the harvesters and the authority through holding monthly meetings; (2) decides on the harvesting system, including individual permits, bag limits, tools and seasons; (3) oversees the implementation of the harvesting system, via community monitors; (4) obtains information for the harvesters about national issues relevant to subsistence use; and (5) networks with other subsistence fishing communities. Sokhulu members of the joint committee are elected within each ward by the harvesters themselves, and the committee has been chaired by a Sokhulu harvester throughout the project (with the support of a member of the provincial conservation authority as vice chair). The chairperson of the committee is re-elected annually as specified in the constitution. In addition, the joint committee attempts to achieve consensus and invokes quorum voting at times. As a consequence, no single individual is able to become too powerful. All Sokhulu representatives, bar one, have been women, and a key issue has been their shyness to speak out at meetings and to assume a leadership role. Nevertheless, some clear leaders have emerged. The legitimacy of the joint committee can be measured by the high level of compliance with its decisions, and the generally good attendance at the community meetings held every three months.

The status of the joint committee within the Sokhulu TA has remained poorly defined. It is recognised by the TA (as the committee was set up with the support of the *Nkosi*), but there has been, and is, limited direct involvement in the project by the tribal leadership. It is likely that the difficulties in institutionalising the mussel project within the male-dominated community leadership structures stem from the fact that almost all harvesters and most of the project team are women (the general perception then being that it is a 'women's project').

There are two other harvester groups within Sokhulu: the gillnet fishers committee and a *nyanga* group. In 2000, towards the end of the funded project, the joint committee amalgamated with the Sokhulu gillnet fishers committee to form a larger resource committee. This was motivated by a need to strengthen the status of the joint committee within the formal Sokhulu leadership structures. It was also aimed at ensuring sustainability of the established co-management system after the funded project ended. The women mussel harvesters did express concern that amalgamation with a male-dominated group might compromise their influence. However, the strongest motivation for this merger came from the male gillnet fishers who sought the involvement of the project team in reviving their defunct committee and monitoring system, in improving networking and information flows and in resolving the impasse between fishers and the authority. EKZN Wildlife favoured the merger to streamline interactions with the Sokhulu resource harvesters. In the end a combined committee was set up, but was structured to allow the individual committees (mussel and gillnet) to retain independence with regard to specific resources.

The joint committee was strongly represented at the Zululand Fishing Forum during the development of the national Fisheries Policy (1996 to 1997), and represented at a national level (1999 to 2000) because the project coordinator chaired the national Subsistence Fisheries Task Group (SFTG), which was appointed to advise MCM on the future management of subsistence fisheries (Harris *et al.* 2002a and b). In fact, the Sokhulu co-management process has been used as a model for formalising subsistence fisheries in 18 other communities in which these are being implemented by EKZN Wildlife. By January 2002, twenty-seven resource-specific local co-management structures had been established in the province of KwaZulu-Natal.

## DEVELOPING OPERATIONAL SYSTEMS FOR JOINT DECISION MAKING

### Gear and equipment

The original tool used for harvesting mussels was a sharpened stick but this was replaced by the bush-knife ('panga'), a wooden-handled implement with a broad metal blade used primarily for chopping vegetation. The 'panga' scrapes off clumps of mussels, rather than selectively picking off individual mussels, as was achieved by the traditional stick. At the start of the co-management project the use of a 'panga' was a point of disagreement between the harvesters and the conservation authority. This was resolved after a joint experiment in which three different tools were tested by the harvesters for efficiency (time to collect 100 mussels) and for bycatch (small mussels dislodged). This showed that although it takes longer to collect mussels using a screwdriver (the recreational legal tool), the bush-knife (preferred by the harvesters) dislodges far more small mussels (see Figure 4.3). This result was communicated to the community by translating the scientific findings (see Figure 4.3a) into a clearly intelligible pictorial form (see Figure 4.3b). The committee unanimously decided to use only the screwdriver in the subsistence zone. Initially, this caused an uproar among the harvesters, with the older women saying that they did not want to be forced to use 'primitive' methods when a more efficient tool had been found. The situation was contained when the joint committee invited a group of the oldest harvesters to repeat the experiment. When this yielded the same result, the harvesters then agreed to switch to a screwdriver, thus reducing the bycatch of small mussels. A deciding consideration voiced by them was that since collecting would now be legal and could take place during the day rather than covertly and at night, the speed of collection would not be a limiting factor.

Irrespective of the harvesting tool used, some undersized mussels are always inadvertently removed. One of the spin-offs of the project is that the community now participates in a mussel-reseeding programme. Undersized

Figure 4.3 a An experimental test of the efficacy of different types of tools used in mussel harvesting

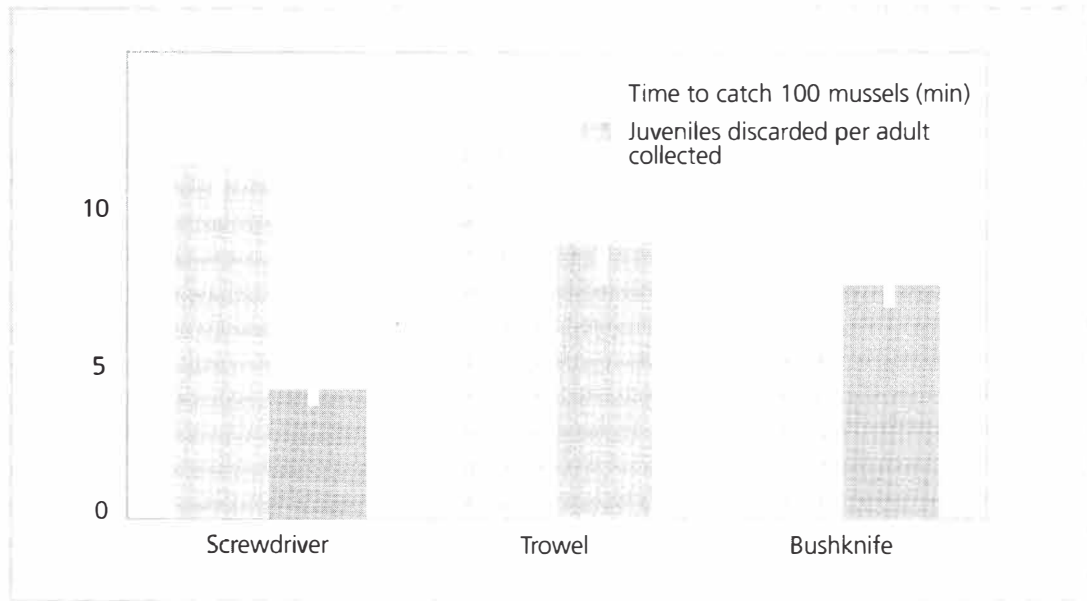
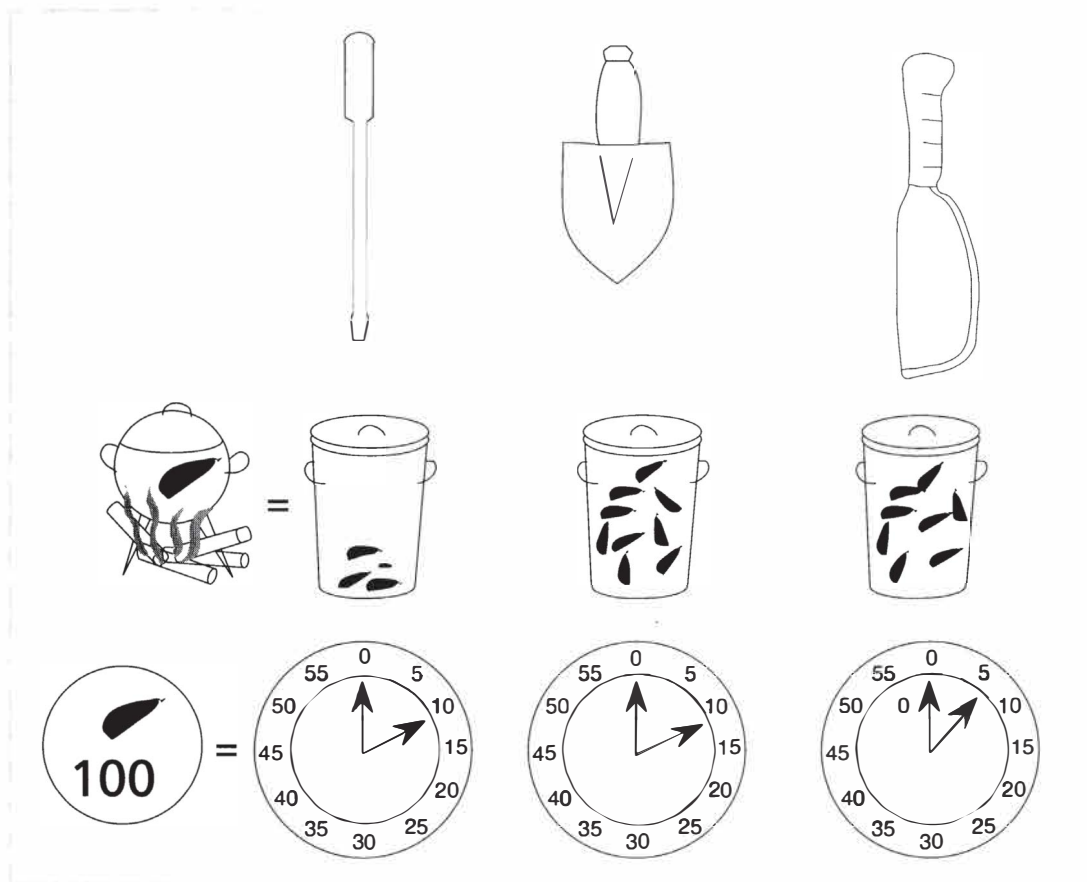


Figure 4.3 b A pictorial representation of the efficiency of different types of tools used in mussel harvesting (illustration used to communicate experiment's findings to harvesters)



mussels are retained, and 'planted' on the shore beneath sleeves of plastic mesh screwed onto the rock (Dye and Dyantyi 2002). The mussels soon re-attach to the rock and the sleeve can then be removed, leaving the mussels to grow to a harvestable size. This enhances future yield, and aims to rehabilitate over-harvested areas because further recruits settle among the reseeded mussels (Harris *et al.* 1998).

### Levels of stock exploitation and determination of sustainable harvesting

Because subsistence use was illegal before the co-management project started, sustainable levels of harvesting were not determined in the past and no quantitative historical data exist on the amounts harvested. As suggested earlier, there was a general perception by the authority and recreational harvesters that the mussels were being depleted due to large-scale stripping by Sokhulu residents. There was some confusion, however, between the effects of strip harvesting and those of natural sand inundation, since both cause sudden disappearances of mussel beds, leaving large patches of byssus threads (the 'beard' by which mussels attach themselves to the rock). Inspection revealed that byssus threads left on the rocks after harvesting are short and irregularly cropped, and thus distinguishable from those left after natural death of mussels, which are long and intact. In any case, large-scale stripping clearly was taking place, as large sacks of mussels were confiscated when arrests were made.

At the beginning of the project the harvesters requested that they be allowed to collect up to an 80 kg bag of mussels per person on each excursion, arguing that it was not practical for them to walk two hours to the beach for a small return of mussels. The law enforcement staff, on the other hand, were adamant that subsistence harvesters should adhere to the legal (recreational) limit of 50 mussels per day.

To resolve the amount that should be harvested, a four-year experiment was undertaken by harvesters, supervised by the project team, in the Dingini subsistence zone (see Figure 4.1). The two main rocky ledges in the subsistence zone were divided into 15 subzones running from the high- to the low-tide marks. Within these subzones harvesting intensities were set to approximate the five levels of fishing mortality of  $F=0$  (no harvesting),  $F=0.3$ ,  $F=0.6$ ,  $F=0.9$  and  $F=1.2 \text{ y}^{-1}$ , with three replicates of each. Annual surveys of the total numbers of mussels with shell lengths in excess of 65 mm were carried out. The survey estimates were used in conjunction with the Baranov catch equation and a natural mortality level of  $1.00 \text{ y}^{-1}$  to determine the amounts to be harvested annually per zone in order to be consistent with the aforementioned fishing mortality levels. These amounts were apportioned into monthly catch limits per zone, a restriction that was implemented by means of a limit on the number of standard-sized bags of mussels (capacity = 20 kg wet weight) that could be removed from each subzone per tide. Harvesters were



allocated different subzones by community monitors in order to achieve the desired fishing level. Boundaries between subzones were indicated by appropriately placed coloured markers (coloured rope and sheep eartags) to indicate the desired fishing level. Harvesters therefore knew exactly which subzone they were harvesting. To ensure that collectors understood the experiment, role-playing was conducted both before and during the experiment: collectors simulated collecting different quantities from different areas by removing paper 'mussels' from large coloured poster 'subzones' as directed by 'monitors', and observed the effect on the remaining 'stock'.

Community monitors (initially paid by the project) regulated the activities of collectors and monitored offtake. Surveys of the mussel beds were undertaken by the project team and the monitors throughout the four-year experiment. Thus, measurements were made of both offtake and the state of the mussel stocks. Virtual population analysis was used to calculate the actual fishing levels ( $F$ ) imposed in each subzone, (by relating catch-at-age data back to the original stock survey data), and the relationship between fishing intensity and depletion was plotted (Figure 4.4a). With information on growth rates, mortality rates, selectivity, the relationship between stock size and recruitment and on the amounts of juvenile mussels discarded during harvesting (discard mortality), a sustainable-yield model was developed to estimate the maximum sustainable yield (tonnes per year) for the entire subsistence zone (Figure 4.4b). This figure could then be translated into a permissible number of bags per month.

There was, however, a complication in applying the results of the experiment. Generally, harvesting did not occur uniformly over the mussel bed in the intertidal zone, but was instead concentrated on the landward sections that were most accessible and exposed for long periods. As a result, the harvesters depleted the mussel bed to progressively lower levels on the shore at the higher intensities of fishing (Figure 4.4c), effectively 'mowing' the mussels back from the top of the shore. As a consequence, at the end of the experiment instead of  $F=0.5 \text{ y}^{-1}$  (the fishing level at which the maximum sustainable yield was indicated, see Figure 4.4b), a more conservative value of  $F=0.4 \text{ y}^{-1}$  was agreed upon. This aimed to provide a close-to-maximal harvest, but to compensate for the 'mowing' effect.

Through participation in the experiment the harvesters soon learned that intense harvesting led to over-exploitation because the subzones set at  $F=1.2 \text{ y}^{-1}$  fishing levels became depleted after only one year. They then requested closure of the most intensely harvested subzones so as to allow recovery. This hands-on demonstration of over-fishing did more to convince harvesters of the need for limits on fishing than scientific equations could ever have done. It must be noted that over-harvesting in some of the subzones was an explicitly planned part of the experimental design. In fact, in order to

Figure 4.4a A virtual population analysis model predicting depletion at different fishing intensities

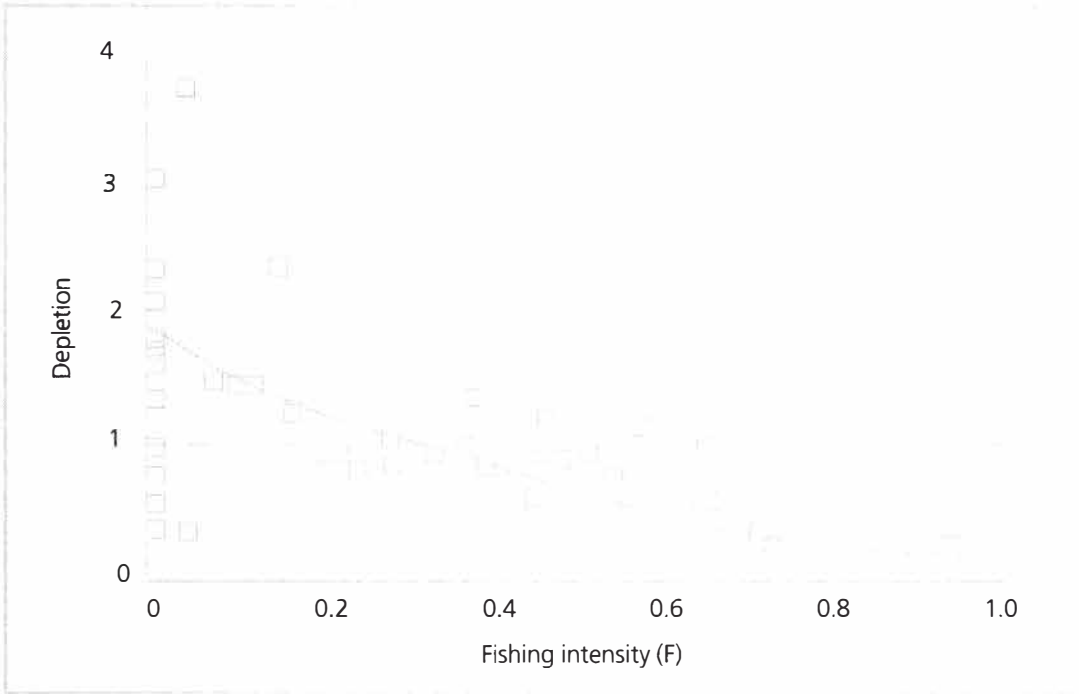


Figure 4.4b A yield-per-recruit model showing predicted sustainable yields and stock sizes at various intensities of fishing

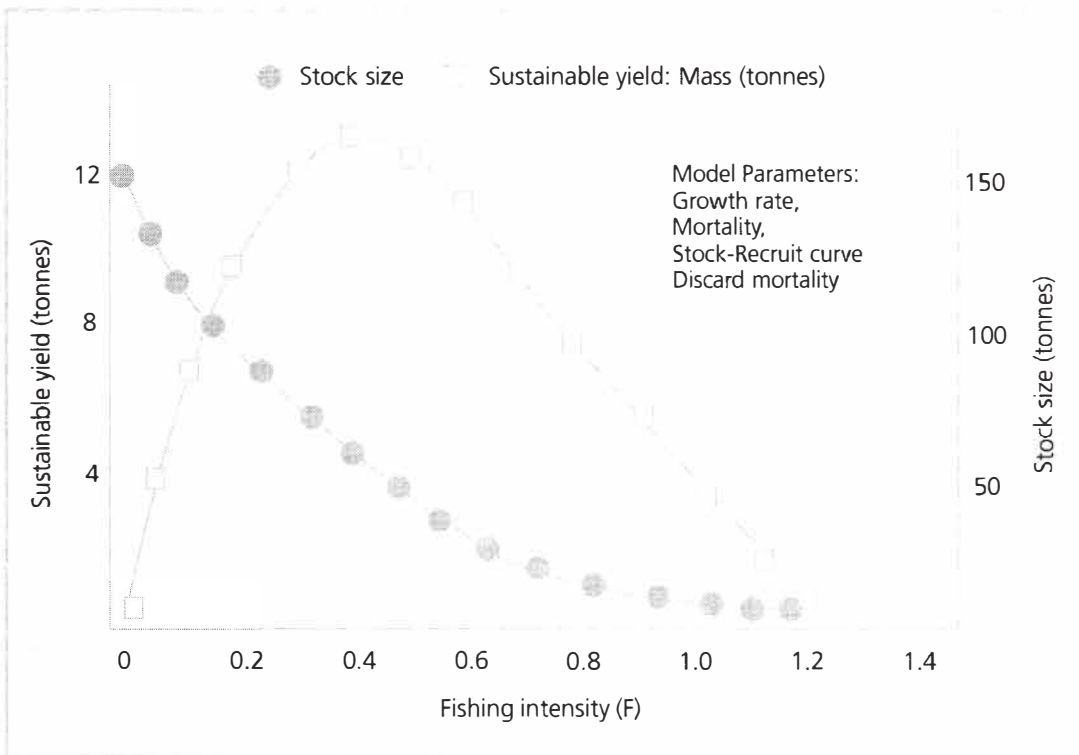
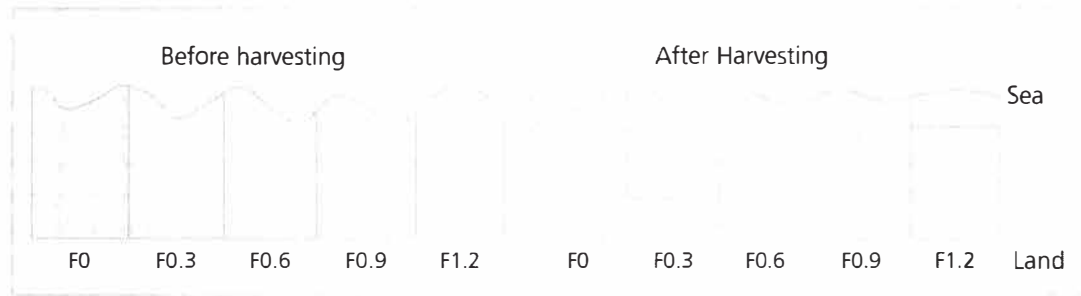


Figure 4.4c Diagrammatic representation of the division of the shore into five subzones that were subjected to different levels of fishing intensity (left) and the manner in which the mussel beds receded down the shore after harvesting had taken place (right)



visually demonstrate the correct harvest level it was necessary to span a range of harvesting intensities, including levels of removal that were clearly unsustainable. At intervals during its implementation and at the end of its duration, the results of the experiment were presented at joint committee workshops using simple models and diagrams to ensure that the collectors understood the outcomes and implications. Complementary training courses covering topics such as sustainable resource use, basic fisheries management and mussel population dynamics were also conducted.

At the outset of the project, the total experimental catch from the entire subsistence zone was 200 bags per month, and each harvester was allowed to collect two bags of approximately 20 kg each (shell and flesh wet weight) on the eight to ten days of spring tide per month. One year into the project, this was adjusted to a total of 65 bags per month after the annual stock survey revealed the stock depletion in the subzones with high-target fishing levels ( $F=0.9$  and  $1.2 \text{ y}^{-1}$ ), and only one bag per harvester per month was permitted, to spread the available bags amongst the harvesters. A further reduction down to 56 bags was made in the last year of the project, following the stock survey and using the agreed final target fishing level of  $F=0.4 \text{ y}^{-1}$  (derived from the experiment). Acceptance of these measures was largely due to the participation of harvesters in the experiment. Thus, as Jentoft and McCay (1995) have noted, participation emerged as a key ingredient of successful co-management. It was also invaluable to feed results back to harvesters in an understandable manner, using images, models, role-playing and clearly intelligible graphs, as well as translating the findings into Zulu.

### Monitoring of resource use and stock

Throughout the project, resource use was monitored by four community monitors who were drawn from the youth and had a minimum of Standard nine (or Grade eleven) education. They were selected by an interview with the

joint committee and project team. The community liaison officer supervised the monitors. The monitors underwent training in literacy, administration and finances, computer operation (for data entry) and basic fisheries management. They in turn provided training to the collectors and children. The monitors directed and recorded resource use on all spring tide days (marked on a collecting calendar issued to collectors with their annual permit). The monitors also measured the sizes of mussels in a randomly selected bag of mussels each day, and assisted the scientists with field surveys of the mussel stocks. The data collected comprised catch (number of bags, weight of mussels); selectivity (size structure of the catch relative to that of mussels on the shore); mussel-bed percentage cover and density; and an assessment of the impact of mussel harvesting on biological community structure and biodiversity (Sink 2001). Monitors are currently active, engaged in the same tasks outlined above.

### Sharing information

Indigenous knowledge about the resource was probed early in the project through workshops and interviews. Traditional knowledge played a valuable role, but was limited to observable phenomena and demonstrated little detailed understanding of causes and processes. For example, harvesters knew when mussels were in a good condition for harvesting, that sand could decimate mussel beds and that new small mussels grew 'from the rocks'. On the other hand harvesters were at first adamant that there was no need for concern regarding over-exploitation since 'the seawater would come over the rocks and cause new mussels to grow'. The need for large mussels to provide the 'seed' was initially rejected. Sometimes the information provided by the harvesters revealed conflicting views. For example, the seasons suggested for a closed period varied. Such conflicting opinions may have arisen because most households were no longer harvesting, and relied on the memories of old women.

Providing harvesters with scientific information to better understand the resource and participate in decisions affecting resource use has been a valuable aspect of this project. The principle has been that the harvesters need to be involved in all research and monitoring activities so that the scientific results form part of the pool of common knowledge shared by all participants. This has been achieved in three ways. First, because harvesters were involved in participatory experiments they could see the results for themselves. Second, effort was put into explaining the principles of the experiments and interpreting the results in a creative way, involving models, diagrams and role-playing scenarios. Third, formal training courses on intertidal foodwebs and basic fisheries management were conducted. As a result, there has been a significant improvement in the general knowledge about the biology of mussels and the principles of sustainable use amongst committee members and monitors. Targeting committee members and monitors rather than



harvesters was considered more effective, mainly because of low literacy levels among harvesters. Consequently, the dynamic has shifted from researchers trying to convince harvesters, to committee members and monitors arguing with the harvesters about issues such as recruitment and reproduction.

The most effective mechanism for transferring information was training the monitors to become trainers, and developing an educational programme that targeted the children of active collectors. Consequently, after being trained by Sea World Education Centre, the monitors developed training modules for children. Included in these modules was teaching about principles of resource use and marine ecology, as well as a guided visit to the seashore. 'Explore the Seashore' (Branch 1998) was used extensively because it is pitched at an appropriate level and encourages participatory learning. Appropriate resource material for trainers and children remains a key need, and a manual that describes sustainable mussel harvesting is currently being prepared.

The present system of harvesting is a blend of traditional and scientific knowledge. The quota is based on the scientific results of the participatory experiment, and the tool restriction is still strongly defended by the joint committee (on the grounds of 'their' experiment). On the request of the harvesters, a closed season has been imposed for three months each winter for the past two years, since they assert that mussels will disappear more quickly if this is not observed. There is no scientific basis for this belief. Regardless, it does accomplish a reduction in effort, and serves as tangible recognition of traditional knowledge and approaches.

### Decision-making processes

The co-management system that has arisen from the project is characterised by two tiers of decision making. Decisions about the size and placement of the exclusive subsistence zone are taken by the provincial conservation authority, albeit in consultation with the harvesters. During the experimental harvesting period of the project the conservation authority, with the assistance of the researchers, also set the total allowable catch (total number of bags that could be harvested from the whole subsistence zone). This was based on the catch required to allow experimental determination of sustainable offtake levels and to demonstrate the effects of over-harvesting. This responsibility was devolved to the next tier – in the fourth year of the project – when the joint committee was allowed to determine the total allowable catch. The decision of the committee was, however, supported by the researchers who interpreted the results of the participative harvesting experiment and outlined the risks and consequences of different total allowable catches. There was unanimous agreement by the committee on the quota for the following season, despite the fact that it was significantly lower than that set by the conservation authority

at the start of the project. In fact, it was the harvesters who tended to vote for the more conservative options, having witnessed first hand the depletion of mussel beds (caused by over-harvesting) and the slow recovery rates. To compensate for the reduction in total allowable catch and to accommodate all active collectors who were historically involved in the fishery, the committee has since requested that the exclusive subsistence zone be enlarged to incorporate more of the rock ledges that were traditionally harvested by Sokhulu. Thus, the fishers have recognised that a larger quota cannot be obtained from the stocks at Dingini, and that a greater length of coast is required if the needs of the community are to be satisfied. The promulgation of the MLRA has introduced an additional (national) tier of decision making. EKZN Wildlife is no longer mandated to zone sections of the coast or to set total allowable catches. It has thus instead assisted the joint committee in the preparation of an application for a community permit and in compiling a request for an extended exclusive subsistence zone. The request for the enlargement of the collecting area will shortly be submitted to the national authority (MCM).

At the local level, the joint committee makes the decisions about who should gain access to the subsistence zone and the individual number of bags allowed per person. The committee also decides on its own constitution and structure, administrative and financial systems, committee activities, permissible collecting tools, screening of permit applicants, individual permit fees, closed seasons, monitors and harvesting rules. Decisions of the joint committee are by consensus or by majority vote, as specified in its constitution. Thus, the harvesters and EKZN Wildlife representatives have equal voting power. No formal joint management agreement has been formulated to define responsibilities and roles. There is, however, clear documentation of agreed responsibilities and commitments in the minutes of all meetings (which are translated into Zulu, distributed to all committee members and ratified at the subsequent meeting).

Conducting collaborative studies to determine the best course of action is a key mechanism to overcome an impasse or conflict (e.g. the experiment to determine the most appropriate collecting tool). In addition, emphasis has been placed on increasing the knowledge and capacity of the harvesters to allow equal participation in decision making, a process akin to 'social preparation', which Berkes *et al.* (2001) list among conditions for successful co-management. Basic issues such as literacy, language and confidence impact on decision-making processes. At the start, most harvesters did not believe that the conservation authority and project staff would want to seek their opinions. Rather, they simply requested that the rules be made known to them. To overcome these constraints, committee members attended courses on committee functioning, literacy, administration, finance and basic fisheries management.

## Rules and regulations

During the first three years of the project, the Sokhulu harvesters enjoyed a formal right to harvest mussels through an experimental subsistence permit issued to the joint committee by the provincial Fishing Licensing Board. This was supported by an exclusion clause endorsed on each recreational permit, barring recreational fishers from collecting mussels in the subsistence zone. The committee then issued individual household permits to the harvesters on an annual basis. After the promulgation of the MLRA, which brought the authority for marine resource management under the national control of MCM, the right to harvest in the designated areas was maintained by an extension of these permits.

These permits were and indeed are temporary and will eventually be replaced by a national permitting or licensing system. This is currently being developed and EKZN Wildlife has been given responsibility for managing the process in KwaZulu-Natal (EKZN Wildlife 2001, Harris *et al.* 2002a and b).

Currently subsistence harvesting is limited to the subsistence zone at Dingini (which is demarcated by signboards on the beach) and to harvesters issued with permits by the joint committee. Only one permit is issued per household (defined as a 'woman-family' since one man may have more than two families). Applications for permits are screened at joint committee meetings. Renewal of permits occurs once a year. The number of permits issued was not limited during the experimental period of the project. Rather, the total quota was shared amongst the registered permit holders. Since then, the committee has decided that permits for 2002 will only be issued to collectors who applied for permits in 2000 and 2001, on the grounds that entry to the fishery needs to be limited. It has been further decided that those permit holders who were not active during the research period are probably not dependent on the resource, and should consequently not receive a permit. Interestingly, this stipulation arose when alternative livelihood opportunities that were being pursued by the joint committee on behalf of the harvesters began to yield benefits. Currently, only collectors with valid permits can gain access to the craft production and marketing sub-project which targets the 'poorest of the poor' and seeks to reduce dependence on the resource. Thus, entry to the fishery appears to be seen as a passport to involvement in these other initiatives.

By 1996 the joint committee had devised a set of collecting rules for the subsistence zone. These rules have been revised and issued each year with the permits, together with a collecting calendar that shows the spring tide periods and the approved collecting days. The formal rules include:

- Specified days on which collecting may occur, as marked on the collecting calendar;

- An annual quota (expressed as a monthly quota);
- A daily quota (number of bags per permit holder per day);
- The use of the single household permit only once a day, but by any member of the household;
- A specified standard collecting tool must be used (screwdriver);
- Use of a standard-size bag, issued at the collecting site;
- Within the subsistence zone, collectors are directed to specific subzones each day to spread the effort;
- No children under the age of 16 are allowed to collect (for safety reasons);
- All bags of mussels collected must be weighed by the monitors;
- If requested, collectors must allow monitors to measure the mussels they collect; and
- Closed seasons are imposed from time to time, currently over winter for a period of three months.

## Compliance

Because subsistence harvesting was illegal before the advent of the project, the current system and its associated rules is seen as a relaxation of controls. This is no doubt a reason for its favourable reception and acceptance. The benefits of participating in co-management are currently perceived to outweigh the costs, and compliance with the rules is high. Harvesters now accept that the screwdriver is the most appropriate tool for removing mussels. Furthermore, they recognise the need to limit the quota.

The cooperative spirit of the harvesters was demonstrated on one occasion when the monitors arrived late and the harvesters, who had walked two hours to get to Dingini, waited patiently for their permits to be checked, despite the fact that the period of low-tide was going to waste. Similarly, on a few occasions there have been too few screwdrivers available, and harvesters have waited until others finished collecting so that they could use the approved tool. During the five-and-a-half years of the funded research project there were only two confirmed incidents of poaching by subsistence harvesters inside the subsistence zone, and surveys of the mussel stocks confirmed that poaching was minimal. Nevertheless, there was and still is discontent among the harvesters with regard to the daily quota per person, and the size of the collecting area.

Compliance amongst recreational harvesters has been less satisfactory and there have been a few aggressive incidents when monitors have asked them not to harvest in the subsistence zone. However, this must be kept in perspective. Recreational harvesting is a relatively minor issue, as only three to four recreational collectors harvest in the subsistence zone each month.

Five incentives encourage community members to cooperate: legal access, involvement in joint decisions, active enforcement of rules, sense of



'ownership' of the subsistence zone and moral pressure from peers. The community does not allow rules to be broken within the subsistence zone, and community members of the joint committee or monitors have periodically confiscated mussels and non-standard tools, apprehended people without permits and rescinded permits of rule-breakers. However, following threats when they tried to apprehend a poacher, the joint committee has ruled that monitors and committee members should not undertake law enforcement. Law enforcement is therefore the responsibility of EKZN Wildlife. The joint committee does not concern itself with poaching that occurs outside the subsistence area, although this illegal harvesting diminished once legal access was afforded by the project.

Monitors are present at the subsistence harvesting site each day during spring tide. They play important compliance and educational roles, provide a watchdog presence, check permits, oversee harvesting, guard the mussel beds and report problems to the committee. They also inform recreational harvesters not to collect in the area and, while they do not try to prevent them from doing so (because of threats), they take down details of vehicle registration and record the catch. This information is handed to EKZN Wildlife law enforcement officers who follow up on these complaints and issue warnings.

## Conflict

Prior to the project there was overt conflict between the conservation authority (NPB) and the community, sometimes manifested in violent interactions. This has largely ceased since the establishment of co-management and the subsistence zone. There is now, however, a measure of conflict between the joint committee and the harvesters, centred on the limits imposed by the committee. The harvesters want to be able to collect larger quantities per person. They also resent having to collect in relatively depleted areas when a 'healthy' stock exists in the adjacent control area. However, the Sokhulu members of the joint committee competently and confidently debate these management issues with the harvesters and stand their ground even in the face of angry harvesters. This recent conflict between community members of the committee and harvesters can be attributed largely to an increased understanding of sustainable management issues by Sokhulu members of the joint committee. Intermittent overt conflict exists between subsistence harvesters and recreational collectors. Although very few recreational collectors frequent the subsistence zone, some have been coming to the area for many years and resent being excluded. Confrontational individuals are, however, the exception and many recreational visitors react positively to the initiative when its aims are explained. Monitors are encouraged to talk to and inform recreational mussel collectors and to hand out a leaflet that explains the aims of the project.

## IMPLEMENTING CO-MANAGEMENT: OBSTACLES AND MILESTONES

### Obstacles

*Stock limitations* – The mussel stocks in the subsistence zone are too small to meet the subsistence needs of Sokhulu, and the small bag limits mean that the long walk to the site yields small returns for the effort. The research project made it clear that long-term co-management cannot work if too small a quota is allocated to the community. Consequently, EKZN Wildlife is recommending that the subsistence zone be increased to provide for subsistence needs without compromising the stocks. In addition, alternatives to direct consumptive use of natural resources should be sought and promoted.

*Mistrust* – The past management regime created a substantial amount of mistrust between the authority and the harvesters. The authority was regarded as the enemy who prevented the Sokhulu people from gaining access to a resource that they considered their own. On the other hand, the provincial conservation staff and managers viewed the collectors as criminals and poachers. In this regard, the singular influence of the individual manager who was stationed at Maphelane (at the start of the project) was pivotal – his attitude was humble and he conveyed a genuine desire to put the past behind and work together. This did much to build trust. Engagement in joint activities also contributed to improving relations. One example was a trip to Dwesa in the former Transkei, which was undertaken to enable the Sokhulu joint committee to meet and discuss issues of mutual interest with mussel harvesters at Dwesa. This forged a joint history and built personal relationships that carried the project through difficult times.

*Skills* – Research has revealed that numeracy and literacy levels amongst the harvesters were and are very low, making it difficult for them to match EKZN Wildlife staff during debates and assume administrative roles on the committee. Literacy classes and training in administration and finances were provided. However, the greatest benefit was gained by in-house training by project staff. For example, the treasurer paid the monitors and kept the books but was assisted until she mastered the system. Similarly, two secretaries were appointed: a Sokhulu secretary who kept a Zulu record of the meetings and attendance, and a project secretary who produced the official minutes. Insistence on certain standards of education for the community monitors meant that they could assist with interpretation and training. Despite these measures, the co-management system did rely heavily on the project staff, especially for coordination and logistic support. The joint committee needs to become more self-reliant, with the authority and community assuming more responsibility for maintaining it.

An unforeseen obstacle was the lack of confidence amongst harvesters to engage with EKZN Wildlife in an assertive and confident manner. A long history of disempowerment seems to have created a climate of tacit acceptance of suggestions from EKZN Wildlife rather than one that allows the collectors to actively challenge proposals that they perceive to be unacceptable. Building trust and confidence has been a slow process, but gradually the harvesters began to realise that they had the right to be equal partners in all decisions.

*Language* – Over the duration of the project, differences in language hampered communication. Both the provincial conservation authority and the Sokhulu harvesters could not converse freely in each other's first language. All interactions had to be translated and this retarded personal rapport. Meetings needed to be paced so that all participants could follow completely. The value of a proficient translator who enables smooth, clear communication cannot be over-emphasised. All decisions were documented to avoid later misunderstandings. Documents and notices were translated into English and Zulu. This is still the case with all joint committee proceedings.

*Gender* – Most of the harvesters were and are women. Due to societal norms, the women were uncomfortable when challenging men, especially in a public forum. Over the course of the five-and-a-half year project it was readily apparent that the women tended to go along with suggestions rather than contest the opinions held by the men. It was clear that the success of co-management would depend in part on full participation by all. Towards this end, many sessions of committee training and role-playing were held.

Since most members of the EKZN Wildlife management staff are men there was always the possibility of a gender-based communication barrier creating a stumbling block to equal decision making. This was the nature of the relationship between the harvesters and the authority at the outset, but things have changed for the better and women now actively participate, possibly spurred on by the role models provided by the project coordinator and research assistant, both of whom were women. Work needs to be done to maintain the active participation of women.

*Commitment by the authority* – During the project the conservation authority experienced extreme budget cuts. This resulted in a decline in law enforcement at a time when the joint committee was requesting strong protection of the subsistence zone. More recently, the inability of EKZN Wildlife to effectively police the zone has threatened to jeopardise the cooperation of the harvesters and result in stock depletions. It is essential that the authority be willing and able to back-up the management system with

effective law enforcement, otherwise the legal harvesters who observe the regulations may soon become resentful and question the point of cooperating.

There was originally mixed buy-in by individuals within the conservation authority to the concept and implementation of co-management. Whereas the senior staff members were in complete support, some of the staff on the ground, who were thrust into the project after it had been running for a while, were not convinced of the merits of the project and were uncomfortable interacting with communities. In short, they gave minimal input. This was soon noticed by the harvesters (who were not shy to point it out). It is essential that staff stationed where co-management is embarked upon be fully trained in the principles, and tasked with full and formal participation. Although it is recognised that key individuals are important for the success of co-management, to ensure long-term viability, the commitment of the staff to co-management must become part of their terms of reference. As a direct lesson from this project, EKZN Wildlife has incorporated the training of field management staff in conflict resolution, committee functioning and co-management principles as part of the implementation of co-managed subsistence fisheries in the province (EKZN Wildlife 2001).

There is a fast turnover of management staff at most EKZN Wildlife stations. This is a problem because communities build relationships with individuals and after staff leave, new relationships need to be forged. This problem needs to be addressed, especially in areas where management of resources depends on community involvement. Furthermore, awareness that some people are better than others in working with communities should be a consideration when placing staff. Simply put, a considerable amount depends on the individual.

*Protocol* – The format of meetings can hinder proceedings. Initially, the joint committee employed a formal and conventional meeting format, partly because the harvesters felt ‘that was how it should be done’. However, a more workable format evolved in which the agenda was set at the beginning of the meeting by participants. Presently, only issues of importance to the members are tackled. An attempt is made to limit the length of meetings to two hours. This is done for two reasons: concentration lags and moods deteriorate over time, and the women have expressed problems with being away from home for too long.

*Shifts in levels of governance* – At the start of the project in 1995, the use of marine resources was controlled by provincial legislation, and the joint committee gained a formal right to harvest mussels in the form of a provincial permit issued by the then KZN Fisheries Licensing Board. With the promulgation of the MLRA (in 1998), all provincial legislation related to



marine resource use was no longer applicable, and the new legislation formally recognised subsistence fishing for the first time. Paradoxically, this led to a short-term loss of security regarding access to the resource for the Sokhulu community as there were no national mechanisms in place to review and grant subsistence rights. Furthermore, this shift in control from the provincial to the national level disempowered the conservation authority, and was contrary to the principles of local involvement in decision making. While recognising the benefits of uniformity and national policies, key recommendations of the Subsistence Fisheries Task Group are that top-down approaches are not appropriate for subsistence fisheries, that control should be devolved to relevant provincial agencies wherever possible and that local co-management structures should be promoted (Harris *et al.* 2002b). Slow implementation of these recommendations and national systems remains an obstacle for co-management at local levels.

### Significant milestones

*Joint research* – The joint experiment to evaluate the efficiency and impact of different collecting tools laid the foundation for the modus operandi of decision making. The exercise took place early in the project and demonstrated the concept of an experiment, the value of research, and the principle of joint decision making. It paved the way for the large-scale participative experiment to determine sustainable harvest levels.

Community monitors participated in field surveys of stock abundance, and helped to process samples. Their close interactions with the project team and familiarisation with research techniques proved invaluable when explaining these matters to the harvesters.

*Networking* – The exchange visit to Dwesa Nature Reserve in the former Transkei, to see the intertidal zone and share problems and experiences with the fishers there, was enormously important because it gave broader perspective to both collectors and management staff.

*Formalising operations* – Adoption of a constitution by the joint committee seemed to legitimise the committee. Similarly, the minutes of meetings were and are seen as valid records of decisions taken. Formalisation of the permit system, collecting calendar and rules was an intensive process but was invaluable since all decisions regarding use within the subsistence zone were made by the joint committee. This established its credibility in the community, and promoted a genuine desire amongst EKZN Wildlife staff to involve the community in decision making.

*Community monitoring of resource use* – Appointment of community monitors was a crucial step in gaining support for co-management. The valuable role

played by monitors should not be underestimated, and ranges wider than simply monitoring resource use. Other important aspects included the involvement of committee members in interviewing and selecting monitors (since they then felt responsible for their performances) and the decision that no committee members should be monitors (to avoid conflicts of interest).

*Training* – The Sea World Education Centre used the Sokhulu project to develop a basic fisheries management course. This was an important milestone and created receptiveness to scientific knowledge and the concept of sustainability. The committee developed a number of ‘models’ and presentations, and then used these to provide training for the collectors. A clear gain in confidence amongst collectors about their knowledge of the resource and its management was associated with the training programme.

*Alternatives to dependence on resource* – It was (and is) of central importance that the project be broadened to support and facilitate initiatives that seek alternative forms of income to reduce dependence on the resource. This intention generated a lot of goodwill, even though there are as yet few tangible benefits in the form of significant positive economic outcomes.

*Public relations* – An unexpected positive input was provided by photographic and media coverage of the project. It was the subject of numerous newspaper and magazine articles (*The Natal Witness*, 10 June 1996, 6 May 1998, *The Mail & Guardian*, 5–11 June 1998, 7–13 August 1998, *Keeping Track*, October 1996, *Africa, Environment & Wildlife*, October/November 1996), and two television documentaries. These created considerable public awareness, and generated a sense of pride among the committee, authority and collectors regarding their achievements, fostering further commitment to the project.

*Effective communication* – This review has highlighted five important ingredients for successful co-management: (a) document everything and make the documentation available to all concerned; (b) report results of all actions and experiments back to the fishers; (c) involve fishers in as many of the management and research activities as possible; (d) use appropriate interpretation tools to facilitate communication, including pictorial illustrations, role play, models and games; and (e) build personal relationships and common understanding between the managing authority and community through team-building activities such as visits to other communities and educational institutions.

## EVALUATING SUCCESS OF THE CO-MANAGEMENT INITIATIVE

The management system established in this project has consistently involved the harvesters at all levels of decision making, and in most of the management

functions (except for law enforcement). Decision making about activities within the subsistence zone has been and remains a joint endeavour, with the harvesters involved in decisions about the quota and in setting collecting rules. A co-management system is therefore currently in operation. In terms of 'ownership' of the system, commitment from the community is high, but during the project the overall coordination was largely by the project staff.

This caused concern to be raised about the long-term maintenance of the co-management initiative, especially after the funded project activities ended. This was a major point of discussion in joint committee meetings in the final year of the funded project (2000). Since then, however, EKZN Wildlife has actively embraced the idea of subsistence fishery co-management. The procedures developed by the Sokhulu joint committee have been identified as a model that should be adapted and applied to other types of fisheries throughout KwaZulu-Natal. Of significance is the fact that the Sokhulu project community liaison officer has been appointed as the manager of the provincial KwaZulu-Natal Subsistence Fishery Management Unit, and that two of the Sokhulu monitors have been promoted to work within this new Unit as province-wide extension officers. They are now involved in implementing co-management in 18 communities across KwaZulu-Natal, with Sokhulu being one of them and providing an ongoing case-model. Since the end of the funded project, this Unit has continued to facilitate meetings of the joint committee, albeit less frequently, and EKZN Wildlife staff have remained committed and involved.

The monitoring programme is now being funded by MCM from the national Marine Living Resources Fund. Thus, there is cause to be optimistic about the maintenance of this co-management arrangement. A number of issues remain outstanding and may prove to be important. These include: formalisation of the legal status of the joint committee, a formal management agreement between the authority and the harvesters, increasing the size of the subsistence zone so that the resource that is available better matches community needs, and the need to raise the status of the predominantly 'women's' joint committee within the male-dominated Sokhulu Tribal Authority.

It is evident that implementation periods of less than five years may well be too short to ensure that co-management becomes entrenched, and it is premature to judge the stability of the system developed. However, in the case of Sokhulu, several positive outcomes are evident: the project has improved relations between the authority and the harvesters, reduced poaching and unsustainable use of the resource, provided the community with legal (albeit limited) access to a traditional resource, and successfully completed a large-scale experiment to determine sustainable levels of harvesting. The community is involved in decision making and has begun to take responsibility for management of the resources in the subsistence zone. In addition, the

community has demonstrated its commitment to sustainable resource use by reporting poachers or attempting arrests. The project has also improved the level of skills and confidence amongst many of the harvesters and committee members by providing courses in literacy, administration, finance and basic fisheries management. A representative joint committee has been established, and a formal constitution drafted and adopted. The project has also yielded other benefits to the community, such as a craft initiative, greater networking with other communities, access to information about current legislation and increased publicity.

In hindsight, an important factor contributing to the success of this project has been the broad base of individuals and organisations involved, and the wide range of activities engaged upon (some quite peripheral to resource management). This has meant that diverse skills were available, emphasising the point made by Agrawal (2001) that heterogeneity of capabilities can contribute to the success of co-management projects.

Overall, the Sokhulu Mussel Co-management Project has been successful in many respects. Figure 4.5 summarises the background conditions that contributed to this success (see Chapter 13, Agrawal 2001 and Berkes *et al.* 1991 and 2001 for reviews of conditions predisposing co-management initiatives to success). It also highlights the achievements of the project, and the beneficial spin-offs that were not part of the original goals but would never have happened if the project had not taken place.

There remain components that can be improved, but one of the hallmarks of the project's success has been critical ongoing evaluation. Limitations that have been identified have been regarded as opportunities and not setbacks,

Figure 4.5 Summaries of: a) the conditions that existed during the initiation of co-management at Sokhulu and contributed to its success, b) achievements of co-management at Sokhulu and c) beneficial spin-offs that were a consequence of the co-management project, although they were not part of its original goals

Figure 4.5a

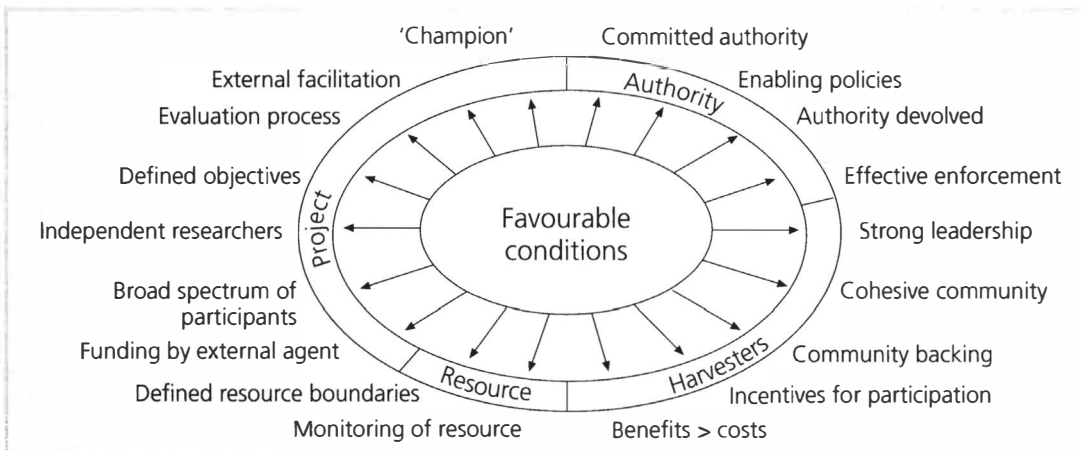




Figure 4.5b

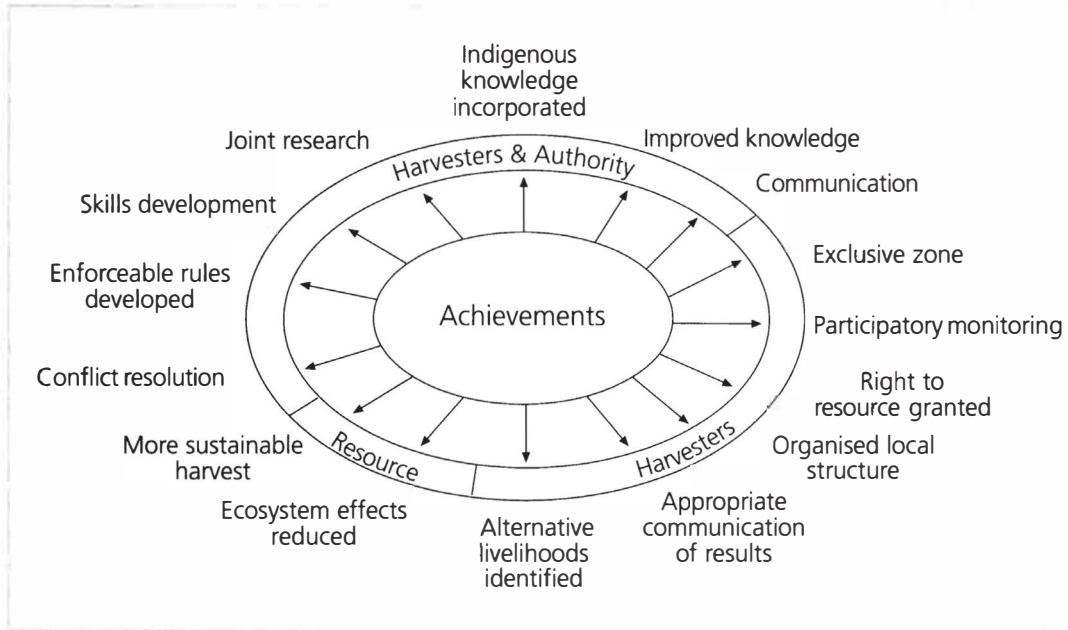
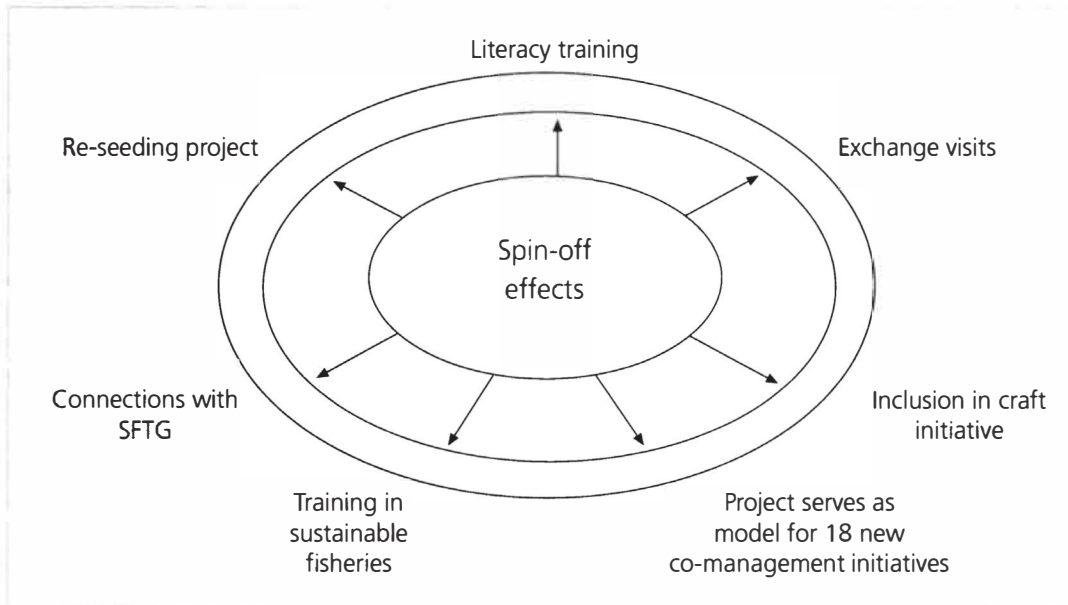


Figure 4.5c



and ongoing improvements have been a feature. The benefits of the project for the community clearly outweigh any costs, and the resource is now managed in a way that is founded on sustainability and that diminishes adverse ecosystem effects. In many respects, the mussel project serves as a model of what can be achieved with co-management, but the challenge now remains to use the principles and the lessons learned from it and to determine how best co-management can be applied under various circumstances.

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# The St Lucia Subsistence Gillnet Fishery

*Bruce Mann*



A good catch of mullet and grunter in a gillnetter's boat at St Lucia.

*Photograph Bruce Mann*

## INTRODUCTION

In 1990 a research project was initiated by the Natal Parks Board (NPB) – now known as Ezemvelo KwaZulu-Natal Wildlife (EKZN Wildlife) – and the Oceanographic Research Institute (ORI) to investigate the multiple usage of Lake St Lucia's fish resources. The aim of the research was to assist in the development of a management plan which would ensure the sustainable utilisation and equitable distribution of the lake's fish resources. This research project, carried out between 1990 and 1994, focused on attempting to quantify the total catch and catch composition made by the various fisheries (recreational angling, illegal gill- and seine-netting and the bycatch of the bait prawn fishery) and by natural predators (piscivorous birds and crocodiles, *Crocodilus niloticus*).

During this research project, much effort was focused on trying to quantify both the number of people involved in the fishery and the catch taken by illegal gill- and seine-net fishers in Lake St Lucia (Mann 1995). An outcome of this research was a proposal to the then NPB to consider implementing an experimental subsistence gillnet fishery in Lake St Lucia in an attempt to resolve the conflict between nature conservation authorities and rural neighbours who were undertaking netting illegally and on an unsustainable basis. This recommendation was strongly influenced by the implementation in 1992 of a similar gillnet fishery in Kosi Bay to the north, which had achieved reasonable success (Kyle 1999, see Chapter 6). The recommendation received support from the NPB and funding was obtained to implement an experimental fishery during 1995. The author acted as a facilitator during implementation of this one-year experimental fishery during 1995–96. This chapter will focus on the research leading up to the implementation of the subsistence gillnet fishery in St Lucia, the actual implementation of the fishery and the consequences and developments subsequent to its implementation up to 1998.

## HISTORICAL CONTEXT

Unlike Kosi Bay, which has a traditional trap fishery established by the Thonga people, there is no historical record of indigenous African people utilising the fish resources in Lake St Lucia (Merrett and Butcher 1991). This is probably because the Zulu people, who originally did not eat fish, settled the area around St Lucia. Following European colonisation of Natal, Lake St Lucia was declared a game reserve in 1895, making it one of the oldest protected areas in Africa. Although St Lucia has long been known as an excellent fishing site, catching fish using gillnets has been prohibited since the reserve's proclamation. Illegal netting was initially recorded in St Lucia during the early 1960s when gillnets first became known in northern Zululand (Pooley 1992). Illegal

netting was considered in the same light as poaching and snaring of game in terrestrial reserves and subsequently had similar penalties. Law enforcement by the NPB actively tried to discourage the large-scale commercialisation of illegal netting in St Lucia and during the mid-1970s nearly 40 kilometres (km) of gillnet was confiscated from the lake each year (*pers comm.* D. Nash, Natal Parks Board, 1993). Although NPB law enforcement did manage to maintain some control, illegal gillnetting persisted and demanded a large proportion of field staff's time (particularly in False Bay). Continued law enforcement also led to antagonism between the NPB and neighbouring rural communities.

The primary aim of implementing an experimental gillnet fishery in Lake St Lucia was to attempt to modify an unwise and illegal fishing method and promote the sustainable use of the lake's fish resources (a task that would involve local people in management activities). It was hoped that by giving local communities the right to net in the lake and by involving them in the control and monitoring of the fishery, local support for conservation and sustainable resource use would increase. Fishing committees were elected in each of three communities surrounding the lake. Conditions of the fishery (number of permits, length and mesh size of nets, areas and time of fishing, etc.) were determined by the author, based on scientific data gathered over three years (1992 to 1994), and in consultation with NPB management staff. The conditions were then negotiated with the tribal authorities, elected fishing committees and fishers. The first year of implementation (March 1995 to March 1996) was carefully monitored and then documented in April 1996 (Mann 1996).

The direct involvement of the author ended in March 1996, whereafter the NPB assumed full responsibility for control and monitoring of this experimental fishery (in cooperation with the local fishing committees). However, the author continued to visit the area and report on progress of the fishery on a six-monthly basis. During 1996 and 1997 the NPB continued to monitor the fishery by paying local monitors (previously trained and paid by the ORI researcher) to record catch and effort data. However, in April 1998 the NPB amalgamated with the KwaZulu Department of Nature Conservation to eventually form the KwaZulu-Natal Nature Conservation Services, now known as EKZN Wildlife.<sup>1</sup> This amalgamation was accompanied by a substantial provincial budget cut after which EKZN Wildlife could not afford to continue paying local monitors. Monitoring of the fishery therefore ceased after April 1998 (Mwanyama *et al.* 1999).

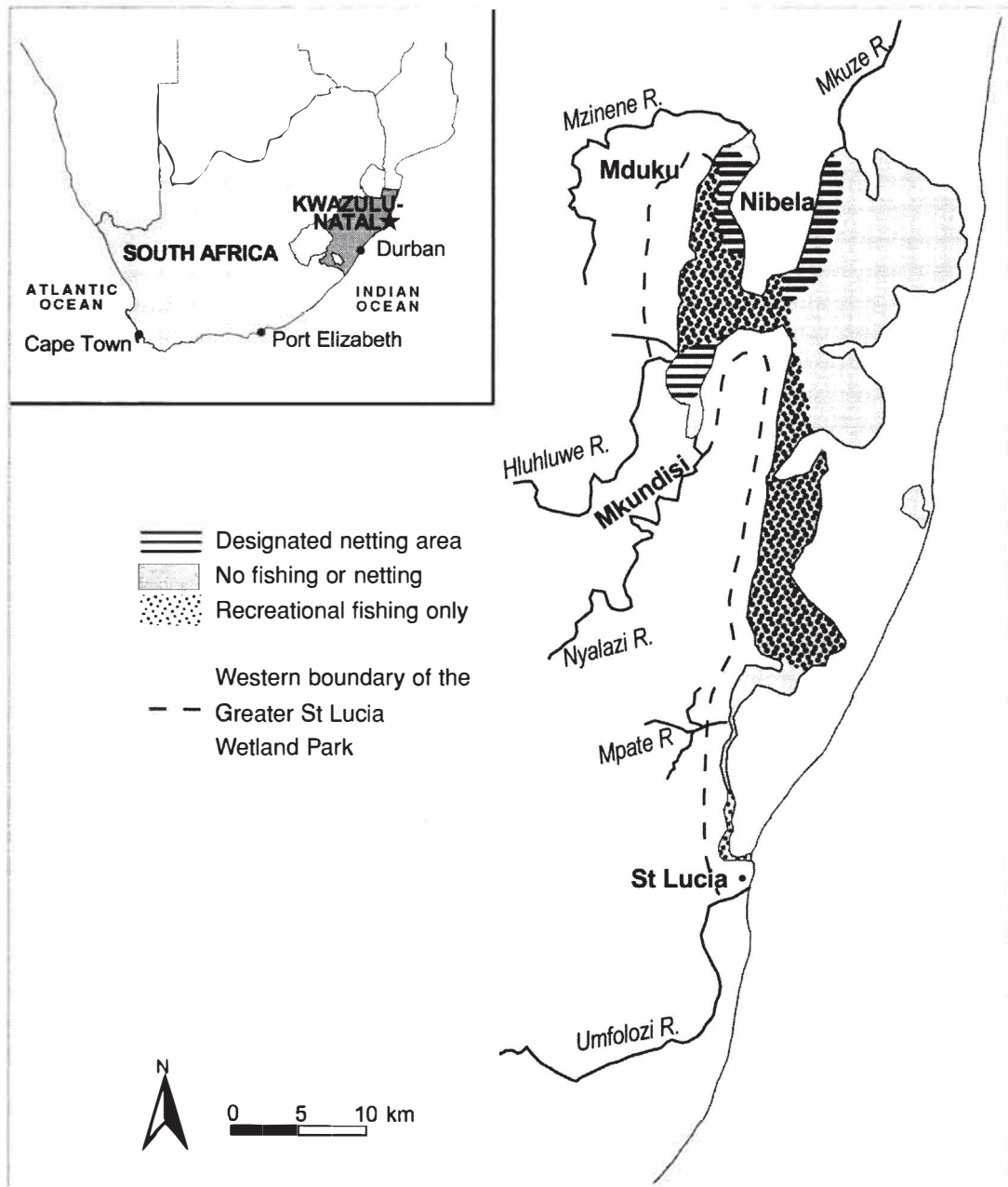
## GEOGRAPHY

Lake St Lucia is situated in northern KwaZulu-Natal (KZN) and comprises an extensive estuarine lake covering approximately 300 km<sup>2</sup> (Figure 5.1). The lake is extremely shallow with an average depth of one metre and is subjected to



considerable fluctuations in salinity based on annual rainfall (Taylor 1991). Lake St Lucia is an important estuarine ecosystem which was designated as a wetland of international importance by the Ramsar Convention in 1986 and, more recently, has been granted World Heritage Site status (December 1999) as part of the Greater St Lucia Wetland Park. It serves as an important nursery area for numerous species of marine fish and invertebrates (Wallace and van der Elst 1975) and comprises 80 per cent of the estuarine area in KZN (Begg 1978).

Figure 5.1 Map of Lake St Lucia showing the tribal areas of Nibela, Mkundusi and Mduku



## RESOURCES AND RESOURCE USERS

### Resources

The main resources exploited by netting in the lake include fish (23 species), swimming prawns (three species) and crabs (one species). It is firstly important to point out that fish and crabs are caught primarily by means of set gillnets whereas prawns in particular are caught by means of seine- or drag-nets (often simply a piece of shade cloth). Use of seine or drag-nets in St Lucia is prohibited as they tend to damage aquatic vegetation (e.g. *Ruppia*, *Potamogeton* or *Zostera* depending on prevailing salinity) and capture large numbers of juvenile marine fishes which utilise the estuary as a nursery area. Illegal netting for prawns in St Lucia is a major conservation problem and is often linked with illegal fish netting operations. Primarily local fishers from Nkundusi, Nibela and Mduku engage in this activity. They obtain extremely high prices for prawns and effective poaching networks have been established which include both middlemen and access to markets. However, this chapter will not deal specifically with this issue but will focus on the capture of fish using set gillnets.

Prior to the establishment of the experimental gillnet fishery, Mann (1995) calculated that between 91 and 135 tonnes (t) of fish were being caught by illegal gillnetting in St Lucia each year. Frequency of fishing was dependent on weather (wind strength), net repairs and NPB law enforcement activity. Time spent fishing was on average nine days (with a standard error of six days) per month. The main species caught in the gillnet fishery are shown in Table 5.1.

Catch composition changes depending on salinity of the lake, with freshwater species such as tilapia and barbel becoming more important in catches when the lake is fresh. Other than the freshwater fish species, all other species caught in the gillnet fishery are marine species which spend varying amounts of their life cycles in estuaries (primarily as juveniles but for some species also as adults). It is important to point out that many of the species caught in the gillnet fishery are also caught in the recreational linefishery in St Lucia and, for some species, in the linefishery along the entire KZN coast (Table 5.1). This has implications for user conflict between fisheries in St Lucia itself and should also be taken into consideration when determining the stock status of certain fish species which are important linefish species throughout their distribution, not only in Lake St Lucia.

The number of permits issued, the number of fishers utilising these permits and their frequency of permit use since the start of the legal gillnet fishery in St Lucia is shown in Table 5.2. Monitoring by the local authority ceased after April 1998 and no subsequent data are available. The total recorded catch taken by the legal gillnet fishery was 18.6 t (1995/96), 46.9 t (1996/97) and 41.7 t (1997/98) (Mwanyama *et al.* 1999). This amounted to an average catch of approximately four-and-a-half kilograms (kg) of fish per 30 metre (m) net

per night during the first year of implementation and was considered appropriate for a subsistence netting operation (Mann 1996).

Table 5.1 Annual catch composition from 30 legal gillnets fished in Lake St Lucia between March 1995 and March 1996

Species	Common name	Wt (kg)	%	No.	%
<i>Pomadasys commersonnii</i> †	Spotted grunter	4 251	23.2	4 524	28.5
* <i>Mugilidae spp.</i> §	Mullet	5 502	30.0	3 540	22.3
<i>Acanthopagrus berda</i> †	Perch	1 573	8.6	2 643	16.6
<i>Argyrosomus japonicus</i> †	Dusky kob	5 391	29.4	2 179	13.7
<i>Johnius dussumieri</i>	Nondi	173	0.9	1 165	7.3
<i>Rhabdosargus sarba</i> †	Natal stumponose	623	3.4	915	5.8
<i>Elops machnata</i> †	Springer	579	3.2	575	3.6
<i>Oreochromis mossambicus</i> §	Mozambique tilapia	41	0.2	115	0.7
<i>Strongylura leiurus</i>	Garfish	12	0.07	59	0.4
<i>Clarias gariepinus</i>	Freshwater barbel	62	0.3	53	0.3
<i>Chanos chanos</i> §	Milkfish	82	0.4	45	0.3
<i>Thyrssa vitrirostris</i>	Glassnose	1.1	0.006	24	0.2
<i>Platycephalus indicus</i>	Bartail flathead	9.7	0.05	10	0.06
<i>Leiognathus equula</i>	Slimy	1.1	0.006	7	0.04
<i>Megalops cyprinoides</i>	Oxeye tarpon	6.4	0.03	6	0.04
** <i>Caranx spp.</i> †	Kingfish spp.	3.1	0.02	6	0.04
<i>Carcharhinus leucas</i>	Zambezi shark	37	0.2	5	0.03
<i>Rhabdosargus holubi</i> †	Cape stumponose	2.2	0.01	4	0.03
<i>Crenidens crenidens</i> §	White karateen	0.4	0.002	2	0.01
<i>Muraenesox bagio</i>	Pike conger	1.4	0.008	1	0.006
<i>Pomadasys kakaan</i>	Javelin grunter	1	0.005	1	0.006
<i>Sphyræna barracuda</i>	Great barracuda	1.5	0.008	1	0.006

Source: adapted from Mann 1996.

Note: § indicates detritivorous<sup>1</sup> fish species, † indicates important linefish species

\* *Mugil cephalus*, *Liza macrolepis* and *L. dumerili* made up an estimated 90 per cent of the total mugilid<sup>2</sup> catch.

\*\* *Caranx sexfasciatus* and *C. sem* were the main *Caranx* species captured.

1 Feeding primarily on algae or detritus.

2 Mullet species belonging to the family *Mugilidae*.

Table 5.2 Number of permits, fishers and percent usage of permits in the gillnet fishery at Nibela, Nkundusi and Mduku from March 1995 to March 1998

Year (19 –)	Nibela			Nkundusi			Mduku		
	95/ 96	96/ 97	97/ 98	95/ 96	96/ 97	97/ 98	95/ 96	96/ 97	97/ 98
<b>No. of permits</b>	15	15	15	10	15	15	5	7	7
<b>No. of fishers</b>	33	48	135	36	120	101	19	8	23
<b>Total net settings</b>	968	2 880	3 033	2 030	2 707	2 079	990	1 549	1 951
<b>Potential net settings*</b>	2 394	4 233	4 413	3 730	5 418	5 376	1525	1 620	2 366
<b>Percent permit usage</b>	40	68	69	54	50	39	65	96	82

Source: adapted from Mwanyama *et al.* 1999.

Note: \* Potential net settings were calculated based on the number of fair weather days and the number of permits available each year.

With implementation of the experimental gillnet fishery, three main areas were zoned for netting based on where netting had traditionally taken place, and on the original number of netters in each community (Figure 5.1). No netting was permitted in river mouth regions as these provide important refuge areas for numerous species during periods of high lake salinity. Furthermore, netting was not permitted in areas of the lake where most recreational fishing takes place in order to reduce conflict between these two sectors. The Wilderness Area of Lake St Lucia had to be violated in order to accommodate the needs of the Nibela fishing community on the eastern shore of Nibela (Figure 5.1).

The implementation of the legal gillnet fishery gave community members in Nibela, Nkundusi and Mduku formal rights to utilise the fish resources in Lake St Lucia (i.e. it was made legal but under strictly controlled conditions).

#### Level of stock exploitation

The catch of the experimental gillnet fishery was considered 'off-target' in that it was not comprised predominantly of mullet species as predicted by Mann (1995). This has serious implications for the future management of the St Lucia gillnet fishery as there is considerable species overlap with the



recreational linefishery (Mann *et al.* 2002). Competition between these two sectors for limited fish resources could ultimately lead to conflict. For example, fish species such as spotted grunter, perch, Natal stumpnose, Cape stumpnose, springer and kingfish are all currently categorised as 'recreational species' that may not be sold (i.e. they have been decommercialised) and are subject to species-specific minimum size limits and a daily bag limit of five fish per person per day. Clearly it is not possible to enforce such regulations on gillnet fishers as they need to sell their catch to supplement their livelihoods and the catch is normally dead when the net is retrieved from the water (i.e. fish cannot be released alive). The recreational linefishery is one of the most important tourist attractions to Lake St Lucia, and all of the above mentioned 'recreational species' form an important component of recreational linefishers' catches in the lake (Mann *et al.* 2002). It is unlikely that further modification of mesh size of gillnets will improve selectivity and reduce the catch of 'recreational species' as gillnet fishers actively target many of these species as they are considered better eating and command a higher price on the black market.

Another important aspect to consider with regard to the environmental impact of gillnetting in Lake St Lucia is the bycatch of non-targeted species. The estuarine mud crab (*Scylla serrata*) formed the most important bycatch species with 3 801 crabs caught and recorded in legal gillnets between March 1995 and March 1996 (Mann 1996). Although it was explained to the netters that the capture of crabs in St Lucia is illegal, crabs often became entangled in the nets and could only be removed once the nets were brought to shore. Gillnet monitors were requested to record all bycatch species. Surprisingly, few (less than five) crocodiles were caught and no incidents of bird entanglement were recorded. Discussions with the netters themselves revealed that their nets were often damaged by crocodiles or hippopotami (*Hippopotamus amphibius*) but that these animals were generally too large and strong to become entangled.

Within the three-year period (1996 to 1998) of monitoring the St Lucia gillnet fishery there was little evidence of an increase or decline in stock availability (Mwanyama *et al.* 1999). This is probably due to the relatively short period of monitoring and the fact that fish stock abundance in Lake St Lucia fluctuates considerably depending on the salinity (and whether the mouth is open to the sea). However, observations by resource managers who have been stationed at St Lucia for long periods of time, suggest that the abundance of mullet (primarily *Mugil cephalus*) has declined substantially. This decline has been largely attributed to illegal netting taking place in the lake (*pers comm.* G. Forrest, NPB, 1993).

The accurate determination of sustainable yield from a dynamic system such as Lake St Lucia is extremely difficult. In the case of the gillnet fishery, it is only through the collection of long-term catch and effort data or perhaps

by undertaking an intensive mark-recapture study that accurate estimates of sustainable harvest levels could be determined. However, an extremely preliminary calculation based on the formula by Gulland (1979) suggested a potential sustainable yield (after natural predation) of between 78 and 388 t per annum for the whole of Lake St Lucia (Mann 1994). Considering that the current catch of the legal gillnet fishery is approximately 45t per annum (i.e. with the current 37 permits) and that of the recreational fishery in St Lucia is around 60 t per annum (Mann *et al.* 2002), one could assume that current offtake may be sustainable. However, one must add to this the illegal catch taken by unlicensed gillnets which may be higher than 135 t per annum (Mann 1995). The overall catch of fish from the lake therefore, may be over 240 t per annum which is approaching the upper limits of potential sustainable yield from the system. In addition to this, one must also consider the multi-species nature of the fishery and the fact that some of the species being harvested for which stock assessments have been completed (e.g. dusky kob) are already in a severely depressed state (Griffiths 1997). Based on this assessment there is little scope for increased levels of harvesting. In fact, because of the importance of Lake St Lucia as a nursery area for numerous species of marine fish, management should focus on reducing the current fish offtake by preventing illegal netting in the lake and enforcing recreational fishing regulations.

From interviews held with illegal net fishers and numerous meetings with the formalised netting committees it is clear that net fishers themselves have little understanding of the limited nature of the fish resources that they harvest. They do not believe that their netting operations (whether legal or illegal) could have any impact on fish populations in the lake. Although the concept of sustainable use was explained to the gillnet fishers at various workshops (by using posters and clearly intelligible models), understanding of the concept seems to be limited. There is much scope for increased education of fisher communities in the fields of fisheries biology, sustainable utilisation and resource management.

### Gear and equipment

The gear used in the illegal gillnet fishery in St Lucia is comprised of mono- and multi-filament gillnets of various lengths and ranging in mesh size with an average of 88 millimetres (mm) (with a standard error of 17 mm) stretched mesh (Mann 1995). Most of the multi-filament nets are hand-made by the fishers themselves, while mono-filament nets are bought. Most mono-filament nets appear to be brought in from Mozambique, although they are also locally available, especially on the black market. Due the prevalence of hippopotami and crocodiles in the lake, nets are usually set from hand-made boats. Communities around St Lucia have become skilled in making basic boats using local timber, corrugated iron and bitumen or tar. These boats are

extremely simple and cheap primarily because past anti-netting patrols conducted by the NPB destroyed any netters' boats that they found, making it pointless for the netters to invest in expensive boats.

With the implementation of the legal gillnet fishery, multi-filament gillnets of 30 m in length and a mesh size ranging between 90–110 mm stretch mesh were permitted. This determination was based on the gillnet length permitted in the gillnet fishery in Kosi Bay (Kyle 1999, see Chapter 6) and on the Cape west coast (Lamberth *et al.* 1997). The mesh size was specified in order to reduce the catch of juvenile fish and to use a mesh size which was most effective in capturing adult mullet which were identified as the target species (i.e. mullet and other detritivorous fish species make up about 25 per cent of the fish biomass in St Lucia and are not caught by the recreational linefishery). It was originally hoped that the mesh size specification would help in reducing overlap in the catch of the two fisheries, but unfortunately this proved unsuccessful (see Table 5.1). Legal nets could only be set after 16h00 in the afternoon and retrieved before 09h00 the following morning. The fishers and the management authorities jointly decided on this condition as gillnet catches are generally better at night and it ensured that catches could be taken to a central landing site each morning for monitoring.

With the implementation of the legal net fishery the issue of boat use became problematic. This was due to the Department of Transport's (DOT) safety regulations which stipulate the size of vessels and other safety features necessary for the use of vessels on Lake St Lucia (and other inland waters). These regulations are strictly enforced by the NPB and all boat owners who use the lake have to comply. However, local gillnet fishers could not comply with these regulations as they could not afford the size of vessel or the safety features specified in the regulations. For this reason the NPB compromised, and allowed the net fishers on the lake in their small boats if they had a legal gillnetting permit in their possession. Nevertheless, this still resulted in double standards, with local gillnet fishers allowed on the lake in unregistered (technically unsafe) boats whereas all other boat owners had to comply with the DOT regulations.

### Permit allocation

At the start of the legal gillnet fishery a total of 30 permits, 15 for Nibela, 10 for Nkundusi and 5 for Mduku, were issued (900 m of net in total). This decision was made by the author and NPB managers based on the relative number of netters in each area, the length of the shoreline adjacent to each community, and a precautionary estimate of the potential yield of fish from the lake (it is better to approach sustainable limits from below, rather than to over-exploit and then try to reduce effort) (FAO 1995). The fishers were then consulted and the permit conditions were discussed. After the first year of implementation the number of permits issued was increased to 15 for

Nkundusi and 7 for Mduku as these fishers had shown a level of responsibility.<sup>2</sup> No increase was given to Nibela as cooperation had been minimal and illegal netting had increased in this area (Mann 1996).

## Market

The fish is generally sold whole and in an ungutted state to both local consumers and middlemen (fish buyers from further afield). Although a fair proportion of the fish is bought on the lake shore by local people, there is a well-established poaching network. Many netters supply fish to middlemen who come into the area with light delivery vehicles, pick up large quantities of fish and sell these for considerable profit in markets further afield such as Hluhluwe, KwaNgwanase, Mutuba, Stanger and Durban. One of the problems associated with the marketing of fish from St Lucia is that the quality of fish deteriorates very rapidly. The climate (especially during summer) is extremely warm and humid and fish caught overnight in gillnets will sometimes remain in the water for over 12 hours before being removed from the nets. There are no fish cleaning sites (local consumers prefer buying their fish in an ungutted state) and few freezing facilities (although the latter are becoming more common with the recent provision of electricity in some of these rural areas). Further, processing of fish such as salting, drying or smoking has not been observed.

With the implementation of the experimental gillnet fishery, the author and the NPB decided that the fishery had to be of a subsistence nature and that commercial fishing would not be allowed. The rationale behind this was that commercial fishing in a protected area of international importance was not acceptable. However, controlled subsistence fishing, by local people living directly adjacent to the protected area, was considered appropriate. Furthermore, tourism is the major economic activity in the area and over 60 per cent of tourists to St Lucia are recreational anglers (Mann 1993). The tourism potential of the area would therefore be greatly diminished if a commercial gillnet fishery was allowed to develop in Lake St Lucia, and conflict between the two sectors would increase. Unfortunately, after implementation of the fishery it soon became clear that the gillnet fishers were not interested in fishing for subsistence purposes and that monetary gain was the most important objective. Financial benefit is the decisive issue that led to the failure of local fishers to fish within the conditions of the legal fishery.

Another complicating issue is that many of the most important species captured in the gillnet fishery are currently decommercialised (i.e. they may not be sold by law). This was overcome with the implementation of the subsistence fishery as fishers were given permission by the NPB to sell their fish locally (i.e. they were allowed to sell their fish to other community members at the lake shore). However, this was clearly not adhered to, nor enforceable.



## Monitoring of the resource

Monitoring of the resource is extremely important in order to ensure that harvests are sustainable in the long-term. Prior to the establishment of the experimental gillnet fishery, the method the NPB used to monitor the illegal net fishery was to record the amount of net confiscated, the number of fish caught and the number of arrests made during anti-netting patrols on the lake. These data were analysed by Mann (1995). With the agreement to establish a legal net fishery in St Lucia, the fishing committees in each of the three tribal areas were asked to find people in their respective communities who would like to become trained as monitors (or enumerators). A minimum requirement of being able to read, write and count was stipulated. Volunteers were selected and trained in fish identification, how to measure fish correctly and how to record daily catch and effort data. Monitors were then shown how to conduct their monitoring activities *in situ*, whereafter they were checked by the author on a monthly basis during the first year of implementation of the legal fishery (Mann 1996). Monitors were paid on receipt of the checked data and this data was captured in a database. This information was analysed on a six monthly basis and feedback was provided to the local fishing committees and the NPB both in printed format and at regular monthly meetings.

After April 1996, the NPB took over payment of monitors and data were captured at head office in Pietermaritzburg. Unfortunately, from this date there was no supervision of monitors, meetings were not conducted regularly and the fishing committees received little feedback from the data analysis. Data quality also deteriorated as monitors were not checked on a regular basis, and it is believed that much of the data was fabricated (Mwanyama *et al.* 1999). Problems were also experienced between some of the monitors and the fishing committees, as mistrust developed between them. After April 1998, the newly amalgamated provincial conservation department was no longer able to pay for monitors and the monitoring system ceased to operate.

## Resource users

At the time of this project the rural areas of KZN were in a degree of political turmoil and in most cases tribal and/or democratic leadership was poor. There was little, if any, compliance with the law in these areas, and there was almost a situation of anarchy. The people living in these areas are predominantly Zulu and most are involved in either subsistence or commercial agriculture. As is common in many historically black rural areas in South Africa, these communities are very poor with high levels of unemployment. Many of the younger men are employed out of the area, mostly in labour-intensive commercial agricultural (sugar cane and forestry) or mining industries. The rates of unemployment may have increased in the past few years with the numerous

retrenchments that have occurred in the gold mining industry on the Witwatersrand (Hirschowitz *et al.* 2001). There are an estimated 5 000 people living in the Nibela/Mduku area and over 15 000 people in the Nkundusi area (*pers comm.* A. Venter, Ecopartners, 1996). However, the accuracy of these estimates has not been verified.

In the past, illegal fish and prawn netting has been conducted primarily from three rural areas adjacent to the lake namely Nkundusi, Nibela and Mduku (Figure 5.1). These three areas have a common boundary with the lake and were therefore the only communities to be included in the implementation of the legal fishery (Mann 1996). Historically, most of the netting has taken place in southern and northern False Bay and in North Lake (Figure 5.1). Prior to the implementation of the experimental gillnet fishery there were an estimated 72 fishers netting illegally in St Lucia (Mann 1995). An interview with some of these fishers revealed that most (64 per cent) had no other employment and that they relied on fish caught by netting primarily for subsistence purposes, although surplus fish were sold locally (Mann 1995). However, since implementation of the legal fishery the number of people involved in the fishery has grown to at least 260 people (101 in Nkundusi, 135 in Nibela and 23 in Mduku) (Mwanyama *et al.* 1999).

Mwanyama *et al.* (1999) estimate that there are at least 260 households that currently benefit from the legal gillnet fishery in St Lucia. At an average of five-and-a-half people per household in KZN, this translates to approximately 1 430 people. With the current legal catch at around 40 t per annum and an average price of R5/kg (US\$0.50) (the price paid by local people buying fish on the lake shore), this amounts to a total of R200 000 (US\$20 000) worth of fish landed per year in the three rural areas under consideration. However, this does not include the catch taken by illegal netting. Illicit catches are currently believed to be in excess of 135 t per annum (Mann 1995). From regular meetings with the fishers and by analysing frequency of permit use it is clear that some fishers are more reliant on fishing than others. Most of the families living in the three rural areas undertake some subsistence farming including both raising livestock and growing crops. This does not include illegal gillnet fishers who undertake fishing as a commercial activity and for whom it is a primary source of income. In this regard most of the illegal gillnetting was run by relatively well-off individuals whose income was effectively endangered by people joining a management forum with the NPB.

It is apparent that prior to the 1960s Zulu people living in the St Lucia region did not make use of the lake's fish resources (Merrett and Butcher 1991). Gillnetting in St Lucia is, therefore, not a traditional fishery (it only began in the 1960s), and because past netting has been undertaken on an illegal basis, indigenous knowledge is limited. There is certainly local knowledge on fish movements as well as times of year, or weather conditions, when

best catches can be made, but there is very little understanding of the biology of the fish or of the finite nature of the fish resources. For this reason there was limited integration of local knowledge into management decisions.

There is an enormous body of scientific literature on St Lucia, and it is without doubt one of the best-studied estuaries in South Africa. In addition, there has been a long history of management of St Lucia as a protected area and much experience has been gained on how to manage this dynamic system. Unfortunately much of the scientific knowledge pertains to the natural sciences and there has been relatively little work done on the socio-economic and cultural attributes of the users and resources.

From implementation of the experimental fishery, it became clear that the majority of gillnet fishers were only interested in fishing for financial gain. They were, therefore, dissatisfied with the conditions of the subsistence fishery from the start, as it prevented them from fishing in a commercially viable manner (i.e. using longer nets and fishing anywhere in the lake where fish were abundant). At a number of meetings gillnet fishers expressed the view that they were tired of eating fish and that they just wanted to sell their fish to make money. By way of contrast, the gillnet fishers in Mduku appeared to be relatively satisfied with the subsistence nature of the fishery and showed better compliance with the conditions of the fishery. Similarly, a number of women in all three areas expressed their support for the subsistence nature of the legal fishery as it meant that fresh fish was readily available at affordable prices. Unfortunately the male-dominated fishing committees did not take these sentiments into consideration. Most of the committee members were either strongly commercially motivated or were intimidated by powerful commercial operators in the community.

## INSTITUTIONAL ARRANGEMENTS

### Legislative framework

At the time of implementation of the experimental gillnet fishery in St Lucia (i.e. during 1995), the Sea Fisheries Act 12 of 1988 (Department of Environmental Affairs 1988) and the Natal Nature Conservation Ordinance 15 of 1974 (Natal Parks Board 1974) were the relevant laws governing the use of St Lucia's fish resources. A number of regulations promulgated under the above legislation had to be compromised in order to implement the experimental fishery. These included allowing the local sale of decommercialised fish species, allowing individual bag limits to be surpassed, allowing fish under the minimum legal size limits to be kept, allowing the use of gillnets in a protected KZN estuary and allowing the use of unregistered boats. In order to overcome these legislative difficulties the fishery was implemented on an experimental

basis. It is important to point out that this was done at a time when a new fisheries policy was being formulated for South Africa and the management authorities believed that the rights of subsistence fishers would be recognised in the future.

The conditions of the fishery – which included areas where netting could take place, the number of permits issued, net length, mesh size and the times at which netting would take place – were developed by the author in association with NPB management staff. These conditions were then taken to the fishing committees from each of the three areas and discussed. Certain conditions, such as where fishing would be allowed, were negotiable and compromises were reached. Other conditions, however, such as net length and the number of permits issued were non-negotiable. From the researchers' and managers' perspective, this was necessary in order to establish the fishery in a responsible manner so as to ensure that fish stocks would not be over-exploited. It was, however, recognised that illegal netting was not going to disappear overnight. It was hoped that by establishing a small subsistence fishery the local fishers would develop a sense of 'ownership' of the lake's resources and that illegal fishing would be reduced due to self-regulation. In order to encourage this, the fishing committees were given the responsibility of issuing permits and ensuring the day-to-day management of the fishery. The three fishing committees responded in completely different ways (Crook and Mann 2002) and only the Mduku Fishing Committee was able to implement the legal fishery successfully. This was largely due to the strong tribal leadership in Mduku and the link between the tribal authority and the fishing committee (Crook and Mann 2002). There had been little illegal netting undertaken by members of the Mduku community prior to the establishment of the experimental fishery. As a result, the legal fishery represented a new opportunity for community members.

### Organisational and decision-making structures

At the onset of the project, an interpreter, who was well known and highly respected in the area, facilitated interaction with the tribal authorities. Due to the mistrust and uncertainty that existed amongst the rural communities with regard to netting, since netting was known to be an illegal activity, considerable progress and alleviation of fears was achieved by inviting the tribal authorities to Sea World in Durban to discuss the project in context (Mann 1995). Once permission had been obtained to implement an experimental subsistence fishery (in July 1994), meetings were held with the tribal authorities and gillnet fishers and representative fishing committees were elected (Mann 1996).

Monthly meetings were held between the fishing committees from each area and NPB managers (the author acted as facilitator at these meetings). Women



were generally excluded from all meetings, as is the Zulu custom. An exception to this was at Nkundusi and Mduku where two of the trained monitors (or enumerators) were women and they were allowed to participate in the meetings. In most instances members of the tribal authority were also present at these meetings in order to report back to the respective *Nkosi* (chief) or *induna* (headman). Decisions regarding management of the fishery were primarily taken by the management authority (NPB) and these were then discussed and sometimes negotiated with the fishing committees. At a local level, the fishing committees took decisions on who should receive netting permits and how to deal with transgressors (except instances where transgressors were arrested by the NPB in which case they were tried by the local magistrate).

### Rules and regulations

The following points summarise the conditions under which the legal fishery was implemented:

- Areas in which communities were to benefit from netting rights were only those which had a common boundary with the shores of Lake St Lucia (i.e. Nibela, Mduku and Nkundusi (Figure 5.1));
- The fishery was implemented on an experimental basis and was to be evaluated after a period of one year (Mann 1996). Any continuation of the fishery would depend on the success of the experimental phase with regard to the degree of cooperation between the conservation authorities and netters (cooperative management), and on biological limitations;
- The lake was zoned into designated netting areas that were marked with poles (Figure 5.1). Zoning was essential in order to protect ecologically sensitive areas and to minimise user conflict with the recreational fishery;
- The length of net allocated per permit holder was 30 m. A total of 30 permits was initially allocated and this was increased to 37 permits after the first year of implementation (Mwanyama *et al.* 1999);
- Netting permits were issued to the tribal authorities, and locally elected fishing committees in each area decided on permit allocation. Permits were transferable between members of each community. Nets had to be marked with the permit number (a plastic tag) and fishers, gillnetting in the lake, had to be in possession of a gillnet permit (a laminated card);
- Only the use of multifilament gillnets of 90–110 mm stretch mesh was allowed;
- Netting was only allowed at night (sunset to sunrise). This was agreed upon as gillnet catches are better at night and it ensured that all catches would be brought to a central landing site each morning for monitoring;
- Boating safety regulations were suspended and anyone found in an unregistered boat on the lake had to be in possession of a gillnetting permit;

- Law enforcement included the confiscation of illegal nets and the arrest of poachers. Regular checking of legal nets and permit holders was conducted by the NPB;
- The fishery was monitored by local monitors (or enumerators), selected by the tribal authorities, trained by the ORI researcher and paid a monthly retainer. Submission of daily catch returns was obligatory and failure to do so could have resulted in suspension of the permit;
- All legal gillnetting in St Lucia took place under an experimental permit. Sale of fish (including recreational species) was only allowed within the three communities in order to enable local distribution of fish.

### Relevance of rules

Although the conditions of the fishery were discussed in detail with the fishers and fishing committees, and there was broad agreement to abide by the rules when the legal fishery was first implemented, numerous problems were experienced. The fishers wanted larger fishing areas, longer nets and more permits. In essence, *they argued for a commercial fishery rather than a subsistence fishery*. Although the first year of implementation proceeded relatively well, the demands of the fishers could not be met and this led to dissatisfaction. Many fishers, therefore, chose to ignore the rules of the legal fishery and continued to net illegally, using longer nets and fishing outside the demarcated netting areas. The legal fishery was, in fact, used as a loophole to increase illegal netting operations. This was not the case, however, with all the fishers. The Mduku area, for example, was most successful in complying with the rules. Strong tribal leadership in this area assisted the fishing committee in ensuring that the rules relevant to the fishery were followed. In the other two areas the fishing committees became corrupt and were largely driven by commercial incentives.

### Enforcement of rules

NPB field staff conducted law enforcement on the lake by undertaking regular boat patrols. Any illegal nets found were confiscated and destroyed. Anyone found netting illegally in the lake was arrested and charged at the local police station. The NPB also checked the legal nets and permit holders during the first year of implementation. If fishers were found to be breaking any of the conditions of the fishery (i.e. nets were longer than allowed or they were found outside the demarcated areas) the nets were removed and taken to the relevant fishing committee. The fishing committee would then pass judgement on the perpetrator by either imposing a fine (as was done for a while in Nkundusi) or by prohibiting fishing (as was the case in Mduku). However, this enforcement by the fishing committees was not successful (except in Mduku) and very

soon there were no legal nets seen during NPB patrols (except in Mduku). As a result, the NPB resumed confiscating and destroying all illegal nets and arresting all perpetrators who were then charged.

The incentives for resource users to cooperate with the rules were largely based on the opportunity to fish legally in the lake and sell the catches locally. Another incentive to comply related to the sanctions given for illegal fishing, which ranged from fines to jail sentences. There appeared to be little or no understanding of the limited nature of the fish resources, which resulted in no real incentive or moral obligation to strictly control and restrict fishing to maintain the resource. It was only in Mduku where strong tribal leadership ensured that the fishers complied with the specified conditions.

High levels of conflict were evident in St Lucia, primarily between the management authorities (NPB) and the rural people in areas adjacent to the lake where illegal fishing was taking place. The implementation of the legal fishery helped to improve relations and cooperation between the NPB and rural neighbours but this largely deteriorated over time (except in Mduku) and after 1998 the situation basically reverted back to square one in Nibela and Nkundusi.

Anger was expressed by the recreational fishing sector, which failed to understand or accept the rationale for allowing gillnetting in a protected area. This sector also raised concern about the unfair restrictions placed on the recreational sector (bag limits, size limits, boat registration, permit fees, etc.), while the gillnet fishers were exempted from many of these restrictions. This 'unequitable resource allocation' was often hotly debated in meetings of the fishing fora established during the national fisheries policy formulation process and is similar in many respects to the conflict that exists between commercial and recreational linefishers in general.

## DISCUSSION

An assessment of the experimental gillnet fishery at St Lucia reveals that the two main objectives of the project (outlined below) were not met:

- to develop an appropriate and sustainable subsistence gillnet fishery in Lake St Lucia, targeting fish species unimportant to the recreational fishery, for the benefit of rural communities living adjacent to the lake; and
- to monitor and evaluate the level of netting to ensure environmental acceptability and sustainable levels of harvesting.

Initially the main objective of the fishers was to obtain permission to fish legally in the lake using gillnets (Mann 1995). However, it later became clear that their main objective was to fish commercially and to obtain as much money from the fishery as possible. The discrepancy between the objectives of

the research and management authorities and those of the fishers was therefore one of the primary reasons for the failure of the project. However, there were numerous other problems and obstacles related to the implementation of the legal fishery that need to be highlighted:

- continued illegal netting on a large-scale, including the illegal use of permits (i.e. permits were attached to nets that were much longer than the allowed 30m);
- continued illegal netting outside the demarcated netting area on a large scale;
- large-scale sale of fish outside the community including recreational species and undersized fish;
- targeting of decommercialised recreational species which obtained better prices;
- reluctance of netters to fish under the conditions of the legal fishery;
- deterioration in monitoring and data quality;
- greatly increased law enforcement due to intensified illegal activities;
- intimidation within the community, particularly by commercially motivated illegal netters;
- use of unregistered boats by the gillnet fishers.

There was, therefore, an almost complete lack of compliance with permit conditions. Managers reported that they did not see any legal nets several years after the initiation of the project. While most of these problems were experienced with the Nibela and Nkundusi communities, fewer problems were experienced with the Mduku community where fishing was generally conducted responsibly according to the conditions of the fishery. The main problem experienced in Mduku was that the demarcated fishing area was very shallow. This was rectified by negotiating with the NPB and a consequent increase in the size of their netting area to include deeper water was agreed upon. The Mduku community also experienced problems with the neighbouring Nibela community, who stole their nets, sank their only boat and fished illegally in their netting area.

Under the circumstances it was unlikely that the problems experienced with implementation of the legal fishery could have been avoided. Perhaps with more time and money, with the inclusion of people with expertise in the social sciences and economics, as well as with the implementation of a training course for the fishers in the principles of fisheries management, more success would have been achieved. However, there have been some fundamental lessons learned from this project and these are summarised below:

- The importance of Lake St Lucia as a tourist destination and provider of many essential ecosystem services suggests that perhaps, in hindsight,



implementation of a gillnet fishery should not have been considered as a viable option. Rather the problem of illegal fishing should have been addressed by a project that assisted neighbouring rural communities developing alternative forms of employment, especially with regard to identifying opportunities in the growing ecotourism industry in the region;

- The project did, however, reflect a deliberate attempt on behalf of the management authority to resolve a particularly thorny issue. Even though at the end of the day the project failed in its objectives in Nibela and Nkundusi, it was successful in Mduku. The fact that the project was implemented on an experimental basis is extremely important in this regard;
- From the outset there were a number of NPB staff who firmly believed that the project would not succeed and that it would be equivalent to 'opening a proverbial can of worms'. This prevailing attitude amongst some members of the management authority undoubtedly hampered the project;
- Many managers felt that it was easier to try to stop all netting than to allow limited netting activities. Because of this uncompromising attitude with its incumbent perceived extra workload on an already stretched staff, managers were fundamentally concerned that the project would fail, and that this would result in raised expectations among the net fishers and a greater workload for themselves. In order to improve the likelihood of success there must be a firm commitment from the management authority to provide ongoing and adequate input to improve compliance. Schemes like this are not able to self-regulate, at least not in the early stages;
- Implementation of a cooperative fishery project of this nature required a 'champion'. Once the principal researcher withdrew from direct involvement in the project there was no single person identified (a mentor) who assumed full responsibility for the continuation of the project;
- After the first year of implementation when the NPB took on full responsibility for managing the legal fishery, the quality of the monitoring data deteriorated. There was no supervision of the data-collection process, yet the data were still analysed in the same way. If we are to learn from this information, adequate supervision of data collection must be ensured;
- Regular and detailed reporting on progress of the implementation process by the ORI researcher proved to be vital as every step was documented. If, in the future, the fishers in Nibela and Nkundusi are to attempt to use political leverage to gain greater access to the fish resources, at least the facts are available for decision makers (Mann 1998);
- It was plainly stated at the outset that the experimental fishery would not proceed beyond the first year if there were serious problems. A longer experimental phase (e.g. three years) would perhaps have been more realistic in terms of gaining an understanding of the feasibility of introducing and maintaining such a fishery on a sustainable basis;

- Literature suggests that for communities to become self-organised there needs to be a threat or crisis to motivate them to control the fishery (Crook and Mann 2002). The conservation authority provided this challenge in April 1998 when it threatened to withdraw netting rights given to Nibela and Nkundusi unless the conditions of the fishery were complied with. A grace period of six months was given for the fishers to comply. However, no action or follow-up was taken on this threat because of the financial difficulties and hardships that beset the newly amalgamated KwaZulu-Natal Nature Conservation Services (KZNNCS) after April 1998.

Although the obstacles to effective implementation were significant, important positive outcomes were also evident. The most important of these was the improved cooperation and communication between the management authorities and their neighbouring rural communities. This had many positive spin-offs not only in connection with fishing but also in terms of many other conservation-related issues in the region. Another benefit was the experience and knowledge gained by members of this project. A number of important steps during implementation that led to positive outcomes are highlighted below:

- Using the correct procedure to meet with tribal authorities and having the assistance of a knowledgeable and well-respected interpreter;
- The project researcher was from a non-governmental organisation (NGO) and was therefore considered to be more objective and impartial. This meant that there was less suspicion and a working relationship with the fishers could be established more easily. The idea of inviting the tribal authorities to Sea World at the start of the project was a great success in this regard;
- The experience gained by a similar gillnetting project at Kosi Bay (Kyle 1999, Chapter 6) was instrumental in assisting the ORI researcher develop ideas and procedures to set up and implement the St Lucia gillnet fishery;
- Organisation of the fishers and establishing of fishing committees was an essential step in the implementation process. This enabled regular meetings to be held to discuss issues and provide feedback to the fishing committees;
- Regular checking of monitors' data (including surprise visits) was essential in order to maintain the quality of data being collected;
- One of the most important factors that contributed to the positive outcomes highlighted was the presence of strong tribal leadership and a recognition and respect for the elected fishing committees. These qualities were present in Mduku from the start and the implementation of the fishery was successful in this community. However, both Nibela and Nkundusi experienced various changes and interactions within their respective systems of tribal leadership during and subsequent to

implementation of the experimental fishery (Crook and Mann 2002). This resulted in a lack of organisation in the latter two communities with consequent outcomes such as unequal power distribution, corruption, conflict within the community and intimidation (Crook and Mann 2002).

## CONCLUSION

The Marine Living Resources Act (MLRA) 18 of 1998 (DEAT 1998) was promulgated after the inception of the St Lucia subsistence gillnet fishery project. This project (and other similar initiatives) has shown that the fair implementation of the MLRA and the equitable distribution of benefits from the fish and marine resources is an extremely difficult goal to achieve, particularly in the subsistence sector. We still have much to learn. Cooperative fisheries management is not a panacea for solving all fisheries-related problems.

In light of the results achieved in attempting to establish a legal gillnet fishery in Lake St Lucia, it is the author's view that the fishery should be terminated and alternative options should be explored to assist St Lucia's rural neighbours develop alternative economic opportunities. With the recent establishment of St Lucia as a World Heritage Site, increased opportunities in the tourism sector will be created and these need to be actively pursued. Unfortunately, despite the relative success of the project in the Mduku area, the people of this region should probably also forfeit the right to net in the lake in order to enable more effective management and ensure the long-term conservation of the lake's fish resources.

Commercial gillnetting for linefish species should not be allowed in any estuary along the south-eastern seaboard of southern Africa as these systems function as important nursery areas which help to sustain adult stocks at sea. The catch taken by the gillnet fishery in St Lucia was predominantly comprised of linefish species and this factor alone should warrant closure of the fishery. The fact that the fishery was purely commercially motivated adds further support for its closure. The fish resources in Lake St Lucia are one of the primary attributes of this vast estuarine system and help to sustain a remarkable diversity of piscivorous predators. The use of these fish resources needs to be carefully managed to ensure their future sustainability and commercial gillnetting cannot be condoned as an acceptable form of use in a system of this importance.

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## NOTES

- 1 All reference to the amalgamated KwaZulu-Natal provincial conservation department since 1998 will be referred to as EKZN Wildlife in this chapter.
- 2 An increase of only two permits for Nkundusi was recommended by the author but this was increased to five by the NPB managers in consultation with the Nkundusi Fishing Committee.

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# Kosi Bay Gillnetting: A Community-Based Joint Management Fishery Inside a Nature Reserve

*Robert Kyle*



A Kosi Bay fisher with a good catch of spotted grunter.

*Photograph Scotty Kyle*



## INTRODUCTION

The Kosi Bay lakes have been the site of substantial fishing by local communities for many centuries, and probably contain the largest true subsistence marine-based fishery in South Africa. Local residents have always been heavily dependent on the use of renewable natural resources, but recent advances in medicine and the economy, plus the civil war in neighbouring Mozambique, have resulted in significant increases in the number of residents close to the lakes. Consequently there has been a marked increase in fishing pressure on the lakes. Since the 1950s there has also been a rapid and sustained increase in the number of recreational anglers visiting the lakes and this is set to rise markedly if the government's efforts to increase ecotourism in the region are successful. The lakes thus support an important subsistence fishery as well as a growing recreational fishery, mainly based on the same fish resources.

The Kosi Bay Lake area was proclaimed a Nature Reserve in 1988, a Ramsar site in 1992 and part of a World Heritage Site in 2000, all demonstrating its conservation importance at local, national and international levels. The policy of the conservation authority that manages the reserve, Ezemvelo KwaZulu-Natal Wildlife (EKZN Wildlife), is to promote the wise, sustainable and appropriate use of renewable natural resources. In practice this has evolved into ensuring that the local people have access to traditional resources,<sup>1</sup> that management is carried out in a cooperative manner, and that recreational fishing is conducted in line with standard national regulations. Prior to the 1990s other fishing methods, such as gillnetting, were illegal and actively discouraged.

The proclamation of the Kosi Bay Nature Reserve in 1987 caused hostility between some local residents and the KwaZulu Department of Nature Conservation (KDNC), the conservation authority at the time (which is now known as EKZN Wildlife), as local people felt that the conservation measures taken were unnecessary and restrictive. The stance of the KDNC on the other hand, was that conservation measures were essential to protect the fundamental ecological processes of the lake system and its renewable natural resources. However, in the last decade, the conservation authority identified two reasons for investigating the feasibility of additional exploitation of fish species thought to be capable of sustaining more fishing pressure. Firstly, it would be consistent with the wise use policy and, secondly, it would begin to show the fishers and residents that this policy, although restricting some methods seen as unwise, could in time increase overall fish yields through appropriate management.

Some local people had used gillnetting in the Kosi Lakes since the early 1950s (Tinley 1964). However, it was illegal, and the provincial conservation authority believed it would interfere with fish migrations, place undue pressure on the resource and be difficult to control. It was illegal in terms of

the relevant legislation as it 'prevent[ed] the free passage of fish' (KwaZulu Nature Conservation Act 8 of 1975, regulations of Gazette 16 of 1979, Department of Agriculture and Forestry 1975). A large amount of effort was put into attempting to reduce illegal netting and this was one of the major management functions of reserve staff. However, little sustained success was achieved. Interactions between management patrols and netters led to serious injuries to both parties and the tragic shooting of an alleged illegal netter by a KDNC staff member in the 1980s. The reasons for prohibiting gillnetting were not well understood by local residents and ill-feeling had arisen around the issue.

Although many illegal gillnetters were simply fishers trying to make a living, many were well armed and some, principally Mozambican refugees, were desperate to obtain a source of food or cash. In recent years EKZN Wildlife patrols at Kosi Bay had also arrested illegal netters from Tanzania and Malawi. There were, however, a number of local residents fishing on a fairly small scale and principally for their own needs. These fishers were fiercely antagonistic to 'outsiders'.

Worldwide, gillnetting has been the subject of considerable controversy in the popular press (Clover 1992, Mann 1994, Parfit 1995, Sumbly 1995) and emotive statements like 'walls of death' have been used (Clover 1992). It has also been associated with over-fishing in the scientific literature (Kothias *et al.* 1981, Phiri 1992). Nevertheless it is efficient and can be a selective way of catching fish (Compagno *et al.* 1989, Payne and Crawford 1989, Sagua and Gubio 1986, van der Waal 1980), and has been used to monitor fish species composition (Bennett *et al.* 1985). Although various types of traditional fishing, including netting, have been allowed in marine reserves and other protected areas elsewhere (Ramos-Espla and Bayle-Sempere 1989) no instances were found where gillnetting was permitted in protected areas in Africa. Gillnetting had also been regarded as a serious problem in Lake St Lucia, about 150 kilometres (km) south of Kosi Bay (Mann 1995, see Chapter 5).

In the early 1980s, research was carried out to establish the impact and sustainability of the traditional fishing methods (Kyle 1986). The next step was to establish whether there was scope for further exploitation using gillnets. Results from experimental gillnet fishing (Kyle 1992) suggested that, if effort and area of operation were controlled, then gillnetting could be used to sustainably exploit certain targeted fish species to the benefit of reserve neighbours.

It was KDNC policy to involve the user groups and reserve neighbours in the management of renewable natural resources as long as every effort was made to ensure the sustainability of catches. However, the mechanisms for involving users in management were not clear. An approach to introducing



legalisation for the gillnet fishery that was phased and that had direct community involvement, was devised. This chapter describes the evolution of the project and summarises results, progress and problems from inception in 1992 until December 1999.<sup>2</sup>

## THE PROJECT AREA

The Kosi Bay lake system is a series of water bodies about ten kilometres in length, situated on the east coast of South Africa just south of the Mozambique border (Figure 6.1). The lakes run parallel to the Indian Ocean immediately behind high-vegetated sand dunes and are within the Kosi Bay Lakes Ramsar site, which now forms part of the Greater St Lucia Wetland Park. Various aspects of the system and its fisheries have been described elsewhere (Begg 1978, Begg 1980, Blaber 1981, Felgate 1965, Kyle 1986, Tinley 1964). The mouth of the system is in the north and is almost always open. Most of the fish species of importance for human consumption and recreational activities are of estuarine or marine origin (Blaber 1981, Kyle 1986). It has been described as the least spoilt estuarine system on the KwaZulu-Natal coast (Begg 1978) and is second, in size, to the St Lucia lakes system. Important features and names used in this chapter are shown in Figure 6.1.

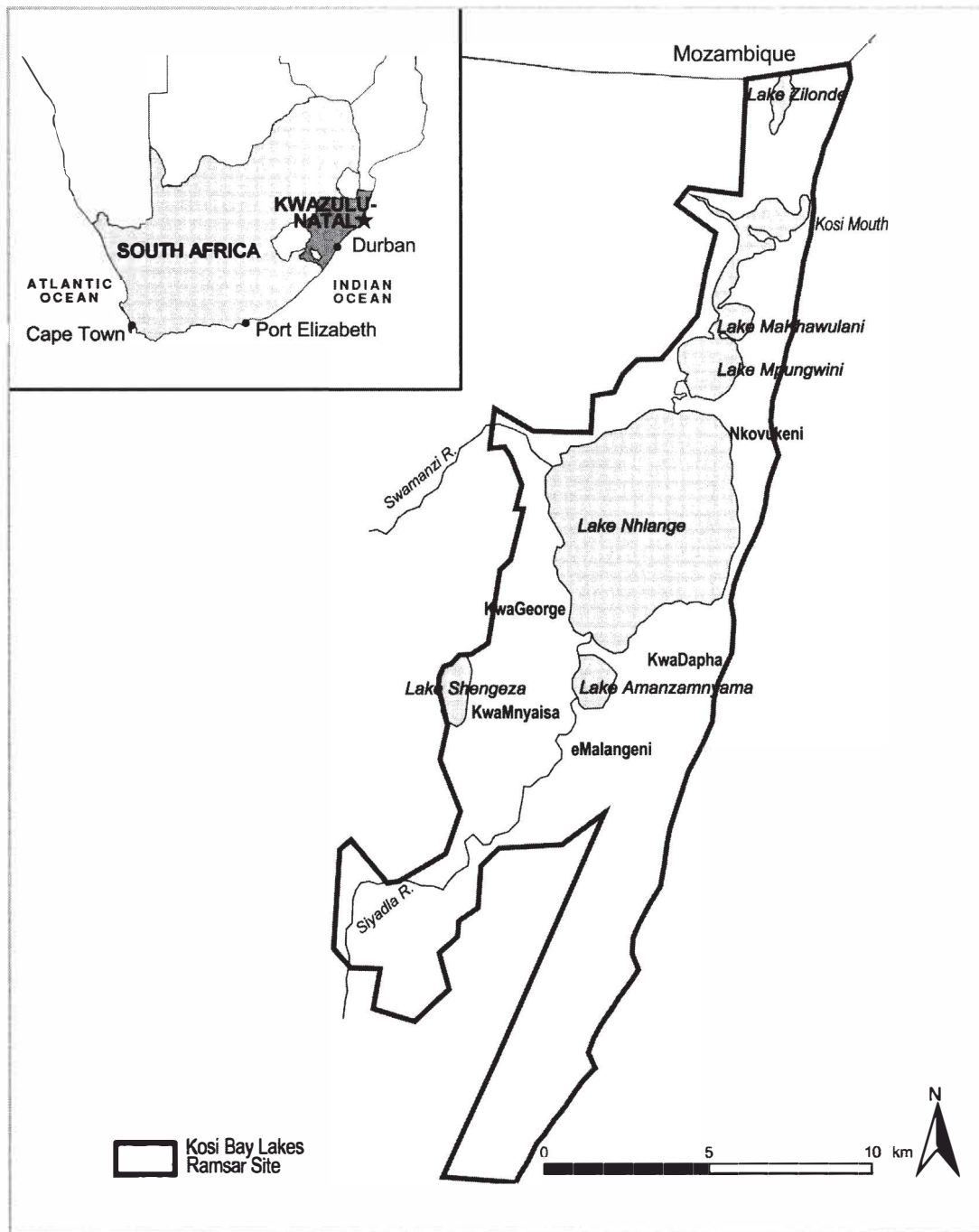
The study area is located in rural KwaZulu-Natal and is surrounded by land under the jurisdiction of the Tembe Tribal Authority (TA), the local traditional government structure. Each sub-ward has an *induna* (headman) who is responsible to the TA for all human activities in his area.

## IMPLEMENTATION OF THE 'NEW' FISHERY

### The experimental fishery

Experimental fishing was carried out by staff from KDNC to establish if it was possible to selectively exploit fish species in the Kosi system that were able to sustain greater use. Early work (Kyle 1986) estimated that traps caught about five per cent of fish stocks annually and recreational angling took less than one per cent, thus leaving scope for increasing fishing effort. In addition to this, freshwater fish in Lake Nhlange were rarely caught and large scale pouter (*Gerres methueni*), an abundant species in the lakes, was not caught by recreational anglers and only in low numbers in traps. Certain species favoured by recreational anglers were caught in large numbers by both recreational and traditional fishers. For these reasons freshwater fish and pouter were considered priority target species for any new fishery, while mullet (*Mugilidae*), although caught in large numbers by the traps, were abundant and thought to be able to sustain greater fishing pressure.

Figure 6.1 Map of the Kosi Bay Lakes showing main features and sub-wards surrounding Lake Nhlange



Results from experimental fishing suggested that netting using set gillnets could be an efficient, selective and controllable way of catching fish in the Kosi lakes (Kyle 1992) and the KDNC decided to proceed with a controlled and monitored experimental gillnet fishery in Lake Nhlange (see Figure 6.1). Experimental results indicated that fish migrations would not be severely

impacted if nets were kept away from channels, while netting in the shallows would catch a high proportion of the designated target species. Netting was considered inappropriate north of Lake Nhlanga as there were already many traps that provided a legal opportunity to fish. In addition, there was ill-feeling towards netters from the trappers. Netting south of Lake Nhlanga was not permitted due to the higher density of Nile crocodile (*Crocodylus niloticus*) and hippopotamus (*Hippopotamus amphibius*). Aspects of the gillnet fishery directly impacting on overall fishing effort, essential fish migrations, or conservation of priority species such as crocodiles, were documented by the KDNC in consultation with experts in the field of sustainable fish use. Other aspects, such as who should obtain permits and how much netting should be allowed per permit were determined through consultation with the local community. Experimental fishing (Kyle 1992) showed that night netting caught fewer 'non-target' fish while day netting was less productive overall, possibly due to the clarity of the water. Netting was thus restricted to nights only. Nets had to be taken out of the water before 08h00 daily so that dead fish did not remain in nets and become rotten.

The scheme began at a low level in order to approach sustainable limits from below, rather than over-exploit, damage stocks, and then have to reduce effort. Due to logistical and other problems it was decided to begin the fishery in one area first and, if successful, to expand to other areas. There was generally a higher level of hostility to the conservation authority in areas where reserve boundary fences had been erected. Thus, it was considered appropriate to begin the fishery in the area with least hostility, and therefore possibly the greatest chance of success.

### Institutional arrangements

When the project was initiated in 1992, the fishing area was part of a Nature Reserve run by the then KDNC and fell under the KwaZulu Nature Conservation Act 8 of 1975 (Department of Agriculture and Forestry 1975). A committee consisting of staff from the KDNC head office made decisions on all aspects of the reserve. This arrangement carried on until there was a protracted amalgamation of all conservation authorities in the province, ultimately forming KwaZulu-Natal Nature Conservation Services (KZNNCS), now known as EKZN Wildlife.

One objective of the project was to produce food on a sustainable basis for people neighbouring the Nature Reserve. The other was to involve local fishers in the management of the fish resource. Thus, once the initial project and conditions had been agreed to, structures had to be created within the participating communities. Kosi Bay had a strong traditional (tribal) local government. There were also several parallel and antagonistic structures set up as a result of resistance to what were seen as apartheid structures. As the

KDNC was part of the KwaZulu government it had no option but to work through the 'legitimate' traditional local structure, the TA.

As the project was to be implemented in several wards of the Tembe TA, approval had to be obtained prior to any fieldwork being carried out. The Chief *induna*, being the most powerful tribal figure, was consulted and was supportive of the project. He called a special meeting of the Tembe Tribal Council at which the scheme was discussed and approved. The KDNC then wrote formally asking for the TA to identify candidates for the first five permits. The TA selected five candidates from KwaDapha at a full public meeting in 1992.

In November 1992, a report on this first phase recommended expanding the scheme to two other areas and increasing the number of permits in each area to eight. This was approved by the conservation authority in May 1993 and then discussed with the TA who approved the recommendation in July 1993. The increase was implemented gradually and by late November 1993, 24 permits were being issued monthly. Another review (issued in August 1994), recommended further increases and ten permits were issued in the original areas plus five in Enkovukeni. Permits were only issued in December in Enkovukeni due to resistance to netting from within the community. Many of the community members were fish trappers. The community finally agreed to proceed on an 'experimental' basis. In December 1996, the KDNC approved a further increase in permits to a total of 45. The new permits allowed for five each for Malangeni and KwaMnyaisa communities.

Motivations were drawn up suggesting that the best scenario would be if all sub-wards adjacent to Lake Nhlange had gillnet committees and some legal and controlled access to its fish, creating a 'buffer' zone of legal fishers around the lake. Illegal fishers from further afield would have to pass through this area to access the fishing grounds.

This proposal was approved, permits were issued, and in turn each of the remaining three sub-wards presented committees with supporting letters from their *indunas* and the TA. Particularly in the beginning, the creation of the committees was left to the communities and the *indunas*. The membership of the committees often changed as gillnet permits proved to be highly lucrative. Nevertheless, by the end of 1994 four well-established committees were in place, and by 1996 there were six full committees in operation.

These committees not only decided who obtained monthly permits, but they also resolved disputes and interacted with the provincial conservation authority to modify the project. For the first few years there were monthly meetings with individual committees but after some time combined meetings of the respective committees were held in order to issue monthly permits. The combined committees had a special secretary for keeping minutes, and he was also the chairman of one of the committees.



No other communities were considered for permit allocation as the sustainable level of fishing effort was thought to correspond approximately to the 45 permits issued. However, even this did not satisfy the demand of communities already issued with permits.

### Permit allocation

The first three gillnetting areas initially applied different methods of permit allocation. In KwaDapha, after the initial permit issue, the *induna* distributed permits to the community while in KwaGeorge the *induna* created a committee and supplied monthly lists of candidates to the conservation authorities. In KwaMazambane, the *induna* appointed a gillnetting coordinator who organised interested residents into a committee and they elected a chairman, vice chairman and secretary. Subsequently all areas developed gillnetting committees and it was the work of the elected chairman, endorsed by the TA, to manage permit issues and any matters relating to netting. Monthly letters requesting the names of candidates were written by KDNC. The various chairmen responded and organised ten candidates to attend a meeting at the authority's research office, where problems were discussed and the month's permits issued.

Permits issued were numbered but made transferable so that they could be rotated within the community. No community, however, is a cohesive unit of altruistic individuals, and the fair distribution of the permits was a goal to be aspired to rather than a simple mechanical operation. Therefore, and on a monthly basis, a name was recorded against each permit number for control purposes. If any problem arose with a permit, it helped if only one person was responsible and accountable for that permit (although several people often used the same permit). Despite appearing to be simple in principle, it took many meetings and discussions to adequately explain the scheme to the local people, many of whom had been involved in illegal netting and were suspicious of, or resistant to, working constructively with the provincial conservation authority.

The concept of the transferability of the permits was discussed at length and, during the study period, there was considerable improvement in the sharing of permits. Several permit holders were arrested, charged and fined for breaking permit conditions. Their permits were seized by KDNC and handed to the relevant gillnet committee who issued the permit to another prospective fisher. This procedure was discussed and agreed to at several of the regular meetings and it was left to the committee's discretion as to whether or not the transgressor should obtain a permit again at a later date.

None of the gillnet committees could be described as truly democratic but usually if one became too corrupt or inefficient some members would rebel and change the office bearers or create a new committee. EKZN Wildlife could

only deal with the gillnet committee officially recognised by the *induna* of the sub-ward concerned.

According to draft recommendations to Marine and Coastal Management (MCM), made by the Subsistence Fisheries Task Group (SFTG), a 'subsistence' fisher should be one who fishes him- or herself for a certain category of fish and uses low-technology gear. Fishers must live close to the resource, have no other full-time occupation, conform to a sustainable level of fishing and only sell excess fish locally (SFTG 2000). In reality, however, the most powerful local people often obtained the permits. These included shop owners, vehicle owners and local 'Mafia' chiefs. Sometimes a powerful local person would arrange to operate several permits at once, thus denying other, possibly more deserving people, access to legal fishing. Many regular permit holders were fully or partially employed.

Although many permit holders were true subsistence fishers, the large-scale allocation of permits to advantaged members of the community by official committees caused concern in EKZN Wildlife. Some argued that the conservation authorities could issue the permits more efficiently and fairly than was done by some of the committees.

### Permit practicalities

Numbered plastic cattle ear tags were to be attached to all nets in the water. Tags were occasionally lost, some nets were stolen and hippopotami occasionally became entangled in the nets and dragged them away. Permits had to be carried by the netter when fishing, and net tags had to be attached to the net whilst in the water. Different colour tags were used in the different areas. Law enforcement patrols seized all nets longer than 30 metres (m) or without tags, and arrested all gillnetters without permits. They also recorded the permit number of netters found during patrols and these were cross-checked against catch returns to ensure compliance with the monitoring.

### Catch monitoring

It was a permit condition that catches be monitored, and initial candidates for this work were selected from each community by the *induna*. Final selection of monitors was by KDNC, and suitable people were trained and equipped with pens, clipboards, measuring boards, forms and a plastic bag to protect the equipment. After a few months of operation it evolved that gillnet committee secretaries became the monitors, or vice versa. They were stationed at places identified by the fishers, where all catches were brought for daily recording. Payment of monitors by the provincial conservation authority created a direct financial benefit to the community and also facilitated improved relations with the conservation authority.

For each fishing outing monitors recorded the permit number, species, length and number of fish caught. Data were available on length/mass regressions and thus estimates of total mass of fish caught could be calculated. Strict supervision of monitors and netters was critical to preclude fabrication of results and avoidance of monitoring. Nets were measured to 30 m by conservation staff and some committees were issued with 30 m long pieces of rope. As netting was to be excluded from all channels and the campsite area, white painted poles were erected in the lake at some distance from either side of these channels to demarcate exclusion zones.

Initially all netting was monitored but due to progressive cuts in funding the number of areas monitored dwindled until, by 1999, only two areas were fully monitored.

### Rules and regulations

The ethic behind the project was to achieve sustainable resource use by involving as many local residents as possible at all levels in the management and control of the resource. It was decided jointly by the community and KDNC that the length of each net should be kept short to allow more small-scale subsistence/artisanal netters in place of a few large commercial operators. Early results (Kyle 1994) showed approximately one kilogram (kg) of fish being caught per ten metres of net nightly and, after discussion, consensus was reached that it was appropriate to allocate 30 m of netting per permit, producing about three kg of fish per outing. Mesh size restrictions were considered but, as the fishery was based on several species, they were thought to be unnecessary unless a relevant problem was identified. To date no such problems have become apparent. Similarly, no restrictions were placed on the type of material used to make the net although historically almost all nets were multi-filament. It was decided that if it was found that the use of mono-filament nets increased, and that they were catching higher numbers of non-target species, then this could be discussed with the committees and the permits modified accordingly.

At first, netting was restricted to the reedy margins of Lake Nhlange, principally to reduce contact with recreational boats (marginal netting also caught slightly more target species), but after discussions with the committees, the permits were amended to allow netting outside the reedbeds. This was agreed on the understanding that there would be increased interaction with recreational anglers. Some nets would be accidentally damaged by boats, but the netters felt that the benefits would outweigh any costs and disadvantages.

Ways to improve the sharing of permits so as to increase their usage were also discussed, but there was often a reluctance to share permits and they were frequently 'hired' out to other people. Despite this, most permits were regularly shared between several people and thus the scheme directly benefited

many more people than the families of the 45 permit holders. A survey indicated that over 90 people regularly used permits and it is estimated that about 720 people obtained direct benefit from the net fishing.

Theft of legal nets, once they were set in the water, became a serious problem and in December 1994 alone, nine legal nets were reported stolen. This meant that not only the legal net, but also its tag, fell into illegal hands. The situation was exacerbated as the conservation authority insisted that floating, reflective, white painted two-litre cooldrink bottles be attached to all legal nets. The reason for this was so KDNC staff patrols could easily spot all legal nets, but the reality was that thieves easily identified the nets and stole them. Several special meetings between reserve staff and gillnet committees were held to deal with net theft. Once the problem associated with marking the nets was explained, the authorities relented and only insisted that legal nets have plastic numbered cattle ear tags attached to them. Generally, in dealing with net theft, the committees were of the opinion that the South African Police Service could not help. Some people favoured taking the matter to the 'Tribal Court' but the most popular remedy was to deal with the matter themselves. By December 1995, netters often congregated at pre-arranged places on the lake's edge to share guard duty. On several occasions when nets were stolen they were later recovered following community meetings and 'vigilante' action. Occasionally nets stolen from legal operators were subsequently recovered by conservation authority patrols and these were returned to the original owners.

Discussions on ways of improving catch monitoring and making it easier for the netters to have their catches recorded resulted in the changing of monitors, their stations and times of duty. Evasion of catch monitoring by netters was also a problem. In KwaDapha, catch monitoring necessitated a walk of up to one km, and in the absence of supervision the netters would simply not bother to record catches. Monitoring was a condition of the permit and if fishers failed to complete catch cards, the permit was withdrawn through a committee process and issued to another community member. If fish were sold between the site of netting and the monitoring station, reeds were cut to the length of the fish sold and recorded by the monitor. All these minor improvements in monitoring were worked out through the gillnet committees.

Initial hostility from some community members towards KDNC was a problem. One local organisation, Isidithi (which was set up to 'fight forced removals by the KDNC'), was initially hostile, but by December 1994 two Isidithi committee members were using permits, providing constructive input to the project, and one was elected chairman of a gillnet committee. By the end of 1995, the level of hostility towards KDNC had decreased substantially.



### Impact on illegal netting

A key objective of the project was to replace the illegal fishery with a managed legal fishery that reduced the amount of management input from the provincial conservation authority. It soon became clear that limiting access to the resource through a permit allocation system would not lead to an overall reduction in illegal netting. There were, however, some promising outcomes as a result of the project. Legal netters began reporting the activities of illegal netters and developing a sense of 'ownership' over the fish resources of Lake Nhlange. Management patrols still had to be carried out, since all illegal nets found throughout the lakes still had to be seized, but the intensity did not have to be increased as a result of the legalisation of some nets.

### Economic implications

The gillnet fishery quickly developed into an artisanal fishery. A mean catch of almost four kg provided the average family in the area with adequate daily protein, and on good days the excess could be sold. Small numbers of local women would congregate near popular fish landing sites and buy excess fish from the netters. They would then transport the fresh fish to local markets for sale. Many fish were therefore sold at least once and there was a 'multiplier effect' in the benefits accrued. The mean price of fish at the waterside in 1999 was approximately R8.00 (US\$0.80) per kg and the fishery was estimated to be worth almost R300 000 (US\$30 000) in that year. Fish were often sold to local women who then fried the fish and sold them in the market, usually at twice the price paid. The true value of the legal gillnet fishery was probably well over R500 000 (US\$50 000) per year. By 1999, the annual infusion of almost 90 000 fish into the local economy had led to the development of a small local industry.

Although many of the target species may have been legally sold, others, such as spotted grunter and perch, were 'decommercialised' and could not be sold. Sale of these species was restricted to protect stocks from commercial fishing (Marine Living Resources Act (MLRA) 18 of 1998, Department of Environmental Affairs and Tourism (DEAT) 1998). At Kosi Bay, fish, including spotted grunter (*Pomadasys commersonnii*), have been sold from the fishtraps for generations but this was not seen as a serious problem as total effort was restricted and sales were local. While this remains the situation, there could be motivation to treat fishtrap and gillnet catches at Kosi Bay as a special case in order to allow local sale. This, however, must not be seen as a precedent to recommercialise the relevant species or legitimise fishtraps and gillnets elsewhere.

## RESULTS OF CATCH MONITORING

Results of catch monitoring (Tables 6.1 and 6.2) show that more than 180 tonnes (t) of fish were caught in the first eight years of the experimental fishery. In the last three years, when 45 permits were issued, the total catch remained fairly steady at just under 40 t per annum. A total of 23 species of fish and two invertebrates were identified in the catches. Of the species caught, only 12 amounted to over one per cent of the catch by mass, and together they accounted for almost 98 per cent of the total. The invertebrates, a large mudcrab (*Scylla serrata*) and prawns (*Penaeus spp.*), were not important in the catches neither in terms of value nor impact on stocks. Catch per unit effort (CPUE) showed no clear overall trend (Table 6.2), although it was substantially higher at the end of the study period than at the beginning.

Table 6.1 Total catch species composition of Nhlange Lake joint management experimental gillnet fishery from January 1992 to December 1999

Species				
Target species	Number	%	Mass (kg)	%
<i>Oreochromis mossambicus</i> (tilapia)	38 569	9.31	26998.3	14.74
<i>Clarias gariepinus</i> (barble)	4 462	1.08	4238.9	2.31
<i>Gerres methueni</i> (pouter)	264 210	63.74	79263	43.27
<i>Gerres acinaces</i> (pouter)	1 363	0.33	408.9	0.22
<i>Mugil cephalus</i> (mullet)	34 149	8.24	30734.1	16.78
<i>Liza alata</i> (mullet)	2 015	0.49	3022.5	1.65
<i>Myxus capensis</i> (mullet)	3 345	0.81	1672.5	0.91
<i>Liza macrolepis</i> (mullet)	12 387	2.99	3716.1	2.03
<i>Monodactylus spp.</i> (kitefish)	1 782	0.43	178.2	0.10
<i>Therapon jarbua</i> (thornfish)	294	0.07	58.8	0.03
<i>Chanos chanos</i> (milkfish)	218	0.05	218	0.12
<i>Anguilla marmorata</i> (eel)	159	0.04	636	0.35
<i>Scylla serrata</i> (mudcrab)	88	0.02	70.4	0.04
<i>Penaeus spp.</i> (prawns)	26	0.01	5.2	0.00
Other target species	201	0.05	61.9	0.03
<b>Total</b>	363 268	87.64	151 282.8	82.59
<b>Non target species</b>				
<i>Rhabdosargus sarba</i> (seabream)	17 613	4.25	5 283.9	2.88
<i>Pomadasys commersonni</i> (grunter)	13 949	3.37	16 459.82	8.99

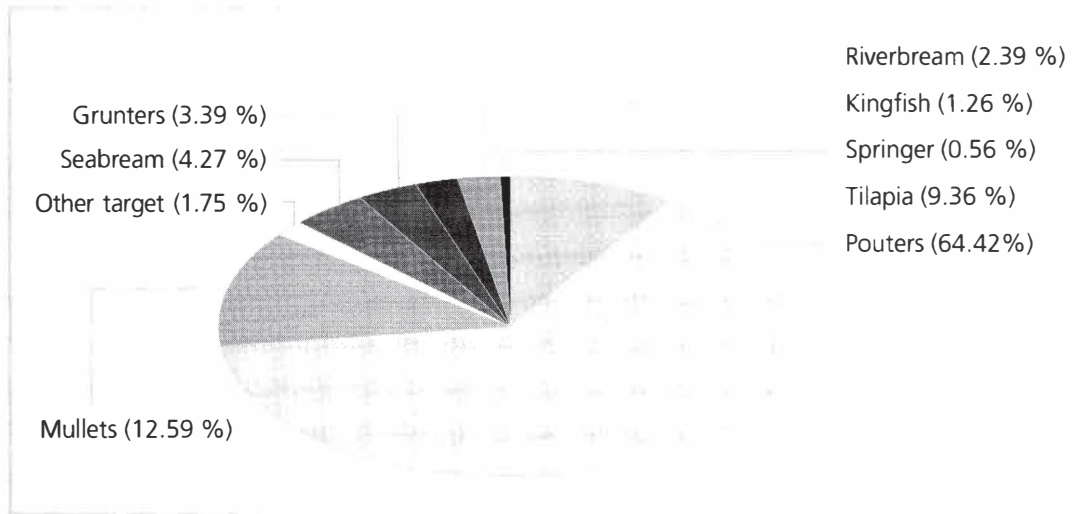
<b>Non target species (continued)</b>	<b>Number</b>	<b>%</b>	<b>Mass (kg)</b>	<b>%</b>
<i>Acanthopagrus berda</i> (riverbream)	9 875	2.38	3160	1.73
<i>Caranx spp.</i> (kingfishes)	5 172	1.25	2 068.8	1.13
<i>Elops machnata</i> (springer)	2 315	0.56	2 083.5	1.14
<i>Lutjanus argentimaculatus</i> (river snapper)	1 477	0.36	2 215.5	1.21
<i>Sphyaena spp.</i> (seapike)	419	0.10	460.9	0.25
<i>Scomberoides lysan</i> (queenfish)	245	0.06	98	0.05
Others	164	0.04	49.2	0.03
<b>Total</b>	<b>51 229</b>	<b>12.36</b>	<b>31 879.62</b>	<b>17.41</b>

Table 6.2 Yearly and total statistics of Nhlange Lake joint management experimental gillnet fishery from January 1992 to December 1999

<b>Year</b>	<b>Number caught</b>	<b>Target %</b>	<b>Mass caught (kg)</b>	<b>Target %</b>	<b>% Settings</b>	<b>Permits</b>	<b>CPUE</b>
1992	4 797	93	2 398	92	57	5	6.3
1993	10 692	90	4 835	84	62	10	6.4
1994	27 925	86	13 720	82	49	30	5.8
1995	45 592	81	20 801	77	48	35	7.4
1996	60 892	83	27 366	79	49	35	9.8
1997	92 144	92	37 058	85	55	45	10.2
1998	83 123	84	39 544	80	53	45	9.6
1999	89 332	93	37 442	88	61	45	8.9
<b>Total</b>	<b>414 497</b>	<b>88</b>	<b>183 164</b>	<b>83</b>	<b>53</b>		<b>8.8</b>

Results show that the fishery succeeded in catching mainly target species (Tables 6.1 and 6.2). Analysis, in terms of the main groupings (Figure 6.2), illustrates that pouter, mullet and tilapia dominated catches while no individual non-target species amounted to over five per cent of the catch by numbers. During the study period target species were almost 88 per cent of the catch by number and 83 per cent by mass, although this figure varied between 81 per cent and 93 per cent by number and 77 per cent and 92 per cent by mass. These data compare favourably with results from the similar initiative in St Lucia (Mann 1996, see Chapter 5).

Figure 6.2 Kosi Bay Nhlange experimental fishery target/non-target percentages of the important fish species by number



### Targeting success

Most fish caught throughout the year were of designated target species in all areas, suggesting that the fishery was successful in catching fish species not important to other legal fisheries in the lake system. Catches changed markedly from month to month in terms of species composition, but large scale pouter were the species most commonly caught throughout the study in all areas (see Table 6.2).

### Impact on stocks and sustainability of catches

In 1999, legal gillnets caught 6 571 non-target fish, the traps an estimated 25 000 fish of these species, while the recreational catch was estimated at around 9 500 fish. Together, using data from Kyle (1986) and Kyle and Robertson (1997), this is estimated to amount to about nine per cent of available standing stock of these species. If these values are correct, then the catches of the present gillnetting scheme should be sustainable and thus the fishery should not pose a threat to the other fisheries or Kosi Bay fish stocks. The project thus appears to be successfully catching a high proportion of target species and, as the total catch of other species does not seem above the sustainable limit, other user groups (recreational anglers and trappers) need not fear that the netters are markedly depleting stocks of fish important to them.

Any progressive reduction in fish abundance would result in a decline in mean catches and results currently available show no sign of this. It is proposed that monitoring be continued and the CPUE be closely monitored. Any marked and progressive decline in mean CPUE or mean fish mass should be investigated as it could be an indication of catches becoming unsustainable.



Other concerns were the impact of the netting on priority conservation species. Results showed that no hippopotami and very few crocodiles were caught. Of three crocodiles recorded in the nets two were released alive. Some cormorants (*Phalacrocoracidae*) were caught but the impact seems limited (Kyle 1996).

### Netting intensity

Throughout the study there was intense pressure on the provincial conservation authority to increase the number of gillnetting permits. Every effort was made to enable permits to be fully used, but results reveal permit usage to have been just over 50 per cent each year. Occasionally people could not net due to bad weather or illness, but the usage rate consistently shows levels well below those that could be explained by these factors alone. It became clear that local residents did not want to fish every possible day, although they wanted the option to be able to do so. This is an important finding when initially deciding on how many permits to issue.

## DISCUSSION

### Benefits of the project

The project provided many benefits to the provincial conservation authority, the community and to people from surrounding areas, including:

- Food production: By 1995 gillnetting was second, to the fishtraps, in terms of legal food production from the Kosi Lakes (Kyle 1986);
- Neighbour relations: As a result of this project, and the way it was carried out, there was a marked improvement in relations between the conservation authority and many of the people impacted by the reserve proclamation;
- Public perception of the provincial conservation authority: Public perception of the conservation authority has been enhanced by the fact that the authority took the initiative to investigate an illegal and unwise fishing method in order to modify it and manage it effectively;
- Fish research: Fisheries research also benefited in that data from catch monitoring provided important insights into fish populations and movements in the lake system. Legal netters also reported the capture of several tagged fish, adding to scientific knowledge on capture rates, growth and migration of fish;
- Capacity building: The scheme, through the associated committees and monitors, helped build the capacity of local communities to assist in the wise management of resources and the organisation of the communities;
- Successful example: The success of the project on the ground and the careful monitoring of catches (and documentation of its development) are

leading to its replication in other areas, both inside and outside KwaZulu-Natal (Mann 1996; see Chapter 5). There are, however, serious limitations to its replicability or appropriateness elsewhere;

- Ownership of resource: As the netters began to feel a degree of ‘ownership’ of the fish resource they began reporting illegal fishing to the conservation authority and became more concerned about the future of ‘their’ fish;
- Economic benefits: The development of a legal gillnet fishery generated direct economic benefits to the fishers and also to some women who carried the fish to markets.

### Lessons learned

Key lessons have been learned throughout the implementation of the gillnet fishery in the Kosi Bay Lakes.

*Long-term commitment in terms of personnel, financial, political and administrative support is essential*

Before the implementation of this project it was agreed by the provincial conservation authorities that adequate time and resources must be allocated to the project. Catch monitoring was compulsory and the implementation phase would last as long as necessary to ensure long-term success. As was found in West Africa (Anon 1990), an integrated approach to development, including the active participation of local committees was considered essential. Many fisheries development projects have collapsed (Mahy 1989) because they were initiated by outside agencies that set up the projects and then withdrew. The project at Kosi is now run by local EKZN Wildlife staff with the direct involvement of the local community.

Certain expectations of the provincial conservation authority, however, have not yet been met. Firstly, it was hoped that the legalisation of some netting would make it easier to control illegal netting by reducing levels, opening up a legal alternative to poaching and creating a body of legal netters who might assist in protecting the fishery from over-exploitation. Unfortunately this has not yet happened. Secondly, it was anticipated that after an initial input of energy and funding, the project would create its own momentum and bring in some funding through people paying for permits. It has not yet done so. Thirdly, it was hoped that the fishery would have a fairly short experimental phase, showing clearly that the fishery was, or was not, appropriate for Kosi Bay, whereafter its administration would become a function of routine management. This too has not happened.

When the project was initiated, the provincial conservation authorities had adequate financial and human resources as well as reasonable capacity to manage the area. Severe budget cuts, impacting all aspects of the work of the conservation authorities, necessitated reviewing the status of all activities.

Projects such as this were not seen as important as, for example, protecting large terrestrial animals.

The advent of democratic elections in 1994 raised expectations regarding access to marine resources. Many people felt that all resources should be made freely available to all South Africans and they were reluctant to comply with the restrictions of the gillnet permits.

In the last few years, the capacity of the EKZN Wildlife to manage the area has been severely reduced. From a management perspective, it is considered easier to prohibit gillnetting altogether, rather than limit access and control and monitor users. Some people within EKZN Wildlife now argue that the most simple and cost effective way of managing an area should be implemented, and it is recognised that a complex project of this nature is expensive to manage effectively.

*Full managerial support from local conservation staff is essential*

From the outset, project proposals were drawn up and motivated with full local support from all sections of the provincial conservation authority. The original suggestion to allow some netting was the result of discussions between local conservation management and research staff. The conservation authority managers thus supported the project and saw it as a means to manage the illegal netting problem and improve relations with neighbours. The project could not succeed without ongoing management support at a time when their capacity was stretched to the maximum. Thus, implementing authority managers must be committed to the initiative. Unless the local managers feel included in the process, and believe that it is important, they will not identify it as a priority.

*Circumstances change*

During the study period the provincial conservation authority managers changed three times. Different management styles and priorities (of new managers) certainly had a fundamental impact on the success and sustainability of the project. Much time was spent explaining the project to new managers and motivating them to assist with aspects of implementation and compliance.

Furthermore, the proclamation of the MLRA in 1998 (DEAT 1998) resulted in the transfer of jurisdiction over the lakes' living resources to MCM, a directorate of the national government's DEAT. Problems within MCM resulted in a decision that all fishery schemes running before 1998 should carry on unchanged through 1999, whereafter new MCM permits would be issued.

This shift in management responsibility for the lakes proved problematic. For the first seven years of the project decisions could be made in the provincial

conservation head office but, after this period, decisions could only be made by the national government. On the ground this has resulted in an effective break in communication between the project and the decision-makers.

*Ongoing monitoring and evaluation must inform decisions on the future of a project*

Once the goals of a project have been identified it is essential that the project be reviewed and evaluated after a reasonable period. For example, and using this project, if the catch species composition was clearly not what it should have been or if relations with the surrounding communities were deteriorating, the project should have stopped. Continuing such a project in the light of overwhelming information demonstrating that it is not achieving its goals, is counterproductive to the whole process of joint management locally, nationally and internationally.

This project has achieved its main goals but declining management capacity and budgets are making it impossible to maintain an atmosphere in which it can survive. Illegal netting is more lucrative and there is insufficient incentive for netters to comply with the conditions, or a lack of disincentives for them to stop illegal netting. The implementing authority must therefore be able and prepared to cancel the initiative. The main issue is that although the project itself has proved successful, the declining capacity of EKZN Wildlife may still necessitate the closure of the fishery.

*Project conditions must be upheld and effectively enforced*

There must be enforcement once conditions for implementation are agreed to by all parties. For example, if management failed to fine fishers using illegal nets (e.g. 40 m long) or nets without tags, the integrity of the project could have been jeopardised and support could have declined. Conditions must be negotiated with the local committees but certain conditions, such as determination of total effort, cannot be compromised. In 1999, many illegal nets were seized and destroyed (burned). Committee members also complained that occasionally they lost tags or could not get nets out of the water by the prescribed time due to the nearness of hippopotami. A compromise was reached whereby nets that were approximately the correct length but without a tag would be seized by conservation authorities, but kept at the field station for one month. This gave sufficient time for a permit owner to claim his net if he gave a reasonable explanation of the contravention.

*Indigenous knowledge must be carefully dealt with*

A local workshop in October 1994 had the aim of sharing scientific and indigenous knowledge between community members, the provincial



conservation authority and scientists. Unfortunately it failed due to a lack of understanding of basic scientific techniques and the closed minds of a few individuals. The first scientist to speak mentioned that a locally abundant fish species could change sex, but many community members saw this as impossible and thus the credibility of science and scientists was undermined. The prevailing community view was that God put adequate fish into the lakes, would continue to do so, and their sexes were fixed. The scientist next said that fish numbers could be estimated accurately but before he could continue, the 94 year old *induna* stood up and said it was time to have lunch and go home. He said that fish could not change sex and counting fish was not possible. Nevertheless the workshop made the scientists aware of the reality and strength of traditional beliefs and knowledge. Subsequently much work has been done to show how scientists work and the scientists have become more aware of local perceptions and beliefs. Since 1994 the situation has improved to the extent that many local people now accept the possibility of fish changing sex. Several male fish have been tagged in the presence of local people and it is hoped that a local person will recover one to discover that it has changed its sex.

Scientists are trained to change views in the light of new information. Indigenous knowledge is often in the form of strongly held beliefs and to challenge these is usually difficult. True exchange of knowledge can only take place once fundamental mutual trust has been built.

## CONCLUSION

The aim of this project has been to reduce illegal netting and create a legal and sustainable gillnet fishery that involved users in various aspects of management. In reality it has not been possible to effectively suppress all illegal netting. A principal reason for this was that many of the permit restrictions made legal fishing less lucrative than the illegal alternative. Illegal nets were frequently put in the channels, where mass fish migrations often occur, and catches would be high. The financial disadvantages of legal netting had to be offset against the advantages of the scheme. The principal advantages included the fact that seizure of nets and prosecution were avoided, and nets could be set and retrieved in daylight when there was less danger from crocodiles and hippopotami.

Without the cooperation of local residents the project would have failed. Throughout the project there were communication problems between the conservation authority and the fishers and there were attempts to politicise this relationship. Initially there was opposition to anyone cooperating with the provincial conservation authority and threats to those taking part. Many meetings were held and the matter was discussed in several fora in the area.

The result was that by December 1996, the scheme was much more widely supported and understood than it had been in earlier stages. Even within the conservation authority, although all local staff supported the project, opinion was divided on the appropriateness of such a fishery in an estuary and a reserve. Several staff members felt that such an experimental fishery was asking for trouble while others felt that it was simply inappropriate to have such a fishery in the Kosi Lakes, or any estuarine system in a nature reserve.

The jury is still out. The main aims of the initiative (to sustainably exploit target species, improve neighbour relations and involve neighbours in reserve management) have undoubtedly been achieved. Unfortunately, the capacity of EKZN Wildlife to maintain its involvement in the programme is now under question due to reduced budgets and the grim reality of trying to enforce unpopular restrictions.

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## NOTES

- 1 For many generations the indigenous people of the area, the Tembe Tonga, have fished in the Kosi lakes using traps and traditional spears.
- 2 More detailed results and scientific discussions are covered in Kyle (1999).

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# The Amadiba Community Tourism and Natural Resource Management Project

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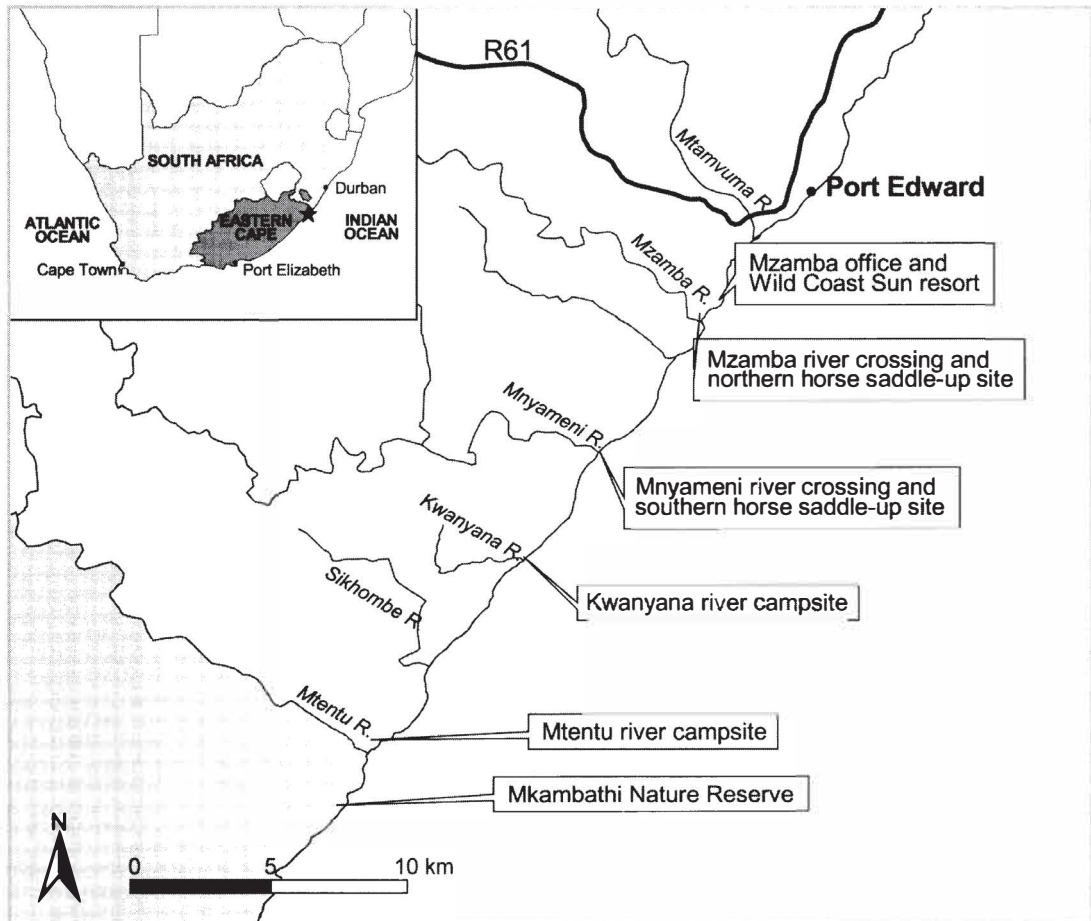
The Amadiba horse trail along the pristine Wild Coast.

*Photograph Chanan Weiss*

## INTRODUCTION

The Amadiba Community Tourism and Natural Resource Management Project (the Amadiba Project) is located along 27 kilometres (km) of coast between the Mzamba and Mtentu Rivers, on the Wild Coast of the Eastern Cape Province (see Figure 7.1 for location of Amadiba area). Initiated in 1997, the project was planned as an integrated development initiative, combining both community-based tourism with sustainable natural resource management. Development of the community-based tourism component was seen as a necessary precursor to establishing the sustainable natural resource management initiative. With the growth and success of the tourism initiative, partnerships with other role players, such as local, provincial and national government, became possible, paving the way for co-management arrangements in both the tourism and natural resource management initiatives. This chapter provides an overview of the project's characteristics and components, as well as the processes followed and strategies employed in establishing the co-management arrangement.

Figure 7.1 Map of the Amadiba area showing key points along the horse trail





The Amadiba area is characterised by a high-energy coastline, with interspersed sandy shores, rocky headlands and deep riverine gorges. The area contains large pockets of indigenous coastal forest which include a diverse number of endemic plant species, and falls within the 'Pondoland Centre of Endemism' (Davis *et al.* 1994). In addition, the three main estuaries of the Mzamba, Mnyameni and Mtentu Rivers are relatively pristine (see Figure 7.1). The Mtentu Estuary specifically is recognised by locals and field workers as being one of the most important natural resources in the Amadiba area. However, both the local community and visitors have heavily exploited coastal and intertidal resources during the last five to seven years, highlighting the need for sustainable utilisation and management of the area's natural resources (Russell *et al.* 2000).

Social and economic under-development is widespread in the Eastern Cape Province, with over 40 per cent of households living in poverty (May 2000). Infrastructure in the area is poor – roads largely consist of tracks and few homes have electricity or telecommunication. Clinics and schools are located further inland from the coast (8 to 25 km), rendering them fairly inaccessible for the Amadiba people.

The Amadiba area falls under the jurisdiction of the O.R. Tambo District Municipality and the Bizana Municipal Council. In terms of the traditional governance systems operating in the Eastern Cape, a local headman governs the Amadiba area. However, the area is located within a larger region that is under the traditional leadership of Chief Baleni, whose relationship with the local Amadiba headman is not clearly defined. (Chief Baleni has subsequently died and the succession is still being debated.) The roles and responsibilities of these two traditional leaders in relation to the newly restructured local government authorities (such as the Bizana Municipal Council) are also still undefined, resulting in confusion between traditional leadership and local authorities (*pers comm.* L. Ndovela, local councillor, 2000).

It was recognised from the outset of the project that the immediate needs of the community must first be addressed (e.g. jobs and income) before any natural resource management issues could be tackled. Consequently, Phase One of the project focused on the provision of tangible economic benefits for the local people, through the community tourism initiative which, if successful, would serve as an 'incentive' for addressing longer term, sustainable natural resource management problems (Phase Two). The key objectives of the Amadiba Project were therefore: 1) to utilise locally available resources in developing a series of linked tourism enterprises that could deliver tangible monetary returns to local people; 2) to build institutional capacity in the Amadiba area; and 3) to link the enterprises to sustainable resource management of the area. At present, the tourism component of the project is well underway, and the institutional development of the resource management component has been completed.



This chapter provides an overview and analysis of the Amadiba Project and its evolution into a co-management arrangement. Firstly, the natural resources and socio-economic characteristics of the area will be described. The initial planning and development processes will then be examined in detail, followed by an overview of the main legal and institutional arrangements governing the project. Finally, an analysis of the successes, strengths and weaknesses of the Amadiba Project will be presented, and lessons learned will be identified.

## NATURAL RESOURCES IN THE PROJECT AREA

### Natural resource base

Natural resources in the Amadiba area have formed an integral part of the local people's livelihood strategies for many years. Available resources include a variety of marine, coastal and estuarine organisms, coastal and riverine forest species, cultivated vegetables and livestock.

Table 7.1 provides a summary of marine, coastal and estuarine resources harvested in the area. Certain resources, such as intertidal organisms, have been targeted more than others. Although the Amadiba area is not ideal for mussel growth,<sup>1</sup> brown mussels (*Perna perna*) have been over-exploited in a number of areas, resulting in the depletion of existing stocks (Fielding *et al.* 1994). This is by comparison to the plentiful mussel stocks in the bordering Mkambati Nature Reserve (see Figure 7.1, Fielding *et al.* 1994). Of the fish harvested, bronze bream (*Pachymetopon grande*), stonebream (*Neoscorpis lithophilus*), shad (*Pomatomus saltatrix*, in season), kob (*Argyrosomus hololepidotus*), grunter (*Pomadasyus spp.*) and blacktail (*Diplodus sargus capensis*) are the most common (Clark 2000). Areas of concentrated resource extraction include the Mtentu, Mnyameni and Sikhombe Estuaries (see Figure 7.1).

Table 7.1 Marine, coastal and estuarine resources harvested in the Amadiba area

T Brown Mussels ( <i>Perna perna</i> )	Sea Cucumber (e.g. <i>Roweia sp.</i> )
Limpets (e.g. <i>Patella sp.</i> )	Various species of worm
Oysters (e.g. <i>Striostrea margaritacea</i> )	Pencil Bait ( <i>Solen cylindraceus</i> )
Chitons (e.g. <i>Acanthochiton sp.</i> )	Various species of fish
Red Bait ( <i>Pyura stolonifera</i> )	Cuttlefish ( <i>Sepia vermiculata</i> )
Giant Periwinkle ( <i>Turbo sarmaticus</i> )	Various species of seaweed
East Coast Rock Lobster ( <i>Panulirus homarus</i> )	Octopus ( <i>Octopus vulgaris</i> )
Swimming Prawn ( <i>Penaeus indicus</i> )	Sand Prawn ( <i>Callinassa kraussi</i> )
Estuarine Crab ( <i>Scylla serrata</i> )	Sand Crab ( <i>Ocypode ryderi</i> )

Source: Information derived from workshops with local community members as part of an early research project in the area (Clark (2000), *pers comm.* P. Fielding, resource and environmental consultant, 2002).

The local Amadiba people also harvest other natural resources for building materials and medicinal purposes as well as food from the coastal and riverine forests. Nuts from the Pondoland Palm (*Jubaeopsis caffra*), the wild spinach (various species, e.g. *Amaranthus spp.*) and mdumbis (*Colocasia esculenta*) supplement part of the local people's diet, which includes a range of vegetables and maize. In addition, most households own livestock that can include cattle, chickens, pigs and the distinctive Pondo pony, which has been bred in the area over several generations.

### Natural resource users

Resource users in the Amadiba area include both the residents and the tourists that visit the area each year. As mentioned, natural resources are an important asset to the local people. Although the majority of harvesting is for subsistence purposes, local people will sell resources, such as fish, locally to other households and to visitors to the area.

Over-exploitation of intertidal resources has, however, depleted many of these edible coastal resources. Harvesting is now largely done by older women and girls from very poor families, and the importance of intertidal resources as an asset is dwindling (Russell *et al.* 2000). A small number of men fish regularly with lines and rods, both along the coast and in the estuaries (especially the Mtentu Estuary). This type of fishing is mainly for recreational purposes and the small numbers of fish caught can provide a minimal supplement to household diet.

Tourists visiting the area have a significant impact on the natural resources. This group of consumers include 'illegal' holiday homeowners,<sup>2</sup> hikers, recreational fishers and campers. Resources are harvested by the visitors themselves, or are bought locally, thereby providing an informal source of income for the Amadiba people (Russell *et al.* 2000). Visitors usually buy east coast rock lobster, mussels, oysters and fish at relatively low prices. Demand for resources peaks during the holiday seasons. For east coast rock lobster, the period of high demand in December/January coincides with the breeding season. Technically the December/January vacation falls within the closed season for lobsters (November to February), but lobster are nevertheless heavily exploited along the coast during this period (Berry 1971). In addition to consumption by visitors to the area, there is also an informal export demand for the resources from other areas, restaurants and hotels. Lobster numbers do not however seem to be decreasing, probably due to the limited market and inability for locals to access a major part of the stock (Fielding *et al.* 1994, Russell *et al.* 2000). It is important to note that the methods of lobster collection differ between the locals and visitors. The locals often use only their hands and feet, whereas visitors and commercial fishers use equipment such as snorkelling gear. The impact of the increased fishing effort

from the latter group has significant implications for the long-term sustainability of the resource base (Russell *et al.* 2000). Due to the expected increase in tourists and visitors to the area in the future, it is anticipated that without appropriate management, natural resources such as the east coast rock lobster will decline.

### Resource management

Natural resource management in the Amadiba area has been, and continues to be, a contentious issue. In the past, resources such as intertidal organisms, fish and forest products have not been subjected to strict management controls and local people and visitors have not taken responsibility for their harvesting actions.

Although legislation such as the Marine Living Resources Act (MLRA) 18 of 1998 (DEAT 1998a) and the Transkei Environmental Conservation Decree 9 of 1992 (Transkei Decree, DEAT 1992) provide for a number of resource management regulations,<sup>3</sup> the regulations are not generally adhered to by local people or visitors. Rather, resource use has primarily been governed in the past by natural limitations such as distance to resources, tides, large waves and strong currents (Russell *et al.* 2000). The main justification for this approach to resource management is that the Amadiba people regard natural resources as common local goods, owned by all and bestowed by God, but usurped by the government. As one local community member outlined, the typical perception is that: 'the resources are actually ours, but the government has taken them. We therefore deserve to be able to use them and if we break the government rules it is only fair. All responsibility for managing the resource is transferred to the government. If we cheat and over-harvest resources, then we are cheating the government and other outsiders of what should be ours in any case'.

The above perceptions are exacerbated by the strained relationship between the Amadiba community and local, provincial and national government authorities. The principal authorities responsible for natural resources in the area are the national DEAT through its Chief Directorate: Marine and Coastal Management (MCM), the Department of Water Affairs and Forestry (DWAF), and the provincial Department of Economic Affairs, Environment and Tourism (DEEAT) through its Chief Directorate of Eastern Cape Nature Conservation. The mandates of the various authorities are not clear and their respective jurisdictions are confusing and often overlapping. DEAT and MCM have in the past also had very little physical presence in the Amadiba area, and have used the Eastern Cape Nature Conservation officials as implementing agents for marine resource management. For example, the Marine Protected Area (MPA) within the Mkambati Nature Reserve is managed by Eastern Cape Nature Conservation on behalf of DEAT (*pers comm.* D. de Villiers, Eastern Cape Nature Conservation, 2000).

In the past, the interaction between the Amadiba community and Eastern Cape Nature Conservation officials has been particularly antagonistic, resulting in a breakdown of relationships between resource users and the government. Arrests of local people harvesting marine resources from within the Mkambati Nature Reserve (Kepe 1997), as well as beyond its borders, have deepened tensions and have contributed to the perception that although the resources should belong to the community, the government is the *de facto* managing authority. Conflict has also occurred between locals and officials regarding the activities of subsistence and recreational fishers. Many locals were unaware of their fishing rights, harvested without licences and believed that they should have greater harvesting rights than recreational fishers (Russell *et al.* 2000). Furthermore, it should be noted that prior to 1998 there were no provisions for subsistence fishers in the legislation (Russell *et al.* 2000).

The driving forces behind the tension between the community and government officials (at all levels) are diverse. In the past, limited presence of officials and law enforcement officers in the area led to intermittent enforcement by the responsible managing agencies (e.g. MCM and DEEAT). A second aspect relates to the historical location of the Amadiba area within the former Transkei homeland. After the breakdown of apartheid, the 'homeland' areas (and their legislation) were amalgamated with the newly demarcated provincial areas. The Amadiba area was incorporated into the Eastern Cape Province and the departments of the old Cape Provincial Administration, Ciskei and Transkei were rationalised into one department. This resulted in both a lack of capacity in many areas and also increased fragmentation of the Eastern Cape legislation (Glazewski and Sowman 1998). For example, natural resource management legislation in each of the three areas (Cape Provincial Administration, Ciskei and Transkei) merged,<sup>4</sup> and the inability to streamline and consolidate such legislation created considerable confusion and inadequate management (Bürgener *et al.* 2001, Glazewski and Sowman 1998).

A third factor fuelling tension is the issue of ownership of the land and its resources by the Amadiba community. All land within the Amadiba area and most of the land along the Wild Coast is nominally owned by the state. Some of this land is tribal land, held in trust by the Minister of Land Affairs, and the rest is held directly by DWAF and the Department of Defence. There is very little privately owned land on the Wild Coast. The problem of land tenure arose at the beginning of the tourism project (Phase One), when the Directorate of Eastern Cape Nature Conservation expressed the desire to devolve management of the Kwanyana Campsite to the local community (see Figure 7.1). The campsite had fallen into disrepair and although it had once attracted many visitors, it was now scarcely used. The Eastern Cape Nature Conservation authorities viewed the campsite as a burden and had neither the



resources nor personnel to renovate the site. Pondoland Community and Resource Optimisation Project (PondoCROP), the non-governmental organisation (NGO) facilitating the Amadiba Project, arranged two meetings between the nature conservation authorities and the Amadiba community representatives to discuss the handover of the campsite to the local people. PondoCROP offered assistance to the community for raising funds to refurbish the campsite and also to promote the facility. The discussions went well at a local level but faltered when they reached provincial government. Nature conservation officials discovered that in terms of current legislation, any income derived from state assets had to be returned to the state treasury and could not remain within the community unless a public tender process had been followed. To date, this problem has not been resolved and the campsite remains in a run down state. So-called 'back-to-back' agreements<sup>5</sup> with the state are currently being investigated to allow local management of the campsite in the interim period before the state asset issue is resolved.

#### SOCIO-ECONOMIC CHARACTERISTICS OF THE AMADIBA COMMUNITY

Poverty is widespread in the Amadiba area, and there are limited opportunities for economic upliftment (Glavovic *et al.* 2001). At first glance the Amadiba community, mainly comprised of Mpondo inhabitants, represents a fairly homogeneous group. The apparent homogeneity of the community does not necessarily mean that there is common purpose at the local level. As with many other rural communities, there is both a plethora of local interest groups and complex power relationships within the Amadiba community. For example, the shop owners are a powerful and distinct local economic interest group, whose visions are very different from those of most other community members (*pers comm.* L. Ndovela, local councillor, 1999).

Local homesteads are within relatively easy travelling distance (less than five km) from the coast, with approximately 120 homesteads located along the 27 km stretch of coastline between the Wild Coast Sun Resort and the Mkambati Nature Reserve (see Figure 7.1). No local homesteads are located within a 1000m corridor landward of the high-water mark,<sup>6</sup> in accordance with the Transkei Decree 9 of 1992 (DEAT 1992).

Natural resource utilisation varies within the Amadiba community. Marine resource harvesting is becoming increasingly difficult as resources decline and the effort-to-reward ratio is no longer advantageous, except to the most needy. It is thus the poorer families who rely more on natural resources (e.g. mussels, oysters and fish) to meet some of their protein requirements. Remittance money from migrant workers and pension income meet most of the households' cash needs, and local agriculture and animal husbandry provide additional economic and dietary requirements.

Although the Amadiba people have intimate knowledge of the natural resources in the area, local knowledge concerning the management of marine resources has not been documented in any systematic way, let alone integrated into management decisions. In accordance with local knowledge, there is increasing realisation amongst the Amadiba people that the natural resource base cannot meet the economic and dietary needs of all coastal stakeholders through the current harvesting patterns. This realisation is not yet widespread, but increasingly, local people are learning that natural resources are not infinite and cannot meet all the development needs of the region. Ways of 'adding value' to resources in a sustainable manner and shifting focus to alternative livelihood and income-generating strategies, need to be explored.

## PROJECT DESCRIPTION

The Amadiba Project arose out of an increasing community need for poverty alleviation and social development in the area. The regional Wild Coast Spatial Development Initiative (SDI), which focused primarily on large scale, macro projects, has to date not delivered on its promises of economic and social upliftment (McCarthy *et al.* 1998). The resultant feelings of alienation and disenfranchisement amongst the Amadiba community members motivated them to approach PondoCROP to assist them in reducing local poverty in their area and in addressing resource management and ownership issues.

Initial discussions held separately between PondoCROP, interested community members, nature conservation and local government authorities led to the conceptualisation of the Amadiba Project. The Amadiba Project comprises two components. The first component is the tourism initiative, which includes horse riding, fly-fishing, hiking and provision of local accommodation. The second component focuses on the natural resource management initiative at the Mtentu River Estuary. Different elements of the project are managed and facilitated by a variety of stakeholders, including community members, PondoCROP, traditional leaders, national and provincial government departments (e.g. the national DEAT and the Eastern Cape provincial DEEAT) and the Institute of Natural Resources (INR). Each component of the project will be described below and a detailed account of the institutional arrangements governing the Amadiba Project and its different elements will be provided.

### The tourism initiative

#### *Current status*

The tourism project was initiated in 1997 and is presently known as Amadiba Adventures. Stretching from the Wild Coast Sun Resort at the Mzamba River

in the north down to the Mkambati Nature Reserve at the Mtentu River in the south, the operation covers approximately 27 km of coastline (see Figure 7.1). Local guides operating through Amadiba Adventures accompany all visitors. Management of the initiative is through a series of linked enterprises, each owned and operated by a local person or group, with support from the Amadiba Project. Small linked enterprises include catering, accommodation, provision of guides and leasing of equipment.

The initial impetus for starting the horse trail component of the project was to maximise the returns from local community assets. In addition to the beautiful surrounding scenery, many households owned ponies, which could be utilised to generate income. Currently R500 000 (US\$50 000) is generated by the project for local community members in over 90 households.<sup>7</sup> Visitors for the horse trail arrive at the Wild Coast Sun Resort and are guided along the coast by a local guide<sup>8</sup> to the Mzamba River. There they cross the river by boat and saddle-up the Northern Amadiba horses for approximately six km of the trail. At Mnyameni River, the visitors cross the river by boat and swap horses a second time. Finally, at Kwanyana, the tourists overnight in a tented camp (provided by the local inhabitants) and the following morning ride to the Mtentu campsite<sup>9</sup> (see Figure 7.1). One or two nights can be spent at Mtentu, during which excursions up the Mtentu River as well as to the Mkambathi Nature Reserve are offered. Visitors then return to Kwanyana and Mzamba via the beach or an inland route.

Once the horse trail enterprise was up and running, the local community wished to explore additional tourism activities in the area and, with the help of PondoCROP, approached a private investor in 1998 to investigate the feasibility of a pilot catch/tag-and-release fly-fishing operation on the Mtentu River. The fly-fishing operation aimed to not only diversify tourism opportunities and attract more visitors to the area, but also to establish non-consumptive, low-impact utilisation of the natural resource. The pilot operation began in mid-October 1999 and was officially opened in October 2000 (subject to permit requirements<sup>10</sup>), by the Deputy Director General of DEAT.

The main target species of the fly-fishing project are the Giant Kingfish (*Caranx ignoblis*) and the Bigeye Kingfish (*Caranx sexfasciatus*). Both Kingfish species are not a commercially important food source. Only four 'rods' are allowed on the river at any one time and non-motorised inflatable vessels are used as fishing platforms. The two pilot fishing seasons completed to date (from mid-October to mid-December 1999 and 2000) were extremely successful. For example, since its inception, over 140 fish from 16 different species have been caught during 1 290 hours of fishing. During this time, only one Kingfish is known to have died. The operation generated over R115 000 (US\$11 500) between 1999 and 2000 for the local community in terms of payment for the Mtentu campsite,<sup>11</sup> wages for local fishing guides, caterers

and cleaners, hire of craft to visiting fishers and for the use of horses for local excursions (Russell 2001).

Accommodation and catering for tourists using the horse trails and fly-fishing is provided by the local community. Its members also cater for and accommodate independent hikers and visitors to the area. The two campsites used by the horse trails and fly-fishing projects (at Kwanyana and Mtentu), provide accommodation for up to ten people and are available for independent visitors. An additional camp has been designed close to the Mtentu Estuary (within 300 m of the existing campsite) and, although not yet operational, it will allow the horse trails and fly-fishing operations to run simultaneously (Russell 2001).

### *Future plans*

A hiking trail, running the entire length of the Wild Coast and managed by Eastern Cape Nature Conservation was established more than 20 years ago. However the overnight rondavels<sup>12</sup> along the trail fell into disrepair and bookings were difficult to make. The Amadiba community together with PondoCROP, and with the support and approval of Eastern Cape Nature Conservation, has taken over management of the northern part of the trail. At present, this section of the trail is operational and the rondavels for overnight hikers are being refurbished and/or replaced. In the interim, however, tented campsites and homestead accommodation with local families is offered to visitors. The future vision is to complete refurbishment of the old accommodation facilities,<sup>13</sup> provide an information centre at the embarkation point and train more local guides to accompany hikers through the area. More effective management and marketing is also part of the development plan for the hiking area. Unfortunately, these plans are reliant on obtaining clarity on land tenure and resource rights issues.

It is proposed that additional future attractions will include a coastal kayaking trail and a mountain bike trail, utilising the same facilities as the horse and hiking trails.

With regard to Amadiba Adventures as a whole, much of its food and supplies are sourced locally. It is proposed that local suppliers of marine and other locally sourced resources (such as chickens and home-grown vegetables) be officially registered with Amadiba Adventures. Although not yet in place, interested parties have been consulted and the officially registered harvesters of marine resources will supply the caterers with food for tourism clients. Any supplier who breaks rules, size limits, seasons or area restrictions agreed upon by those involved in the project will either be removed from the registered list and fined or placed at the bottom of the waiting list of legitimate suppliers. This will ensure a positive incentive to local harvesters to comply with harvesting regulations. A participative action research programme that will



link local harvesters to marine scientists in order to jointly determine the research agenda, monitor resource use and establish appropriate harvesting levels is also proposed.

## The natural resource management initiative

### *Current status*

A comprehensive estuary management programme has been initiated for the Mtentu River and Estuary. At the heart of this programme is investigation of the establishment of a formalised co-management agreement. The proposed initiative will provide a legal framework (under the National Environmental Management Act 107 of 1998 (DEAT 1998b)) for resource co-management, bringing together the needs and interests of the community and other stakeholders. The primary stakeholders involved in such an agreement would include the local community (through their representatives, which include traditional leaders), the local government (the Bizana Local Council and the O.R. Tambo District Municipality), provincial authorities (Eastern Cape Nature Conservation and DEEAT), and national authorities (DEAT, MCM and DWAF). The secondary stakeholders would be PondoCROP and the INR.<sup>14</sup>

A common vision, management goals and compatible activities for the future use and development of the estuary have been developed during several workshops, which were funded by DEAT and attended by the primary stakeholders. Key goals identified by these stakeholders include: 'formation of partnerships between local people, government and the private sector' and 'empowerment of local people through acquisition of knowledge, expertise and skills necessary to participate in the management of the estuary and its surrounds, and to actively engage in economic opportunities' (Eastern Cape Estuaries Management Programme 2001, [www.inr.unp.ac.za/estuaries/management/mtentu](http://www.inr.unp.ac.za/estuaries/management/mtentu)). Outputs from the workshops include a context report on the Wild Coast (and Mtentu Estuary in particular), a draft management plan and a draft constitution (*pers comm.* M. McKenzie, Institute of Natural Resources, 2001).

### *Future plans*

It is envisaged that the Amadiba Community will have finalised their management objectives for the co-management plan by the end of 2002. It will then be possible to formalise the co-management agreement, allowing for more effective enforcement of agreed upon natural resource management rules and regulations. The local skills base will also improve, with the selection and training of local people as 'honorary conservation officers'. In addition, if the Mtentu Estuary co-management agreement is successful, it will be incorporated as the first 'building block' of a broader co-management plan, covering the entire (27 km) coastline of the Amadiba area extending five km inland.

## INSTITUTIONAL ARRANGEMENTS AND MANAGEMENT STRUCTURE OF THE AMADIBA PROJECT

The tourism component of the project was established in 1997, and the natural resource management component in 2001. The institutional arrangements and management structure of the resource management initiative are still being developed and have been facilitated by enabling legislation, such as NEMA (DEAT 1998b). This section provides an overview of the institutional framework and management arrangements of the Amadiba Project, concentrating mainly on the tourism initiative (Amadiba Adventures). Firstly, the evolution of Amadiba Adventures' internal management structure will be outlined, followed by an account of the nature of government involvement in the project.

### Institutional framework

The institutional arrangements governing the Amadiba Project have evolved significantly since its inception, highlighting the fluid nature of the process. Two specific phases, each marking a significant change in organisational structure and management, have been identified.

#### *Phase one*

In 1997, PondoCROP, which had been working in the Mpondoland area for a number of years, was approached by the local people in Amadiba to assist with initiating a tourism development project. At this time, the Reconstruction and Development Programme (RDP) had a functioning committee in the area, and a 'sub-committee', dealing with the proposed tourism development, was subsequently formed. With the 'sub-committee' in place, community representatives together with PondoCROP started the horse and hiking trail components of Amadiba Adventures. PondoCROP facilitated the day to day operational and managerial decisions of the venture, while at the same time building capacity and awareness amongst the Amadiba people participating in, and owning all elements of, the enterprise. As Amadiba Adventures grew it became clear that the community needed to be increasingly involved in, and gain 'ownership' of, the operational and management decision-making process. A shift in such responsibility from PondoCROP to the community resulted in the need for an over-arching management structure. This led to the creation of the Amadiba Tourism and Natural Resource Management Steering Committee, enabling the community to take greater responsibility for the management and development of Amadiba Adventures. At this time, the RDP had dissolved and the original RDP tourism 'sub-committee', now the Amadiba Tourism and Natural Resource Management Steering Committee, became the sole committee governing tourism development in the Amadiba area.

Although established as the Amadiba Tourism and Natural Resource Management Steering Committee, the name of the Committee was altered to the Amadiba Coastal Communities Development Association (ACCODA) in 2000. The change in name reflected the community's need for a management body that addressed not only tourism and natural resource management issues, but also the broader concerns of the community (e.g. health and infrastructure). ACCODA has representation from sectoral interests such as youth and tourism associations, business (such as local shop owners), traditional leadership, women, PondoCROP (as non-voting partners) as well as various geographic areas (community representatives from the five sub-wards in the Amadiba area serve on the committee). ACCODA not only represents the broad interests of the local community, but also facilitates arbitration of disputes associated with development and community rights in interactions with the government and private sector. The community owns the trails and project infrastructure, and decisions regarding use of land<sup>15</sup> and allocation of funds generated from tourism are the responsibility of the community (represented by ACCODA). ACCODA also decides upon the expenditure of income derived from its percentage of the tourism activities.

Amadiba Adventures, composed of individuals and groups actively involved in the tourism operations and representing the operational component of the tourism initiative, is accountable to ACCODA. PondoCROP, as mentioned, serves a facilitative, mentoring and broadly supportive role to both ACCODA and Amadiba Adventures.

### *Phase two*

In time, it became clear that ACCODA was not providing Amadiba Adventures with the support it needed. The broad scope of ACCODA's responsibility was negatively impacting on the growing tourism initiative. Day-to-day operational aspects, dissemination of information and the issue of community ownership, were being neglected. It was consequently considered necessary to form a management body solely responsible for the Amadiba Adventures enterprise. Thus, the Amadiba Adventures Management Committee (the committee) was established. This committee would guide operational and management decisions of the tourism initiative and report to ACCODA. The focus of ACCODA therefore shifted from operational to more strategic decisions – disseminating information to the broader community and gaining support for Amadiba Adventures in the area.

The committee was composed of representatives of each of the operating areas of the project (e.g. catering, guides and accommodation), aiming to keep the management as simple and representative as possible. Most of the financial, administrative and marketing functions continued to be performed by PondoCROP. Although the process of transferring these functions to the

committee, and hence the community, has been gradual. There has been some definite progress in increasing the committee's responsibilities.

At this stage, the precise mandate, function, authority and the responsibilities and accountabilities of the committee are not clear – perhaps a consequence of the committee's short lifespan. In addition, due to intense jealousy and intra-community rivalry and politics, two factors intensified problems with the formation of the new committee: 1) staff selection at the initiation of the project had been poor, and 2) ACCODA did not effectively exercise its disciplinary right to rectify the staff problem. As a result, ACCODA and PondoCROP decided that the management structure of Amadiba Adventures should be improved.

The difficulty with the committee structure was that it was not fully representative of the local people, resulting in decisions being made that were not supported by the entire community. Decisions made at committee meetings were only appropriate for the representatives present, and the time taken to reach decisions was slow. To address this issue, Amadiba Adventures will in the future be governed by consensus management. This type of management incorporates the views of all representatives in the decision-making process. As the entire organisation is too large and too widely dispersed to be governed by consensus of a single team, small, independent, self-managing structures (business units) are being formed to manage Amadiba Adventures. At present, capacity building is being implemented, and the new management structures were put in place in January 2002. It is too soon to gauge the success of these new structures. The current institutional structure of Amadiba Adventures, incorporating the changes occurring from the initial structure,<sup>16</sup> is illustrated in Figure 7.2.

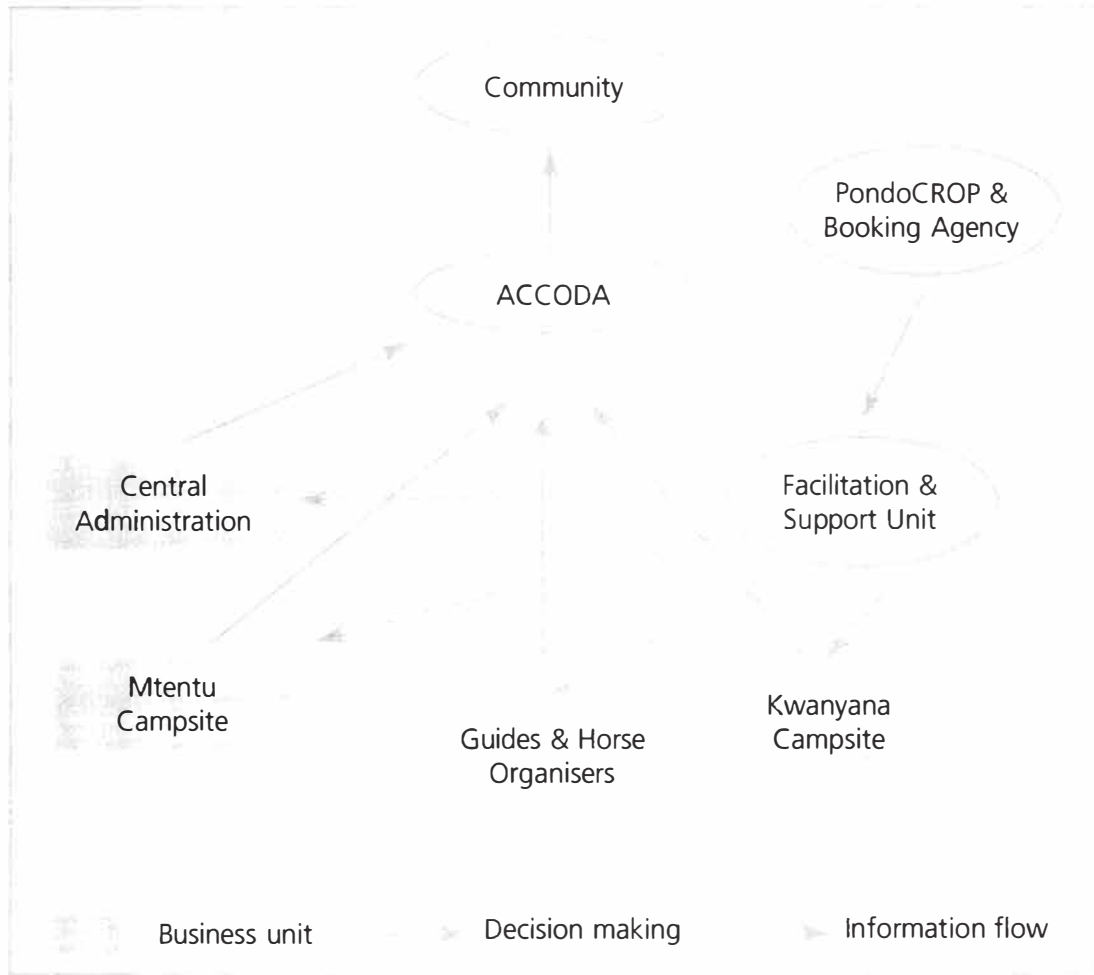
The business units coordinate with, but are independent of, each other. The units are comprised of:

- Mtentu campsite – responsible for hosting guests at the Mtentu River;
- Kwanyana campsite – responsible for hosting guests at the Kwanyana River;
- Guides and horse organisers – responsible for transporting tourists safely by foot, horse or canoe into the trail area, between campsites and up and/or across rivers;
- Central administration unit – 'cost centre' responsible for centralised administration, finance reporting and control, and marketing functions. The central administration unit does not generate profit, but is essential to the operation of Amadiba Adventures.

Profit is generated in the three business units and then managed by the central administration. Each business unit is represented on ACCODA, and the general strategies for each of the units are the joint responsibility of that unit



Figure 7.2 Institutional structure of Amadiba Adventures



and ACCODA. Daily operational decisions, however, are the sole responsibility of each business unit. The facilitation and support unit, managed by PondoCROP, builds capacity within the business units, enabling them to become effective inter-dependent components of the overall Amadiba Adventures initiative. At present, the facilitation and support unit takes the greatest weight of responsibility for Amadiba Adventures, but has an evolving role as skills and ownership are increasingly transferred to the community members in the business units. The facilitation and support unit's role differs with respect to each particular business unit, with less intervention and more facilitation provided for units requiring greater skills and leadership experience.

### Role of government

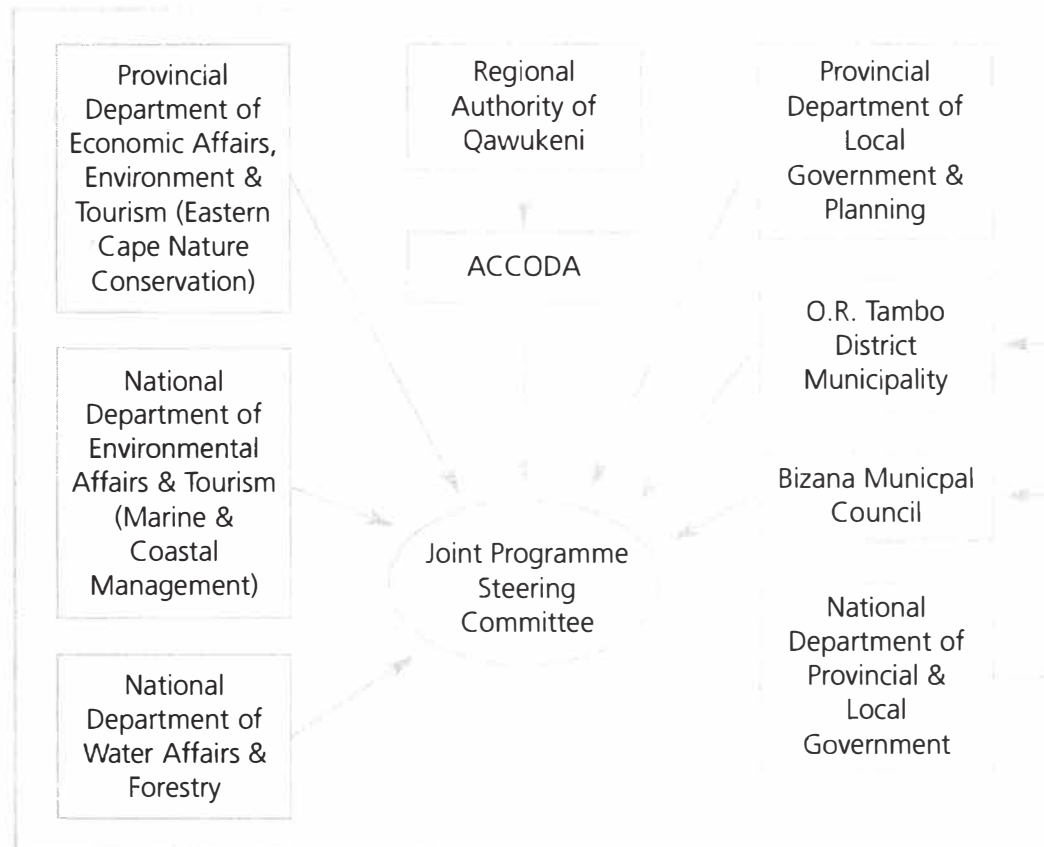
Traditionally, natural resource management has been an area of tension between the Amadiba community and the relevant government departments.

Historically, relations between the local community and the governing provincial authorities, especially those from the provincial DEEAT, were poor. There have therefore been no foundations upon which to develop a co-management initiative. Launching Amadiba Adventures was seen as a way to provide the community with tangible economic benefits, while at the same time recognising the importance of the natural resource base and the need to cooperate and work with government authorities.

The main government role-players in the project are shown below in Figure 7.3 and include DEAT (in particular MCM), DWAF and the National Department of Provincial and Local Government (DPLG), as well as the provincial DEEAT and Local Government and Planning (LGP). The local authorities of the O.R. Tambo District Municipality, the Bizana Municipal Council and the Regional Authority of Qawukeni (traditional authority) are also charged with environmental and natural resource management responsibilities, though these are often not clearly defined (particularly in the case of traditional leadership).

The points of interface between ACCODA and the various government structures are through the joint programme steering committee. Representatives

Figure 7.3 The role of government in the Amadiba Project



from MCM (within DEAT), Eastern Cape Nature Conservation (within DEEAT), DWAF, LGP, the O.R. Tambo District Municipality, the Bizana Municipal Council and ACCODA sit on the joint programme steering committee. The National DPLG has contact with ACCODA only indirectly through the Bizana Municipal Council and the O.R. Tambo District Municipality. The traditional authority, the Regional Authority of Qawukeni, has contact with the joint programme steering committee through its representatives on ACCODA.

In terms of local traditional leadership structures, most of the Amadiba area is presided over by a hereditary headman whose status approaches that of a chief. As mentioned, the nature of the relationship between the headman and Chief Baleni (who presides over a broader region that includes Amadiba) has not been established, although both the headman and Chief Baleni are accountable to King Sigcau of the Qawukeni Regional Authority. The regional authority's area of jurisdiction extends from the Umzimvubu River in the south to the Mtamvuna River in the north. Relationships between the traditional leadership structures and those of the elected government are at present also not clearly defined, and traditional leadership has not played an active role in the Integrated Development Plan<sup>17</sup> for the area. However, the relationship between traditional leadership and the project institutional structures has been described as good, with representatives of traditional leadership sitting on ACCODA, and with all major ACCODA decisions taken to the tribal authority for discussion.

With regard to the role of other government structures, the functions, responsibilities and jurisdiction of MCM and DEEAT in the Amadiba area are not clear. This is a consequence of the nation-wide shift in marine resource management responsibilities from the provincial (DEEAT) to the national authority (DEAT and MCM) (Glazewski and Sowman 1998). Therefore, although MCM now has jurisdiction over marine resources, it has little presence on the ground, and its areas of governance overlap with other national departments (such as DWAF). For example, although it is accepted that the section of the Mtentu Estuary that is within the MPA within the Mkambati Nature Reserve is governed by MCM and their implementing agent in the area, Eastern Cape Nature Conservation, it still remains unclear as to who has final authority over natural resource management in the Amadiba area.

DEEAT, and its Chief Directorate of Eastern Cape Nature Conservation, are the most active in the area with regard to natural resource management. However, as mentioned, the community's relationship with these authorities has, historically, been strained. This relationship is now improving. Various other provincial departments, such as Provincial Housing and Planning, have management responsibilities for different issues in the area, but to date only

DEEAT has been active within the area. NEMA facilitates improved cooperation between these and other role-players. NEMA also provides for the development of agreements between local communities, groups or individuals and DEAT, for the management of natural resources in an area (DEAT 1998b). The process of establishing a cooperative agreement for the area in terms of this Act is currently underway.

With regard to government commitment to the Amadiba Project, local government, in the form of the Bizana Municipal Council, has been and remains very supportive of the development of the community tourism component of the project. They have provided a councillor to work with the project on a full-time basis as a bridge between government and the project, and are also broadly supportive of the efforts to establish a natural resource management initiative in the area. The positive relationship between local government and ACCODA signifies the initial co-management agreement of the project, and as such, has been very successful.

Provincial government personnel within DEEAT and in particular Eastern Cape Nature Conservation, have been actively involved, providing support for the establishment of the two campsites and for the fly-fishing operation on the Mtentu River. The support has been in terms of assistance with the application to MCM for both the catch and release fly-fishing programme, as well as use of the designated campsite at Mtentu.

As the project developed, it became clear that its functional needs necessitated a closer and more formal relationship with relevant national government departments, and PondoCROP and ACCODA actively sought their cooperation. For example, DWAF and DEAT have jurisdiction over land being used for Amadiba Adventures' campsites. The community would like to build permanent structures (at the moment there are only temporary structures in place) at the sites and lease them for a 20-year period. In addition, ACCODA would like permission for excursions to enter the Mkambati Nature Reserve and the catch and release fly-fishing initiative has also requested a three year, instead of three month, permit from MCM. These requests require the community, through ACCODA, to deal directly with national government and foster formal co-management arrangements. Although the support from national government was initially slow in coming, facilitatory support by DEAT in the form of arranging workshops and attending ACCODA meetings has improved government-community cooperation.

## DISCUSSION AND ANALYSIS

The process of establishing and implementing the Amadiba Project has been complex, since the two components of the project have been implemented at



different points in time and a diversity of stakeholders has been involved. This phased approach was a conscious plan by the stakeholders to lay the foundation for the co-management initiative. Relationships between the community and government were such that a co-management plan, focusing purely on natural resource management, would have been very difficult to establish.

However, through the success of the community-based tourism initiative, a strong institutional base and improved awareness of natural resource management issues has been achieved. The establishment of ACCODA, with its constitution, regular meetings, consensus-style management and community representation, allowed community members to manage the tourism initiative fairly and democratically. As the project evolved, the partnership arrangements between the community and government also improved. For example, Eastern Cape Nature Conservation's support for Amadiba Adventures was seen as a stepping-stone toward gaining greater community trust and cooperation. The animosity that once existed between the community and nature conservation officials has been transformed into a cooperative relationship. Regular meetings with ACCODA and other government stakeholders (see Figure 7.3), through the joint programme steering committee, have also improved relations between the community and government. For example, although ultimate natural resource management responsibilities remain a confusing issue in the area, all relevant stakeholders now have access to a forum (the joint programme steering committee) in which to raise their views and agree upon an appropriate way forward.

Once the community was fully supportive of the tourism initiative and relationships between them and government stakeholders had improved, resource management issues could be tackled through the proposed natural resource management initiative. Co-management of both the tourism and Mtentu area could then proceed. The success of Amadiba Adventures was therefore the key towards building community trust and cooperation with the government.

### Key benefits gained from the Amadiba Community Tourism and Natural Resource Management Project

A number of key benefits can be identified from both the tourism and the natural resource management initiative.

#### *Community tourism initiative (Amadiba Adventures)*

- Establishment of a relatively strong local community representative body in the area, through ACCODA, facilitated an improved sense of ownership and management amongst the local people;

- Capacity building improved the skills base amongst community members (e.g. guides and caterers);
- Institutional capital and skills of local people were fostered through acceptance of and cooperation with NGOs such as PondoCROP;
- Relationships between the community and government officials improved – especially Eastern Cape Nature Conservation, the Bizana Local Council and the O.R. Tambo District Municipality;
- Community stakeholders benefited from increased economic upliftment (e.g. over R700 000, US\$70 000, generated from the horse trails and fly-fishing tourism initiative since 1997);
- The importance of natural resources was highlighted by the community's experience of gaining tangible benefits from the tourism initiative. In addition, there was improved community awareness that resources in their area needed effective management and enforcement of regulations;
- Eastern Cape Nature Conservation provided strong commitment to development and implementation of a co-management agreement with the Amadiba community to manage natural resources;
- Success and proposed expansion of the tourism initiative provided incentives for community members to enter into a natural resource management initiative.

#### *Natural resource management initiative (Mtentu Estuary)*

- Activities that were implemented as part of the tourism initiative (e.g. improved management of natural resources) have been formalised;
- Relationships between community and government have strengthened and improved through workshops, agreement on a draft management plan and a draft constitution for the Mtentu Estuary;
- An improvement in regulation of fly-fishing activities and enforcement of approved-upon regulations have resulted in a reduction of the offtake of fish in the Mtentu Estuary;
- There has been improved community 'buy-in' to natural resource management.

#### Key obstacles to and weaknesses of the Amadiba Community Tourism and Natural Resource Management Project

There have been a number of constraints to the project's success. These are briefly discussed below.

#### *Flow of benefits from state owned assets to the community*

Difficulties in securing tenure rights to the land and resources used by the Amadiba Project have severely impacted upon the continued success of the

project. Confusion amongst different government authorities as to specific mandates and overlapping environmental legislation resulted in frustration and time wasted on the part of ACCODA and PondoCROP. As mentioned, the tenure problem concerning the Mnyameni campsite has still not been resolved, and without security of tenure it is impossible to maintain and upgrade tourist facilities, to the detriment of Amadiba Adventures.

#### *Difficulties in engaging MCM in the process*

As mentioned earlier, the fly-fishing project has been a very successful component of Amadiba Adventures. In 2000, the Deputy Director General of MCM granted official sanction to the fly-fishing project and agreed to issue a permit for a three-month period each year. However, the process leading up to the agreement was fraught with difficulties. There was disagreement concerning use of the Mtentu River by Amadiba Adventures as the river fell within the boundaries of the MPA within the Mkambati Nature Reserve, which was declared without the agreement or participation of the local community.

With the assistance of PondoCROP, ACCODA approached Eastern Cape Nature Conservation to lobby their support for the pilot fly-fishing project so as to test its feasibility. Permission was readily obtained, although Nature Conservation stressed that they were only implementing agents for MCM. Nature Conservation agreed to provide support for the application to MCM. However, when approached with the proposal, MCM did not reply for a period of ten months, despite three written communications on behalf of the community. ACCODA decided to proceed with the fly-fishing initiative, even though there was no official national government approval. Eventually, MCM replied and suggested that the proposed project be deferred until investigation of a Pondoland Marine Reserve had been completed. As the response had been received after initiation of the fly-fishing project and the process of establishing a potential Pondoland Marine Reserve had only recently started, ACCODA decided to continue with the project, exercising caution and carefully documenting the experience. The delays were typical of frustrations in the past, and although the permits have now been allocated and the situation improved, such problems did not improve the standing of MCM with the local community at the time.

#### *Poor staff selection process at the initiation of the project*

The responsibility for staff selection was given to community representatives early in the project and measures were taken to ensure that the staff's families supported those selected in their new roles. Detailed guidelines stipulating the choice of participants (e.g. personality, skills, work experience, work ethic and home location) were given to the community selection committee.<sup>18</sup> Unfortunately, the guidelines were not adhered to and unqualified community

members were selected for the new roles. Optimal staffing of Amadiba Adventures was not achieved, and little corrective action for poor staff selection was implemented by ACCODA. The time taken to date in building capacity of these unsuitable staff members also limited the speed of change, resulting in ongoing difficulties in the daily operations of Amadiba Adventures. It is crucial that ACCODA exercises its management powers and carries out difficult staff decisions. However, ACCODA remains hesitant to do so. This problem will hopefully be partially resolved with the shift in institutional structure of Amadiba Adventures.

*Limitations experienced in the planning stages of the natural resource management initiative at the Mtentu Estuary*

One of the main limitations remains the confusion over natural resource management responsibility. DWAF appears to be nominal 'owner' of the campsite at Mtentu (but this still has to be confirmed) and MCM has jurisdiction over the Mkambati areas of the MPA bordering the estuary. However it remains unclear as to where the ultimate responsibility for resource management lies. The natural resource management roles and responsibilities of the transitional local council also remain unclear.

Limited capacity within Eastern Cape Nature Conservation has unfortunately reduced the chances of a timely conclusion to the co-management development process. Confounding this has been the hesitancy of MCM to engage the community in local management of the Mtentu River. Luckily, attitudes amongst MCM officials appear to be changing for the better.

## CONCLUSION

The Amadiba Community Tourism and Natural Resource Management Project has been detailed and discussed as an example of the evolution of a co-management initiative. Poverty in the area is widespread and historically there has been little regard for natural resource over-exploitation amongst the Amadiba people. With the help of local government and an NGO, the community initiated a tourism project, building on the skills and capacity of the area. The vision from the outset was to develop a successful tourism project, provide economic benefits for the community, build institutional structures through representative committees and provide a building block from which to develop a natural resource co-management initiative. Through the success of the tourism initiative, the community recognised the need for both resource management and cooperation with government. This set the scene for development of the second phase of the project, the natural resource management initiative at the Mtentu Estuary (which is in the planning stages) and will involve a formalised agreement between the community and the government.



There are three main lessons to be learned from analysis of the Amadiba Project: Firstly, *the economic benefits emanating from tourism facilitated community buy-in and led to the establishment of a strong local institutional structure*. At the start of the project, the community was not in a position to enter into a co-management agreement with the government. Relationships were particularly poor with the provincial and national authorities, and there was no basis from which to develop trust between different stakeholders. It was therefore crucial to implement an initiative that would first provide what the community needed most (economic upliftment), while at the same time facilitating other necessary precursors to a formalised co-management plan (e.g. strong local institutional structure).

An additional and related lesson is that the incentive to local participants must be readily apparent, clear and present. Those directly involved receive the 'lion's share' of the benefits. The community trust operates at the local level, with local stakeholders. Current moves by local government to form higher-level trusts, covering areas relatively remote and removed from the activities generating income and immediate benefit are likely to provide little local incentive and will probably result in the failure of sustainable local resource management.

Secondly, *incentives to develop the tourism initiative led to improved awareness of natural resources, setting the scene for the natural resource management component of the project*. Prior to the implementation of the tourism initiative, the Amadiba people over-exploited the natural resource base and felt no sense of ownership of the resources. By utilising the natural resources in the area (such as the ponies, fish in the estuaries, beautiful scenery and home-grown food) to generate income, awareness of the importance of these resources has been raised. The institutional structure of Amadiba Adventures allowed for self-management of these resources, and for the first time the community is beginning to feel a sense of ownership of the resources and the business that they produced.

Thirdly, *partnerships of trust were developed through the tourism initiative, which provided the building blocks for further collaboration on resource management issues*. Through Amadiba Adventures, relationships of trust have developed between the community and various national, provincial and local government authorities. The community realised that in order to implement the tourism initiative successfully, certain agreements would have to be entered into with these officials (e.g. the fly-fishing permit, use of the campsites, etc). Through the establishment of these agreements, all of the stakeholders were ready to take discussions a step further towards planning the natural resource management initiative. Although the natural resource initiative has highlighted the difficulties in dealing with the multiplicity of managing authorities who have overlapping authority, the initiative's preliminary success is evidence that

a co-management initiative can be developed in an area where there was previously tension and conflict.

Finally, current mineral prospecting in the area, if it ultimately leads to mining of the region's titanium deposits, could have an extremely negative impact on local resource management initiatives. Mining practices and principles do not fall under the national environmental impact assessment regulations, and local people will have little say over the process.

## ACKNOWLEDGEMENTS

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## NOTES

- 1 For example, along some stretches of rocky shore in the area, such as at Mzamba, the intertidal zone has a shallow slope and is subjected to being sanded over (Fielding *et al.* 1994).
- 2 Holiday homeowners who procured land through non-regulatory means have constructed cottages within the demarcated 1 000 metre (m) exclusion boundary, landward of the high-water mark (Transkei Environmental Conservation Decree 9 of 1992, Department of Environmental Affairs and Tourism (DEAT) 1992). These cottages are illegal and an Illegal Cottage Task Group has been developed to address the situation.
- 3 Such as bag limits and closed seasons for a number of marine and coastal organisms, and building restrictions close to the high-water mark.
- 4 For example, the Cape Nature and Environmental Conservation Ordinance (19 of 1974, Department of Nature and Environmental Conservation 1974), the Ciskei Nature and Environmental Conservation Ordinance (10 of 1987, Department of Agriculture, Forestry and Rural Development 1987) and the Transkei Environmental Conservation Decree (9 of 1992, DEAT 1992).
- 5 Where the Minister of Land Affairs will sign an agreement with an external investor on behalf of the community as a form of security.
- 6 As opposed to the illegal holiday cottages mentioned previously.
- 7 This figure includes the use of horses, accommodation and food.
- 8 Local guides accompany the visitors along the entire length of the trail, and offer additional guided walks, etc.
- 9 An informal agreement has been entered into between the community and Eastern Cape Nature Conservation to manage the designated campsite at Mtentu. The campsite was originally part of an old hiking trail along the coast – see following description of the hiking trail.
- 10 It was a catch-and-release operation only, no motorised vessels were allowed on the river, no fishing was permitted above the first waterfall and fish were to be minimally handled.
- 11 Visitors to the fly-fishing operation stay at the Mtentu campsite.
- 12 Rondavels are round thatch-roofed huts or rustic cottages.

- 13 Completion of construction is planned for the end of 2002.
- 14 Other interested and affected parties include: fishing clubs, the Wildlife and Environment Society of South Africa (WESSA) and recreational users of the river.
- 15 There is no binding, formal agreement between the community and the Minister of Land Affairs (who holds communal land in trust on behalf of the community), and Amadiba Adventures' tourism infrastructure is not permanent (i.e. it can be removed). If ACCODA wished to enter into a joint venture for constructing permanent tourism infrastructure, a more formalised agreement with the Minister would have to be sought.
- 16 Namely, the evolution from ACCODA (as the primary managing authority of Amadiba Adventures), to the Amadiba Adventures Management Committee, to the present day institutional structure of Amadiba Adventures comprised of the independent business units.
- 17 Integrated Development Plans are strategic planning and development instruments adopted by local government under the Municipal Systems Act 2000 (Department of Local Government 2000).
- 18 A committee set up to select people for participation in the business venture at the inception of the project.

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# Complexity and Change: The KEN Experimental Tourism Camp at KwaDapha

*Penny Urquhart*



A beautiful beach, accessible to guests staying at the KEN Camp.

*Photograph Penny Urquhart*

## BACKGROUND

This chapter provides an overview of the KEN Experimental Tourism Camp, established at KwaDapha in the north-east corner of South Africa (see Figure 8.1). The KEN community tourism project was first established to resist the forced removal of three communities after whom the project is named – the KwaDapha, eMalangeni and Nkovukeni (KEN) settlements – from the area which was declared the Kosi Bay Nature Reserve in 1987.<sup>1</sup> This nature reserve falls under the jurisdiction of the provincial nature conservation authority, now known as Ezemvelo KwaZulu-Natal Wildlife (EKZN Wildlife). The KEN settlements comprise three small villages with a dispersed settlement pattern, lying within an area of approximately 100 square kilometres (km<sup>2</sup>) (Turner 2000).

The KEN camp is located within the Kosi Bay Lakes Ramsar Site in an area known as Maputaland (Figure 8.1). This was formerly part of the ‘homeland’ of KwaZulu, and is divided into 14 Tribal Authorities (TAs). Maputaland comprises roughly 8 000 km<sup>2</sup>, stretching from Lake St Lucia in the south to the Mozambique border in the north. The Indian Ocean lies to the east, with the Lebombo mountains and Swaziland in the west. In 1996, the total population of the region was estimated to be 300 000, but is likely to be substantially larger at present.

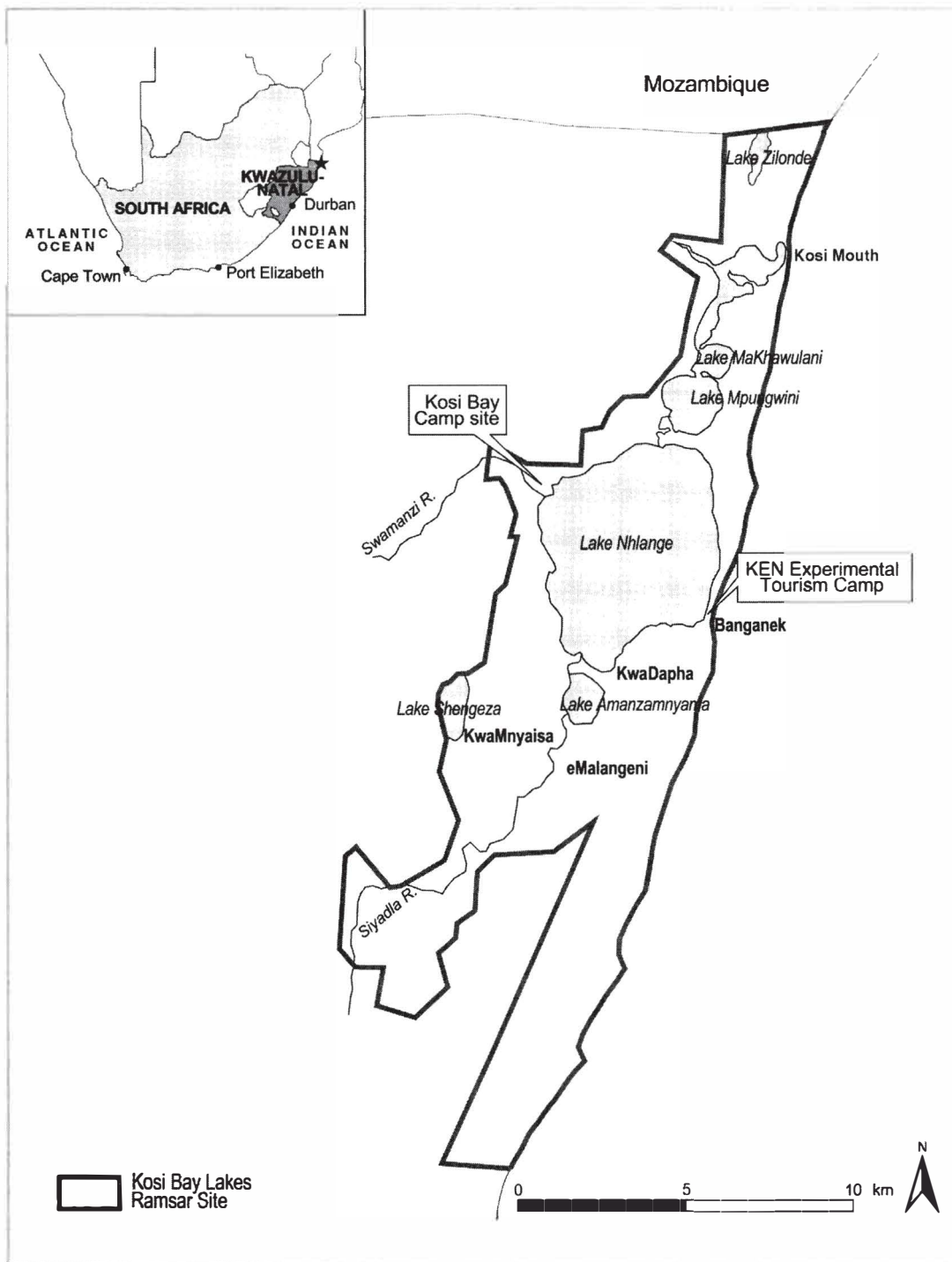
The Kosi Bay Lakes system consists of four inter-connected lakes, as well as swamps, pans and marshes, stretching over 12 km and emptying through a narrow mouth into the ocean. The areas of KwaDapha, eMalangeni and Nkovukeni, which form part of the Tembe TA, make up the south-east side of the Kosi lake system. Up to 50 per cent of the Tembe TA area has been rated as having a high conservation value. This includes some 70 per cent of available arable land (CROP 1996). However, due to the fact that the arable land is considered to have infertile soils, high pressure is placed on the high-biodiversity swamp forests.

The KEN camp is located at Banganek, on a narrow spit of land comprising a forested sand dune, lying on the seaward side of Lake Nhlange. The nearest hospital, shops and school are at Kwangwanase, a two-hour walk away to the west of the largest lake. Movement between the villages is mostly on foot. Residents of the KEN settlements are descended from the oldest communities in the Maputaland region, having lived in the area for over 700 years. The unspoilt Kosi Estuary, lake system and splendid natural scenery harbour high levels of biodiversity and the remoteness combines with these attributes to confer an extremely high tourist potential on the area. Until 1999, the KEN tourism facility consisted of a small, rustic tented camp, accessible either by boat across Lake Nhlange or by a 4×4 vehicle.

The KEN community tourism project was established in 1991 to resist forced removals by provincial nature conservation authorities, and to provide an alternative source of income in this impoverished area. It had the approval



Figure 8.1 Map of the Kosi Bay Lakes and the location of the KEN Experimental Tourism Camp



of the local Tembe TA and was supported by the non-governmental organisation (NGO) Community and Resource Optimisation Project (CROP). The removals have been described as a process of ‘removal by attrition’, after the



1987 proclamation of the nature reserve. The idea behind the tourism development project and associated proposals<sup>2</sup> was to put in place as many positive development initiatives as possible to strengthen the position of communities with the intention of regaining control of the land and the resources from the provincial conservation authority. At the time, this was the KwaZulu Bureau of Natural Resources (KBNR), which became the KwaZulu Department of Nature Conservation (KDNC), and has recently amalgamated with the former Natal Parks Board (NPB) to form the KwaZulu-Natal Nature Conservation Services (KZNNCS),<sup>3</sup> now renamed EKZN Wildlife.<sup>4</sup> The KDNC has denied that forced removals occurred, stating that resettlement was negotiated with residents and fair compensation provided (Grossman and Koch 1995). The removal process was discontinued in the early 1990s, and in 1994 the remaining residents were guaranteed land rights and the right to remain within the protected area by the Minister of Land Affairs.

According to CROP, harassment by nature conservation officials, which included threats of arrest, continued into 1993. In 1992, armed game scouts shot and killed a 'poacher' (apparently while resisting arrest) who was caught gillnetting. All of these incidents occurred within a long history of conflict concerning access to land and resources. Pilot tourist trips were begun in 1994, after funding was received from an international aid agency, Medico International. In 1995 the KEN tourism project began operating, although it was still considered to be in a pilot stage. Operations continued until late 1999, when the KwaDapha community took over management of the camp and it was reportedly 'sold' by the KwaDapha *induna* for R28 000 (US\$2 800) to a private entrepreneur, who was subsequently replaced by another private investor in October 1999. Since this date, substantial developments have taken place at the camp without the required planning and environmental assessment approval processes. This chapter describes and analyses the nature of the management process as it unfolded during the original KEN operations, but also refers to more recent developments with both private investors and provincial conservation authorities.

## NATURAL RESOURCE UTILISATION

### Resource use

Visitors to the KEN experimental tourism camp are attracted to the area because of the scenery, remoteness, and the beguiling combination of the lake system, the forests, raffia palms, the beaches and ocean, and the Kosi Bay estuarine environment. While the KEN tourism experience is largely non-consumptive in nature, the activities of tourists do result in environmental impacts. For example, tourists generate solid waste that needs to be disposed

of, use far more water than the local populace, trample sensitive vegetation, disrupt traditional activities and have sophisticated sanitation needs that may place a strain on the natural environment. In addition, the area is renowned for its fishing and these resources are directly targeted by tourists. Many tourists visit the area for game fishing, and often request local people to catch fish for them. While fishing provides an additional source of income for local communities, this is not considered to be significant as domestic tourists in particular prefer to fish unguided. As local communities are highly dependent on fish, with few alternate sources of food and revenue (*pers comm.* R. Kyle, KwaZulu Department of Nature Conservation 1997), tourism development could have a potentially negative impact on livelihoods and nutrition in the area. It does not appear as though this has been the case yet. In fact, the Kosi Bay gillnetting project has reported some success in restoring fish populations in the lakes to abundant levels, and has not discerned any negative long-term trends from recreational fishing, the fish traps or gillnetting to date (see Chapter 6). However, the long-term effects of uncontrolled recreational fishing on fish stocks, such as has occurred due to the recent consolidation of development on the former KEN site, are potentially negative (*pers comm.* R. Kyle, EKZN Wildlife, 2000).

Disruption of the egg-laying activities of two endangered turtle species that nest on the beaches to the east of Banganek is a further possible impact of tourism activities. However, for some years this has been fairly well controlled through guided turtle tours, led by local guides trained by the conservation authorities.

### Access rights

Regarding rights of resource users, there is a long-standing history of informal access rights to local natural resources, as the KEN communities are descendants of communities that have been in the area for hundreds of years. However, local user rights within the protected area are still not clearly defined. Land rights, in particular, are problematic as the area falls under the tribal authorities, and thus within a system of communal tenure. This would normally mean that the relevant tribal authority controls access to land and other resources. However, the traditional land tenure framework is complicated by other factors, such as unresolved issues concerning communal versus individual tenure, and the fact that Kosi Bay falls within a proclaimed conservation area. In addition, the Kosi Bay area falls under the Ingonyama Trust, which was established prior to 1994 as the legal trustee of all tribal land. In terms of this agreement, the board of the trust is vested with the power to refuse or grant development requests on all tribal land in the former KwaZulu 'homeland'. It is not clear how the powers and interests of the Ingonyama Trust, the Tembe TA, the ward and the individual households who hold

traditional rights, are balanced. In 1998, the KEN residents still lacked formal rights to land, and the interests of different stakeholders with respect to land rights had not been resolved. For example, the recent 'sale' of the KEN Experimental Tourism Camp site by one of the *indunas* is clearly not legitimate and has been challenged in a court of law.

### Resource users

The resource users involved in the KEN Experimental Tourism Camp comprised the communities of KwaDapha, eMalangeni and Nkovukeni, as well as the tourists who came into the area. At the time of resistance to removals, the KEN communities consisted of approximately 150 homesteads (at least 700 people). A recent estimate of the population of the KEN wards is 2 500 (Turner 2000). The inhabitants are of Tembe-Tonga origins. While most speak Zulu, many still speak Tonga and support the kinship traditions of the Tembe-Tonga people. The research of David Webster<sup>5</sup> indicated that while the area in which the KEN settlements lie was one of the wealthiest areas of the sub-continent in pre-colonial times, it is now one of the poorest sections of South Africa. A report quoted in Grossman and Koch (1995) describes the people of Maputaland in general as being in a state of 'crisis', due to poverty and being left behind in South Africa's industrial and economic development.

Apart from tourism, other major economic and subsistence activities in the area are agriculture and fishing. Maize and bananas are grown, the latter through slash-and-burn methods that threaten the swamp ecosystems around the lake. These subsistence activities persist without the permission of the local nature conservation authority, which is concerned about their impact on the water quality of the area. Indigenous fishing methods developed over the past 600 years include the system of fish kraals<sup>6</sup> at Kosi Mouth. These kraals are constructed from local wood and binding materials and, in conjunction with the action of the tides, they trap fish moving out of the lakes into the sea. Another indigenous method used is the *xirongo* system, whereby fish are caught in conical traps in pans and rivers on the coastal plains (Grossman and Koch 1995). Villagers also fish on a permit basis using gillnets in the lake (see Chapter 6).

The levels of poverty that exist mean that people are highly dependent on natural resources for their livelihoods. Firewood is collected, fruits are gathered and lala palms are tapped to make a nutritionally rich wine that forms the basis of a flourishing local industry (Grossman and Koch 1995).

### Local knowledge

Individuals within the KEN communities have extensive local knowledge relating to the use of natural resources, and research suggests that past gener-

ations have used local resources in a sustainable manner. However, due to a range of factors, including increased population pressure, earlier traditions of sustainability are falling away. Thus more and smaller agricultural plots are being developed, slash-and-burn methods have resulted in destruction of fertile swamp forests and resource harvesting has become less sustainable (Grossman and Koch 1995).

While indigenous skills and knowledge concerning natural resource management exist, there is very little tourism and management expertise within the KEN communities. Indeed, a primary objective of the KEN project was to provide for the transfer of such skills. However, as noted in an assessment of the project, in 1998 the project was 'falling well short of its mission' (Mafisa 1998). Tourism is a complex and competitive industry, the success of which relies to a large extent on good marketing, positive interaction between host and guest, and high and consistent levels of service. In all of these areas, there was room for improvement within KEN operations. As a KEN community member stated: 'what worries the community is that they are unable to manage the camp on their own, and they are receiving insufficient training to enable them to do that' (GEM/DNFFB 1998, p. 21).

## THE TOURISM ENTERPRISE

### Tourism infrastructure and resources

In late 1998, the KEN Experimental Tourism Camp consisted of the following accommodation structures: three two-bedded tents, one three-bedded tent and one four-bedded rondavel, all with basic furnishings and equipment including bed linen and mosquito nets (Mafisa 1998). Thus a total of 13 beds were available for use by tourists. The tents were erected on concrete platforms. In addition to the accommodation structures, a shack formerly used by David Webster served as a storage space and communal kitchen. Other camp facilities included: one long-drop toilet, one flush toilet, two manual 'bush showers', a reed dining area and a wooden deck overlooking Lake Nhlange. Camp infrastructure appeared to have a minimal impact on natural resources such as the reeds and palm fronds that were used in the construction of structures. Solid waste management was noted to be inadequate (Mafisa 1998) and no pollution studies have been carried out to determine the effects of this or of sanitation facilities on the ecosystem. Large trees were retained in the camp area and provided shade and shelter.

The KEN project owned two hard-bottom inflatable boats with outboard engines, and a 4x4 vehicle for delivery purposes. Although Telkom telephone equipment was installed on the site, this was not operational and there was no electricity. A generator, gas cylinders and paraffin were used for refrigeration,



cooking, lighting and maintenance activities. In general, with the fairly low levels of tourists visiting the camp during KEN operations, provincial nature conservation authorities agreed with the findings of an earlier site visit: the original KEN camp had very little negative environmental impact.

## Marketing

Marketing is a critical activity for community tourism initiatives, as it is for all forms of tourism. It is also an activity that tends to be neglected by tourism-related community development projects.

The KEN tourism project was marketed as an affordable, rustic, low-impact, 'get away from it all' ecotourism experience, that was also owned by the three local communities. Simple brochures were developed which emphasised the unspoilt nature of the camp and the excellent fishing to be had in the area. Initially, the KEN tourism camp was advertised purely by word of mouth. This situation changed when a private entrepreneur, who had an interest in the future development of the KEN tourism facility, provided marketing and a basic booking service between 1997 and 1999 at no charge to the KEN communities. However, the KEN tourism enterprise as such had no marketing capability, nor was it able to process reservations. Reservations were communicated to the camp via the conservation authority's fax at the Kosi Bay headquarters, or by cellular phone link to the camp manager. As pointed out in a recent assessment, this dependency on external support for the critical marketing and reservations function undermined the autonomy and the sustainability of the initiative (Mafisa 1998).

While no statistics are available, the tourists visiting KEN included both domestic and international tourists, with the former being more prevalent. The camp reportedly began operating well in terms of tourism numbers in 1997, and occupancies increased throughout 1998. During the peak December holiday season, tourists were being turned away from the camp.

In the absence of reliable records, an independent assessment estimated an average bed occupancy of 40 per cent and a total gross monthly revenue of R22 000 (US\$2 200). While operating costs were difficult to gauge, this assessment suggested that the camp was generating an operating surplus (Mafisa 1998).

Although occupancy levels had been increasing towards the end of 1998, according to the camp manager's reports there were many incidents of dissatisfied tourists, including tourists who refused to pay the balance of their accounts because of bad service and poor conditions in the camp. This included reports of theft of food, clothing and money, as well as complaints from guests of uncooperative workers. Specific complaints included a lack of hot water and pots, as community members were using these facilities themselves. In 1999, a number of well-publicised hijacking incidents of

tourists occurred – reportedly ten hold-ups within the space of two months. In one incident, a tourist was shot and injured. The perpetrators of this shooting were apprehended, and included local residents.

### Distribution of benefits

The extent of benefits received by the average community member from the KEN tourism camp is uncertain, but does not appear to have been significant. A report by Mafisa (1998) revealed a lack of willingness on the part of stakeholders to disclose this information. In 1998, the camp employed three full-time staff: a camp manager (who was not from the area), an assistant manager and a driver. Other employees consisted of boat drivers, guides, security guards and cleaners, all of whom were drawn from the three KEN wards on a rotational basis. One representative from each of the three communities served on the KEN executive and received a fixed payment, but the frequency of remuneration and the motivation for serving on the executive is unclear. Mafisa (1998) estimated a monthly salary bill of R10 000 (US\$1 000).

The initial motivation for the KEN community tourism camp was to form part of a larger resource development programme as a resistance strategy against forced removals and for income generation (Poultney 1997). As CROP stated, the original idea for the tourism development came from them and did not originate from within the communities. In the words of one of the directors: ‘as a development worker with long experience in Maputaland, I identified tourism as a promising prospect for income generation in many parts of Northern Natal – such as the incomparable Kosi Bay ... The challenge then was to sell the notion of tourism to communities ...’ (Roper 1994, p. 30). However, local Kosi communities were deeply bitter and suspicious of tourism, since their experience of this had been one of direct or indirect alienation from their land, which was then used as a ‘playground’ for wealthy whites.

## LEGAL AND INSTITUTIONAL ARRANGEMENTS

### Legal framework

The legislative framework governing the KEN Experimental Tourism Camp is unclear and has also been dynamic since inception. Both of the provincial conservation agencies that had merged to form the KZNNCS (now EKZN Wildlife) had written policies that promoted sustainable use of natural resources within protected areas and argued the need for neighbouring communities to benefit from the parks. The KBNR, which became the KDNC, paid 25 per cent of the revenue from gate fees for ‘social upliftment’ projects. This was a legal requirement. These amounts were paid to local TAs, an arrangement that was perceived by many, including the KDNC, as unsatisfactory.

Regarding enabling legislation for user involvement in management, the KDNC had developed a framework to allow for the establishment of tripartite alliances between communities, the private sector and Isivuno, the conservation body's business arm. Isivuno survived the amalgamation of the KDNC and the NPB, and was apparently involved in meetings in late 1998 with the KEN communities. These meetings addressed the development of the old KDNC trail camp network. This process is currently being facilitated by a private investor who has maintained an interest in development in the area for some years. The wards of eMalangeni and Nkovukeni are currently engaged in a process with EKZN Wildlife and with the private investor around setting up a new institutional and legal framework for co-management of three of the trail camps. The fourth camp, situated within KwaDapha ward, is not included at this stage.

Since the establishment of the protected area at Kosi Bay, the KDNC was clearly unhappy about people remaining within the nature reserve, but in 1994 land and occupation rights were guaranteed by the Minister of Land Affairs. However, as pointed out, land rights are complex and unresolved and the status of the KEN Development Committee, under which the project was initiated and run until 1999, is not clear. There does not appear to be any agreement in written form between the conservation authority and the communities regarding the KEN Experimental Tourism Camp. Thus there is no simple answer to the central question of who holds the right to develop the site at KwaDapha, on which the KEN camp was located. This situation has led to what has been termed a 'chronically unstable development environment' (Mafisa 1998). However, local boards (in terms of the impending KwaZulu-Natal Nature Conservation Management Act) are in the process of being set up in KwaZulu-Natal in order to jointly manage all protected conservation areas. The local boards embody the collaboration of the conservation authority and affected communities. There are hopes that these boards will promote further involvement and cooperation.

### Institutional framework

The institutional framework clearly needs to be viewed within the uncertain legal context outlined above. After establishment of the KEN community tourism project in 1991, each of the three settlements elected community development committees to form a central KEN Development Committee. The three-member KEN Executive Committee was made up of a representative from each of the KEN wards. Each individual had been elected from the broader KEN Development Committee. The project was reportedly actively supported by a working group of the Tembe TA, although the role of this group was not clear. A working group was also established with nature conservation officials once some progress had been made towards improving the

relationship between the authorities and the communities. Although institutions thus existed for management of the tourism enterprise, there were major institutional capacity building needs.

Decision making concerning the KEN camp was carried out by the KEN Executive Committee. While this was positive, in the sense that the 'resource user' communities were in control of the development, the lack of management, tourism and bookkeeping skills meant that there was little empowerment and no informed decision making. This was recognised at an early stage, and a manager was employed by the *Gesellschaft für Technische Zusammenarbeit* (GTZ)-supported 'Training and Support for Resource Management' programme (TRANSFORM).<sup>7</sup> However, a crisis developed in the management of the camp, as the camp manager's authority was reportedly contested by the KEN executive and other staff members. This apparently extended to daily management issues, resulting in less effective operation of the camp.

In addition, developments since 1998 have indicated extremely high levels of conflict both within and between the three settlements. A significant dynamic was that created by the imbalance in power between the *indunas* of the three settlements. The power base in the area appears to rest with the *induna* of KwaDapha, who is very powerful in the regional TA. As the executive committee member from KwaDapha is a family member of this *induna* (*pers comm.* D. Baker, manager employed by TRANSFORM, 2000) this seems to have resulted in skewed power relations within the KEN executive. In 1999 certain members of the KwaDapha committee, headed by the *induna*, made a decision to take over and run the KEN facility without the other two KEN communities. Thus there appears to be a powerful local elite operating in the KwaDapha area. Recent developments in KwaDapha indicate many different factions within the settlement. This is reflected in the fact that three different businessmen are currently putting up structures in partnership with different KwaDapha groupings.

The importance of the traditional system of governance in the Kosi Bay area has had implications for the way in which the residents have been able to manage conflict. The extremely skewed power relations that exist as a result of powerful traditional leadership elements, mean that local people are not empowered to question local leadership. This has prevented successful management of conflict, which has tended to go underground, with the final result of a splitting apart of the social fabric and the collapse of the KEN project. Turner's (2000) evaluation report suggests that Kosi Bay has no capacity to manage conflict through existing local social structures. This has had extremely negative impacts on the effective management and decision making of the KEN camp, and on the development of more formalised co-management arrangements with the conservation authorities.



## Leadership, management and regulations

Local elites, intimately connected to traditional leaders, have played a leadership role in the KEN tourism project, although in many cases this has been negative. Leadership in rural areas is clearly linked to the interplay between traditional and modern systems of governance. Seven years after the advent of democracy, the role of tribal authorities still remains to be clarified within the current South African system of governance. However, their responsibilities previously centred around the allocation of land rights and the promotion of development within the tribal wards, within the system of traditional or customary law. There are, however, enduring political tensions between democratically elected members of local government and traditional leaders.

There have been allegations of corruption on the part of tribal authorities in Maputaland, with local residents stating that authorities use the profits generated by game reserves for personal use, such as expensive motor vehicles, rather than for community development projects or facilities such as schools and crèches (Koch 1994). This may be the case for some of the tribal authorities operating in the KEN area, but certainly not for all.

A further issue complicating the developmental context concerns political agendas. KEN constituted a separate power base from the tribal authority, and was not part of the traditional power play or customary practice of governance. It seemed to run independently of the tribal authority until events in 1999 that saw it fall under the control of the *induna's* family.

Responses from interviews in the area indicated that many residents were fearful of the powerful family of the local elite. Others felt that the KEN Executive had failed to provide a strong leadership role. One respondent noted that power and control over large amounts of money appeared to have had an increasingly negative effect on the executive as time went by. Women were represented on the KEN Development Committee, although it is not clear in what proportion, and only one of the members of the KEN executive committee was a woman. In practice gender equity in leadership and decision making was very poor (Turner 2000).

Employment at the camp was regulated through a system of rotation between the three wards. This system was apparently devised by community members. While the system was positive in the sense that the limited employment opportunities were shared equally between the three wards, it did not promote effective camp operations. The rules governing distribution of project benefits to community members, represented by the development committee and the executive, are not clear. The functioning of the entire operation could have been improved through a system of checks and balances on the activities of the executive. Advice provided by the camp manager was very often ignored, meaning that this management function was not able to ensure that

informal and formal rules concerning acceptable behaviour for staff members were followed. Much depended on *ad hoc* decisions taken by the executive and other staff members. The manager became frustrated by the high levels of consultation that were a characteristic of daily operations. It was suggested that the power of one of the *indunas* and his family had a negative effect on the operation of the project since people were more likely to keep quiet about financial and other transgressions.

Many stakeholders expressed reservations concerning the financial accountability of the executive. An assessment of the project could not reveal clear recording and reporting of financial matters, and no accounting books were made available (Mafisa 1998). Effective financial management and monitoring procedures were not operational. The conservation authority played no role in enforcement of any regulations concerning the tourism operation, but did enforce regulations relating to associated activities of recreational fishing, as well as the use of gillnets on the lake by subsistence fishers. However, the conservation authority has been unable to control past and current developments, which have seen the illegal construction of structures by three different developers in the KwaDapha area without formal planning approval or environmental assessment. This situation within a proclaimed nature reserve has been described by one conservation staff member as 'entirely embarrassing'.

### Role of resource users in management

Resource users were not formally involved with provincial conservation authorities in making rules about access to and use of resources. However, in effect they were responsible for water and waste management at the camp and control over tourist activities within the sensitive ecosystem. These management activities may be seen as an informal framework of rules. More formally, members of the KEN communities who were trained as turtle guides were responsible for enforcing the rules of the provincial nature conservation authority with regard to the behaviour of tourists. By all accounts this was functioning effectively at the end of 1997. There were, however, reports subsequently that some KEN residents were killing turtles in response to their dissatisfaction with the selection process for turtle guides, but the extent and frequency of this is not known.

The issue of involvement of resource users in protecting resources from over-exploitation is a complex one, since tourism impacts on many different natural resources in different ways. While there is no clear answer to this, the current situation of *ad hoc* allocation of 'development rights' in the KwaDapha area points towards exploitation rather than protection, at least on the part of local elites.

### Role of government in management

A number of different levels of government have been involved in some way in the KEN tourism camp. Provincial conservation authorities and the local TAs have been the most visible organs of government linked to the KEN project. However, national government also has a stake in development in the area through the Lubombo SDI.<sup>8</sup>

A further agent involved in Kosi Bay was Isivuno, which was the KDNC's business arm. This was a section 21 (not-for-profit) company set up to facilitate tripartite investments for conservation and/or development initiatives between the KDNC, communities and private sector operators. Isivuno does not appear to have played a major role in the Kosi Bay area, although it was centrally involved in the establishment of a community-public-private partnership in the Ndumo Game Reserve, located to the west of Kosi Bay.

EKZN Wildlife is currently the provincial conservation authority responsible for resource management in the area. In general, there are a number of indications pointing to sub-optimal cooperation between different government entities operating in the Maputaland area. In addition, there was a lack of interaction or alignment with regional development planning. One forum that was intended to pursue this was the Northern Maputaland Tourism Development Association, but this did not appear to be active. The regional authority for the area is the Uthungulu Regional Council (URC), which does not appear to have played a major role in the KEN tourism development. This may be traced to lack of clarity concerning whether the Regional Council's jurisdiction included development within the protected area. The Tembe TA is a part of the URC, and is thus in theory involved in the planning processes undertaken by the council. The TA is also involved in issuing Permission to Occupy certificates (PTOs), which remain the basis for individuals obtaining access to tribal land (Collins 2000). A further complication is the formation of a breakaway group within the Tembe TA, the Madingi Committee, which claims to be the 'true tribal authority' for Kosi Bay and the Coastal Forest.

While responsibility for overall governance in the Kosi Bay area appears to be unresolved, it is clear that EKZN Wildlife is responsible for conservation and environmental management functions in the area. However, the organisation is understood to be weak on the ground and is currently unable to control illegal development occurring in KwaDapha. The perceptions of local communities concerning the conservation authorities have been extremely negative, as these authorities are seen to be illegally occupying land that previously belonged to residents in communal tenure. While the conservation authorities claim some improvement in relations, this is not clear. In the past there have been meetings between the conservation authorities and local communities to discuss resource management issues, but this has not resulted in effective measures concerning tourism development.

In summary, support from any level of government to the KEN tourism group was limited. Hopefully, this situation will be different for the new Kosi Bay trails camp development currently under discussion. However, the lack of an effective, accountable local government structure is a major constraint to effective tourism development in the area, as it is critical that nature conservation and ecotourism planning are an integrated part of local development planning. Currently, and when and where it occurs at all, this integration is extremely limited (Turner 2000).

### Involvement of external agents

The isolated location of Kosi Bay served to increase the dependency of development initiatives in the area on outside organisations and individuals. The major external agents involved in the KEN Experimental Tourism Camp were the NGOs CROP and Interface Africa, the funding and technical support agents TRANSFORM, the Independent Development Trust (IDT)<sup>9</sup> and private investors.

As mentioned earlier, the KEN Development Project was initiated in 1991 with the support of CROP. As an NGO, CROP played a strong role in project management and implementation in the early years of operation of the KEN project, and was also responsible for lobbying for funding for the KEN project. As a result of these activities Medico International granted KEN the sum of R171 720 (US\$17 172) in 1993. This grant funding was routed through CROP, and used to purchase equipment for a 'multi-functional centre' (the KEN camp). To this end the money was used to buy a vehicle and a boat for the camp, to cover the salary of a driver and cover vehicle running costs, and it paid for a feasibility study.

In 1995, the TRANSFORM project began to provide financial and facilitatory support to the KEN project. It is unclear how much funding was provided between 1995 and 1999, when the organisation, after an assessment of the effectiveness of its intervention, ceased support for the KEN project. Between 1995 and 1999, funds from TRANSFORM were paid directly into a KEN account for which the three-member executive had signing powers. The TRANSFORM funding was intended to be used mostly for training and capacity building for KEN members. However, it appears that very little effective training took place. As a report for TRANSFORM noted: 'Kosi Bay shows very little progress in developing the necessary technical skills, despite the efforts of TRANSFORM and other agencies over many years to build 'community-based' ecotourism ventures there' (Turner 2000).

Interface Africa is an organisation that was contracted by the TRANSFORM project to provide ongoing facilitation and training support to the KEN project once CROP had withdrawn. Thus the organisation was involved in the KEN project from May 1998 to December 1999. There have been



suggestions that while the intentions of Interface Africa were good, its success may have been limited as the tourism support required did not fall within its core business.

The IDT was also involved in providing support to the KEN project at some stage. This was apparently in the region of R20 000 (US\$2 000), and there appears to have been some confusion as to what was done with these funds and even whether they were ever spent. The private investor who has been involved with the KEN communities since 1995 estimates spending between R100 000 (US\$10 000) and R200 000 (US\$20 000), with no obvious return, in providing marketing and other support.

There was potential for good integration between the Lubombo SDI, under whose umbrella Kosi Bay falls, and the KEN project as the Lubombo SDI project manager was also involved in the KEN project from the early days as a CROP member. However, this potential has not yet been translated into action on the ground. There are reports that some key stakeholders felt alienated from the SDI process, which was the case for the Uthungulu Regional Council at the end of 1999 (Collins 2000). The arrival of the SDI 'fast train' in the area also led to tension between the communities and CROP, with KEN members feeling that CROP was holding them back from potentially more beneficial development opportunities to be accessed through the SDI process.

While there is no formal figure for the total amount of grant funding from different sources that was given to the KEN tourism initiative from 1993 to 1999, it was certainly a sizeable amount. One stakeholder estimated that this figure could be in the region of R2.5 million (US\$250 000). Whatever the figure, there is no doubt that significant resources were poured into the KEN project. In terms of external resources, an undeniable constraint is that assistance occurred in an uncoordinated and haphazard fashion, with the communities often feeling that they were not in a position to refuse this support or to direct it in a more optimal way (Collins 2000).

## DISCUSSION AND ANALYSIS

The fact that the KEN tourism enterprise was initiated as a vehicle to further tenure claims, and not as a commercial venture, hampered it from the start. The major incentives for establishing the venture were a desire on the part of KEN residents to gain secure tenure to their land and to resist removals from the newly proclaimed protected area. The KEN communities were intensively supported by CROP in the early days. The provincial conservation authorities, however, were not involved in the initiation of this project. On the contrary, the project was initiated to resist the strategy of the conservation authorities. Thus, the project began within a confrontational context.

## Key obstacles and weaknesses of the KEN project

Many obstacles related to implementation of the tourism management regime have already been noted in this chapter. Key implementation obstacles are summarised below:

- The directly confrontational relationship between communities and nature conservation officials, stimulated by the removals process;
- Conflict between NGOs and other development agencies active in the area;
- Lack of coordination between different stakeholders (government/private sector/NGO/community);
- Extremely tense power relations and conflicts between different stakeholders, and an inability to manage this conflict;
- The linking of the three KEN wards in the project – while this made sense from the point of view of resistance, this grouping began to fall apart as the orientation of the project changed from one of resistance to one which promoted an economically viable and environmentally sound development;
- Few benefits flowed to community members from the KEN tourism project;
- The tourism initiative's lack of a strategic business focus;
- Low level of tourism and management-related skills of the KEN residents;
- Lack of accountability in dealing with finances on the part of the executive;
- Manager with skills was not able to manage effectively;
- No clear training and capacity building framework and schedule;
- Initiation of the project as an operational venture before the required skills and necessary rules to govern operations of staff and managers were in place;
- Imbalance of power within traditional authorities; and
- Lack of interaction or alignment with regional development planning.

One of the major factors contributing to the failure of this initiative has been the lack of commitment on the part of government, in the form of the earlier conservation authorities, to support any possible co-management arrangement, as they were fundamentally opposed to the KEN settlements remaining within the nature reserve. While this confrontational relationship has changed over time, with the realisation on the part of the provincial conservation authority that it needed to work with the KEN residents towards better and joint management of the area, there was little, if any financial, human or institutional support to the KEN tourism development process. Thus one may wish to question whether the authority ever had any intention of providing genuine support, and making a concerted effort to turn around the polarised situation in the area and work in true partnership with the KEN communities, in an attempt to make the original KEN Experimental Tourism Camp a success.

One of the negative implications of the conflicting and ineffective management systems in the Kosi Bay area has been the proliferation of illegal development on the eastern side of the lake in the KwaDapha ward. This haphazard and uncoordinated approach to development has potentially negative ecological effects as well as associated social impacts, such as the retention of benefits arising from the development by local elites. While the KZNNCS, now EKZN Wildlife, has obtained a court interdict against the current developer of the original KEN site, this has not been enforced. Development has reportedly included extensive clearing of natural vegetation to develop a 64-bed facility (as opposed to the 13 beds of the original KEN facility), and visual impact is already apparent from the lake (*pers comm.* R. Kyle, EKZN Wildlife, 2000).

While operation of the original KEN camp did not appear to cause degradation of the resource base on which the development depended, subsequent activities (such as the uncontrolled development of tourism facilities currently occurring in the area) mean this is becoming a distinct possibility. Some of the subsistence activities of the KEN residents, as discussed above, have resulted in negative and, in the case of the destruction of areas of swamp forest, seemingly irreversible ecological impacts. These activities are clearly against the regulations of the local and national conservation authorities. However, these regulations (and the authority of the relevant conservation organisation to enforce them) have not been seen as legitimate by KEN communities. It remains to be seen whether current discussions around establishment of a co-management regime between communities and EKZN Wildlife for running the trail camp system will be more successful in turning around these deep-seated perceptions.

Users clearly did not have the capacity to execute management responsibilities, and were not willing to take advice from the appointed manager. While users participating in the KEN structures did indeed have ultimate authority for management of the KEN facility, there are questions around the representivity and legitimacy of management structures. The KEN Development Committee and its executive were apparently elected in a democratic fashion. However, the power relations between different elements, and the overwhelming power of a local elite closely linked to traditional authority, meant that the systems did not operate democratically or in an accountable fashion.

A critical weakness, as identified above, was the lack of effective capacity building and skills training for KEN residents. Furthermore, there does not appear to have been any attempt to provide the necessary training for nature conservation officials to enable them to support and work together with the KEN communities. Such training should have included sessions on re-orientation and conflict management, to help officials move away from their old style of management towards a more developmental and facilitative approach.

## Key positive developments and successes of the KEN project

The obstacles and weaknesses summarised above paint a grim picture of the KEN operations. Further, the KEN tourism facility has ceased to exist, with current developments on the site involving only certain elements of the KwaDapha community. However, during the operation of the KEN project, various positive developments could be noted.

Firstly, the KEN communities, supported by CROP, were successful in retaining their land and resisting removals. It is contentious, however, to ascribe this success causally to the establishment of the community tourism venture. Secondly, the KEN Experimental Tourism Camp was a pioneering project that played a significant role in putting community tourism on the development map in South Africa. Thirdly, the KEN residents were able to access equipment such as boats and a vehicle that provided them with a means to improve their livelihoods through tourism development.

Perhaps the most significant success has been the political benefits that have been gained, as KEN residents have been guaranteed land rights and occupation rights. However, this is not so much a result of the management system than of the resistance strategy adopted and the change in government in South Africa in 1994. Nevertheless, tourism development was at least a catalyst for this achievement. However, six years after land rights were guaranteed by the then Minister of Land Affairs, there is still no clear policy or strategy for providing unambiguous tenure of land and natural resources in communal areas, and KEN residents still lack formal land tenure (Turner 2000). Land ownership is clearly a prerequisite for external investment in the area to establish community-public-private partnerships for ecotourism development, and will impact negatively on the future of legitimate developments in the area.

Although the KEN development and management system was not characterised by effective resolution of original conflicts, there is hope that all stakeholders have learned from the negative experiences, and that conflict will be better managed in the new trail camp development. As EKZN Wildlife and the communities of eMalangeni and Nkovukeni are currently in the process of negotiating a joint ownership and management regime for the trails camp network, this may be seen as a sign of better communication and improved relations between these stakeholders. However, no conclusive statements can be made at this stage. This negotiation process is currently being facilitated by the original investor who provided marketing and other support to KEN, thus indicating a nascent partnership between the three sectors of government, community and private sector. A relationship has thus been established between the private sector on one hand, and communities and government on the other hand, through the KEN process. However, much depends on the ability of communities and government in this area to work in true partnership in the future.



While there are a number of steps during implementation that were potentially critical for the success of the project, unfortunately many of these were not capitalised upon. Critical steps include the following:

- Strong support from an NGO (i.e. CROP) in the early stages of development – however, this created a dependency on CROP, who lacked the necessary tourism skills and experience;
- Linkage with the national Department of Land Affairs (DLA) through the TRANSFORM programme – however, the DLA does not appear to have been sufficiently supportive and the promised training and capacity building through TRANSFORM was never effectively implemented. This may have had much to do with the lack of accountability of the KEN executive for funds received from TRANSFORM for this purpose;
- Initiation of the Lubombo SDI mid-way through the KEN operations provided the possibility for coordinated local development planning – however, internal KEN problems hampered effective integration into this development strategy, and the SDI has itself not been able to deliver direct benefits to date; and
- Appointment of a skilled tourism manager – however, the manager was not permitted to manage effectively, and advice was frequently not accepted.

### KEN as a form of co-management?

While the KEN Experimental Tourism Camp may in some ways be seen as the precursor for more formal cooperative management projects currently under development in the area, it cannot itself be considered a co-management arrangement. While there was a high level of user participation in decision making, as the camp was community controlled (after the initial years), users (i.e. the KEN residents and the executive) were not involved with government in management functions and decision making. In fact, as highlighted above, the initiative began as a resistance strategy to the conservation authorities. There were, however, attempts to move the arrangement towards co-management, and this intention was stated by CROP at the National Workshop on Coastal and Fisheries Co-management in mid-1997 (EEU UCT 1997). At this stage, activities that could have been precursors to co-management, such as information sharing, consultation and communication between the nature conservation authorities, CROP, KEN communities and a private investor, had begun but had not developed into true cooperation and no joint actions were taken between communities and government.

The management regime for tourism activities at Kosi Bay can be conceptualised as one of two opposing management systems that struggled to find common ground. The ‘formal’ system comprised of government management

of tourism activities at the conservation authority-run campsite to the west of Lake Nhlange, and for conservation activities throughout the nature reserve. On the other side of the lake, a system of community-based management was in place for tourism activities at Banganek and in the KEN wards. However, initially this was supported to a large degree by CROP, and financial resources were secured from a range of funders. While the KEN communities did obtain full management support from CROP, initially they were not able to manage the project in a coordinated, systematic and effective manner, leading to the eventual collapse of the venture.

Allocation and regulation of resource utilisation is less simple for tourism, as a wide range of natural resources combine to create the tourism experience. Clearly, in terms of land allocation, the development was seen as a way to leverage the recognition of land rights. While these have been guaranteed by the DLA, a formal mechanism has not yet been put in place to grant rights to resident communities. Thus, official ownership still resides with the conservation authority and ultimately the state. Land claims have been lodged by KEN communities, but their status is unclear – according to EKZN Wildlife, they have not yet been officially tabled (Turner 2000).

### Lessons for future tourism co-management initiatives

Co-management may be seen as a continuum running from completely community-based management approaches to those in which government has total responsibility for management. The KEN Experimental Tourism Camp was an example of community-based management, although strongly supported by various external agents. However, the opportunities to move towards greater involvement of government were never optimised. Despite the fact that KEN cannot be viewed as a co-management initiative, some key lessons can be distilled from the KEN experience for future tourism co-management initiatives. Note that many of these have been identified through their absence from the KEN management system. In summary, supporting conditions for tourism co-management are:

- Mutual trust and transparency and manageable levels of conflict between stakeholders;
- Capacity on the part of users to carry out management responsibilities, or a well thought out capacity building strategy, with sufficient dedicated resources, accompanied by interim arrangements that will provide effective management until local resource users are able to take on these responsibilities;
- Good communication through formal channels between stakeholders;
- A lead-in period during which potential problems are identified and strategies developed to address these. The lead-in period should also include

extensive workshopping of all stakeholders so that the principles of co-management are understood;

- Clear allocation of roles and responsibilities before operations begin, and genuine acceptance of these on the part of all stakeholders; and
- Commitment on the part of all stakeholders to making the co-management process work.

It is clear from the above criteria that tourism development which involves impoverished rural communities with low levels of tourism-related skills and management expertise in a true co-management arrangement needs to be conceptualised as a long-term development approach. It is equally critical that a business-like approach is adopted in the management of the facility. This will improve the chance of long-term sustainability. Additionally, tangible benefits need to flow to resource users within a relatively short time period. This necessitates an incremental approach that merges developmental and economic viability imperatives, within an ecologically sound framework. The KEN experience highlights that this is not a straightforward process, and should not be attempted by the fainthearted.

## CONCLUSION

The KEN Experimental Tourism Camp proved to have insurmountable obstacles and too few skills to overcome these. However, it remains a pioneering project that was visionary in its approach, and led the way for other community-based tourism developments or co-management arrangements for tourism in the area. While it is regrettable that it was unable to make the transition to a long-term and sustainable enterprise, there is hope that pending developments in the Kosi Bay area will be more successful. This will, however, require concerted action and strong leadership from government at the highest level to halt uncontrolled activities and address, as a matter of urgency, the land tenure question. A critical step will be to address the ongoing disempowerment and critical lack of institutional capacity of the KEN wards. Only when strategies have been put in place to address these key issues, will government, communities and the private sector be able to work in partnership towards enhanced quality of life and sustainable resource management in Kosi Bay, the 'jewel of Maputaland'.

## ACKNOWLEDGEMENTS

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## NOTES

- 1 This nature reserve is now part of the Greater St Lucia Wetland Park (see Chapters 5 and 6).
- 2 These included environmentally sensitive market gardening and craft work with other Small Medium and Micro Enterprises (SMMEs). Projects were to include the integration of indigenous knowledge and resource management systems through practical application (CROP 1996).
- 3 This amalgamation was initiated after incorporation of the 'homelands' into South Africa subsequent to the transition to democracy in 1994.
- 4 All reference to the amalgamated KwaZulu-Natal provincial conservation department since 1998 will be referred to as EKZN Wildlife.
- 5 David Webster was an anthropologist and political activist who was engaged in long-term work in the area. He was assassinated by apartheid security forces in Johannesburg in 1989.
- 6 Kraals are literally pens or corrales – small enclosures.
- 7 TRANSFORM provided vital support to the KEN community tourism project.
- 8 The SDIs (spatial development initiatives) are strategic attempts by the national Department of Trade and Industry, in conjunction with the private sector, to unlock the inherent development potential of specific geographical areas in the Southern African region.
- 9 The IDT was a parastatal development agency set up by government during the apartheid years. The IDT underwent massive transformation post-1994.

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Hut accommodation for tourists at the KEN Camp (Chapter 8).

*Photograph Penny Urquhart*



The stern of a trawler fishing for hake off the west coast of South Africa (Chapter 9).

*Photograph Marine and Coastal Management*





Guided canoe trips up the Mtentu River (Chapter 7).

*Photograph Chanan Weiss*



Fly-fishing boats on the Mtentu River (Chapter 7).

*Photograph Maria Hauck*





Sokhulu collectors, participating in an experiment to determine sustainable harvest levels at the subsistence zone, use the agreed collecting tool and standard bags which are colour-coded to facilitate experimental design (Chapter 4).

*Photograph George Branch*



Diagrams and models are used to interpret research and monitoring results and for sharing information at monthly Sokhulu joint committee meetings (Chapter 4).

*Photograph Maria Hauck*





Two people setting a gillnet in the margins of Lake Nhlange (Chapter 6).

*Photograph Scotty Kyle*



Four Lake Nhlange netters and a catch monitor talking and examining catches (Chapter 6). *Photograph Scotty Kyle*





Monitors being trained in fish identification (from left to right: Sipho Ngobese, Bruce Mann, Mduduzi Mlungwana, Zodwa Msweli and Zagheous Mdluli) (Chapter 5).  
*Photograph Caroline Fox*



Gillnet monitors Zodwa Msweli and Mduduzi Mlungwana record the daily catch at Nkundusi (Chapter 5).  
*Photograph Bruce Mann*





Successful *Gracilaria* farming is practiced in Luderitz, Namibia. Here workers harvest lines of the seaweed from a small boat (Chapter 10).  
*Photograph Rob Anderson*



Workers threading *Gracilaria* into netting lines at Saldanha Bay, for an experimental farming attempt. This low-tech activity is fairly labour-intensive (Chapter 10).  
*Photograph Rob Anderson*





A group of self-proclaimed poachers from the Proteadorp community (Chapter 11).

*Photograph Reneé Hector*



Members of the 'poaching' group with their first legal catch of rock lobster, through the experimental quota (Chapter 11).

*Photograph Reneé Hector*





Fishers preparing their nets for a fishing trip at the Olifants River estuary (Chapter 12). *Photograph Genevieve Maharaj*



Local Ebenaeser fisher with his catch at Olifantsdrift, Ebenaeser (Chapter 12).



# Industry-Government Co-management Arrangements in the South African Offshore Demersal Hake Fishery

*Trevor Hutton*



One of the new breed of stern trawlers operating in South Africa's hake fishery.

*Photograph Marine and Coastal Management*

## INTRODUCTION

This review considers the extensive industry-government co-management arrangements that have formally and informally characterised the commercially exploited deep-sea fisheries off the coast of South Africa over the past five decades. These arrangements have evolved out of the close working relations that were initiated after the Second World War, when the government actively concerned itself with the objectives of developing the fishing industry in South Africa. These extensive institutional arrangements were more formally institutionalised, subsequent to the 1970s, setting in place various interactions between the major commercial fishing sectors and the government's fisheries management bodies.

An important aspect of these industry-government co-management arrangements is that they existed prior to the usage of terms such as 'co-management'. Common usage of the term 'co-management' in the literature occurs from the 1980s and the early 1990s (see e.g. Amend 1989, Berkes 1989, Berkes *et al.* 1991, Dubbink and van Vliet 1996, Jentoft 1989, Jentoft and McCay 1995, McCay 1989, Pinkerton 1989, Pinkerton 1994). However, the co-management arrangements between the industry and government in South Africa fall directly within the bounds of the internationally recognised definition of co-management, since a formal partnership agreement exists between the users of the resource (harvesters) and the management authority. The management authority is generally accepted to be the Minister and government department responsible for fisheries. While some co-management projects involve the users being grouped within fishing communities (e.g. Donda 1997), it is well accepted that co-management can occur between government and user associations (industry associations, representative gear groups and fisher's organisations) (e.g. Amend 1989, Jentoft 1989). Thus this study does not review a 'co-management' project *per se*, but examines the nature of the management arrangements between government and the fishing industry in South Africa.

Although there is a history of joint participation in the management of certain fish stocks, the final decision under South African law inevitably rests with the management authority (Hutton and Pitcher 1998).<sup>1</sup> In this circumstance joint participation reflects the numerous occasions where the industry played a joint role in the decision-making process. As is the case with many other nation states, the government has decisive responsibility for and ultimate authority over the sustainable management of fish stocks. The concept of the 'government as the responsible manager' has developed out of clauses negotiated under the Law of the Sea Convention (United Nations 1982), and these principles have now been embodied within the South African Constitution (Department of Constitutional Development 1996). As far as past regulations were concerned, the Diemont Commission (Diemont *et al.* 1986) recom-



mended that control of the fishing industry should be a responsibility of central government. This was in line with Roman Dutch law, adopted after the British influence on legislature and jurisprudence in the country, in that the state exercised jurisdiction over territorial waters.

Hutton *et al.* (1997) and Hutton and Pitcher (1998) consider the relevance of co-management arrangements to South African fisheries in general. The local fishing industry associations are a critical aspect of the government-industry co-management arrangements in South Africa. Since 1934, these associations have played a major role in fisheries management. Hutton *et al.* (2002) consider the importance of the extensive government-industry arrangements within the hake fishery that are reviewed in this chapter. Important aspects of this fishery are reported here, recent developments are reviewed, and the impacts of the implementation of new legislation on the industry-government co-management arrangements are considered.<sup>2</sup>

## THE DEEP-SEA WEST COAST HAKE FISHERY

The dominant fisheries in South Africa target the demersal and pelagic stocks. Most of the demersal catch consists of hake (*Merluccius capensis* and *M. paradoxus*), which occur on the south coast over the Agulhas Bank and on the west coast. The distribution of each species is depth-dependent; *M. capensis* occurs in shallow water while *M. paradoxus* is a deep water species (Botha 1973). The deep-sea fishery operates on the west coast, and in waters deeper than the 110 metres (m) isobath on the south coast. A small inshore fishery operates over the shallower Agulhas Bank on the south coast.

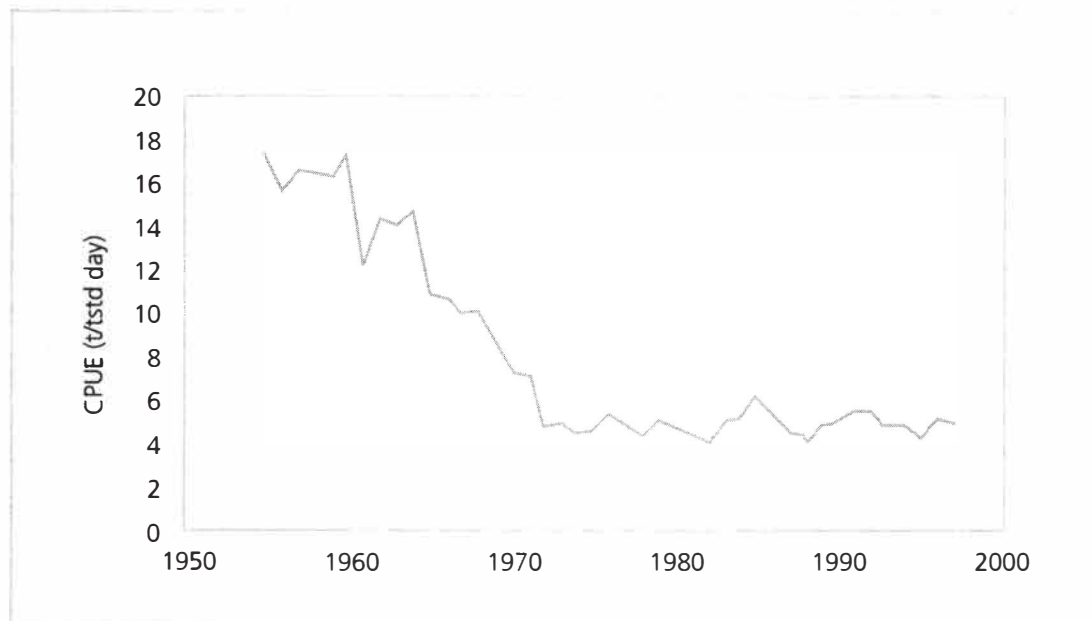
The South African demersal trawl fishery developed in the early 1900s as a sole-directed fishery (De Jongh 1974, Muller 1938). The annual hake catch had increased to about 1 000 tonnes (t) by the end of the First World War (Payne and Punt 1992). From 1932 onwards, the mainly sole-directed fishery began taking a larger amount of hake. By the end of the 1940s, the hake catch was approaching 60 000 t. Foreign trawlers from several countries began fishing in the south-east Atlantic and by 1972 achieved a maximum recorded annual catch of just over 1.1 million tonnes (Payne and Punt 1992). This resulted in a further decline in the catch rate (catch per unit of effort (CPUE), see Figure 9.1) and concern regarding the over-fishing of the resource increased. The International Commission for the South East Atlantic Fisheries (ICSEAF) was established in 1972 and one of its objectives was to investigate and control the international hake fisheries off the South African and Namibian coasts (Andrew and Butterworth 1987).

The reduced catch rate forced ICSEAF to introduce an observer programme and allocate quotas to member nations and change mesh size regulations (in 1975 the minimum mesh size was increased from 102 to 110



millimetres (mm)). The South African government declared a 200 nautical mile Exclusive Economic Zone (EEZ) on 1 November 1977, forcing foreign fleets to withdraw from South African waters. National individual quotas were introduced in 1979 and the apportioning of these individual quotas was based on catch history. This process was undertaken in consultation with the industry. A conservative rebuilding strategy for hake (which included the cooperation of the industry) was set in place in 1982 and the result was a halt to the declining catch rates. The management strategy also resulted in annual hake catches by the South African fishing fleet remaining fairly constant over the period 1982 to 1991, averaging 138 000 t per year for both the west and south east coast fisheries. The hake Total Allowable Catch (TAC) for both coasts has since increased to a current annual level of more than 150 000 t. In addition, various bycatch species are landed (e.g. kingklip (*Genypterus capensis*), monkfish (*Lophius piscatorius*), angelfish (*Pomacanthus spp.*) and snoek (*Thyrsites atun*)).

Figure 9.1 The hake estimated CPUE from 1955 to 1997 in ICSEAF division 1.6 (the west coast of South Africa)



Source: Data from Geromont and Glazer (1998), Leslie (1998)

Current scientific TAC recommendations for the South African hake fishery are based on a dynamic production model estimation procedure that utilises catch, CPUE and survey biomass data (Butterworth *et al.* 1992). Since 1996 the CPUE trend has been standardised with a General Linear Model (GLM) taking into account fishing vessel power factors, indicating that the CPUE has not changed much over the last few years (Figure 9.1).

## The fishing fleet

The local trawl fishery was initially based at Cape Town, but in the late 1960s it also became established at the port of Saldanha. Fishing effort is directed mainly on the 'trawl grounds' off the west coast which run north-south along the 200 m isobath and are referred to as 'the banks'. The characteristics of the vessels are such that the deep-sea fleet consists of about 25 wetfish vessels (fish are laid on ice) and 36 factory vessels (some with freezers and/or processing capability). As of 2000, the vessels have an average age of 20.4 years. All the vessels are stern trawlers with an average length of 54.1 m. In comparison, in the inshore fishery there are 35 small trawlers with an average length of 23 m. Wetfish vessels remain out of port for about six days, whereas factory vessels remain at sea for up to two months. On average, wetfish vessels land 50 t whereas factory vessels can process fillets on board, typically processing a catch of 500 t in 40 days. The factory vessels have an average crew size of about 46, whereas the average size of the crew on the wetfish vessels is 25 (Stuttaford 1994).

The deep-sea fleet has a combined tonnage of at least 50 000 t, which had a replacement value of R400 million (US\$40 million) in 1993 (SADSTIA/SECIFA 1994). The total fixed investment in 1997 for the trawling sector for vessels, equipment, machinery, buildings, vehicles, etc. was estimated at R273 million (US\$27.3 million), with a replacement value estimated at R1 022 million (US\$102 million) (MTG 1998). This includes investment in the catching, processing, storage and distribution divisions. There are 58 land-based factories processing fish landed by the trawl fishery (SADSTIA/SECIFA 1994). The 'offshore' deep-sea trawl fleet captured 88.3 per cent of the demersal fish in 1994, and this reflects the importance of this sector. A new sector in the hake fishery is the longline sector. The demersal trawl fishery is the dominant fishery; however, if we consider the increasing number of applicants for longlining, then the trend strongly suggests that the hake longline sector has the potential to grow in South Africa. The trawl-based fishery requires a large capital outlay as the industry has extensive land-based processing facilities, whereas longlining is a less capital-intensive method of fishing than trawling and is seen as a means whereby access to the hake resource can be broadened within the government's objective of redistribution and re-structuring.

## The market for Cape hake

About two-thirds of the demersal catch is landed in order to be further processed in extensive shore-based facilities. The balance is processed into marketable products aboard factory ships at sea. The whitefish industry has developed an extensive international market with the development of high value products.<sup>3</sup> The trawling industry supplies the majority of fresh and

frozen seafood consumed in South Africa. Consumers in South African supermarkets now have a choice from a wide selection of natural and processed hake: fillets, steak, loins, portions and sticks, breaded, battered and sauced products (Anon 1997).

The major fishing companies play a dominant role as they have established markets and networks of contacts. These companies have facilities for storage, processing and marketing and the products are marketed country-wide as fish products are transported by road and/or rail. They directly or indirectly supply the four major food retailers and the catering or food service industry. About 40 to 50 per cent of the hake catch is exported (Anon 1997). Exported prime quality hake had a selling price of R10.42 (US\$1.00) per kilogram (kg) in 1996, whereas processed fish on the South African market had an average (1996) selling price of R5.99 (US\$0.60) per kg (MTG 1998). Line-caught hake can sell for as much as R28 (US\$2.80) per kg (export price, 1999) on international markets depending on the exchange rate and the quantity that is being marketed. In 1997, the overall revenue from trawling was estimated to be in the region of R725 million (US\$72.5 million) (MTG 1998). Of this, the export revenue generated from selling unprocessed and processed hake was estimated to be R327 million (US\$32.7 million) (MTG 1998). Only 1.5 per cent of the international whitefish market share is 'controlled' by South Africa and therefore the industry aims for high quality and consistency of supply in order to stay competitive in this market.

## THE HAKE FISHERY UNDER APARTHEID: A HISTORY OF EXCLUSION

Prior to the beginning of the 20th Century most of the species that were targeted were inshore species such as snoek, kob (*Argyrosomus hololepidotus*), yellowtail (*Seriola lalandi*), geelbek (*Atractoscion aequidens*), white stumpnose (*Rhabdosargus globiceps*) and hottentot (*Pachymetopon blochii*). These were either caught by hook and line or with beach seine nets. The craft used were small wooden vessels that were rowed (some of the larger vessels were rigged). An important factor, critical to this study, is the historic involvement of mostly 'black' fishers in this artisanal inshore fishing industry. Prior to the introduction of formal racial segregation in the form of apartheid, the political economy of the country was very much dominated by the 'white' population. The economy focused mainly on terrestrial resources such as agriculture and mining (with the discovery of diamonds in Kimberley in 1871 and the discovery of gold on the Witwatersrand in the 1870s). Fishing was, as it is in many other economies, a livelihood mostly for the poor and marginalised (in this case the 'black' ethnic groups), although the crew ethnicity in the trawl sector prior to the Second World War was predominantly 'white'. The development of the trawl sector is described by Baard (1971) and Lees (1969).

Accounts of the development of the industry in the early 1900s are reported in *The Fishing Industry* (Fahey *et al.* 1934), as well as in Thompson (1913).

The system of apartheid, through its discriminatory policies and practices, systematically excluded all 'black' ethnic groups from full access to the various economic activities of the fishing industry (Hersoug and Holm 2000a). In many cases, not only were these groups denied access to fishing quotas, permits, licences and/or harbours, but the whole system also discriminated against their involvement in the fishing industry (Hersoug and Holm 2000a). This sector of the population now belongs to a group classified as 'previously disadvantaged' because they were disenfranchised as a consequence of the policies of the previous government.

### Socio-economic characteristics

It is over and against this history of segregation and legislated discrimination that the current socio-economic reality for all South Africans is dominated by major differences in wealth between the race groups. These differences greatly affect the incentives for cooperation and the patterns of interaction between the stakeholders in the hake fishery. Extensive social, economic and political boundaries existed in the past and the consequences of these are still being felt by people, despite a new political dispensation. Fishing communities were affected negatively by the laws under the apartheid system to the extent that 'previously disadvantaged' people simply had to seek employment with the fishing companies (*Financial Mail*, 17 February 1995). In the past, the 'white' minority held positions of power in government and business, whereas most of the blue-collar workers in all the industries were from the 'black' majority. Although this description is rather general, the effects were evident in the fishing industry as commercial fishing was embedded in the larger political economy (see Hersoug and Holm 2000a).

In the late 1990s, the demersal (hake) and midwater trawl industry employed about 8 700 people, of whom approximately 2 800 were employed full time at sea, the balance being employed on land in the processing and distribution divisions. In 1997, total labour costs (salaries and wages) amounted to about R260 million (US\$26 million), including bonuses, commissions and remuneration (MTG 1998). This value increases to R290 million (US\$29 million) per year when pension and provident funds, medical assistance and housing assistance are factored in. The result is that in small towns dependent on landings and processing of deep-sea hake (e.g. Saldanha) the average monthly income of the 'previously disadvantaged' communities surveyed is higher than the average monthly income of all households in South Africa (see Schutte 1993). The socio-economic differences between the wealthy minority and the 'previously disadvantaged' majority create a dilemma as far as redistribution of quotas and fishing rights is concerned (*Financial Mail*, 17 February



1995). Greater access to the hake fishery via less capital-intensive methods such as longlining was seen to provide new opportunities for the 'previously disadvantaged' to improve their socio-economic status. However, the companies in the hake industry employ and provide remuneration to many people, including people belonging to 'previously disadvantaged' communities. Therefore, any redistribution has to take into account the fact that these companies employ over 8 700 people. The companies have argued that if fishing rights and quotas are redistributed they will be forced to lay off workers. This possibility is an issue of major concern for organised labour.<sup>4</sup>

### The deep-sea hake trawl sector

When individual quotas were introduced in 1979, 95 per cent of the quota went to three companies: Irvin and Johnson (I&J) Limited, Amalgamated Fisheries Limited, and Sea Harvest Corporation Limited. This was based on the catch histories of these companies. Seventy-one per cent of the hake quota was held by the two major quota holders (I&J and Sea Harvest) in 1996, both of which were public-listed companies at the time (Cochrane and Payne 1998). This has resulted in many arguing that there is extensive 'concentration' in the hake industry. Monopolisation is a legacy of the past when a single company dominated the hake fishery in the inter-war period because the small fragmented domestic market necessitated the vertical integration of primary production and wholesale distribution to ensure profits (van Sittert 1994). This monopoly made sound economic sense, but it was politically controversial even then. However, the Board of Trade and Industry at the time twice exonerated the dominant company for its monopolisation arguing that the company had acted in good faith.

These large companies in the industry are sometimes referred to as 'big business' by people opposed to concentration in the fishery (Informal Fishing Sector 1995). Those who have been discriminated against in the past believe they have a strong basis for their requests that there should be considerable redistribution of fishing rights and quotas (Hersoug and Holm 2000b). Since 1996, the government has been actively trying to involve new entrants in the industry. Correspondingly, the percentage share held by the two major companies has decreased, especially in the past four years (it was 63.5 per cent of the hake TAC in 1999).

### A HISTORY OF INDUSTRY PARTICIPATION IN MANAGEMENT

The fishing industry's<sup>5</sup> interest in participating in resource management began at the beginning of the century when it covered the costs of certain aspects of research. Cooperation between the industry and government was

actively promoted by the first Director of the Marine Survey Division, Cecil von Bonde (von Bonde 1936). It was his totalitarian ideology that influenced state intervention in the management of fisheries. He was convinced that it was the state's duty to regulate fishing, realising that the absence of private property rights under free market conditions would bring eventual ruin to all (van Sittert 1995).

Von Bonde was influenced by experiences in the USA and Canada and called for strict state legislation to reduce over-fishing and promote the conservation of fish stocks. He argued that although their freedom was being curtailed, it was in the industry's best interest and it would result in fish stocks being saved from destruction. A rift between the industry and those who conducted the marine survey grew as von Blonde attempted to obtain true effort and catch data from the fisheries. The responsibility of management finally came to rest with the national government (as opposed to the provincial authorities) after a crisis with the French government in the mid-1930s (van Sittert 1995). Imposed import restrictions by France on rock lobster facilitated a call for political action at a national and indeed international level.

The first serious legislation for the trawling sector was aimed at reducing the reported dumping of 50 per cent of the catch. In the 1920s and early 1930s, every fish landed weighing less than two pounds was discarded (van Sittert 1994). The reports of dumping were followed by the introduction of 'savings' trawls on the west coast in 1937. A complete prohibition on dumping followed in 1940 (van Sittert 1994). The formal government-industry interaction began with the formation of the Fisheries Development Advisory Committee (on 30 October 1944). There was a need for cooperation as, during select committee meetings, the industry expressed a 'healthy disrespect' for scientists and a profound mistrust of the state. After the Second World War there was a concerted effort on the part of the government to make the fishing industry internationally competitive. Cooperation was also promoted to help poor 'white' fishers (van Sittert 1995).

The first comprehensive legislation developed to manage marine resources was the Sea Fisheries Act 10 of 1940 (Department of Commerce and Industries 1940). This Act was mostly concerned with marketing and placed little emphasis on conservation. The 1940 Act was superseded by Act 58 of 1973 (Department of Industries 1973). The fact that quotas were granted by a Minister led to severe criticism by successive commissions of inquiry – the Du Plessis Commission (Du Plessis *et al.* 1971) and the Treurnicht Commission (Treurnicht *et al.* 1980). Even with government control, the situation in the past was biased in the sense that there was greater input from industry than from the state, in fact to such an extent that Grindley and Rabie (1983) expressed the view that the Fisheries Advisory Council (Sea Fisheries Act, Department of Industries 1973) was heavily weighted with representatives from commerce and industry.

Based on the recommendations of the Diemont Commission (Diemont *et al.* 1986), the Sea Fishery Act 12 of 1988 was introduced (Department of Environmental Affairs 1988). The Act granted extensive discretionary powers to the Minister, who was then responsible for appointing a Sea Fisheries Advisory Committee (SFAC) and a Quota Board. Unlike the previous Fisheries Advisory Council, which had 19 members representing industry sectors and other organisations, the SFAC had nine members appointed by the Minister (not as representatives of organisations but in their personal capacities). Their appointments were based on their expertise and the belief that they could contribute towards the functions of the committee (mainly advise the Minister on any matter). The current Act (the Marine Living Resources Act (MLRA) 18 of 1998, DEAT 1998) makes provision for a Consultative Advisory Forum (CAF) that has a similar role to its predecessor.

In the MLRA (as in previous Acts), the Minister can recognise any industrial bodies and interest groups in any branch of the fishing industry, and these groups have the power to furnish information and make recommendations to the advisory committee or the Minister.<sup>6</sup> Table 9.1 lists the interest groups and industrial bodies recognised under the Sea Fishery Act 12 of 1988. This recognition resulted in organisations such as the South East Coast Inshore Fishing Association (SECIFA) playing an active role in the management of the inshore trawl fishery, which targets hake and sole.<sup>7</sup> In terms of the deep-sea sector of the hake fishery, the industrial body with the main responsibility for representing the industry is the South African Deep-sea Trawling Industry Association (SADSTIA).

Table 9.1 *A list of the interest groups and industrial bodies that are recognised under the Sea Fishery Act of 1988, as of 23 October 1992*

<b>Interest Groups</b>	<b>Principal Fishery</b>
South African Marine Linefish Management Association	Linefish
False Bay Trek Fishermen's Association	Treknets fishing
Mariculture Association of Southern Africa	Mariculture
<b>Industrial Bodies</b>	
South African Deep-sea Trawling Industry Association	Hake demersal trawl fishery
Abalone Sea Management Committee	Abalone
South African Seaweed Concessionaires Association	Seaweed
South East Coast Inshore Fishing Association	South coast inshore trawl
South African Frozen Rock Lobster Packers (Pty) Ltd	West coast rock lobster
South African Squid Management Industrial Association	Squid

Source: Government Gazette No. 4967 (Department of Environmental Affairs 1992).

## National management associations and committees

In order to be consistent, the most important industry associations and joint industry-government committees are described below each in terms of their history, composition of membership, principal objectives and organisational structure.

### *South African Deep-sea Trawling Industry Association (SADSTIA)*

The South African Deep-sea Trawling Industry Association was formed in 1979. At that stage the main members were Irvin and Johnson Limited, Amalgamated Fisheries Limited (which became Atlantic Trawling Limited), and Sea Harvest Corporation. In 1997, out of the 151 700 t TAC, SADSTIA received 84.95 per cent of the TAC as a group, representing the main industrial body in the South Africa hake fishery. The Constitution of SADSTIA defines membership in terms of companies who operate deep-sea vessels (membership is based on size and tonnage). User participation, although indirect, is thus dependent upon the role that SADSTIA plays in the management of the hake fishery. In the past, recommendations made at SADSTIA meetings were formally presented to the Sea Fisheries Advisory Committee (SFAC) and it is assumed that the new Consultative Advisory Forum (CAF) will play a similar role and receive input from various committees and industry bodies.

### *The South African Deep-sea Resource Management Committee*

The close cooperation between the established industry and the government (in this case, Sea Fisheries) was facilitated by the involvement of South Africa in ICSEAF, in that dual representation (by government and industry) was important to the process. Over the years the meetings would be attended by the same people. This built relationships and fostered trust. The declining hake CPUE was cause for concern. Both industry and government were in favour of reducing foreign effort in South African waters, to the extent that an unofficial joint venture existed between government and industry to exclude foreign fleets. At that stage, only five companies were involved in the industry and extensive government-industry interaction took place.

The first meetings of the South African Deep-sea Resource Management Committee (the committee) were held in 1982 and the Fishery Advisory Council was advised of its establishment. The formation of the committee was initiated by the industry, as they were concerned about the low catch rate of hake. The secretariat was provided for by SADSTIA and since 1982 the government and industry have met twice a year to discuss various issues related to the rebuilding of the hake stock. For example, in 1983 industry requested that the TAC be 5 000 t lower than initially recommended. Further



on in the process  $f_{0.1}$  and  $f_{0.2}$ <sup>8</sup> fishing strategies were chosen as conservative strategies to rebuild the stock. These were shared long-term decisions and it is postulated that the industry wanted to receive the benefits of their conservative approach to management. In fact, when long-term planning was discussed in 1984, the industry wanted the long-term benefits of short-term sacrifices to accrue to them. In addition, the committee deliberated over the fishing vessel power factors, the TAC split between the west and south coasts, as well as mesh size regulations (all factors pertinent to stock assessment and management). In 1985, discussions were held on the objective to achieve greater self-regulation in the industry. The government representatives at that time indicated that the government was satisfied with the standard of compliance and valued the workings of the committee.

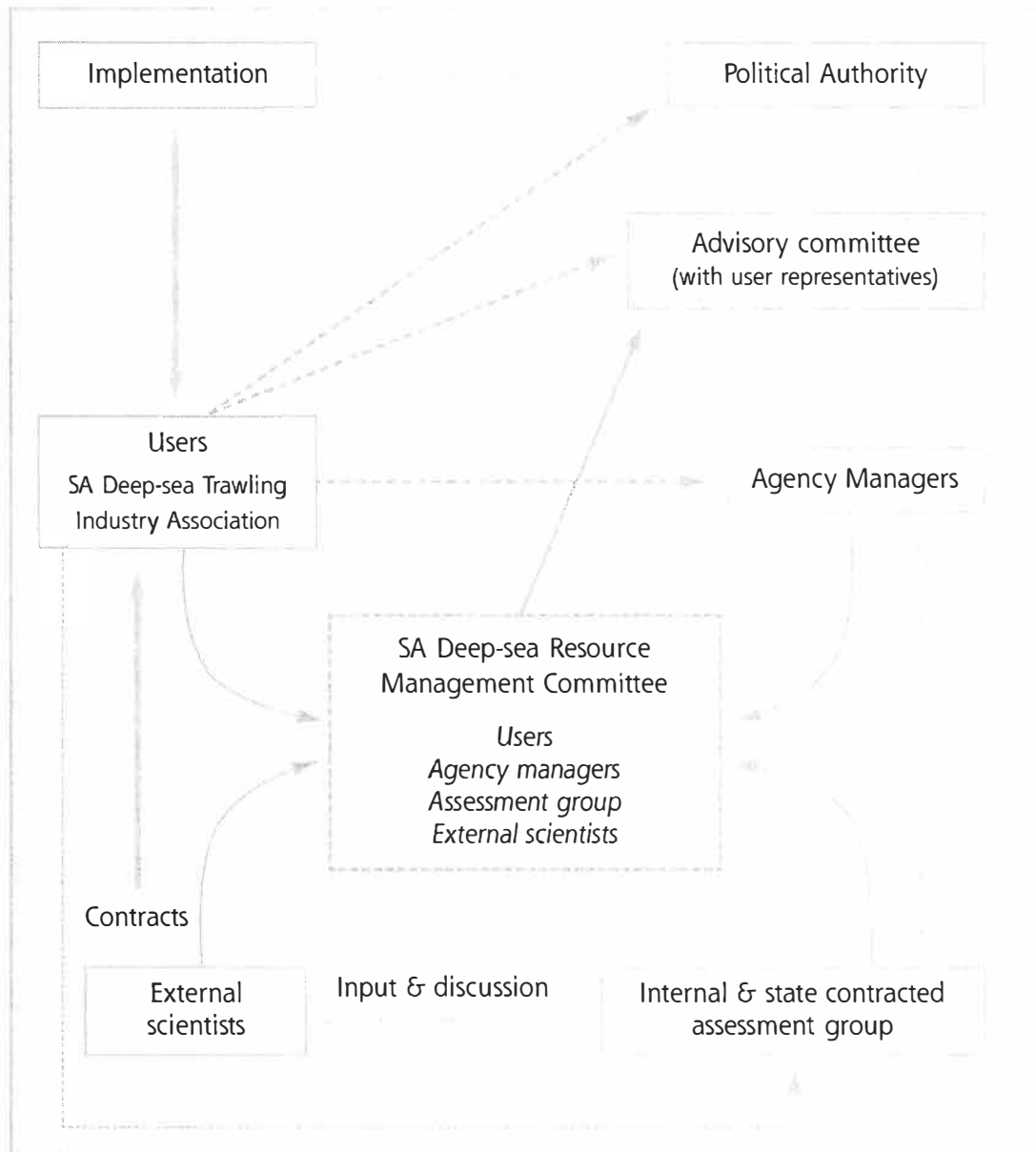
At one stage (1983 to 1984), the industry argued that its role on the committee was not about access (by this time all the stakeholders had already negotiated their 'shares' of the TAC based on catch histories). However, if the industry could have been directly involved in a rebuilding strategy, each party's quota would have increased if the TAC was set at higher levels in the future. In addition, each company that was part of this management committee was in effect obtaining a source of legitimacy for its continued access to the resource. This served as another important incentive for involvement considering that quotas were only allocated on an annual basis.

Participation of local users in management is dependent on an organisation representing the interests of the users of the resource. Essentially, the committee formed the basis of a formal successful co-management arrangement between government and industry. This co-management arrangement of sorts has existed for 16 years (see Figure 9.2). It was considered legitimate by the users (those who had a hake quota) and was supported by the government at the time. An exact description of the process is difficult as the system was complex (Figure 9.2 attests to this fact). Decisions concerning national resources were made at various levels. The industry made use of every opportunity it could to meet with the management authorities. Thus, not only does the committee represent a co-management arrangement at one scale, but the advisory committee (see Figure 9.2) also represents a co-management arrangement at a different scale. In addition, various decisions made by the committee were tabled along with other inputs (from other fishing sector associations) at advisory committee meetings (i.e. SFAC) (Figure 9.2). Bross (1986) highlighted the benefits for the industry of industry-government partnership arrangements. A positive repercussion of the arrangement was a halt to the decline in the hake CPUE.

The South African government-industry institutional co-management arrangement went further than mere consultation, but it did not represent complete joint management as the government reserved the right to make the

final decision on all issues. Based on the co-management spectrum (see Chapter 2, Figure 2.2; see also Sen and Raakjær Nielsen 1996), the type of co-management discussed here can be categorised as falling on the border between ‘consultative’ and ‘cooperative’.

Figure 9.2 A flow diagram, representing the institutional arrangements in place for the management of the deep-sea hake resource



Note: Solid grey arrows represent the government decision-making process whereas curved arrows represent those who were members of the South African Deep-sea Resource management Committee. Dashed lines indicate all the avenues users have to influence management at different levels. In addition, external scientists interact both with users and the assessment group.

Source: Modified from Figure 1 in Cochrane (2000).

### *The Association of Small Hake Quota Industries (ASHQI)*

The formation of the Association of Small Hake Quota Industries (ASHQI, the association) in early 1996 was facilitated by changes to the fisheries policy development process and the addition of new entrants to the hake fishery. The objectives of the association are to promote the interests of quota holders receiving less than 2 000 t, to make representations to the state agency on all aspects of small hake quota holders, and to create a forum for discussion of matters relating to resource management. The total quota held by all the members was equal to 11 655.7 t in 1997, 8.2 per cent of the TAC for that year. More specifically, the association makes use of collective action in order to put pressure on the government to allocate more of the TAC to longlining. In addition, the association is attempting to negotiate security of tenure for its members, since over the last five years the initial members have not had security of tenure and the risk of investment in the fishery is high. Essentially, the incentive for the small hake quota holders to cooperate is to try and force the new government to redress the inequities of the past as many of its members have been 'previously disadvantaged'. The future formal role of the association is uncertain as it has only recently been established and the implementation strategies of the new fisheries policy are still ongoing. However, the association has potential to play a meaningful role in facilitating user participation in the management of marine resources since it represents new participants.

### The industry's role in management and enforcement

The established industry regularly consults with independent scientists who undertake assessments (Figure 9.2). Thus within the hake industry, basic knowledge of the scientific process and management is extensive, especially among certain individuals (e.g. directors and fleet managers). Control and enforcement was previously undertaken nationally by Fishery Control Officers within the Marine Control Section of the Chief Directorate of Sea Fisheries. During 1999, Marine Control was integrated into the two separate Directorates of Inshore Resources and Offshore Resources management. Since 2000, the control and enforcement has reverted to its predecessor (a marine control section under the Chief Directorate).

Historically, there was little at-sea inspection of the deep-sea hake fishery by the authorities. The companies, under their permit conditions, were required to log and record their catches and the data were sent to the department responsible for fisheries (presently the Department of Environmental Affairs and Tourism (DEAT)). Although the data were entered by the companies, state scientists would verify the figures. In summary, the industry provided the government with catch, effort, as well as bycatch data and there

was close cooperation with the government in terms of monitoring. The fact that only a few quota holders existed in the hake fishery meant that self-monitoring by the companies was practical and thus common. Moreover, occasional monitoring by the government was also possible because there were only a few participants. The increase in the number of new entrants is going to place a greater strain on the enforcement of regulations in the hake fishery and there are now concerns about compliance.

## THE RE-STRUCTURING OF THE FISHING INDUSTRY

Fishing companies are more likely to invest resources in co-management arrangements if they can significantly benefit from such arrangements (i.e. the right conditions create positive incentives). With the expulsion of foreign fleets from South African waters in the late 1970s, the industry had reason to cooperate with the government. In the past, government-industry institutional arrangements were extensive, as is evident from the review of the national management associations and the South African Deep-sea Resource Management Committee. In addition, the government-industry relationship was further developed with the birth of the Industry-Sea Fisheries Forum (INSEF) process in the early 1990s, a development that was not specific to the hake fishery. This was a government-led initiative and the purpose of this forum was to discuss key technical and scientific issues within the in-house resource working groups. Issue-driven informal meetings were held for each sector. When INSEF meetings were held to discuss the hake resource these complemented scientific issues discussed at the meetings held by the committee. As stated before, the industry made use of every opportunity it could to meet with the management authorities.

However, the established industry believes that its participation has been significantly threatened in the last few years, especially with the abolition of the SFAC and the formation of the CAF. This is due to the fact that the established hake industry has no direct representatives on the CAF. So-called 'big business' representatives on the CAF are from the pelagic sector, not from the demersal trawl sector.

There is no doubt that the promulgation of the MLRA in South Africa and the questioning of rights (under the re-structuring of the industry) have impacted on the previous government-industry cooperative management arrangements. The committee typically met twice a year, that is, SADSTIA met biannually with government officials to discuss management. It is apparent from the proceedings of these meetings that there is a direct correlation between security of tenure and the investment that established industry will make in facilitating cooperative management arrangements between themselves and the government. In other words, there is a critical relationship



between 'rights to fish a resource' and 'user-participation in management' (i.e. co-management).

The established industry will invest resources into a co-management process to a greater degree when security of tenure is guaranteed to the extent that they will benefit from decisions (Hutton *et al.* 2002). The assumption is that industry will be able to plan in the long-term and meet the objectives of sustainable management. In accepting longer term objectives, short-term gains are forfeited in the belief that long-term gains will accrue to them.

The critical factor is that during periods of uncertainty, when rights to fish are threatened, industry will invest in attempting to negotiate security of tenure and any processes which involve long-term management goals (e.g. co-management) then become irrelevant. Under these circumstances the industry is only concerned with maintaining access to the raw material upon which its production relies.

Two critical time periods in the history of South African fisheries management policy relevant to the co-management of the west coast deep-sea hake fishery can be identified (as presented in Hutton *et al.* 2002) and are summarised in Table 9.2.

The outcome of the transformation process is that previous co-management arrangements between government and industry are 'on-hold' and not functioning as before. Thus it can be argued that security of tenure facilitates participation in co-management as participants can only justify committing to binding agreements promoting sustainable management if security of tenure results in them receiving the benefits. In other words, clear long-term rules with regard to access are postulated to be necessary conditions for successful co-management arrangements to exist.

### Stakeholders and the government

The objectives of the new government are to increase user participation in management and to provide greater access to fishing opportunities for those who have been disadvantaged in the past (ANC 1994). Thus, the new government actively pursued a consultation process with fishers and 'previously disadvantaged' sectors in order to develop the new fisheries management policy in the 1990s. The fisheries policy development process has been extensively reviewed during its different stages (see Cochrane and Payne 1998, Hersoug 2000, Martin and Raakjær Nielsen 1998, O'Riordan 1999).

Within the hake fishery, interested parties can be placed into three broad categories: established industry, small hake quota holders (mostly new entrants) and rejected applicants. These three categories have major differences in their interests and competition exists between the sectors in the hake fishery for the same stocks, creating disincentives for cooperation. A lack of cooperation is common because of the unequal relationships in economic

Table 9.2 *The relationship between rights to fish and user participation in management within two critical time periods in the history of South African fisheries management policy relevant to the co-management of the west coast deep-sea hake fishery*

<b>The Apartheid Years (before 1994)</b>		<b>The Transition Period and Post-1998 (MLRA implemented)</b>	
<i>Rights to fish a resource:</i>	<p>Rights to fish (i.e. quotas for companies) negotiated on catch histories.</p> <p>Alienation of the majority through socio-political &amp; economic systems.</p>	<i>Rights to fish a resource:</i>	<p>Rights to resource questioned.</p> <p>Threats of litigation by established industry if rights to fish are re-distributed.</p> <p>New group of participants as government processes applicants &amp; makes allocations.</p> <p>The formation of associations of new quota holders.</p> <p>'Black' investment groups buy into established companies, reflecting both need &amp; political reality.</p>
<i>User-participation in management:</i>	<p>Close relationship between industry &amp; government due to joint attendance at ICSEAF meetings in the 1970s and 1980s.</p> <p>Formal arrangement (SA Deep-sea Resource Management Committee) initiated by organised industry (the South African Deep-sea Trawling Industry Association).</p> <p>Clear objectives &amp; <i>modus operandi</i>.</p> <p>Number of participants small – government personnel work closely with industry through structures such as SFAC.</p>	<i>User-participation in management:</i>	<p>Policy creates new bodies (SFAC becomes CAF). Previous long-term formal &amp; informal relationships are threatened.</p> <p>Changes in state department structures &amp; positions (Minister and senior officials).</p> <p>Minister opens door to previously alienated parties (marginalised fishing community).</p> <p>Informal relationships between government &amp; new quota holders develop, but no formal relationships are agreed to.</p>

Source: Adapted from Hutton *et al.* (2002).

wealth between fishers in the different user groups. Finding common ground with regard to other objectives is essential to the process. This is especially so given a myriad of diverse interests and fundamental differences in attitude between established industry and the new entrants (Hutton *et al.* 2002).

Table 9.3 presents the fundamental differences between the two dominant stakeholders, the new entrants and the established industry. The division of these stakeholders into two associations is readily apparent. Established industry predominantly supports the past structures, but argue that they are somewhat alienated from the new structures set up under the MLRA. The new entrants are opposed to the past structures and the current allocation proportions to the quota holders. These results are similar to those documented by Strydom and Nieuwoudt (2001) who conducted a postal survey. They found that applicants for quotas, and new entrants, wished to see a rapid redistribution of quotas. The reason for the latter becomes clear when one considers the large difference in average size of quota allocated to each of these stakeholder groups.

Lane and Stephenson (1995) state that management systems that involve co-management can only be established by formalising arrangements defining the hierarchical organisational structure and responsibilities of all parties in the process. In the hake fishery, the participation of user groups is limited largely by the characteristics of the system, in that there are many participants and their numbers are increasing. There is a trade-off between administrative efficiency in relation to the number of stakeholders and equity in terms of including all parties in the process. The ASHQI could formally represent the small hake quota holders by being incorporated into the process as an integral part of the new fisheries management system.

In the past, the established hake industry representatives had direct representation on the SFAC, whereas now they are indirectly represented at CAF meetings. A representative from the pelagic sector represents large industry in general, whereas in the past (at SFAC meetings) representatives from all of the large sectors were present. However now other parties, for example small and medium size enterprises, play a role, reflecting the government's will to be more inclusive.

The South African Deep-sea Resource Management Committee has not met for the last two years. However, a less formal all-inclusive hake management forum is evolving where the focus has been on a series of workshops to discuss the Operational Management Procedure (OMP) for the hake stocks (see Cochrane *et al.* 1997 for a review of OMP procedures). Again, this represents a joint decision-making forum between users and government on the rules and regulations concerning the harvest rate of the various sectors which target Cape hake.

Table 9.3 *The differences between established industry and new entrants for certain key factors that affect their involvement in management*

<b>Factor</b>	<b>Established Industry (n=5)</b>	<b>New Entrants (n=7)</b>
<b>1. Average size of quota:</b>	22816 tonnes	369 tonnes
<b>2. Harvesting technique:</b>	Trawling	Paper quota <sup>1</sup> or longlining (1 trawling)
<b>3. Land operations:</b>	Processing plant – large factories Export & supply local market	Export
<b>4. Membership:</b>	SADSTIA	ASHQI
<b>5. Level of risk – new investment:</b>	Medium to high	High
<b>6. Knowledge of management &amp; the scientific process:</b>	Very high as industry members interact with scientists from the government plus other external scientists who independently undertake stock assessments	Medium
<b>7. Support for previous structures:</b>		
<b>Sea Fisheries Advisory Committee</b>	Yes	No – little representation
<b>Quota Board</b>	Yes	Allegations of corruption
<b>8. Support for new structures:</b>		
<b>Consultative Advisory Forum</b>	Not represented as before	Yes (n= 4 out of 7)*
<b>Fisheries Transformation Council</b>	No benefits for this sector	Yes (n= 4 out of 7)*
<b>9. Support for current allocation proportions</b>	Yes	No
<b>10. Support management rules</b>	Yes	Yes
<b>11. Involved in management</b>	Extensive consultation & cooperation	Consultation

Source: Table adapted from Hutton *et al.* (2002).

Note: \*Support from the four new-entrants belonging to the 'previously disadvantaged' group, n = number interviewed.

1 'Paper quotas' refer to fishing rights, which are allocated portions of the total allowable catch and that have been sold or leased to other persons who then catch the fish.



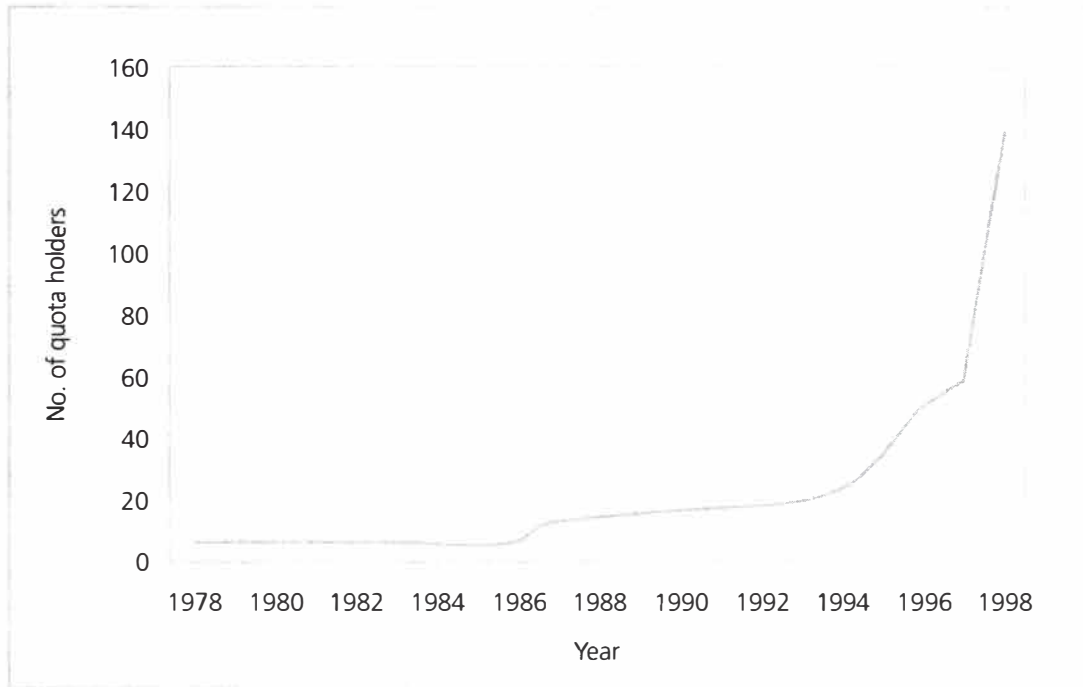
## IMPLEMENTATION OF THE NEW FISHERIES MANAGEMENT POLICY

The South African government's policy objectives are to reduce the administrative costs of governance and move towards policies based on the 'user-pay' principle and 'agency-client' relationships. Meanwhile, the government also wishes to include users in the sustainable management of marine resources. This is evident from the structural changes being made in DEAT under the new MLRA.

DEAT is undergoing extensive change to accommodate new structures. Research, enforcement and monitoring were initially integrated within two resource groups (e.g. coastal and inshore versus offshore). Two clauses, one under functions allocated to the recently established Directorate: Economics and Resource Development, and the other, under functions allocated to the Directorate: Coastal and Inshore Resource Management, are relevant to this discussion (DEAT 1999). These are:

1. 'To facilitate community interactions, partnerships and cooperative governance'. Function (number 5) Directorate: Economics and Resource Development.
2. 'To facilitate the establishment of partnerships for coastal and inshore resource management'. Function (number 4) Directorate: Coastal and Inshore Resource Management.

However, the aim to restructure and accommodate the above functions must involve adjustments to existing institutional arrangements. Furthermore, the objectives of the South African government's policy initiatives would have to be clarified and mechanisms put in place to give effect to these policy objectives. Recent increases in the number of hake quota holders have resulted in a situation in which the number of quota holders has increased by a significant order of magnitude (Figure 9.3).<sup>9</sup> The situation is similar to that in the pelagic industry in that the number of quota holders has increased dramatically over a short period of time. Established quota holders in the pelagic sector have had their quotas reduced by 50 per cent. A recent unpublished draft document from Marine and Coastal Management (MCM) (formerly Chief Directorate: Sea Fisheries) indicates that the government wishes to further restructure the deep-sea hake trawl fishery such that new entrants have 30 to 40 per cent of fishing quota rights (MCM 2000). The range associated with these numbers indicates that the government does not have a clear objective and at this stage appears to be 'muddling through', unaware of a specific target for transformation.<sup>10</sup> The result is that trust in government policies is waning more and more as time passes and events unfold. However, more recent developments (i.e. clearer guidelines for allocation and targets for transformation) under the auspices of the Rights Allocation Unit (RAU 2000), may convince all the users of the government's ability to implement policy within a well-planned structure.

Figure 9.3 *The increase in the number of quota holders over the last twenty years*

Source: Data from Stuttaford 1983, 1991, 1993, 1996 and 1997.

Whereas in the past the government had to form a relationship with one group (i.e. the established companies within the industry), it now has to form relationships with both the established industry and the new quota holders. These relationships have to be fostered in addition to all institutional relationships with the other stakeholders in each and every fishery (e.g. pelagic, rock lobster, abalone, squid and linefish). This is creating a situation where the administrative costs (the overall transaction costs) are rapidly increasing. These costs are increasingly being borne by re-allocating levies in the Marine Living Resources Fund to administration and policy initiatives, whereas in the past funds went to research and development.

The aim of this review is not to suggest that re-structuring is harmful or detrimental, but rather to allude to the fact that the government should be creating a positive environment for all stakeholders (both established industry and new participants) such that all users consider the long-term viability of the hake stock. Recent policy initiatives (RAU 2000) and suggestions (see Bailey 2000) to put in place a system of longer term rights may be welcomed by the industry despite the fact that lease fees for resource use will be charged. When users are not assured of the long-term rights to harvest (their rights and security of tenure cannot be guaranteed), a negative incentive structure is created; consequently, all parties consider only their own short-term interests.

Co-management arrangements become second to the conflict over rights. Thus, only after the restructuring of the fishing industry has occurred, and longer term rights to fish are set in place, will co-management arrangements become important again to the process of managing fisheries in South Africa.

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## NOTES

- 1 The term 'joint participation' is used throughout this chapter to reflect the equal contribution both the government fisheries management agency and the industry make to management forums. In my opinion, the fact that the right to make executive decisions is left with the Minister does not undermine the concept of co-management as co-management in principle calls for greater involvement of users. That is, a strengthening of the democratic process and not the undermining thereof.
- 2 This chapter reports on events up to and including January 2001. As of July 2001, longer-term exploitation rights (four years) have been established for many of the stocks, an initiative which will partly off-set the short-term view taken by users, reduce conflict over rights and allow the process of co-management to re-emerge in the hake fishery.
- 3 The product is marketed internationally under different names: in Italy as Nasello, in France as Merlu du Cap, in Germany as Seehecht, in Australia as smoked cod, in the USA as whiting and Yankee clipper, and in Spain as Lomos y Centros de Merluca (steaks and loins) (Anon 1997).
- 4 For example, the Food and Allied Workers Union (FAWU).
- 5 Throughout this review the 'fishing industry' or 'industry' is used to reflect the collection of companies (public and private) involved in South Africa's main commercial fisheries, specifically in this case the deep-sea hake trawl fishery.
- 6 In the MLRA the Consultative Advisory Forum has to give consideration to information submitted to it by these bodies and groups.
- 7 The formation of SECIFA was the result of the reconstitution of the Mossel Bay Trawler Owners' Association in 1978 and provided a forum for the owners of small trawlers operating in waters shallower than 110 m between Hangklip and the Great Kei River (Stander 1995).
- 8 Fishing effort strategies that would result in increases in yield of 10 per cent and 20 per cent at a rate of increase of yield at very low fishing effort, respectively.
- 9 This information on the number of quota holders represents the situation for the west and south coasts of South Africa. In addition, in September 2000 a further 148 quota holders (each with 34 t) were added to the list.

- 10 The term 'muddling through' is from Lindblom's (1959) paper, and in the same respect as was intended by Lindblom, it is postulated that although there is some structure to the current policy initiatives, the specific goals of the government are not well defined.

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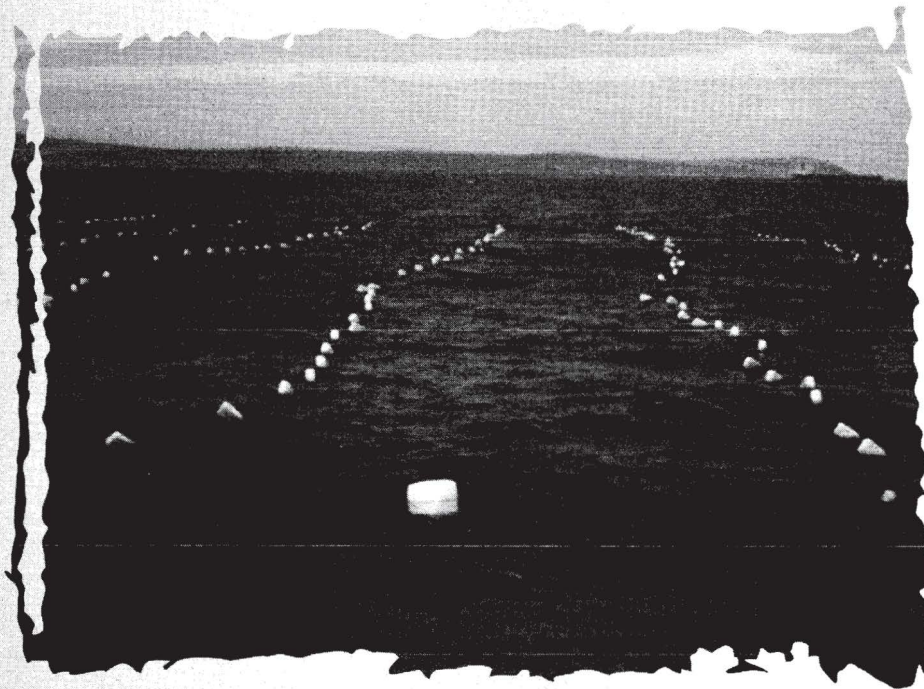
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# Co-management of South African Seaweed Resources: A Seaweed Mariculture Project in St Helena Bay

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A typical *Gracilaria* farm in a shallow bay.

Photograph Rob Anderson

## INTRODUCTION

The seaweed (marine alga) industry in South Africa has been in existence since the 1950s. Commercial interest in Southern African seaweeds began when agar (a type of gel obtained from seaweed) from Japan became unavailable in Britain during the Second World War. South African seaweeds were then exploited for the removal of the gel. The development of the seaweed industry since then focused mainly on the collection of beach casts, which are seaweeds deposited on beaches by wave action, and the removal of attached plants (Anderson *et al.* 1989). Seaweeds can also be produced by farming, which is known as mariculture (aquaculture in a marine environment or farming of marine organisms). It is only in the last two decades that seaweed mariculture has been seriously considered as an alternative means of production in South Africa. Although no successful large-scale mariculture of seaweeds has been undertaken to date, some experimentation has taken place by the central government and universities. This chapter deals in general with co-management arrangements between the seaweed industry and the government, and specifically with a pilot community-based seaweed farming project which has begun exploring co-management partnerships.

Seven seaweed species are commercially exploited in South Africa. The resource is formally managed by the Chief Directorate: Marine and Coastal Management (MCM) within the national Department of Environmental Affairs and Tourism (DEAT), mainly in terms of the Marine Living Resources Act (MLRA) 18 of 1998 (DEAT 1998a) and the Seashore Act 21 of 1935 (Seashore Act, Department of Lands 1935). Harvesting and collection takes place according to a concession system, whereby the coastline is divided into concession areas and the right to exploit the seaweeds in a specific area is then leased to a concession holder. MCM is also the authority responsible for mariculture management.

The total annual harvest of seaweeds in South Africa is about 2000 tonnes (t) dry weight. Most of this is exported as raw material, and fetches around R8 million (US\$0.8 million). In addition, a relatively small amount of fresh kelp of the genus *Ecklonia* (less than 1000 t wet weight) is processed into a liquid plant growth stimulant and marketed internationally, fetching an additional R8 million (US\$0.8 million) in foreign currency. Kelp is a collective term for the large brown seaweeds from the division *Phaeophyta* such as *Ecklonia*, *Laminaria* and *Macrocystis*, also known as sea bamboo in some coastal areas. Kelp plants can grow up to 10 metres (m) in length and often occur in underwater 'forests'. Red seaweed is a term often used for seaweeds from the division *Rhodophyta*. The economically important seaweed species in South Africa are *Gracilaria gracilis* (red), *Ecklonia maxima* (kelp), *Laminaria pallida* (kelp), *Gelidium pristoides* (red), *Gelidium abbotiorum* and *Gelidium*

*pteridifolium*. *E. maxima* is used as a fertiliser and a source of plant growth hormones, or as feed for cultured abalone; *L. pallida* is exported for alginate or used as fertiliser; *Gracilaria gracilis* and *Gelidium* spp. are utilised as a source of agar (Anderson *et al.* 1989).

The economically important seaweeds in South Africa are collected from beaches as wash-ups, harvested from the intertidal area or, in the case of kelp for liquid stimulant or abalone feed, harvested from their natural underwater populations. Thus, exploitation takes place in the intertidal zone or sub-tidally. Harvesting is the partial or total removal of attached material from intertidal or submersed beds, using diving equipment, knives and protective clothing. Collection involves the removal of washed-up algae from the beach, with the use of rakes, forks and tractors. Both methods of exploitation depend on the tides and seasons, and the equipment and gear is specific to the type of seaweed or the method of use.

Marine algae can be cultivated in tanks or ponds on land, on rafts or ropes in the sea, or planted on the bottom of shallow lagoons or bays (Oliveira *et al.* 2000). Tank cultivation is expensive because of the need to pump water from the sea and control nutrients, pH and water movement. Seaweed cultivation in tanks can be combined with cultivation of high-value organisms, such as abalone, to offset pumping costs.

The only seaweed species in South Africa for which a successful method of cultivation or farming has been established is *Gracilaria gracilis*. It can be cultivated in tanks and on rope rafts in the open sea (Anderson *et al.* 1996). Research on seaweed, and its cultivation, is conducted by the government, universities and in some cases, sponsored by the commercial companies involved in the industry. Companies are required by law to supply MCM with records of the seaweeds harvested and collected each year.

At present, the seaweed industry is completely based on the wild resource, which is accessed through a system of concessions. Commercial seaweed mariculture is not yet a reality in South Africa. The people involved in the industry are seaweed buyers, concession holders, sub-contractors and workers or seaweed collectors. The concession areas are allocated to companies or individuals, including a number of new entrants from 'historically disadvantaged' communities. Country-wide, several hundred workers are employed on a permanent basis and at least 300 on a temporary basis. In the former 'homeland' of Transkei, seaweed is collected informally by many hundreds of coastal dwellers and sold to the concessionaires. The pickers are generally the poorest of coastal dwellers (often women and children), who collect seaweed as well as organisms such as lobsters and mussels (Russell *et al.* 2000). In the past, access to concessions was dominated by 'white'-owned companies, which was in keeping with former apartheid policies. In 2000, however, for the first time five of the 23 concession areas were allocated to new entrants from



'historically disadvantaged' communities. These allocations represent between 25 and 30 per cent of South Africa's seaweed resources by weight.

## INSTITUTIONAL AND LEGISLATIVE ARRANGEMENTS GOVERNING THE EXPLOITATION AND CULTIVATION OF SEAWEEDS IN SOUTH AFRICA

The exploitation and cultivation of seaweeds is centrally managed by MCM, in terms of the various laws and regulations that apply to mariculture, harvesting and collection. In this section, mariculture and seaweed harvesting and collecting will be discussed separately. Most of the information has been obtained from officials within MCM and from the proceedings of a national mariculture workshop held in 1999 (MCM 1999a).

### Mariculture

The establishment of a seaweed mariculture enterprise is subject to a range of regulations promulgated in terms of the MLRA as well as various other Acts such as the Environmental Conservation Act, 73 of 1989 (ECA, Department of Environmental Affairs 1989). The issues covered by these pieces of legislation include the right to farm at a specific site, environmental assessment and monitoring requirements and the control of diseases. The following section describes the legislative framework and administrative procedures relevant to these issues.

#### *The right to engage in mariculture*

The MLRA is the first piece of legislation that specifically addresses seaweed mariculture in South Africa. According to the MLRA, a right to engage in mariculture activities has to be obtained from MCM (DEAT 1998a). Control of these rights (obtainable for periods of up to 15 years), is administered through the issue of annually renewable permits and is dependent upon performance.

#### *Environmental impact assessments*

According to the MLRA, an Environmental Impact Assessment (EIA) may be required by MCM for proposed mariculture activities. In addition, EIA regulations promulgated in terms of section 21 of the ECA stipulate that the concentration of livestock in a confined structure for the purpose of mass commercial production may have a detrimental effect on the environment, and requires a scoping report to be submitted before an application can be processed. This report should include a description of the project, the environmental impacts associated with project activities, identification of all feasible alternatives as well as a description of the public participation process

followed. If MCM does not accept this report as sufficient for consideration of the application, it may request an EIA that focuses on the alternatives and environmental issues identified in the scoping report.

#### *Site selection*

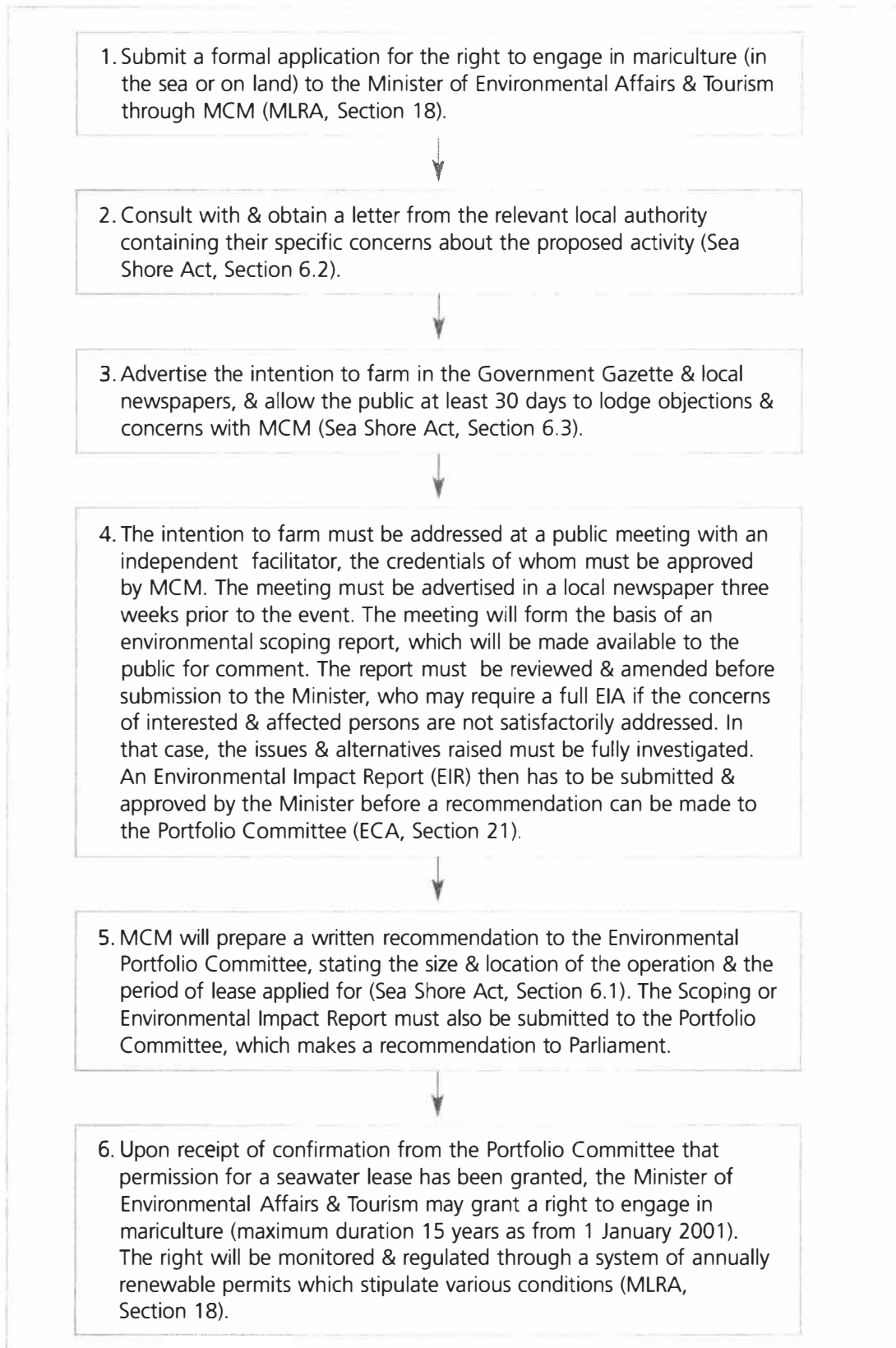
The Seashore Act requires that a lease agreement be established for mariculture on the 'seashore' or in the 'sea'.<sup>1</sup> Since the Seashore Act identifies the State President as the owner of the sea and seashore, the National Assembly (the law-making house of Parliament), through the relevant Portfolio Committee, must approve the letting of the sea or seashore for mariculture purposes. Relevant authorities such as the local municipality or Portnet (South Africa's official port authority) must be consulted where proposed areas are within or adjacent to their areas of jurisdiction. In the case of land-based operations, landowners or, in the case of public land, the relevant authority, need to be consulted. If areas need to be re-zoned, an environmental assessment may be needed in terms of the EIA regulations. Discharge permits may be required from the Department of Water Affairs and Forestry (DWAF) if the operation is planned for an estuarine environment (National Water Act 36 of 1998, DWAF 1998). Discharges for pump ashore facilities based on the seashore may be subject to an environmental assessment in terms of the MLRA and ECA.

#### *Pest control, exotics and genetically modified organisms*

Legislation under which marine pest organisms will be regulated include the MLRA, the ECA and in future, possibly the National Environmental Management Act (NEMA) 107 of 1998 (DEAT 1998b). Any plant or animal that has been declared a weed or invasive may be subject to an environmental assessment in terms of the ECA.

The process of obtaining a lease for seaweed mariculture activities in the sea and on the seashore can be cumbersome and time consuming. For farming in the sea, the applicant must obtain approval for a seawater lease from the Portfolio Committee on Environmental Affairs and Tourism. If the farm is to be situated in a harbour, permission must be obtained from Portnet. For any land-based activities such as drying of the seaweed, permission must be obtained from the landowner or relevant authority, for example, the local municipality. The applicant must obtain a right to engage in mariculture from the Minister of DEAT as well as an annually renewable permit from MCM. The process is outlined in detail in Figure 10.1 (*pers comm.* R. Zeelie, MCM, 2000). Applications for tank farming (on land) do not have to go through the portfolio committee. However, they have to comply with other regulations associated with the terrestrial authorities.

Figure 10.1 A flow-chart outlining the process for mariculture applications in the sea



## Collection and harvesting of seaweeds

The collection and harvesting of seaweeds is managed by MCM in terms of the MLRA and the Seashore Act. The processes of application and allocation, as described below, are currently under review (*pers comm.* R. Anderson, MCM, 2000). Members of the South African Seaweed Concessionaires Association (SASCA) have been consulted in the review process, thus giving input into future management decisions. SASCA is essentially an industrial body intended to represent concession holders, although membership is not obligatory.

There are 23 concession areas along the South African coastline. Each concession area is given to one concessionaire for a set number of years, subject to an annually renewable permit. Criteria for the assessment of all 'fishery' applications (of which seaweed concessions is one case) include active involvement of the applicant in the operation, past performance, product enhancement, environmental considerations and transformation aims. Permit conditions include specifications of the species exploited, the source (for example beach-cast), levy per tonne dry mass, annual fee and also specify areas where the activity is prohibited, for example in reserves (Anderson *et al.* 1989 and 2001). In terms of the MLRA, rights are transferable but permits are not. Such transfers are subject to approval by the Minister of DEAT. In some cases, concessionaires hire sub-contractors to manage their seaweed harvesting or collecting operations, but do the processing and/or exporting themselves (Levin 1996). If a rights holder does not comply with permit conditions or the code of conduct for the fishery, or fails to perform or to utilise the concession, the Minister can withdraw the right in terms of Section 28 of the MLRA (DEAT 1998b).

The task of deciding who is allocated concessions was delegated, by the Minister, to the Deputy Director-General of MCM in 2001. The MCM chooses concessionaires on information supplied by the applicants, as well as the input of a team of lawyers and accountants, and on advice given by MCM scientific personnel. Prior to 2001, the Chief Director appointed an advisory body (the Seaweed Allocation Committee), which then made recommendations regarding allocations. This advisory body included a scientist in the relevant field, an economist, a resource management official, a law enforcement officer from the compliance section of MCM and was chaired by a high-ranking official from DEAT (MCM). There was no user group representation on this body. In future, a verification unit administered by private accountants will analyse all application forms to reduce processing time and ensure that applications not meeting prescribed standards are eliminated early in the process.

While commercial users have formal rights approved by MCM, every public person has a right to collect ten kilograms (kg) of seaweed per day for personal



use. A 'recreational permit' is required for this and the seaweed cannot be sold. There is no information on the amount collected for this purpose, but it is likely to be negligible in comparison with commercial quantities.

### Involvement of stakeholders in management

Resource users involved in mariculture are encouraged to become members of the Mariculture Association of Southern Africa (MASA). Seaweed concession holders have the option to become members of SASCA. MCM recognises these organisations as legitimate industrial bodies. Industrial bodies may submit information to the Consultative Advisory Forum (CAF), which is responsible for advising the Minister on any aspects of marine living resources. The Seaweed Allocation Committee has in the past provided advice to the Minister or to CAF. In addition, individual persons may also make presentations on aspects of marine living resources to the Minister (*pers comm.* R. Bodenham, MCM, 2001).

Resource users, through the recognised industrial bodies (MASA and SASCA), are invited to give input into decision-making processes at fora such as workshops and policy meetings, and they meet regularly with MCM researchers to address various issues. Policies, rules and regulations related to acts governing the use of marine resources are made at national level by the Minister of DEAT, although stakeholders give input into policy and decision making. Before any regulation is made, the intention must be advertised in the Government Gazette to give the public an opportunity to comment on the regulations or lodge objections. Formal comments and/or objections must be registered within 30 days of publication of the regulations.

The Seaweed Research Unit of MCM is responsible for the scientific research on which decisions about seaweed harvesting, collection and mariculture are based. Concession holders are obliged to submit monthly returns of their yields to MCM, and MCM researchers liaise with them on various issues including the biology of the resource species and the ecological effects of harvesting. In general, there has been good cooperation between government and these bodies in improving the management of South African seaweed resources and in developing sustainable methods of harvesting.

MCM is actively trying to involve stakeholders in the future establishment of a mariculture industry. A national mariculture workshop was held in October 1999, where stakeholders from a broad range of backgrounds convened to discuss planning for sustainable development of mariculture in South Africa. Two of the most important outcomes of the workshop were the identification of key objectives for sustainable mariculture development, and the identification of guidelines that will form the framework for developing and implementing a mariculture sector plan (MCM 1999b). This plan will serve the industry in the short-, medium- and long-term by providing MCM

and other stakeholders with guidelines on how to facilitate and coordinate the advancement of mariculture in South Africa.

## SEAWEED RESOURCE MANAGEMENT IN SOUTH AFRICA – A FORM OF CO-MANAGEMENT

An assessment of the management of seaweed resources in South Africa indicates that a form of co-management has been in practice for a long time between central government and traditionally established industry stakeholders. Through the respective industrial associations (such as MASA and SASCA), seaweed concessionaires and mariculturists have given input into management decisions. Decisions, however, are ultimately taken by the Minister of Environmental Affairs and Tourism.

In the case of seaweed collection and harvesting, ‘historically disadvantaged’ persons who have entered the industry in the past few years, have become part of these co-management arrangements between government and user groups, both as SASCA members and, where necessary, by direct liaison with MCM. As far as seaweed mariculture is concerned, the government is involving stakeholders in the policy and decision-making processes (for example the development of a mariculture sector plan). However, some management aspects still need to be addressed.

According to Sen and Raakjær Nielsen (1996), co-management arrangements can be classified into five broad groups. These range from instructive (where government makes decisions and informs user groups) to informative (where user groups make decisions and inform government; see Chapter 2, Figure 2.2). The management of South African seaweed resources has been instructive in the past, but could now be classified as consultative, especially after the promulgation of the MLRA. User groups are consulted before decisions are made, as in the case of the involvement of SASCA members in the revision of the seaweed application and allocation process (*pers comm.* R. Anderson, MCM, 2001).

The benefits of the current system of management include the following: initiatives to improve access to seaweed resources for coastal community members, development of a mariculture sector plan, preparation of guidelines for mariculture development and assignment of personnel to a mariculture section within MCM. The formation of a mariculture section within MCM has clarified the responsibilities of personnel regarding the implementation of the MLRA. This should lead to greater attention to the development of the mariculture industry and to addressing constraints in the future. The process of application for mariculture ventures has been clarified and communication amongst stakeholders, especially from a ‘historically disadvantaged’ background, has improved since the proclamation of the MLRA.

## THE ST HELENA BAY SEAWEED MARICULTURE PROJECT

### The case study – historical and geographical context

The St Helena Bay Seaweed Cultivation Project started as a post-graduate research project at the University of the Western Cape in 1995. The initial research included a site selection study for the cultivation of *Gracilaria gracilis*, investigations into the feasibility of cultivation of the seaweed and the involvement of local ‘previously disadvantaged’ community members in the industry (Brown 1999). The involvement of community members was facilitated through a series of workshops, meetings and a formal course on seaweed mariculture.

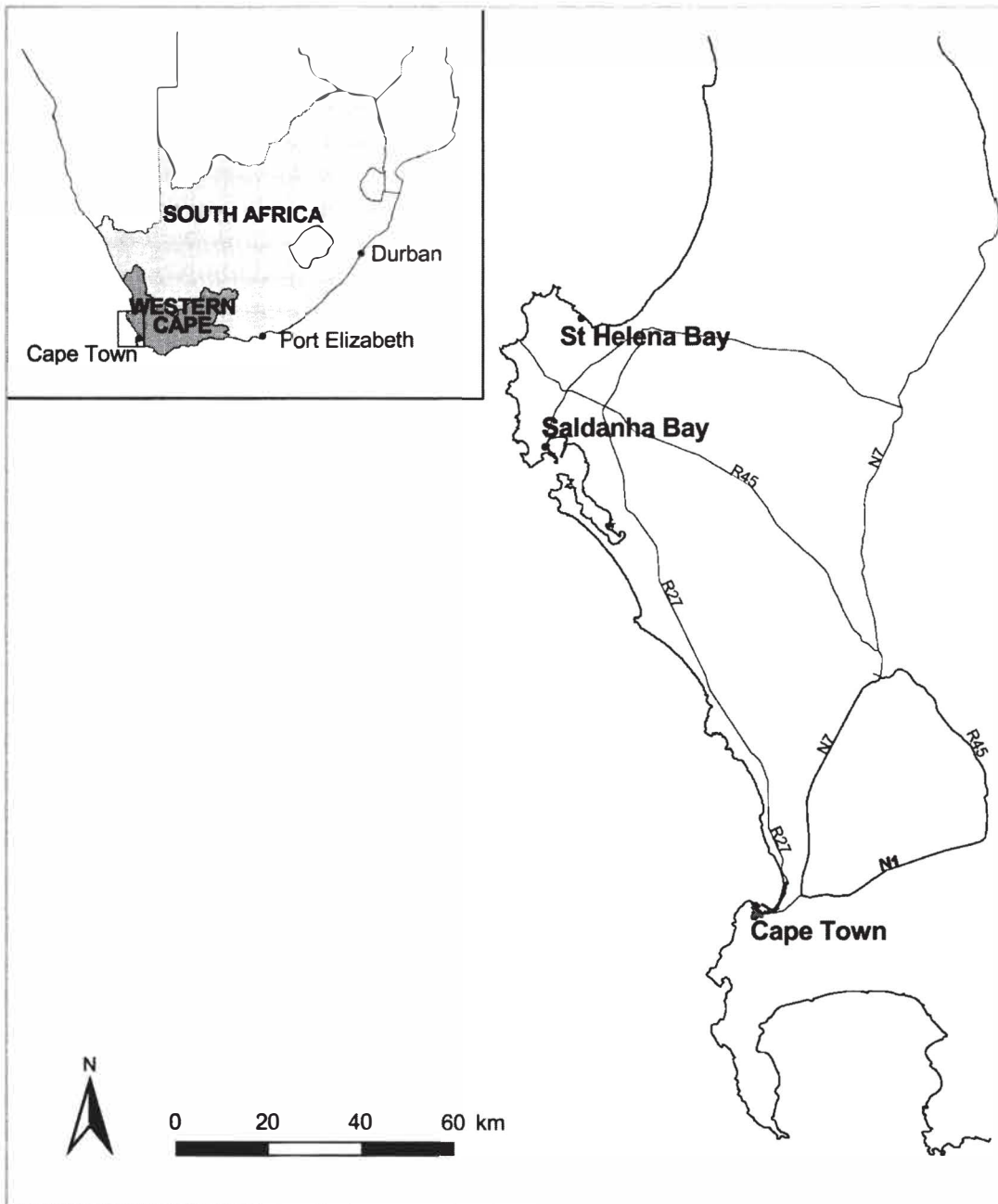
In 1997, the International Ocean Institute, Regional Operational Centre for Southern Africa (IOI-SA), based at the University of the Western Cape, initiated a mariculture programme comprising two main projects. The first project focused on an investigation into the growth and agar characteristics of gracilarioids cultivated in St Helena Bay (Wakibia 1999) and was undertaken with the close cooperation of the Seaweed Research Unit of MCM. The term gracilarioid is used here because the seaweed found in St Helena Bay, previously assumed to be *Gracilaria gracilis*, is now thought to be a different species, *Gracilariopsis lemaneiformis*. The results of this study indicated that gracilarioids of high quality could be grown in St Helena Bay, using the same technology as that used in experiments on *Gracilaria gracilis* in Saldanha Bay (Anderson *et al.* 1996).

The second project, which is still underway, concerns the establishment of a community-based gracilarioid farm in St Helena Bay, on the West Coast of South Africa, about 180 kilometres (km) north of Cape Town (see Figure 10.2). For the purpose of this project it is assumed that both species from Saldanha Bay and St Helena Bay can and will be cultivated, hence the use of the term gracilarioid.

The project developed from experiments on the cultivation of *Gracilaria gracilis* in Saldanha Bay (Anderson *et al.* 1996). In that locality, summer water conditions were not suitable for cultivation, and St Helena Bay appeared to offer a better environment for farming this seaweed. Furthermore, there is less potential competition for water space in St Helena Bay. The objective of the project is to provide support to members of the local, ‘historically disadvantaged’ community to establish a gracilarioid cultivation farm in St Helena Bay and thus contribute to economic development in the region.

The population of St Helena Bay is approximately 3 000. Fishing and agriculture are the most important economic activities in the area. Amongst the ‘historically disadvantaged’ community of St Helena Bay, there are Afrikaans-speaking and Xhosa-speaking individuals, with most of the individuals involved in the project being Afrikaans-speaking and ‘coloured’.

Figure 10.2 Location of St Helena Bay along the west coast of South Africa



According to Schutte (1993), the socio-economic profile of the 'coloured' community of St Helena Bay can be summarised as follows: an average age of 43.7 years, average household size of five members, an estimated literacy level of 81.3 per cent and an average household income of R1 435.90 (US\$143.60) per month. There is a clear need for economically viable initiatives, and it is envisaged that the seaweed farm will create jobs for between two and three persons per hectare (ha) cultivated.



In order to raise awareness and build capacity of local community members with an interest in becoming involved in the seaweed mariculture project, IOI-SA presented a 10-day seaweed mariculture course to the local community in July 1997. This led to the formation of the St Helena Bay Community Seaweed Initiative (CSI), consisting of 32 community members. In 1998, the Department of Trade and Industry (DTI) provided IOI-SA with a small grant to help the CSI with the planning stage of the project. In 1999, the *Gesellschaft für Technische Zusammenarbeit* (GTZ) provided funds to IOI-SA to provide ongoing project management services.

With the grant from DTI, IOI-SA was able to assist CSI in preparing a business plan in 1999, in establishing a private company called Maribus Industries (Pty) Ltd. in 2000 and in applying for seawater space in which to farm the seaweed. Two community members were registered as directors of the company. To date, 18 members of the original interest group have been registered as shareholders. Most are fishers, factory workers, unemployed or other professionals such as teachers. It is proposed that seaweed farmers will be employed by the company once the farm is operational and will be trained with the help of IOI-SA and other organisations involved in the seaweed industry.

An important stage of project planning that is not yet complete is the granting of a seawater lease. An application for an experimental farm in St Helena Bay was lodged with MCM in August 1998, but by 2000 no answer had been received. A second application (for a 20 ha commercial farm in St Helena Bay) was submitted in May 2000, but the processing had still not been concluded by September 2001. The application process is thus proving to be a major obstacle to the practical implementation of the farm. There were initial delays in the processing of the application because of uncertainty regarding the interpretation and implementation of relevant provisions of the Seashore Act. Subsequent delays occurred due to implementation of the recently promulgated environmental assessment regulations relating to the ECA and National Environmental Management Act. The next stage of the project, if approved, will include the securing of funds, appointment of personnel, construction of the cultivation system, practical training of farmers and a testing phase of at least one year. The testing phase will give insights into the seasonal growth and quality of the seaweed and the cyclical performance of markets.

### Physical aspects of the proposed farm

The seaweed will be grown on rope rafts in the sea. The farming technology is simple, and the raft structure is made of ropes, chains, floats and anchors. Farming is expected to have a low environmental impact, especially because seaweed naturally occurring in the area will be used, with no chemicals such

as fertilisers. This information has been included in the scoping report. Because seaweed takes up nutrients, the activity is likely to provide the ecological benefit of removing some of the waste nitrogen that is routinely pumped into the sea by fish factories in the area. The major impact of the activity would be visual, and there would also be competition with other water users. The rafts will be anchored to the sea bottom with rope, chains and anchors, and will float just beneath the water surface with 25-litre plastic floats. The size of one raft will be approximately 0.5 ha, with boat lanes around it. The seaweed is grown on Netlon, which is tied to the raft frame (Dawes 1995). Netlon is plastic netting, which forms a rope when pulled tight. These ropes are removed at harvesting time and taken to a sheltered area on land (for example a warehouse), where the seaweed is removed. The same ropes, with fresh tufts of seaweed, are then re-attached to the rafts.

The product could be sold in fresh form as a supplementary feed for farmed abalone in the immediate area, or in dried form for the extraction of agar. The drying process could take place on land leased from farmers. Agar is used in the preparation of processed foods (e.g. sweets and confectionery), pharmaceuticals such as toothpaste, and as a bacteriological growth medium (Armisen 1995). Agar processing does not currently take place in South Africa. The dried seaweed will be sold to processing factories in other countries such as Asia, Germany and South America, or to local seaweed exporters. The dried seaweed has a high value (about R11 000, US\$1 100 per dry tonne) and the international demand for food-grade agar is about 7 500 t per year valued at R1 452 million (US\$145.2 million – *pers comm.* H. Porse, seaweed industry consultant, 1998).

### Proposed future institutional arrangements for managing the project

The organisations that were formally involved in the development and management of the project are the IOI-SA, the University of the Western Cape, the University of Stellenbosch, and Maribus Industries (Pty) Ltd. The IOI-SA was responsible for project management and training. Maribus Industries is the official body representing community shareholders. The University of the Western Cape provided institutional support and formally trained community members involved in the project and the University of Stellenbosch provided advice on the financial and economic aspects of the project as well as some training. More recently, the DTI, through its Community-Public-Private Partnership Programme, has provided services such as the facilitation and structuring of partnerships, and the brokering and removal of bureaucratic bottlenecks.

Since the establishment of Maribus Industries in 2000, there have been several changes to the institutional arrangements. The company operates as an

independent entity and, once water rights have been secured, will own and manage the farm. IOI-SA continues to manage other aspects of the project, including research, the provision of training and assistance with formal applications. Once a seawater lease has been secured, the Seaweed Research Unit of MCM has agreed to provide technical training, expertise and advice. In 2001, the Seaweed Research Unit made a small experimental raft system in St Helena Bay available to Maribus Industries. Experiments will be conducted by the company with the help of IOI-SA, and will be used as a mechanism to start training company personnel in the practical aspects of gracilarioid cultivation, while providing research data to MCM that can be used by other entrepreneurs.

Maribus Industries is managed as a private business by two elected directors. As already mentioned, there are 18 registered shareholders from the local community, who bought shares in the company. The directors are elected on an annual basis by the shareholders, and their responsibilities include the establishment of partnerships with other organisations. The broader community will benefit indirectly as the company will appoint farmers and labourers from within the community, who may also elect to become shareholders. The increase in jobs could boost the local economy and contribute to an improvement in the living standards of shareholders, farmers and labourers. Once the farm is operational, a farm manager and administrative assistant will be appointed.

Although Maribus Industries is involved in a cooperative arrangement with the Seaweed Research Unit and other institutions regarding research and training, decision-making power still rests with the government. Other management aspects such as the determination of access criteria, monitoring and enforcement remain the responsibility of the government. When the company becomes a member of SASCA or MASA, directors and shareholders will be able to further contribute to management decision-making processes.

### Project summary

The most significant achievements in the development of the project have been the introduction of the concept of seaweed farming to community members, the presentation of a seaweed mariculture course to community members, the formation of the CSI in 1997 and its registration as Maribus Industries (Pty) Ltd. in 2000 and the increased collaboration and communication between Maribus Industries and government. The involvement of IOI-SA is based on its role as a research, development and training organisation. Through its involvement, IOI-SA fulfils some of its own objectives of research and training. Maribus Industries benefits from the arrangement because it receives training and assistance that would otherwise be unavailable to them due to financial constraints. MCM benefits from the project by having access to persons in the field who can help conduct experiments and provide research data on a continual basis.

When operational, the seaweed project aims to provide full-time jobs for two to three farmers per hectare (with a viable farm size of 10 to 20 ha) and other personnel. Shareholders and farm workers will exploit the resource for commercial sale and profit, and IOI-SA and MCM will collect data for publication and incorporation into training material.

## CO-MANAGEMENT OPPORTUNITIES

### The benefits of forming co-management arrangements

A number of positive outcomes have emerged from the co-management arrangements between government and the industry stakeholder groups (SASCA and MASA). First, increased communication between these groups has led to greater participation of stakeholders in policy and decision-making processes. For example, user groups were consulted during the revision of the seaweed application and allocation processes. In addition, stakeholders participated in the development of a mariculture sector plan, giving input into policy implementation. Second, interaction with user groups has contributed to government's understanding of the obstacles that currently exist in establishing mariculture ventures. There is recognition that greater capacity is required within government to implement policies effectively. Furthermore, through their experiences with stakeholders, government is now able to provide more effective and realistic advice to new entrepreneurs emerging in the mariculture sector.

Although the St Helena Bay seaweed farming project is unable to establish a formal co-management arrangement with government until access rights are secured (in the form of a seawater lease), positive outcomes have emerged from this initiative:

First, it is recognised that preparatory activities are required for the establishment of co-management. These provide the foundation for developing partnerships at a later stage. The formation of formal organisations or institutions, for example, is an effective way for 'historically disadvantaged' individuals to gain access to resources and become part of co-management arrangements with other institutions. Thus, the development of Maribus Industries, by the community members involved in the project, was a significant development in organising and operationalising the mariculture venture.

Formal organisations are also significant for developing partnerships with other institutions. For example, in the Northern Cape Province of South Africa, the provincial Department of Economic Affairs (DEA) provided finance for the formation of the Fishing and Mariculture Development Association (FAMDA). FAMDA received funding from DEA for the appointment of a development officer, office expenses and an assistant. In turn, it



provided access support services, funding and assistance with rights applications to coastal community organisations such as closed corporations, along the Northern Cape coast. In 2000, seaweed concessions were granted to a number of community organisations and FAMDA assisted these groups with the establishment of a consortium to enable them to manage the concessions (*pers comm.* L. Phillips, Alexkor, 2000.). If community members did not organise themselves into commercial entities they would not have benefited from the arrangements between provincial government and FAMDA (arrangements in which FAMDA received assistance from the state and in turn contributed to economic development in the province).

Second, there was increased communication between government and community stakeholders. Channels of communication have opened up to allow greater consultation with the users on policy implementation, to inform the users of application procedures, to inform government of the obstacles to mariculture application and to begin exploring future partnership arrangements. For example, it has been established that Maribus Industries would benefit from a co-management arrangement with the Seaweed Research Unit of MCM by potential farmers receiving technical training and advice from researchers. Government, on the other hand, would benefit through the involvement of farmers in certain management functions such as research and monitoring.

A third positive outcome from this initiative is the training and capacity building that has been implemented for members of the seaweed farming project. The most significant development was a 10-day seaweed mariculture course, which was implemented jointly by IOI-SA and the Seaweed Research Unit of MCM, to raise awareness and train project members in establishing and maintaining a sustainable venture. Furthermore, additional skills were developed through the process of preparing business plans, registering as a private company, managing the organisation, liaising with government personnel and conducting research (which will be discussed below).

Finally, a significant development that has emerged from the preliminary partnership between Maribus Industries and government is the establishment of cooperative research and monitoring. Although a fairly informal arrangement, the Seaweed Research Unit has trained potential farmers to monitor the experimental raft in St Helena Bay and to maintain temperature records. This has ensured that the scientists are kept informed of developments and has contributed to the protection of the raft. These collaborative efforts have established a foundation of cooperation between the partners that will be valuable when more formal arrangements are put in place in the future.

Weaknesses of the current management system and issues to be addressed

The main weaknesses of the present system of seaweed management in South Africa are: firstly, the long processes involved in acquiring seaweed maricul-

ture leases, rights and permits; secondly, the frequent changes in legislation and procedures; and thirdly, a shortage of personnel within MCM. There is also a need to streamline the cumbersome administrative processes and create a 'one-stop shop' where applicants can obtain assistance and submit mariculture applications.

In the case of sea-based mariculture, the process of obtaining a seawater lease is extremely cumbersome. The process of gaining access to sea areas not under the jurisdiction of Portnet, has proved to be very difficult for all stakeholder groups. For example, Maribus Industries submitted their water space application in May 2000, and they are still in the process of fulfilling various requirements that have been stipulated by government. More significantly, a private company, Agartek, was granted a seaweed mariculture lease in 2000, which was four years after their initial application. However, because of differing interpretations of their lease conditions within MCM, Agartek decided to discontinue seaweed farming only a few months after initiating the project in 2000 (*pers comm.* F. Basson and J. Robinson, Agartek, 2000). Investors in Agartek were not willing to invest in the initiative due to the uncertainty ensuing from the fact that leases were only guaranteed for one year.

The implication for prospective seaweed farmers is that they are practically restricted from access to seaweed mariculture rights in sea areas under the direct management of MCM because of inefficient processes. In the case of Maribus Industries, the long application process contributed to an increase in human and financial resources spent on following up and complying with new requirements, with a resultant loss of interest from community shareholders and potential funding agencies. To date, a number of potential investors have withdrawn from the initiative due to lengthy delays.

Because seaweed resources are centrally managed, administration is handled through MCM in Cape Town. Some users prefer to travel to Cape Town to make sure that all necessary documentation related to applications reaches the correct person on time. There is a need for improved extension services to assist new entrants wishing to engage in mariculture activities. This support could be provided by non-governmental organisations (NGOs), government departments such as MCM or organisations similar to FAMDA.

Another constraint facing MCM is the shortage of personnel, which leads to situations where scientific researchers have to deal with management issues as well as research and development issues. At present one section of MCM deals with all resource applications including mariculture permits. The huge volume of applications received contributes to the length of time an application takes to be processed. The process of ongoing change in legislation applicable to mariculture, which leads to changes in the procedures for applications, is another constraint faced by MCM.

## CONCLUSION

Co-management of seaweed resources in South Africa has been taking place to some extent for a long time, but the arrangements have been instructive and between government and ‘historically advantaged’ stakeholder groups. User groups from ‘historically disadvantaged’ backgrounds have been excluded from access to these resources. However, since the promulgation of the MLRA, there has been an improvement in the participation of new entrants in the utilisation and management of marine resources. This has been facilitated by the organisation of stakeholders into representative user groups, enhancing their opportunities to gain access to the seaweed resources of South Africa, and to participate in co-management arrangements. There are appropriate institutions (such as FAMDA and IOI-SA) in place to facilitate partnership arrangements between government and user groups. The agreement between the Seaweed Research Unit of MCM, Maribus Industries and IOI-SA is evidence that certain tasks (in this case, research and training) can be shared between government and appropriate institutions.

However, there is still a lack of trust between government and user groups, especially in the case of users involved in seaweed mariculture. Even though the government is committed to transformation in the seaweed industry and to mariculture, problems such as a lack of resources and capacity and changing legislation continue to hamper the development of the industry. The process of obtaining water space for mariculture is still complex, not transparent and remains an impediment to the development of a mariculture industry and in particular, the participation of ‘previously disadvantaged’ individuals in the industry.

There is potential for the management of South African seaweed resources to further evolve to such an extent that management responsibility is shared between government and stakeholders. However, this is a slow process that will take several years to develop. Ultimately what is required is a strong commitment from both government and stakeholder groups to embrace the principles of co-management in order to give effect to policy objectives governing marine living resources in South Africa.

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## NOTE

- 1 Although 'sea' is not explicitly defined, the Act states that it exercises control over the seashore and of the sea and the bed of the sea within the three-mile limit. The three-mile limit is defined as 'the distance of three nautical miles out to sea from the low-water mark'. In addition, 'seashore' is defined as 'the land situated between low-water mark and high-water mark' (Department of Lands 1935).

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# Towards Abalone and Rock Lobster Co-management in the Hangklip-Kleinmond Area

*Maria Hauck and René Hector*



An informal meeting with fishers to discuss the experimental rock lobster quota.

*Photograph Project Team*

## INTRODUCTION

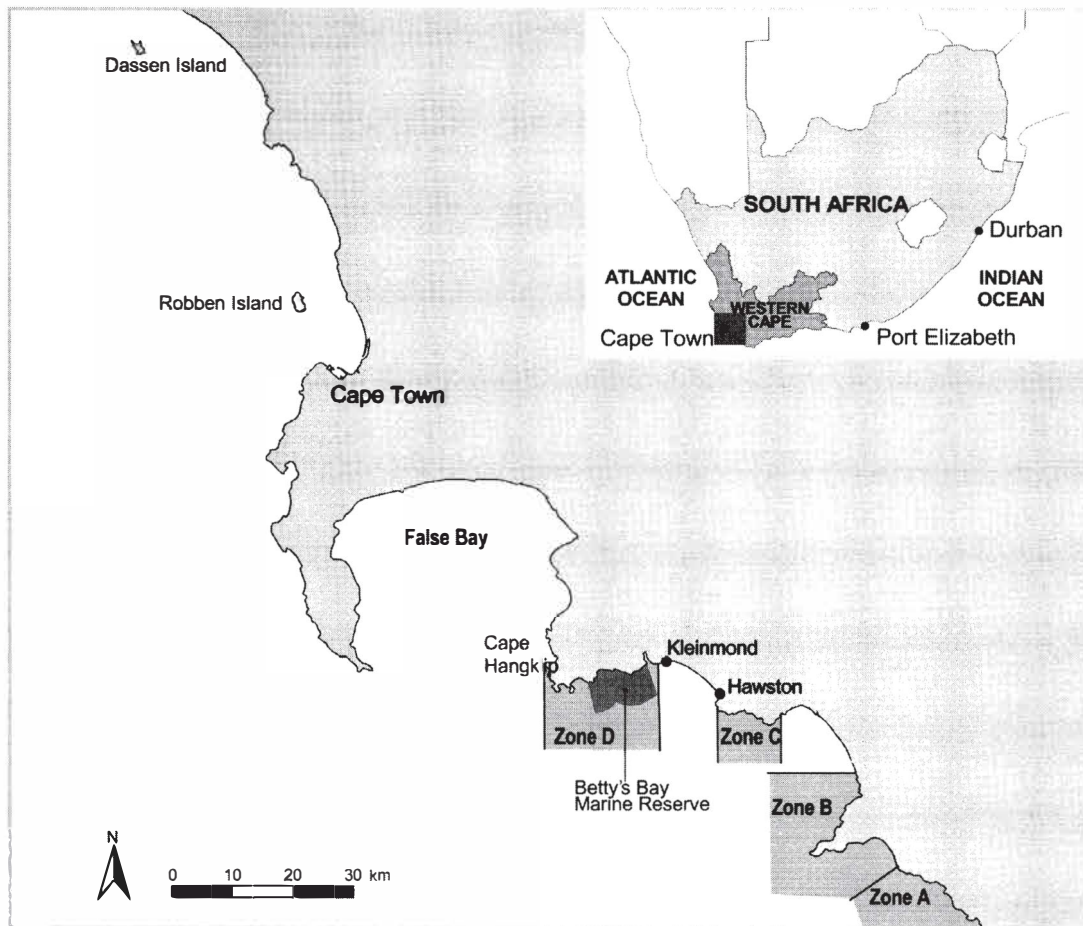
A significant problem that has escalated over the past decade in South Africa is the illegal harvesting of abalone (*Haliotis midae*) and rock lobster (*Jasus lalandii*) along the south west coast. The scale of poaching has been one of the most significant factors contributing to an approximately 45 per cent reduction in commercial abalone allocations in key management zones A to D (see Figure 11.1) between 1990 and 2001 (Tarr 2000, *pers comm.* A. Mackenzie, Marine and Coastal Management, Department of Environmental Affairs and Tourism, 2001). The bulk of this overall reduction is due to a 100 per cent cut in the commercial abalone allocation to management Zone C, traditionally a key abalone fishing area near the community of Hawston. Poaching has also had significant socio-economic impacts on coastal communities in this area (Hauck 1999a). Furthermore, the poaching problem has been exacerbated by the lucrative prices fetched for abalone products, linked to organised criminal networks in South Africa and to international markets (Hauck and Sweijd 1999). The project outlined in this chapter emanated from an 18-month research study by the Institute of Criminology, University of Cape Town (UCT) to investigate poaching activity in the Hangklip-Kleinmond area, south-western Cape (Figure 11.1). The results of this research, which included inputs from fishers, poachers, community organisations, scientists and government authorities, clearly emphasised the need to explore new strategies to address poaching other than a sole reliance on law enforcement (Hauck 1999b).

Thus, the key aim of the project, which was initiated in July 1999, was to bring all of the conflicting stakeholders together to identify, and implement, a coordinated strategy to diminish poaching in the Hangklip-Kleinmond area. Similar to developments occurring in terrestrial nature conservation (with respect to elephant poaching – Barbier *et al.* 1990, Child 1996), a significant goal was to identify a means of encouraging poachers (through a series of incentives) to protect rather than plunder inshore resources. Although it was recognised at the outset that law enforcement had a critical role to play in addressing the criminal networks, this project aimed to explore new strategies for intervention that involved users and other relevant stakeholders in management activities, including an investigation into issues of access.

This approach has also been discussed in fisheries compliance literature. It is argued that although law enforcement is seen as a necessary and important element of compliance, it should not be implemented in isolation of strategies that encourage voluntary compliance (Kuperan and Sutinen 1998, Sutinen *et al.* 1990). Compliance is closely linked to the legitimacy of rules and regulations. As Sutinen explains, ‘a high level of support by the fishing community translates directly into compliance with management regulations’ (Sutinen 1996, p. 13). It is therefore argued that co-management arrangements are one



Figure 11.1 Map of the abalone fishing zones A to D and the location of the Hangklip-Kleinmond area



way of achieving increased legitimacy of the management system (Jentoft 1989, Sutinen and Kuperan 1999). Thus, this pilot project in the Hangklip-Kleinmond area was an attempt to plan and develop a co-management arrangement with the local fishers as a means of achieving some level of voluntary compliance.

Although planned as a three to five year project, implementation only occurred over twelve months due to a lack of further funding. Nevertheless, experience gained from the planning stage, which has been identified by Borrini-Feyerabend (2000) as the preparatory phase of co-management, has identified a number of important lessons that could be usefully incorporated into similar initiatives. From a community perspective, most of the fisheries co-management projects that have been implemented in South Africa have largely focused on subsistence fishing. This project, which focuses on lucrative resources linked to an active commercial sector, and an organised poaching element, highlights important issues that need to be considered if co-management is to be explored as a potential management strategy for small-scale



commercial fisheries. The complexity of incorporating the poaching sector (that lives within the community) as a stakeholder in fisheries management cannot be underestimated. Nevertheless, this project attempts to explore whether or not broadening access to resources, and the development of a co-management arrangement, will lead to a reduction in illegal fishing. With recognition that reliance on law enforcement alone to solve the poaching problem is short-sighted and would not have a positive long-term impact (Hauck and Sweijid 1999), pilot projects of this nature (that actively seek to test and explore alternatives to crime control) need to be implemented.

## BACKGROUND

This project was implemented in the Hangklip-Kleinmond area between the communities of Cape Hangklip and Kleinmond (see Figure 11.1) from July 1999 to June 2000. A commitment to fund the first phase of this project was secured from the Chief Directorate: Marine and Coastal Management (MCM) of the national Department of Environmental Affairs and Tourism (DEAT). No further funding was allocated after this date, resulting in the termination of further research in, and support to, the community.

The Hangklip-Kleinmond area was identified as an appropriate case study largely due to the background research that had already been undertaken in the area (Hauck 1999b). Many of the key role-players had been identified and the Institute of Criminology at UCT had been approached by a community organisation to assist in exploring new strategies for addressing the local poaching problem. In addition, this area was considered important due to a growing concern by MCM scientists about the increase in poaching activity in the adjacent marine reserve (see Figure 11.1). Although a concern, it was also recognised that poaching had not yet reached the level of organisation experienced in the coastal community of Hawston, and the abundance of abalone and rock lobster had apparently not yet been as adversely affected by poaching activity as was clearly evident near Hawston.<sup>1</sup> Thus, the implementation of this project was identified as a potential mechanism to try and prevent the establishment of highly organised poaching networks in this area.

The Hangklip-Kleinmond area has a population of 3 383 permanent residents (Statistics South Africa 1998), and has become a tourist destination in recent years, attracting a number of holiday makers and the establishment of holiday homes. Fishing activity, however, has historically been based in the Kleinmond community, dating back to 1915 with the establishment of the Jogensklip fish harbour. Largely an Afrikaans-speaking 'coloured' community, the fishers' houses were erected on the hill opposite the harbour and their livelihood was based on the harvesting of marine resources. However, in 1948 the fishers living near the harbour were moved inland, and in 1954 the harbour

was proclaimed an industrial zone. This relocation, based on apartheid policy through the Group Areas Act 41 of 1950 (Department of the Interior 1950), led to the development of the 'coloured' community of Proteadorp (geographically separate, but adjacent to Kleinmond), where many of the local fishers still live (Hofmeyr 1985).

The fishers in the Proteadorp community harvest a number of different marine species.<sup>2</sup> The area has an abundance of various linefish species as well as large quantities of the more lucrative rock lobster and abalone. At the beginning of the project the fishers had access to rock lobster and abalone through recreational permits only and not via commercial fishing rights. Commercial access to linefish species is in place, however, through a permit system and these permit holders typically hire crew from the local community to work on their boats. Some of the linefish species in this area are seasonal while others are available throughout the year. Most of the fishers harvest whatever linefish species are available to them.

According to Attwood *et al.* (1997), linefish stocks in this area have experienced extensive declines over the years. The abundance of abalone has also decreased, which has meant that the overall harvest from the abalone resource in this zone may not be sustainable. The impact of poaching is particularly harmful to the resource because poachers harvest abalone much smaller than the legal minimum size, causing a reduction in the number of individuals that recruit to the legal exploitable size. The response by fisheries managers to the poaching crisis has been to try to reduce the impact on the resource by imposing legal controls (i.e. on the commercial and recreational fishers). As a result, the commercial allocations have been severely reduced over the last ten years (Tarr 2000) and the recreational fishing season was also substantially shortened for the 2000–01 season. More recently, abalone confiscations from poachers have revealed a larger size-class of individuals which scientists believe may be from the Hangklip-Kleinmond area, specifically from the nearby Betty's Bay Marine Reserve. This raises serious concerns about the future viability of the resource. To complicate matters, research has also indicated that the decline in abalone stocks is influenced by biological interactions between lobsters, juvenile abalone and sea urchins (Day and Branch 2000, Mayfield 1998, Tarr *et al.* 1996). The relationship between these three species involves sea urchins providing protection to juvenile abalone, and rock lobster preying on sea urchins. An influx of rock lobster eastwards of Cape Hangklip (see Figure 11.1) over the last ten years has increased the predation on urchin populations. This has resulted, in turn, in a reduction in juvenile abalone survival rates (Tarr *et al.* 1996). If these processes and their quantitative implications are confirmed by scientific research in the near future, and if there is no reversal of the situation, then further declines in the abalone Total Allowable Catch (TAC) in this area are likely.

The available evidence indicates that the abundance of rock lobster east of Cape Hangklip has increased since the early 1990s (Tarr *et al.* 1996). The exact cause of this phenomenon, which has been documented by MCM scientists, is unknown, and it is accordingly not known whether a reversal to pre-1990 rock lobster distribution patterns is likely in the near future. The resource has been heavily exploited by poaching groups both from within and outside the Kleinmond community. In Hawston, for instance, where the abalone resource has been poached to unsustainable levels, rock lobster are now being targeted in large numbers. This heavy poaching could result in local depletions of rock lobster, with negative implications for any commercial fishing activity that may be contemplated for this area in the future.

## PROJECT OBJECTIVES

The increase in inshore poaching activity in the Hangklip-Kleinmond area was the key impetus to project development and implementation. Concern and frustration regarding the situation were expressed by both local and national government, as well as by community members and organisations. In May 1999, the community took the important step (with the assistance of an external facilitator) of establishing the Hangklip-Kleinmond Coastal Management Forum (the coastal management forum), which included representatives from local conservation organisations, boat clubs, recreational fishers, artisanal fishers, poachers and local government. This forum provided a platform to discuss and debate coastal and fisheries issues and was a first attempt to bring conflicting roleplayers together. In addition, the forum provided the institutional structure for the project. Key objectives and goals of the project were developed and supported by representatives of this forum.

### Objective one: strengthen the coastal management forum

The first agreed upon objective for the project was to strengthen all stakeholders' participation in the coastal management forum. It was agreed that certain key roleplayers from the 'historically disadvantaged' fishing community (Proteadorp) were not involved in the forum and that if the forum was to be effective, it needed to be more participative and more representative. At the outset, the forum largely consisted of people from the middle class sector of the Hangklip-Kleinmond area and included those community groups involved in informally managing and policing the coastal and marine resources. Both national government (MCM scientists) and local government (municipal conservation officer) were often represented at meetings. The regional MCM fishery control officers, however, did not play any role in the coastal management forum (nor the project) despite their responsibility for policing and

monitoring the coast. Another key roleplayer participating in the forum was the community-based organisation, Seawatch, which was actively involved in monitoring poaching activity and liaising with the authorities.

The fishers in the area are a diverse group and were not well represented on the coastal management forum. Some recreational fishers participated, but racial divisions were evident between those who were dependent on the resource for a livelihood and those who fished for sport or relaxation. Another group of fishers in the community are the 'traditional fishers', which include boat owners and their crew. Most crew on the boats are 'coloured' fishers, living in Proteadorp, who have been fishing for most of their lives. Although they rely on fishing for their livelihood, they are not subsistence fishers in the sense of living from hand to mouth. Most of their catch is sold to generate cash income.

Most of the boat owners in the area could be classified as small-scale commercial. These fishers are mostly 'coloured' fishers, but also include fishers from the previously demarcated 'white' community. In Proteadorp, the boat owners are the leaders who have gained the respect of the fishing community. The boat owners and the crew from this area organised themselves into three separate fishing organisations. Two of the groups are racially mixed, with the majority of the fishers being 'coloured'. One of the groups includes Xhosa-speaking fishers (who moved to Kleinmond as labourers from the east coast) and the other group, the largest of the three, includes some of the local 'white' fishers. There is conflict and tension between each of these groups as they compete for access to local resources.

Another group of fishers in the community is the poachers. The poachers do not fish from boats, but make their living by diving for both abalone and rock lobster. Previously, some of these poachers had other forms of employment but left their jobs for this more lucrative alternative. Although there are other *ad hoc* poachers in the area, this group has been identified due to the fact that they recognise themselves as 'poachers' and have organised themselves into a private company in order to apply for legal access to marine resources.

Women have a limited role in the fishing sector within the Proteadorp fishing community as fishing is perceived to be a traditionally male profession. However, some of the women have been involved in harvesting alikreukel (*Turbo sarmaticus*) and other intertidal resources. In addition, the women were historically involved in cleaning fish and working in the factories. During the project they were not active, however, in any of the fishing organisations in the community.

The objective of strengthening the representation of the coastal management forum was thus aimed at involving all of the different groups in the area who were involved in coastal and marine activities. It would be fair to state, however, that there were racial divisions between these groups that led to the



existence of mistrust and underlying animosity. Although research indicated that many of the goals of the community organisations were similar to those of the fisher organisations, there remained a historical division of ‘us and them’, which was readily perceived by the fishers. As a result, it was agreed that the first phase of the project would focus on working with the different fisher groups (particularly from Proteadorp) to build capacity and ultimately strengthen the coastal management forum by obtaining representation of all user groups on the forum. A strong institutional structure would then provide a foundation on which to build a joint management arrangement between the different stakeholders.

#### Objective two: clarify strategies for access to resources

The second objective was to clarify appropriate strategies for enhancing access to inshore marine resources. This relates directly to the overwhelming agreement among the coastal management forum members that local fishers should have access to local resources. They identified this objective as being the most important element to achieving the sustained management of resources in their area. Members of the forum argued that commercial permits would provide an alternative to the poachers and would encourage a sense of stewardship over the resources.

Rights of access to the abalone and rock lobster resources in the area had been an issue of contention and active attempts had been made by the different stakeholders to secure commercial permits or quotas. However, when the project was initiated, none of the fishers living in the Hangklip-Kleinmond area had access to these inshore resources on a commercial basis. Although some of the fishers utilised recreational permits during the prescribed seasons, these permits were restrictive in the sense that catches could not be sold. From an historical perspective, both abalone and rock lobster were at one stage accessible to all fishers through an open access system before regulations were established by central government (the commercial abalone fishery began in 1949 (Tarr 1992) and the commercial rock lobster fishery began in the late nineteenth century, with management measures being introduced in 1933 (Cockroft and Payne 1999)). In the abalone fishery, for example, fishers are currently required to apply for entitlements that would allow them to catch and sell their fish commercially. In the past, however, access to quotas in most fisheries was often centralised in the hands of a few ‘white’-owned companies, which gave little opportunity for fishers in coastal communities to benefit. Prior to the 1998–99 fishing season, only five quota holders were established in the abalone industry. However, there were a number of abalone divers (approximately 50) who were allocated *diving* entitlements, which allowed them to harvest the abalone and deliver to the quota holders for export (Tarr 2000). In the Hangklip-Kleinmond area there were three divers from

Proteadorp who were allocated entitlements to harvest abalone. However, in the mid-1990s, when the abalone industry was being restructured, all three of these abalone divers sold their diving entitlements as they feared that the abalone industry would collapse. Issues surrounding the historical access to the abalone fishery have led to underlying conflict and mistrust between the different fishing sectors within the community.

With respect to rock lobster, a commercial inshore fishery has not been historically documented in this area (prior to 1980), and has either never existed or has only existed on an informal and minor basis (*pers comm.* A. Cockroft, MCM, 2001). In the 1980s, regulations were promulgated closing the area east of Cape Hangklip to commercial rock lobster fishing as rock lobster abundance in this area was not regarded as significant at that time. The historical records point to the west coast as the area where the rock lobster fishery developed and where it has always been concentrated (van Sittert 1993), consistent with the scientific view that the bulk of the resource abundance was traditionally and still is located there (Mayfield 2000).

However, there are indications that the abundance of rock lobster east of Cape Hangklip increased substantially during the 1990s, possibly initiated by an eastward migration of adult rock lobster. As a result, research conducted by the Sea Fisheries Research Institute (SFRI)<sup>3</sup> in the early 1990s began exploring the possibility of an inshore commercial rock lobster fishery east of Cape Hangklip. A test fishery was implemented in 1991 (SFRI 1991). This test fishery, however, was terminated by the Chief Director of Sea Fisheries with a press release stating that commercial rock lobster fishing would not be permitted east of Cape Hangklip (media release, 7 April 1991, Chief Director: Sea Fisheries, DEAT, Cape Town, South Africa).

More recently however, in 1998, MCM identified subsistence fishers as a new sector in fisheries (DEAT 1998). As a result, local fishers in the Hangklip-Kleinmond area had the opportunity to apply for subsistence permits for both rock lobster and abalone and that would allow them to sell their catch according to the regulations. Although subsistence permits were allocated in this area in 1998, the fishers from the Hangklip-Kleinmond area submitted no further applications in 1999 as they felt they would benefit more significantly by applying for commercial access. A number of problems were identified with the issuing of subsistence permits, perhaps the most significant of which was the implicit support for or legal sanction of the black market.

As a result, in mid-1999, when the project was initiated, the four community fishing organisations in the Hangklip-Kleinmond area had already applied to MCM for access to the abalone fishery. Some of these groups also attempted to apply for access rights to the commercial rock lobster fishery, despite the absence of a commercial fishery east of Hangklip. For the purpose of applying for access rights, these groups (which represented a total of

70 fishers) legally registered themselves as private companies. However, their applications for commercial access to abalone and rock lobster were not successful. Consequently, one of the key focus areas of the coastal management forum was to clarify mechanisms for gaining access to these resources.

#### Objective three: education

The third objective was related to education and raising awareness. It was emphasised that this did not only refer to increasing the understanding of resource systems and management amongst community members, but also enhancing the understanding within MCM about the community and local issues. Key to this objective was the active involvement of MCM fisheries scientists in the project. They provided a channel of communication between government and the community. Although greater emphasis was placed on the other two objectives at the onset of the project, stakeholders such as Seawatch became active in implementing education and awareness programmes in the area.

### PROJECT IMPLEMENTATION AND METHODOLOGY

Although the original budget for the project made provision for a project manager and facilitator, the team expanded to include two facilitators and a research assistant. This was largely a result of the wide range of issues that needed to be addressed by the project and the necessity to have frequent interaction with the community. There were two spheres of government that were actively involved in the project. First was local government, which supported local access to resources and was in favour of delegating the governance and management of marine resources to the local level. Its participation in the project was largely through the involvement of its conservation officer. The second sphere of government was at a national level, through the involvement of fisheries scientists from the abalone and rock lobster research units at MCM. They became involved in the project largely due to their concern for the future sustainability of these resources and a willingness to explore new strategies that would impact on large-scale poaching. In addition, they saw this process as an opportunity to gain access to new information on the stocks as a result of establishing a working relationship with the resource users.

The fishers, on the other hand, became involved in the project as a mechanism to try to gain access to the abalone and rock lobster resources. In view of their unsuccessful efforts in the past, they requested assistance from the project team in applying for access and establishing a better working relationship with the scientists at MCM. This incentive to gain access to resources was the underlying impetus for a high level of participation in project activities.

This was also the case for other members of the community, such as those involved in the coastal management forum. There was general agreement that local fishers should obtain access to local resources. As a result, all stakeholders gave their full support to the project.

### Agree on project objectives

The first step in the implementation process was to establish agreement among the different roleplayers on the key objectives of the project. As a result, a workshop was conducted with the coastal management forum to explore the objectives and activities of the project and to identify how the forum and the project could work together. In addition, a series of meetings were held independently with each organisation participating in the forum (as well as other stakeholders) to clarify the objectives of the project and to establish the needs and concerns of the different roleplayers. A second workshop fed back information gathered from these meetings, and the three objectives outlined above were agreed upon.

### Interaction between conflicting stakeholders

Historically, the four fishing groups did not work together and were in fact in conflict, over both personal and professional issues (the latter predominantly having to do with access to resources). However, during project implementation, when mechanisms were being identified to increase opportunities for gaining access to rock lobster and abalone, members from MCM encouraged a collective application from the community. In other words, the process was being steered in the direction of merging the different groups to apply collectively for quotas. Through a series of workshops and meetings a project management team was created that consisted of the leaders from each of the fishing groups. This was a time-consuming process as deep-seated conflict and animosity existed between the different organisations.

During one of these workshops it was suggested that the different fishing groups come together to form a joint company to apply for access rights. As a result, a significant amount of time was dedicated to establishing this company (called Kleinmond Marine Products), addressing the legal implications and electing a board of directors. The fishers and the broader community supported this initiative as they understood that it would be the most effective means of jointly securing access rights. The Board of Directors (which was the management team) became the key institutional structure working with the project team to achieve the agreed objectives. It was the responsibility of each of these leaders to feed information back to their organisations. Two of the directors participated in the coastal management forum as representatives of the broader fishing community.



### Appeals for abalone quotas

After the project was initiated, all four fishing groups were notified that they were unsuccessful in their previous applications for abalone quotas. This impacted negatively on the project because the fishers became angry and even more disenchanted with the 'unfair' decision-making processes within government. As a result, a public protest was organised with the involvement of the fishers, the coastal management forum, local authorities and the project team to appeal the refused applications and highlight the community support for local access. This protest was covered in the local media and served the purpose of bringing all roleplayers together around a common goal. Formal letters of appeal were submitted to MCM that included letters of support from a variety of influential people in the area including the local mayor and police commander.

### Rock lobster experimental quota

Due to the focus of the project on access to resources, and the involvement of MCM scientists in the project, various options for harvesting rock lobster in the area were discussed. Research conducted during the 1990s indicated an increase in the number of rock lobster east of Cape Hangklip (Tarr *et al.* 1996). This influx of rock lobster led to MCM exploring the possibility of introducing an experimental rock lobster fishery in this region. It seemed appropriate for the project team to assist fishers with the application process and the development of an appropriate management strategy.

Although the experimental rock lobster quota was not officially announced in the Government Gazette until the project was coming to a close, the project provided an opportunity for stakeholders to assist MCM develop criteria for assessing applications that local fishers felt were fair. Initial criteria, that were developed by a task team at MCM, were fed back to the community for discussion. Workshops and meetings with the coastal management forum and the fishers' management team led to recommendations that were submitted to MCM. These recommendations included criteria such as whether the applicant was from the local area or not, whether crew would be employed from the disadvantaged community and whether the applicant currently had access to rock lobster through a commercial or subsistence permit. The fishers were eager to participate in this process and were supportive of the criteria that they collectively agreed upon.

Further meetings were then organised with the leaders of the different fishing organisations to identify who from the area should be eligible to apply and how to manage the quota if it was allocated. Scientists from MCM indicated that 10 one-tonne (t) permits would likely be allocated in the Kleinmond area. This information resulted in the identification, and agree-

ment, of twenty potential fishers from the area who would apply for the experimental rock lobster quota. Full-day workshops were then conducted with these applicants and members of the coastal management forum to develop guidelines for harvesting, financial management procedures, monitoring strategies and codes of conduct. Each of the decisions made, however, was effectively applied in a hypothetical context. At the time there was little certainty as to if and when this experimental quota would be allocated. Furthermore, none of the project participants from MCM were involved in this process due to the uncertainty surrounding major institutional changes occurring within the Directorate. Therefore, the decisions that were made in the community were fed back to the scientists at MCM for comment, but interaction between the two groups did not occur.

## POSITIVE OUTCOMES

Although this project was only implemented for one year, some positive outcomes were achieved. The long-term implications of these developments, however, are difficult to evaluate. A sustainable management structure, based on the complexities of this particular case, cannot be implemented and evaluated in such a short timeframe. Nevertheless, progress has been made towards the agreed objectives outlined by the stakeholders.

### Access to the abalone and rock lobster resources

It was through the activities of the project that fishers were given assistance to appeal against their unsuccessful abalone applications and lobby government for local access to resources. The project provided a liaison mechanism between the resource users and top-level management at MCM and political decision makers. This communication with government enabled them to provide a case for their appeals and to illustrate their commitment to sustainable management through their involvement in the project. In addition, the project team, through interaction with MCM scientists, put pressure on decision makers to implement the rock lobster experimental quota. The fishers were then given the opportunity to feed into the development of application criteria and motivate some level of access.

Although the project ended due to a lack of funding, positive developments relating to access rights were forthcoming. In April 2000, three of the four fishing groups received abalone quotas as a result of their appeal. A total of 8.1 t of abalone was allocated to these groups, representing 53 fishers in the community. These quotas were allocated for a second year (i.e. for the 2000–01 season). In addition, calls for applications for the experimental rock lobster quota, east of Cape Hangklip, appeared in the Government Gazette in April

2000. Ten one-tonne permits were allocated to the Kleinmond community in July 2000, and the recipient group included fishers who were not involved in the abalone fishery.

### Increased communication between MCM and fishers

With the involvement of MCM scientists in the project, communication channels between fishers and scientists improved. Scientists were able to answer a number of queries from the community and were in a position to clarify procedures for applying for quotas and for appealing against unsuccessful applications. They showed goodwill by attending a number of workshops and they assisted the fishers in filling out the application forms for the experimental rock lobster quota. Furthermore, interaction with the scientists provided an opportunity for fishers to give input on the criteria and application process for the experimental quota. The scientists became more familiar with the fishers, which allowed them to ask questions about local stocks and other problems in the fishery. This process has led to an amiable relationship between the two groups and is considered a positive development in terms of future management arrangements.

### Interaction between conflicting groups

Although deep-rooted conflict within the community cannot be resolved over a short period of time, some progress was made in this regard. First, in meetings and workshops all the fishing organisations came together as one group to explore a way forward for fisheries management in their area. It was particularly significant that these fisher groups accepted the poacher group as an important stakeholder. Each of the fisher groups recognised that some of their members poached during various times of the year, and they needed to come together to resolve this. As a result, all of the groups supported each other in their applications for quotas. In addition, although the project did not focus much time on strengthening the coastal management forum (refer to Objective 1), advances were made in increasing the participation of the disadvantaged fishing groups on the forum. A great deal of work still needs to be done in this regard, particularly due to racial divides, but in general the fishers have become more actively involved on the forum.

## PROBLEMS AND OBSTACLES

A number of fundamental problems were identified during project implementation that would have to be considered in any future co-management effort.

### Lack of transparency by leaders

A key problem that was identified during the closing months of the project was the lack of feedback to the fishers by their leaders. Although the project team organised workshops with all the fishers at critical stages in the process, intensive interaction occurred directly with the management team that was elected. As a result, decisions and developments that occurred between the management team and the project team were often not explained or discussed with the broader fishing community. This lack of consultation led to a perception by the fishers, and the broader community, that the leaders were the ones who were going to benefit the most from future quota allocations. This led to mistrust of the leaders and lowered the incentive of the broader fishers to remain involved in the process. Although an informal mechanism of accountability existed through the coastal management forum, this should have been strengthened (with input from the fishers) in order to prevent abuse of power and to monitor decision making.

### Identification of *bona fide* fishers

The question of who are the 'real' fishers in the community was not adequately explored by the project. The decision was taken at the onset by the project team that the identification of the fishers in the community would take place by the community itself. However, the criteria for making this decision, and for evaluating the decision, were not effectively defined by the project. As a result, conflict emerged as to the credibility and legitimacy of people applying for, and receiving, access to resources.

Firstly, one of the groups, which largely consisted of the Xhosa-speaking fishers, usually did not participate in meetings and workshops. Their commitment to the process and their ability to fish the quota, if allocated to them, was never verified. Secondly, there were questions raised regarding people potentially benefiting from this process if they had been outside of the fishing industry for many years. In other words, there were people who used to fish in the past, but were now involved in building, business or other forms of employment. Finally, some of the leaders themselves had not fished for many years and had also been involved in other professions. This caused concern as to whether they were *bona fide* fishers, or whether they were businessmen with other priorities and interests. There was never finalisation of the criteria to determine who qualified as a 'fisher' within the community. Therefore, when rights were allocated after the project was terminated, conflict broke out within the community as fishers argued that some of the quotas did not go to the 'real' fishers in the community. The identification of and agreement on criteria regarding who qualifies as a 'fisher' needs to be clarified for future resource allocation processes.



### Mistrust between stakeholders

There is a long history of conflict between the different stakeholders involved in this project – an issue that needs to be fully understood. There is conflict between the fishing organisations, the fishers applying for legal access and the poachers, the fishers and the policing authorities, as well as the community and MCM. In addition, there are racial divisions between the communities. Most of the mistrust originates from a long history of segregation and will not be addressed through ‘quick-fix’ approaches. As a result, even though there has been progress between and among these stakeholders with respect to finding common goals, speaking in one voice and working together to make decisions, this is only the beginning. Mistrust will rear its head again and again, particularly during times of uncertainty and conflict, resulting in the collapse of relationships that have been built. This poses serious concerns regarding decisions that were made during the project, and raises questions about the necessity of ensuring that important management decisions are legally binding.

### Organised poaching networks

A key concern for the project team was the escalation of organised poaching activity in the area. Some progress was made in addressing this concern through the commitment of the local poaching leader to participate in the process. Meetings were frequently held with the poachers to ensure that they were on board and committed to the project goals. However, due to the lack of success in obtaining access to resources while the project was being implemented, frustration and apathy grew among the poaching group. The incentive to attend meetings and workshops waned as they saw little progress in their fight for access to resources. At the same time, a main poacher from the Hawston community moved into Kleinmond and began establishing new poaching networks that were more organised and more lucrative than these poachers had previously experienced. This will remain a serious problem in future management efforts as poaching is lucrative and economic incentives are high. The problem is exacerbated with the encroachment of Hawston middlemen who are looking to target new areas along the coast. Many of the poachers who were part of this pilot project have become involved in the new poaching structures and it will be difficult to break these networks now that they have been established.

### Lack of commitment from MCM

Despite the fact that MCM had funded this initiative, there was agreement among the project team, and the community, that MCM did not demonstrate a commitment to the process. Although some of the personnel at MCM, involved in day-to-day management, were supportive of the project and

attended meetings and workshops, the decision makers at MCM did not take an active role in the process. This was particularly relevant with respect to allocation issues. The active and committed role of the community in contributing to decisions and feeding information back to MCM regarding the experimental rock lobster quota went largely unnoticed. Without the commitment and active involvement of MCM in terms of meeting project objectives, further implementation of this project will not be successful. If this project is seen as a pilot for assessing the suitability of co-management arrangements as an alternative management strategy, then it should receive the support of decision makers at MCM in order for there to be any hope for success.

### Lack of long-term funding

The first nine months of this project were funded directly by MCM. However, without a longer-term commitment to funding, this project will remain in a state of uncertainty. It has been recognised internationally that co-management arrangements are multi-year efforts based on long-term strategic management plans. Community organisation and institution building can take several years, particularly when a significant amount of time is invested in including marginalised groups in decision making (Pomeroy and Berkes 1997, Noble 2000). A variety of funding options should be investigated so that this project can continue and project goals can be implemented effectively.

### CONCLUSION

This project was initiated by organisations in the community (such as Seawatch), which were eager to identify possible strategies to reduce poaching activity in the area. It was agreed during project planning that the first step was to secure local rights to abalone and rock lobster. The focus on acquiring access rights to resources provided the key incentive for fishers to participate in discussing future management strategies. At the same time, however, it provided a recipe for conflict and apathy if access to resources was denied.

The project was an attempt to bring a wide diversity of roleplayers together to find common strategies to protect inshore resources in their area. The 12-month planning phase established a *foundation* for co-management in the Hangklip-Kleinmond area between users and government. Known as the 'preparatory phase' of co-management, this planning period is considered a critical step in preparing the stakeholders for partnerships (Borrini-Feyerabend 2000). Important activities in this phase include conducting research and a needs assessment, assessing potential resources, establishing a project team, identifying and organising the stakeholders and establishing a flow of information and communication (Borrini-Feyerabend 2000).

In the case of the Hangklip-Kleinmond project, relationships were built between conflicting groups, channels of communication were opened between the various stakeholders, interaction occurred between the resource users and the government, awareness regarding resource management issues was enhanced, and local management plans for selected resources were explored and discussed. The *implementation* of this model of management, however, can only be considered now that some level of formal access to local resources has been achieved. There is still a great deal of work to be done in strengthening local institutional structures, building capacity within the community and within government, addressing a number of conflicts, establishing certainty with respect to access rights, determining roles and responsibilities of different stakeholders and negotiating a formal co-management arrangement.

One must recognise, however, that many of the fishers' expectations were not met through this project, particularly with respect to securing access rights for each of the groups, setting up long-term partnerships and providing ongoing support from the project team, and therefore there are high levels of frustration and scepticism. The impact that the abrupt end to this project will have on future efforts is difficult to predict, but will certainly be another obstacle for the stakeholders to consider.

Although many problems were encountered during project implementation, most of these are not unique to this case study. Imbalances of power, conflict and mistrust amongst stakeholders, identification of *bona fide* fishers, lack of commitment from government and lack of resources, are all outlined in the literature (Jentoft *et al.* 1998, McCay and Jentoft 1996, Pomeroy 1998). There are other problems, however, that complicate this case study. Firstly, the political history of South Africa has an inevitable impact on resource management (Isaacs and Mohamed 2000). Although the issue of securing access to resources has been identified as a key condition for co-management in the literature (Jentoft 2000, Pomeroy 1998), government in South Africa is still grappling with achieving the equitable allocation of fishing rights. Political conflict over access to resources has emerged and an increased number of people are attempting to gain access to the fisheries. This has exacerbated the allocation problem, which 'remains a complicated and emotional process and is further compounded by the past economic, social and political imbalances that characterise the South African fishing industry' (DEAT 2000, p. 1). The absence of a detailed plan for the re-allocation of fishing rights has resulted in delays and in some instances litigation.

The second factor that complicates the implementation of co-management in the Hangklip-Kleinmond area is the organised poaching sector, both within and outside the community. The high demand and value of certain inshore resources (particularly abalone), has created significant economic incentives to participate in illegal fishing. Although the compliance literature

emphasises the importance of encouraging voluntary compliance, this theory is directly related to fishers who have secured access rights. Thus, the compliance literature refers to those fishers who participate in an established fishery. The poachers in this case study, however, are a separate group, outside of a commercial fishery, who are violating the regulations. In this situation the dynamics of compliance change in that a key mitigating factor for non-compliant behaviour (other than the economic incentive) is the lack of access rights to the fishery. Thus, mechanisms to achieve compliance move beyond the commercial fishery, and include those outsiders who are involved in an organised illicit network. In this situation, issues of access become important, as do issues of addressing outside poachers and closing the links to organised poaching. Simple solutions are not forthcoming, and research still needs to determine whether broadening access to resources, and adopting a cooperative management approach, will have an impact on aspects of fisheries compliance.

This project was developed and implemented as a pilot study to explore a number of questions: Is a co-management arrangement viable when lucrative resources are involved or when the community in question is diverse with respect to racial and economic barriers? Is it feasible to bring poaching groups into a legitimate system of management or will the economic spin-offs of poaching be too appealing? Will government commit to a new strategy of management when marine poaching is entertained as part of ongoing political debate? Will local community structures be able to put in place strategies to keep external poaching groups out of their area? Will the broad fishing community ever trust the poachers to the point that poachers themselves become involved in monitoring? These are fundamental questions that can only be answered when a serious attempt is made to implement new and participatory management systems in the community. No attempt, however, can be considered serious if a key partner (government) is not fully committed, and if long-term resources are not allocated. Co-management strategies should be implemented in a range of test cases as a means of answering some of these questions. Resolving issues of access rights, designing appropriate research programmes and putting in place appropriate monitoring and enforcement mechanisms are all critical components of such efforts. Only then can research accurately assess the impact and effectiveness of co-management as an alternative management strategy.

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## NOTES

- 1 Hawston is the community where abalone poaching emerged in the early 1990s, and where the greatest conflict and concentration of poaching activity has centred (Hauck 1997).
- 2 This information is based on the raw data gathered during Phase 1 of the Subsistence Fisheries Task Group (SFTG) research process. For a compilation of this research see Clark (2000).
- 3 SFRI was the research institute of the Directorate of Sea Fisheries, which has now been renamed Marine and Coastal Management (MCM).

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# Co-management of the Olifants River Harder Fishery

*Merle Sowman*



A Papendorp fisher, setting off to the Olifants River estuary fishing grounds.

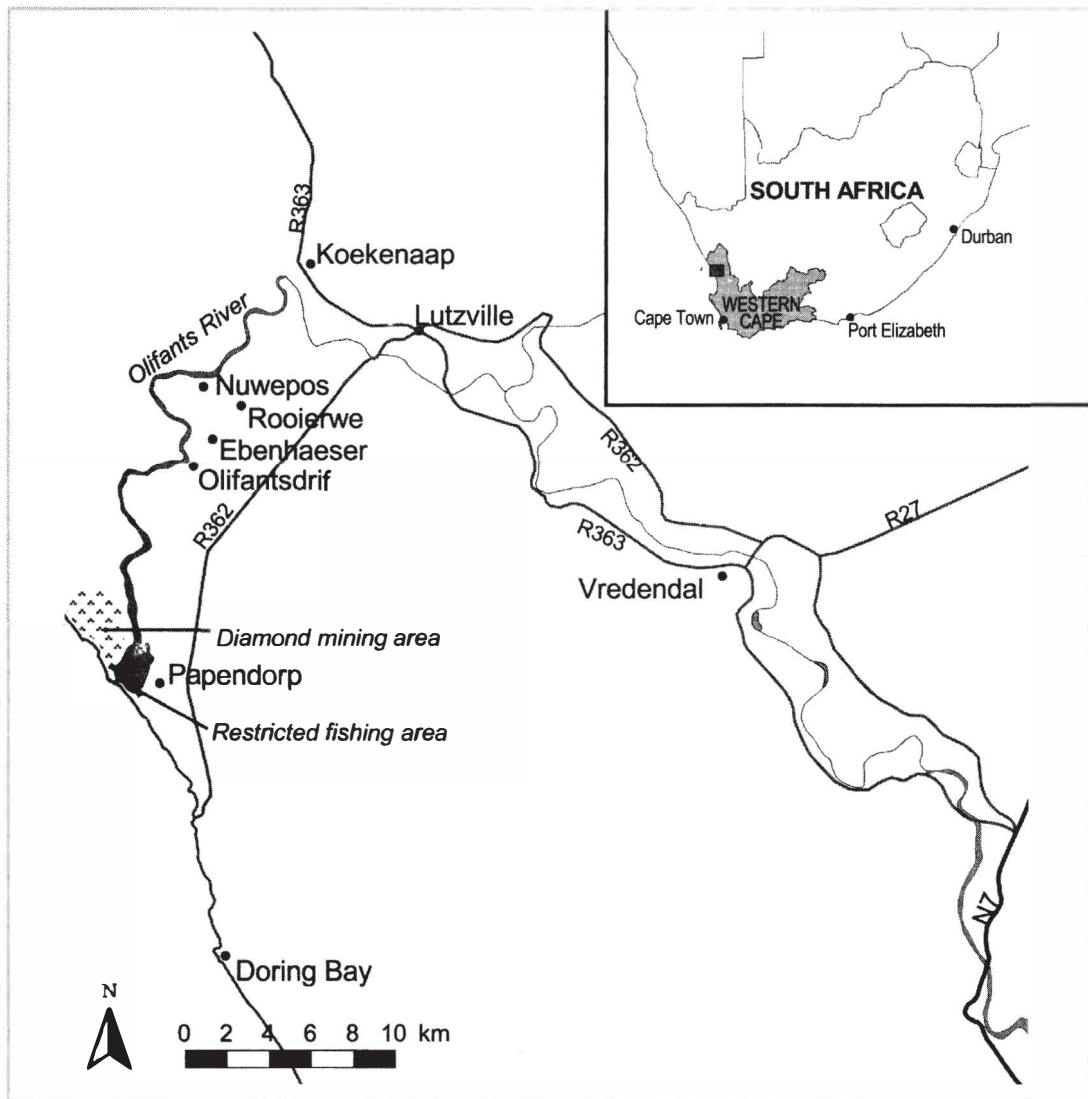
*Photograph Merle Sowman*



## INTRODUCTION

This chapter provides an overview and analysis of the development, implementation and subsequent collapse of a co-management system for the Olifants River harder fishery situated along the west Cape coast of South Africa (Figure 12.1). The events described below took place during the 1990s, a time of great political transformation in South Africa, a time full of hope and promise, especially for the poorer sectors of society. This case study revolves around the fisherfolk of Ebenhaeser and their efforts to work with government to manage the estuarine resources upon which they depend. It also discusses the progress made and successes achieved. Furthermore, this chapter examines some of the difficulties experienced in implementing participatory democracy in resource management at the local level.

Figure 12.1 Location of case study



The reasons for initiating a co-management project in 1993 at Ebenhaeser were fourfold: Firstly, the fishers were concerned about the presence of diamond recovery vessels in the estuary, which they blamed for a perceived decline in fish catches during the early 1990s. Secondly, the fishers believed that the rules and regulations governing the estuarine resources were outdated and no longer relevant. Thirdly, the government department responsible for managing the fishery, the Provincial Department of Cape Nature Conservation (CNC), lacked the resources and capacity to fulfil its management responsibilities effectively. Finally, as people gained political rights they began demanding a greater say in decisions affecting their livelihoods.

These factors prompted the fishers of Ebenhaeser to seek assistance from the Environmental Evaluation Unit (EEU) at the University of Cape Town (UCT), which initiated a research project in collaboration with the Peninsula Technikon. The primary objective of the project was to develop a co-management system for the Olifants River harder fishery. By the end of 1997, after several workshops with the fishers and CNC, a draft partnership agreement was prepared which outlined the roles and responsibilities of each partner with respect to managing the harder fishery.

However, at about the same time, South Africa was undergoing a major law reform process. The promulgation of the Constitution of the Republic of South Africa Act 108 of 1996, identified marine resources, which included estuarine resources, as an area of national competence. As a result, there was considerable confusion regarding which government agency was ultimately responsible for the management of estuaries. This uncertainty, and lack of government involvement in, and support for, the co-management arrangements for the Olifants River harder fishery, contributed to its collapse in 1999.

Now, nearly three years later, there is still no clarity regarding the status of the Ebenhaeser fishers and their access rights to the estuarine resources. Neither has a system for the future management of the harder resource been agreed upon. This chapter focuses on the development and implementation of the Olifants River harder fishery co-management system during the period 1994 to 1998. It also provides information on more recent developments (1999 to 2001) which affect the management of the estuarine resources upon which many of the Ebenhaeser community members depend.

## HISTORICAL CONTEXT

In 1832, Captain Andries Louis, leader of the Khoikhoi, asked the Cape government for permission for his people to settle on land adjacent to the Olifants River near present day Lutzville (Figure 12.1). In the same year, he invited the Rhenish Mission Society to establish a mission in the area. The actual right to the land was settled in 1837, when the Governor of the Cape

ruled that the land in question belonged to the Rhenish Mission Society (Surplus People's Project 1995). The name given to the new mission station was Ebenhaeser.<sup>1</sup> The realities of the Ebenhaeser community today are rooted in the history of a land exchange which took place in 1925. The Ebenhaeser Exchange of Land Act of 1925, resulted in the exchange of 11 000 morgen (9 460 ha) of fertile land, with access to fresh water from the Olifants River, for land located on the lower reaches of the river, where the water is saline (only a small portion of this land had access to water for irrigation). Essentially, this meant that the Ebenhaeser community was resettled further downstream, where the land was less fertile. The rationale for the transaction originated at the turn of the century when the full agricultural potential of the land at the site of old Ebenhaeser was recognised. This land was surveyed for the development of an irrigation scheme, and designated for 'white' farmers, who, in the view of the Governor General, would exploit the potential of the area far more productively than the Ebenhaeser community (Surplus People's Project 1995). In addition, it was argued that the residents of Ebenhaeser would not be able to assist in the repayment of a £250 000 loan that was taken in order to fund the construction of an irrigation canal.

Today, the Ebenhaeser community is involved in a land claim, in terms of the Restitution of Land Rights Act of 1994, to claim just compensation for the removal from their land in 1925.

## CASE STUDY CONTEXT

The project was initiated in 1993 when fishers from the Ebenhaeser community requested assistance from the EEU at UCT to investigate possible reasons for a decline in fish catches (Environmental Advisory Unit 1993). The community believed that the decline in catches was due to the presence of diamond recovery vessels in the vicinity of the river mouth.

A fisheries biologist was contracted to undertake an initial assessment of the situation. This preliminary study pointed out that there were a number of factors which could have affected fish catches (Environmental Advisory Unit 1993). The consultant felt that the most likely explanation for the reduction in catches was the granting of additional net permits in 1991. Unfortunately, historical catch statistics (annual catches, catch rates, size of harders landed) were for all practical purposes non-existent. All statements regarding trends in the fishery were based on impressions verbally gleaned from the community and managing authority. As a result, it was not possible to make any reliable quantitative statement about the status of the resource, or to assess whether the catch levels were sustainable.

Regardless of these preliminary findings, fishers were of the opinion that the main reason for reduced catches was the presence and activities of the

diamond recovery vessels. This conviction was fuelled by their general dissatisfaction with the manner in which mining companies operated in the area, and the fact that there was no consideration of the impacts of mining activities on the community's resource base, nor any attempt to consult with them.

In 1994, the fishers asked the EEU to facilitate a workshop with all relevant stakeholders, including the mining company, Ebenhaeser community representatives and relevant government departments. The forum was to discuss the problems facing the fishers and to actively seek solutions. It was agreed that whilst the activities of the diamond boats and over-fishing may have been contributing to the perceived reduction in fish catches, other factors such as the legal minimum gillnet mesh size, could also have been affecting fish catches, and therefore ought to be investigated. Consequently, the EEU, in collaboration with researchers from the Environmental Unit at the Peninsula Technikon, initiated a research project that was designed to address the following objectives:

- Determine the social and economic importance of the fishery;
- Develop a community-based catch monitoring system to make it possible to obtain reliable monthly values for the total tonnage of fish caught and the variability of catches, and to enable the community to participate in resource management;
- Ascertain whether harder catches in the estuary are limited by an over-capacity of fishing effort, or by other factors;
- Build the capacity of the local fishing organisation so as to enable the fishing community to play a greater role in the management of the resource; and
- Facilitate the development of a co-management system for the Olifants River harder fishery.

In consultation with the fisher community, a research proposal was prepared and submitted for funding. Funding for the project was obtained in 1994 and the research team comprising researchers from the EEU at UCT, the Peninsula Technikon and a staff member from the Coastal Management Unit of the Department of Environmental Affairs and Tourism (DEAT), began work on the project.

## THE FISHERS OF EBENHAESER

Ebenhaeser is located approximately 15 kilometres (km) upstream from the Olifants River mouth and about 370 km from Cape Town on the west coast of South Africa (Figure 12.1). Ebenhaeser comprises five different districts along the Olifants River, including the settlement of Papendorp, located close to the river mouth. It is an Afrikaans-speaking rural community, and at the time of



the study comprised approximately 500 households. The community consists of descendants of the families that were evicted from their land in 1925, as well as additional people that have, over the years, settled on land and been accepted as part of the community. The people of Ebenhaeser have battled against drought and poverty since 1925. Upon relocation they had to learn a new way of life due to the limited availability of fresh water and fertile soils. Fishing for southern mullet, *Liza richardsonii* (or harders, as they are commonly known) in the river and estuary became a means of subsistence for many. In contrast to the highly subsidised and well-serviced commercial farming area further upstream (and on the site of old Ebenhaeser), present-day Ebenhaeser has limited infrastructure, although government programmes to upgrade infrastructure have been introduced in recent years. Consequently, residents of Ebenhaeser have to travel to the towns of Lutzville or Vredendal for various goods and services (Figure 12.1).

While there is ethnic and religious homogeneity amongst the people of Ebenhaeser, there are marked tensions in other areas. These tensions seemed to be linked to very different values held by the younger and older generations, the educated and the uneducated members of the community, as well as the different political ideologies and socio-economic circumstances found amongst members of the five settlements.

During the EEU's involvement in Ebenhaeser, two socio-economic surveys were undertaken, one in 1996, where 98 per cent of the fisher households were interviewed, and the other in 1999, where 89 per cent were interviewed. Data obtained from both surveys revealed that those currently engaged in fishing are strongly dependent on the harder resource for both food and income. A comparison of data obtained from the two surveys indicates that fishing households were earning less income per month in both summer and winter in 1999 than in 1996 (Sowman *et al.* 1999). Survey results also show trends toward the community becoming more dependent on the harder resource (Sowman *et al.* 1999).

In the most recent survey (1999), 40 per cent of survey respondents noted that their highest source of income was from fishing, and their second highest source, from pensioners in the household. This was true for both winter and summer seasons.

In view of the fact that fishing was the highest source of income for respondents in both winter and summer, yet accounted for a relatively low overall percentage of total income, it would appear that many households enjoyed no disposable income and were merely subsisting. Additionally, while it was shown that over 40 per cent of fishing households had access to land for either raising crops, livestock or both, 70 per cent of livestock and 54 per cent of crops were used solely for consumption (Sowman *et al.* 1999). At this point in time, in 2002, there is little reason to assume that much has changed.

Information from the surveys suggests that the fishers seldom had surplus catch that they sold for income. Fish that were sold were most often purchased by farmers from the area or by Ebenhaeser community members. Fish were either sold fresh on a per fish basis or salted and dried and sold as a bundle of 25 fish.

## THE HARDER NET FISHERY

### Biological characteristics of the harder fishery

Catches in the Olifants River gillnet fishery were and are dominated by southern mullet, *Liza richardsonii*. These so-called 'harders', are endemic to South Africa and occur in coastal waters from Namibia to KwaZulu-Natal. The species is the subject of a number of estuarine fisheries along the South African coastline as well as a dispersed marine fishery using beach-seine nets (which are operated from the shore at various localities across the length and breadth of the South African coast). The highest concentration of gillnets and beach-seine nets is found on the west coast of South Africa (Hutchings and Lamberth 2000). Total landings in the Olifants River estuary probably comprise less than one per cent of the annual landings of harders in South Africa (based on rough estimates of landings from the number of fishers, and information in Lamberth *et al.* (1997)).

General scientific information on the harder resource is well documented in the literature (de Villiers 1987, Sauer and Erasmus 1996, Lamberth *et al.* 1997). Adult southern mullet (hereafter referred to as harders) breed in the sea, probably close inshore. A large number of juveniles of this species enter the Olifants River estuary (and other estuaries along the South African coastline), utilising the sheltered, protected environment as nursery grounds. Juveniles of *Liza richardsonii* are, however, not dependent on estuarine nursery areas, although they do benefit substantially from the favourable conditions provided there. Since the species is migratory, stock assessments are difficult and costly.

When the co-management project was initiated, there were no reliable records of the numbers, sizes or species composition of fish landed in the Olifants River. However, records of catch rates elsewhere along the South African coast and in the Berg River, approximately 200 km south of the Olifants River, did exist.

Although harder fishing has long been a popular activity of both amateur and professional fishers in the Western Cape, the fishery has not been regarded as one of serious commercial importance and consequently fisheries management authorities and scientists have paid very little attention to it. However, after 1967, when professional beach-seine operators in St Helena Bay (situated along the west coast) complained about a decline in their catch rate, the

importance of the resource was highlighted and the need for better information on, and management of, the harder resource was realised. In subsequent years, a number of control measures were introduced including the compulsory licensing of nets, restrictions on the use of certain nets, the introduction of new boundaries, restrictions on the number of permits issued and the compulsory submission of monthly catch return cards (Sowman *et al.* 1997).

When the project was initiated in 1993, fishers in the Olifants River estuary reported a marked decrease in catches of harder as well as the number of other species landed in recent years compared with the past. However, fishers reported that elf (*Pomatomus saltatrix*) were still caught in fairly large numbers. The fishers' concerns regarding the decline in fish catches and the absence of reliable catch records and other data to verify these claims, resulted in the community supporting the proposal to develop a community-based catch monitoring system and participating in a mesh size experiment. This scientific work comprised a large component of the initial stage of the co-management project.

### Fishing effort

When the project was initiated in 1993, there were 65 licensed fishers. Although licences were issued to individuals, only one licence could be issued per household. The majority of licence holders owned a small wooden rowing boat and a 35 metre (m) gillnet, although for many this had increased to 60 m over the subsequent two years. The minimum legal mesh size at the outset of the project (1993) was 51 millimetres (mm) although an increase in mesh size from 51 mm to 54 mm had been introduced by the managing authority in the 1990–91 fishing season. In view of the fishers' concern regarding reduced catches in 1993, a key activity of the project was to undertake a mesh size experiment to determine the relationship between fish size, catch rates and gillnet mesh size.

In addition to the 65 licensed fishers, it was estimated that a further 30 to 40 unlicensed fishers operated on the Olifants River. Most of these fishers did not own a boat or a net and were dependent on the equipment belonging to the licensed fishers. Although the number of licences issued was increased to 87 in 1999, the situation regarding the unlicensed fishers remains the same today.

Fishing takes place mainly during the summer season (October to April) since the influx of fresh water during the winter months reduces catches. The long rainy season has a serious economic impact on households that are dependent on fishing. Most fish is landed during December and January. Fishers go out to fish whenever the weather is suitable. Information from the surveys conducted in 1996 and 1999 indicates that most fishers spend one to three days per week fishing and spend an average of 14 hours on the water at any one time. There is a preference for fishing at night. Catches may vary from 10 to 1 000 fish (for an excellent catch).

## Markets

The fish are either eaten fresh or salted and dried and stored for the winter. The salted dried fish are known locally as 'bokoms', and are sold in bunches to neighbouring farmers and shops in Lutzville and Vredendal (Figure 12.1). However, catches are erratic and unpredictable, making it difficult to set up organised and collaborative marketing arrangements. When there are good catches, fishers contact farmers in the area to assess whether there is a demand for the fish, which is purchased as a food source for farm labourers. A vehicle then has to be hired to transport the fish from Ebenhaeser, either to Lutzville or Vredendal. While an abundance of fish saturates the market easily, there is usually not sufficient fish for a formal marketing arrangement, such as transporting fish to a market in Cape Town, or organising for fish to be sold to a local factory (Sowman *et al.* 1999). While fishers are eager to improve opportunities for marketing the fish, commercialisation of the resource is likely to reduce local consumption of fish with resultant health implications.

## LEGISLATIVE AND INSTITUTIONAL ARRANGEMENTS GOVERNING THE FISHERY

Management of estuaries and estuarine resources has been an area of considerable administrative confusion in South Africa (see Chapter 3). At the outset of the project, the responsibility for the management of estuaries was the sole function of the provincial administration. In the Cape Province, the provincial Department of Cape Nature Conservation (CNC) was responsible for managing the harder fishery, including determining fishing effort (number of licences to be issued each season), setting mesh size and net length and identifying closed areas. They were also responsible for enforcement of the 1992 Proclamation issued under the Cape Nature Conservation Ordinance of 1965, which set out the rules for managing the Olifants River estuary and its resources.

Although certain rules are regulated in terms of this legislation, such as restricted fishing areas and the use of boats in these areas, others, such as restrictions on mesh size, net length and total number of licences allocated, were determined by the regulatory authority, CNC, on an annual basis. Information regarding changes to the rules and regulations was usually communicated to the fishers via the fishing committee or by officials when they attended general fisher community meetings or when they met fishers while patrolling the river. While certain fishers adhere to the regulations and acknowledge the importance of restrictions on, for example, fishing in the river mouth area, others have ignored these, use a variety of mesh sizes and net lengths and fish in the restricted area.



In the initial years of the project, the enforcement of rules and regulations was carried out by two officials from the CNC district office at Van Rhynsdorp, approximately 50 km from the estuary (Figure 12.1). They would patrol the estuary by boat and arrest fishers undertaking any illegal activities. In some cases, fish and fishing equipment would be confiscated. Fishers would then be taken to the local magistrates court for trial. If convicted the offender would either be fined or imprisoned.

However, in 1995, during the implementation of the co-management project, the Sea Fishery Amendment Act was promulgated which transferred management control of estuaries from provincial to the national government. This shift in management responsibility was reiterated in the South African Constitution (Act 108 of 1996), which declares marine resources a national competence and that was given the force of law with the promulgation of the Marine Living Resources Act (MLRA) 18 of 1998 (DEAT 1998a).

These legislative and administrative changes had major implications for the co-management arrangements being developed for the Olifants River harder fishery. During this transition period there was much confusion regarding which government agency was responsible for issuing licences and enforcing the rules. Although DEAT was now legally responsible for managing these resources, the provincial conservation department continued to act as *de facto* manager of the estuary until the end of 1999. However, its powers were increasingly diminished, its responsibilities reduced, and its involvement with the fishers of Ebenhaeser eventually ceased in 1999. This left an institutional vacuum, since the new responsible agency, namely the Chief Directorate: Marine and Coastal Management (MCM) within DEAT had not yet developed procedures or systems to manage estuarine resources nor developed a communication strategy to engage with fishing communities.

### The fishing committee

A fishing committee (the committee), comprising licensed and non-licensed fishers, has been in existence in Ebenhaeser for the past 15 years. This committee had a three-year term of office and was elected by the Ebenhaeser community fishers at a public meeting. All five fishing districts were and are represented on this committee. Prior to the initiation of the project, the fishing committee had limited interaction with CNC but it did not have decision-making powers.

In general, the fishing sector in Ebenhaeser, including the committee, has traditionally been accorded a very low status in the community. Prior to the first democratic elections in South Africa in 1994, the committee operated as a puppet of the management board, a local-level institution established during the apartheid era to deal with local government issues. The committee had no

legitimacy within the community, and any changes to the management of the fishery, which would give the fishers greater power in decision making, were actively resisted (Sowman *et al.* 1997).

The development of a system of co-management for the harder resource between 1995 and 1997 changed this situation as specific management responsibilities and decision making powers were given to the fishing committee. During this period, communication between the fishers and the newly elected local Council increased as members of the council were invited to attend fishing committee meetings.

### Rules and regulations

Prior to 1994, decisions on the rules for the resource were *ad hoc*, with minimal scientific rationale and no explanation given to the resource users. Firstly, for example, it has not been possible to obtain an explanation from the CNC for the reason behind the decision in 1991 to change the legal mesh size to 54 mm. The legal mesh size used in the harder fishery in the Berg River estuary, some 200 km south of the Olifants River estuary, is 48 mm (Sowman *et al.* 1997).

Secondly, decisions on changes to the number of permits allocated were made in response to an increased demand for permits. In 1990, the CNC more than doubled the available permits, from 24 to 65, in an attempt to legalise the large numbers of illegal fishers. This decision was not based on any scientific information but on the conservation officers' opinion of the biological sustainability of the resource.

Thirdly, the boundary of the restricted fishing zone is another example of a regulation that was neither scientifically nor rationally motivated. General regulations restricting use of nets in all tidal waters are set out in Proclamation 357 of 1972, issued in terms of the Nature Conservation Ordinance. Details on the boundaries of the restricted fishing area in the Olifants River mouth are provided in Part 3 of this Proclamation: In the Olifants River, there is a section between the sea and a beacon located one km upstream, in which no person shall use (1) a treknet<sup>2</sup> of more than 100 m in length, or (2) any boat or craft for the purpose of speedboating, aquaplaning, waterskiing or for any purpose other than the transportation, at a speed of not more than 10 km per hour, of animals, goods or persons by the shortest route from one point to another.

The location of the beacon is contentious as it keeps fishers out of the richest fishing grounds, yet diamond recovery vessels are permitted to anchor in this area. From discussions with the fishers, it would appear that historically the beacon was of practical use as it separated fishers using treknetts from those using gillnetts. However, the use of treknetts has since been banned and the reason for the positioning of the beacon is no longer valid (Sowman *et al.* 1997).

At the outset of the project, the fishing community had virtually no voice in determining or changing the rules governing the management of the fishery. Consequently, a key objective of the project was to develop a system of co-management which would give the fishers certain decision-making powers and management responsibilities.

## DEVELOPING A CO-MANAGEMENT SYSTEM FOR THE HARDER FISHERY

### Establishing a community-based catch monitoring system

One of the key objectives of the research project was to develop a community supported management system for the harder resource. This included an agreed upon harvesting strategy, which stipulated the total number of fishing permits that should be allocated, the appropriate net length and mesh size and an agreed system of allocating access rights. In order to address the concerns raised above, it was agreed that information on annual catches, catch rates and fish size was urgently needed to clarify the status of the resource and determine whether additional fishing effort could be accommodated in the fishery. Consequently, during 1994, 1995 and 1996 the research team worked closely with the fishing committee and fishers to establish a community-based monitoring system. A series of workshops were held to discuss the need for, and value of, a monitoring system. Once there was broad support from the fishers for the monitoring system, further discussions were held with the committee to design the monitoring card. The key purpose of this monitoring system was to gather data to determine whether current fishing effort was sustainable. The system required fishers to complete catch cards upon returning from a fishing expedition.

Initially a system of monitors or 'walskippers'<sup>3</sup> was instituted. In each district, a 'walskipper' was appointed and paid to assist fishers in completing their cards on a regular basis, collect all cards at the end of each month, and hand them in to the research team. The 'walskippers' participated in a series of capacity building workshops prior to implementing the monitoring system. Furthermore, *in-situ* field training and support were provided during the first year of the programme. A member of the research team spent periods in the field monitoring the 'walskippers' and providing support to them at key landing sites where the fish was measured and counted. Meetings of 'walskippers' were held on a monthly basis to discuss problems, collect catch cards, distribute new catch cards and pay monitors. Although a few fishers did not participate in this programme, most fishers completed cards for the months during which the 'walskipper' system was in place.

The catch monitoring system was implemented from November 1994, and although initially successful (probably due to assistance from paid 'walskip-

pers'), the system did not function effectively after April 1995, mainly because of the time required to complete the forms. The monitoring system was, however, re-introduced towards the end of 1996 (the beginning of the fishing season) with simplified catch return forms.

Despite the simplified catch cards, and a commitment by the fishing committee members to coordinate the monitoring programme in their districts, the number of cards returned during the 1996–97 and 1997–98 fishing seasons were significantly lower than during the 'walskipper' period and did not yield any statistically relevant information. There was no evidence of a decline in CPUE. Clearly, ongoing support and capacity building from the research team and relevant government agency was needed to revitalise the monitoring programme. The re-appointment of 'walskippers' was seen as crucial to the success of the monitoring programme.

Information obtained for the period 1994 to 1997 did not reveal any decline in the CPUE and given the results obtained from the mesh size experiment (see below), the research team recommended that additional licences be allocated to the most needy, unlicensed fishers, and that this increase in fishing effort be closely monitored for possible changes in CPUE.

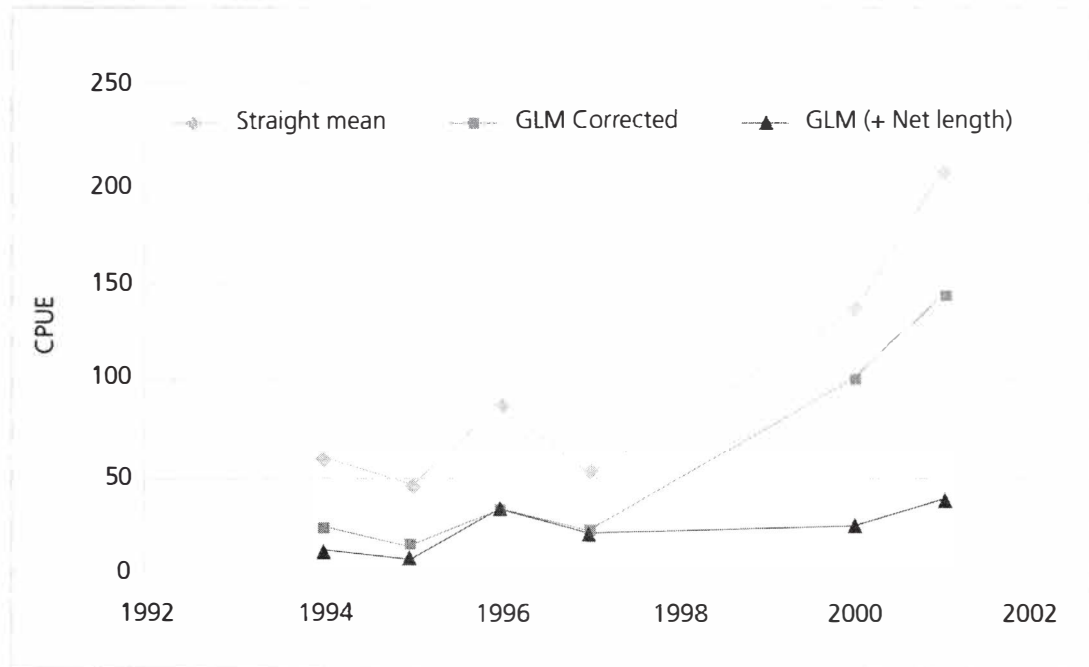
During the period 1998 to 1999, for reasons discussed below, no monitoring was undertaken. The catch monitoring system was revived at the beginning of the 2000 fishing season as part of a new research project aimed at reviving community-based monitoring. Two factors rekindled the fishers' interest in a catch monitoring system. Firstly, the research team informed the fishers of the findings of a study on the status of the harder resource in South Africa undertaken for MCM (Hutchings and Lamberth 2000). This study presented a negative view of the status of the resource. The authors claimed that 'there is compelling evidence that the harder resource is over-exploited' and recommended a reduction in the number of permit holders in over-subscribed areas (Hutchings and Lamberth 2000, p. 53). Linked to this, rumours were circulating that MCM was considering phasing out net fishing in South African estuaries. This development prompted the fishers to reconsider the importance of reliable catch records in negotiations with MCM. Secondly, the catch monitoring system provided part-time employment for four, and at times five, unemployed members of the Ebenhaeser community and therefore enjoyed broad support. Some concerns were raised about the reliability of the monitors.

Monitoring results from the co-management project, for 1994 to 1997, and from the period 2000 to 2001, are presented to provide estimates of CPUE trends in the estuary (see Figure 12.2). An appropriate interpretation of the 1994 to 2001 monitoring data for the Olifants River harder fishery is complicated by the existence in the database of records for different months, net lengths and net mesh sizes. For example, fishers increasingly used 60 m nets



from 1999 onwards. Statistical techniques (General Linear Modelling, GLM) were used to standardise the annual mean CPUE data to obtain an unbiased index of resource abundance. A summary internal report (Sowman and Bergh 2001) documents results obtained from the monitoring data for the Olifants River harder fishery for the period 1994 to 2001. Figure 12.2 gives a summary of the CPUE data, including the GLM corrected indices for the Olifants River harder fishery. This figure shows the nominal CPUE (straight mean), CPUE corrected for month and mesh size effects (GLM corrected) and CPUE corrected for month, mesh size and net length effects (GLM – net length). Even though there was a switch from predominant use of 30 m nets in the period 1994 to 1997, to the predominant use of 60 m nets from 2000 to 2001, and that the catching efficiency of 60 m nets is much higher than 30 m nets, the corrected CPUE (which is regarded as an index of resource abundance) shows stability or even an increase over the sampling period.

Figure 12.2 Mean CPUE versus year for the Olifants River harder fishery



### The mesh size experiment

Another aspect of the research was concerned with undertaking a field experiment ('mesh size experiment') to determine the relationship between fish size, catch rate and gillnet mesh size. This field work, which involved fishing with four different mesh sizes at different localities in the river, was conducted over a five-day period and repeated approximately every two months during the

fishing season (summer) in 1995 and 1996. Fishers from the community were employed to assist with the experiment, and boats and nets belonging to the fishers were hired for the work.

Five experimental sessions were conducted, between March 1995 and April 1996. These results showed clearly that the catch rate declines markedly with increasing mesh size. For example, an increase in mesh size from 51 mm to 54 mm, only three mm, results in a more than 40 per cent reduction in catch rate. The difference between a 51 mm and a 54 mm mesh size is subtle and is not immediately obvious from a cursory inspection of a gillnet.

With the benefit of hindsight, and in view of the sensitivity of catch rate to subtle changes in gillnet mesh size, a historical review of management regulations was carried out. This revealed that in 1990, Cape Nature Conservation instituted an increase in mesh size from 51 mm to 54 mm. The research team is now of the view that this increase in mesh size may well have been the key reason for the decline in catches experienced by the fisher community in 1990, 1991 and 1992.

In 1993, following workshops held between the fisher community of Ebenhaeser, the CNC, the research project team and other interested parties, it was decided that the mesh size be reduced to 51 mm (the pre-1990 mesh size). This reduction in mesh size improved catches. However, it was agreed that ongoing monitoring was essential to assess whether this improvement was sustainable.

### Allocating powers and management responsibilities

A key objective of the research project was to facilitate the development of a community supported management system, where the fishers, in partnership with the conservation authority, jointly manage the resource. The ideas were first discussed in meetings between the fishing committee, research team and officials from CNC. Once there was agreement in principle between the CNC and the fisher representatives that some form of co-management was a desirable option, a process was initiated with the broader fisher community to inform them of these possibilities and ideas and to assess the extent of their support. Having obtained the support of the broader community to embark on this process, a series of workshops with the fishing committee and the CNC was held over a three-year period from 1995 to 1997. These workshops were facilitated by the research team. Discussions focused on identifying the capabilities of the respective partners to undertake particular management functions and on clarifying decision-making powers that should be afforded to the partner organisations. Table 12.1 lists the various management activities, identifies which activities would be managed by either the Fishing Committee or CNC and identifies which issues would require joint action or decision making.

Table 12.1 *Division of management responsibilities*

Management functions	Single management		Joint management
	Fishing committee	CNC	
<b>(I) Issuing of licences</b>			*
1. No. of licences	*		
2. Maximum number to be issued			*
3. Develop guidelines/criteria	*		
4. Comment on guidelines		*	
5. Management of licence fees			*
<b>(II) Regulations</b>			*
1. Mesh size			*
2. Net length			*
3. Restricted area			*
<b>(III) Law enforcement</b>			*
1. Report offenders	*		
2. Determine fines		*	
3. Apply/pay fines		*	
<b>(IV) Other aspects</b>			*
1. Decisions regarding seals			*
2. Decisions regarding diamond boats			*
<b>(V) Gathering &amp; analysis of scientific information</b>			*
1. At a national level		*	
2. At a local level	*		
<b>(VI) Development of the resource</b>			*

Further discussions were needed to put procedures and systems in place in order to make this joint management approach operational. One of the first tasks for the fishing committee was to identify assessment criteria for the allocation of fishing licences. It had been agreed that the number of licences

would be limited to 65 until further results of the monitoring programme were available. Key considerations were the applicant and his/her family's dependence on the resource for food and livelihood, as well as the fisher's historical links with fishing. These criteria were discussed and accepted by the broader fishing community and were used by the fishing committee to determine access rights to the fishery.

Up until the 1998–1999 fishing season, CNC would determine the number of permits to be allocated for the fishing season. This decision was based upon results obtained from the monitoring system, discussions with the research team, as well as reports from fishers regarding fish abundance relative to previous years.

Agreement was also reached regarding the regulations governing mesh size, net length and the restricted fishing area, although certain fishers felt that the rationale for declaring a restricted area no longer applied and that the extent of the area needed to be reviewed. CNC and the fishing committee agreed that it would be necessary to review these regulations as results from the monitoring became available. The committee members undertook to coordinate monitoring efforts in their districts and set in place procedures for collecting catch return cards from fishers, which were then handed over to the project team for analysis.

With respect to law enforcement, fishers agreed to work with CNC to identify and report offenders. In particular, the fishers at Papendorp were identified as being well placed to report offenders to CNC and this would be done telephonically. CNC undertook to respond to these calls whenever possible and enforce rules on behalf of the fishers. The fishers were reluctant to become involved in enforcement activities since this could pose a threat to their safety.

Finally, it was agreed that other issues affecting fishing activities, such as management of seals, issuing of permits to diamond boats to anchor in the river mouth, beneficiation of the resource, and proposed developments in the area, would be discussed and handled jointly by the two partners.

### Preparation of a partnership agreement

Once both groups agreed on the division of management duties and responsibilities, the next step in the process was to finalise these arrangements in a formal 'partnership agreement'. The project team agreed to assist in preparing a draft partnership agreement and facilitating the process further, if required.

The draft partnership agreement was discussed at several workshops with members of the fishing committee and CNC. The intention was to involve all fishers in this partnership agreement formulation process and arrive at a consensus document that would be legally binding. Various legal mechanisms were considered. One such mechanism was the establishment of an



Environmental Management Cooperation Agreement under the National Environmental Management Act 107 of 1998 (DEAT 1998b). In addition to clarifying the powers and functions of respective partners, other important management considerations such as conflict resolution procedures, as well as how clauses would be amended, were addressed. The preamble to the draft Partnership Agreement is provided in Figure 12.3.

Figure 12.3 *Title and preamble to the draft partnership agreement*

**DRAFT PARTNERSHIP AGREEMENT FOR JOINT MANAGEMENT OF OLIFANTS RIVER ESTUARY HARDER FISHERY BETWEEN CAPE NATURE CONSERVATION (VAN RHYNSDORP) OFFICE AS THE STATUTORY AUTHORITY AND OLIFANTS RIVER 'VISSERS VEREENIGING'<sup>4</sup> REPRESENTING THE FISHERS**

**PREAMBLE**

Following an ongoing series of consultative workshops since 1995, the Cape Nature Conservation (CNC), as the statutory authority for the Olifants River Estuary harder fishery (in terms of Ordinance 19 of 1975), and the Olifants River Vissers Vereeniging (ORVV) constituted as a Voluntary Association representing the interests of the broader fishing community, have expressed their intention to enter into an agreement to share responsibility and competence for managing the Olifants River Estuary Harder Fishery.

Having agreed on a division of responsibilities for identified management functions as per annex 1 the parties now seek to formalise the institutional arrangements as set out herein to operationalise their mutual intent for joint management of the harder resource subject to prevailing and prospective legislative and administrative amendments.

At this time, the fishing committee sought financial assistance from the Independent Development Trust, one of the largest development assistance agencies in South Africa at the time. An amount of R20 000 (US\$2 000) was granted to the Ebenhaeser fishing committee to enable them to operate from an equipped office (including a phone and fax machine), to travel to meetings, and to buy nets and repair materials in bulk for sale to local fishers.

By the end of 1997, both the committee and CNC indicated that they were ready to proceed with implementation of the co-management proposals and that less input and support would be needed from the project team.

### Breakdown of the co-management arrangements

Towards the end of 1997, after much time, effort and resources had been devoted to building a partnership between the fishers and the management authority, a variety of events took place, which in the author's view, led to the breakdown of the co-management arrangements.

Firstly, funds acquired for the operational costs of the fishing committee were spent and could not be accounted for. This resulted in suspicion, mistrust and anger amongst members of the committee as well as from the broader fishing community. The fishers no longer trusted the committee, which had been elected to represent their interests, and several committee members resigned. This precipitated a crisis in the fishing community and the research team was asked to assist in facilitating a process to resolve the crisis. Due to lack of funds and other factors described below, this proved to be a difficult and long process. However, with the support of a student from the research team, who lived in Ebenhaeser, a new committee, comprising a group of much younger fishers, was elected in 1999.

Secondly, due to changes in the legislative and institutional arrangements governing estuarine fisheries management, the officials from CNC increasingly began withdrawing from the area. They no longer attended meetings and were seldom seen patrolling the river. By mid-1999, directives from national government confirmed that estuaries management was now a national responsibility.

Since then, there has been considerable confusion regarding the roles and responsibilities of MCM with respect to the management of the Olifants River harder fishery. In the absence of a clearly articulated management system for the Olifants River harder resource, the fishers were informed that the licences issued for the 1998–99 fishing season would remain valid, until administrative procedures for the allocation of the resource had been worked out and agreement has been reached on a sustainable harvesting strategy for the Olifants River harder resource. To date no proposed management system has been discussed with the fishers of Ebenhaeser.

Thirdly, funding for the project was fully utilised by the end of 1997. In addition, the ‘champions’ of the project were only able to provide limited support and advice, mainly responding to calls for assistance in crisis situations such as when the licence fees were unexpectedly increased from R20 (US\$2.00) to R100 (US\$10.00) per annum for the 1998–99 fishing season, and later to R500 (US\$50.00) in 2001.

## POSITIVE OUTCOMES

Despite the fact that the co-management arrangements that were developed and partially implemented between 1994 and 1997 eventually collapsed, there were various positive outcomes which can be attributed to the co-management project:

### Participation and empowerment

At the outset of the project, there was minimal involvement of the fishing community in activities and decisions affecting the management of the

resource. In the initial months of the project, fishers were reluctant to voice their opinion at public meetings or in workshops with government officials. However, as the project developed, fishers increasingly became involved in various aspects of the research, through participation in the monitoring programme, mesh size experiment and socio-economic surveys, as well as participation in numerous meetings and capacity building workshops. Although the research team played a leading role in initiating contact with government and responding to government decisions on behalf of the community in the initial years of the project, as the project progressed, the fishers themselves took the lead in querying government decisions or actions they regarded as unjust.

### Capacity building and skills development

Various opportunities existed throughout the project for the fishers, and others associated with the project, to participate in capacity building and skills development interventions. For example, capacity building workshops were held prior to the implementation of the monitoring programme. In addition, involvement in the monitoring programme and mesh size experiment provided fishers with practical exposure to field research and highlighted the value of scientific information which had been continually challenged at meetings in the early years of the project. Feedback at public meetings, on results obtained from the monitoring and experimental work at regular intervals throughout the project, also enhanced the fishers' understanding of the key concepts of sustainable use of resources.

Members of the fishing committee also participated in various skills development courses organised by the project team. Involvement in the project also provided an opportunity for fishers to participate in various regional and national subsistence fisheries events, such as those associated with the Subsistence Fisheries Task Group (SFTG) process (Harris *et al.* 2002). The project also enabled a member of the Ebenhaeser community studying at the Peninsula Technikon, to undertake further post-graduate studies whilst working as a research assistant on the project.

During the period 1995 to 1997, the fishing committee made significant progress with respect to building organisational capacity and assuming greater responsibility for aspects of resource management. Achievements included: (1) the preparation of a draft constitution and identification of goals; (2) drafting criteria for the allocation of fishing permits; (3) the submission of a funding proposal and receipt of funds for operational costs of the Committee; (4) participation in, and development of a draft co-management system for the Olifants River harder fishery; (5) participation in various regional workshops regarding the future management of subsistence fisheries; and (6) acquisition of skills and confidence to challenge unfair decisions imposed by government.

### Building trust and partnerships

Although relations between the fishers and the regulatory agency, CNC, were tense in the initial years of the project, the process of developing a co-management system for the harder resource improved relations and trust between these two groups. Some of the fishers developed a good working relationship with the responsible CNC officials and the incidence of illegal netting was considerably reduced during the period 1996 to 1997 (*pers comm.* A. Cloete, CNC, 1997). The ongoing process of discussing and allocating management responsibilities also forced both parties to be more understanding of the needs and constraints of the other group. This process led to considerably more tolerance and understanding between the two partners.

### Devolving decision-making powers

Although the decision about the number of permit holders was ultimately taken by the regulatory authority, the results of the monitoring programme and experimental work influenced this decision. In fact, the decision to increase the number of licences to 87 in the 1998–1999 fishing season was based on these results as well as discussions with the fishing committee, which recommended that as many of the *bona fide* fishers as possible should be included in the fishery. This would reduce the amount of illegal fishing, reduce enforcement costs and minimise conflicts amongst licensed and unlicensed fishers.

Decisions regarding access to the fishery were the responsibility of the fishing committee that was mandated by the community to prepare criteria for access to the fishery. This system was judged by all fishers to be fair and decisions taken by the committee were honoured to a large extent.

### External agents provide needed support

One of the benefits of the project identified in the surveys conducted in 1996 and 1999 was the involvement of the two tertiary institutions with the Ebenhaeser fishers, which led to research in other areas including research on the production of a nutritious fish sausage (Sowman *et al.* 1999). Furthermore, throughout the life of the project, the fishers had access to a team of researchers who could provide information or assistance on a range of issues that frequently extended beyond the ambit of the project, for example facilitating access to legal aid. The research team was also able to keep the fishers updated on new developments affecting fisheries and coastal management in South Africa.

However, although involvement of external agents was identified as a benefit of the project, a community development worker also identified this as a weakness, claiming that ‘the local fishers developed a level of dependency on the external agencies’ (*pers comm.* W. Fortuin, University of Cape Town, 2002).



## OBSTACLES TO IMPLEMENTATION OF CO-MANAGEMENT ARRANGEMENTS

There were a variety of obstacles that hindered the effective implementation of the Olifants River harder fishery co-management initiative. Many of these have already been raised in different sections of the chapter. The key obstacles are now discussed in turn:

The apartheid legacy – disempowerment and mistrust

A key obstacle to fostering co-management of the Olifants River harder resource can be linked to past socio-political circumstances in South Africa. The communities now living at Ebenhaeser have been subjected to oppressive and discriminatory policies of the colonial and apartheid past. These political policies denied people the opportunity to voice their opinions, participate in political processes and influence decisions affecting their lives. This history of oppression, inferior and inadequate services and facilities, imposed decisions and lack of community representation on decision-making structures has contributed to a feeling of disempowerment and mistrust.

Over the past 15 years, various non-governmental organisations, development agencies and, more recently, government departments, have attempted to initiate development projects and programmes to alleviate poverty, create employment, and improve socio-economic conditions in the community. Presently, the community is engaged in a land claim process, to claim compensation for land lost in 1925.

Most of these initiatives have been characterised by tensions amongst different groupings, lack of broad community participation in planning processes and inability to reach consensus. For these reasons, many initiatives have failed to proceed further and there is a sense of ‘burn out’. People are tired of attending endless meetings and workshops that do not result in tangible benefits. Even the land claims process, which is certain to result in definable tangible benefits, has been ongoing for four years and there is still no clear resolution.

The tensions in the community can be linked to very different ideals and values of the younger versus the older generations, different political ideologies, varying socio-economic conditions in the community, and the ongoing restructuring of local government.

Failure to implement many of the initiatives proposed for the Ebenhaeser district contributes to this sense of disempowerment and reinforces the perception that the community is unable to implement and manage projects that could improve their quality of life. This disempowerment greatly affects the ability of fishers and the fishing committee members to participate on an equal basis with government partners. This finding is supported by a review of

22 case studies of fisheries co-management undertaken by Sen and Raakjær Nielson (1996), which found that poorly represented user groups, low levels of education and lack of empowerment all impede participation in decision making.

Although the fishers' relationship with CNC improved over the course of the project, some fishers remained suspicious of the organisation. The visible lack of government involvement with the Ebenhaeser fishers since the promulgation of the MLRA, has once again rekindled these feelings of mistrust and disempowerment. The significant progress made in fostering positive relations between the fishers and regulatory authority (CNC) during the project has, in many respects, been lost.

#### Lack of capacity, transparency and accountability

Since the research project commenced in 1993, the fishing committee and members of the broader fishing community have participated in several meetings, workshops and capacity building exercises concerned with the sustainable use of the resource and establishing a co-management system.

However, despite the fishers support for, and involvement in, the monitoring and experimental activities, and their expressed desire to take greater responsibility in managing the resource, when it came to following up on matters, executing management functions and reporting back to their broader constituency, the committee did not perform effectively.

There were various factors that contributed to the fishing committee's inadequate performance, including their historical and political circumstances. However, it appears that the key obstacles to the effective functioning of the committee and implementation of the co-management system were:

- weak leadership;
- a lack of incentives for committee members to participate and fulfil their functions;
- inadequate representation of fisher communities on the committee;
- a lack of communication between the fishing committee and fishers; and
- a lack of transparency and accountability of the committee.

In particular, the weak leadership in the fisher organisation in the latter years of the project contributed to the breakdown of the co-management initiative. Furthermore, the lack of accountability with respect to financial matters led to the disintegration of the fishing committee since fishers demanded to know how the R20 000 (US\$2 000) had been spent and whether this money had furthered the interests of the fisher community or not.

Unfortunately, the donor agency did not have a monitoring and evaluation system in place, and the fishing committee was never asked to provide a report on progress and expenditure. It is our view that this lack of accounta-

bility led to the disintegration of the committee, fostered suspicion and mistrust amongst the fisher community, and reduced the committee's overall credibility.

A lack of capacity and commitment from responsible government agency

Although CNC was supportive of the co-management proposals and participated in most of the discussions leading to the draft co-management agreement, they were not proactive in finalising the agreement and in implementing the new system. There were several reasons for this apparent lack of commitment to the process, many of which have been highlighted in earlier sections.

The most notable one is that CNC did not have sufficient capacity and resources to adequately service all areas under their jurisdiction. However, they claim that attempts to arrange meetings with fishers failed, and meetings were either cancelled or postponed by the fishers themselves. While the rationale for proposing a more collaborative approach to management was partly to alleviate CNC's capacity problems, the benefits of such a partnership would only be experienced in the long term. The changing legislative and institutional framework for estuaries and fisheries management in South Africa, as well as the restructuring processes occurring within CNC, created uncertainty and caution, which further affected relations with the fishers.

Enforcement problems

Although the co-management process resulted in improved compliance with respect to rules governing net length and mesh size, the acceptability and legitimacy of other regulations relevant to fisheries management posed a threat to co-management efforts. There were conflicting views amongst fishers regarding the legitimacy of these rules and fishers argued for their review. In particular, rules affecting the boundaries of the restricted fishing area and the presence of diamond boats in the estuary, needed to be reviewed and amended. Unless fishers support the rules and regulations governing the fishery, compliance will not be achieved and conflicts may arise among members of the group and between the fishers and the regulatory authority (Berkes *et al.* 2001, Pomeroy *et al.* 2001, Sutinen and Kuperan 1999).

Although various legal investigations have been undertaken, and meetings have been held with all relevant stakeholders, no concrete actions have been taken to change the status quo. In all instances, government claims that more research is needed to provide empirical evidence before action can be taken. This represents a stumbling block in the process, since the research required would be extremely costly and time consuming. Furthermore, the concerns regarding the diamond boats have much to do with fishers' dissatisfaction about how decisions are made and the apparent contradictory goals of

conserving a pristine environment while at the same time allowing activities that are potentially environmentally damaging. Unless these issues are addressed, it is unlikely that co-management efforts will be broadly supported.

#### Withdrawal of research team

On various occasions during 1997 the future role of, and input from, the research team was discussed. By the end of 1997, both the fishing committee and CNC agreed that the researchers should play a secondary role in facilitating further action regarding management of the harder fishery and that the fishers should assume greater control of the process. However, they requested that the research team should continue to provide technical assistance and information regarding analysis of catch data and implications for management.

This was a positive development, and suggested that capacity had been strengthened, that both parties were eager to work together, and that the fishers were ready to assume greater responsibilities. Also, since limited research funds were available for 1997, and there were no guarantees that funds would be received for the project in 1998, the research team decided to limit their role to providing technical support and responding to calls for assistance.

During 1998, assistance from the research team was only requested during times of crises (e.g. when the license fees were drastically increased in June 1998). During the 1998–99 fishing season, the community monitoring system collapsed, no catch cards were submitted to the research team or CNC, and no meetings were convened between the fishers and the broader community.

Although the reduced involvement of the research team may have contributed to the breakdown of the monitoring system and co-management efforts, there were many other factors contributing to this, in particular the change in management responsibility for estuaries from provincial to national government.

In hindsight, the researchers have reviewed and re-assessed their role in the research process and have identified the following shortcomings in their involvement:

- taking the initiative too often and not allowing the community to set their own pace;
- not giving sufficient attention and allocating adequate resources to capacity building and skills training;
- ineffective feedback mechanisms to the broader fishing community regarding results of the monitoring and experimental work and its implications for management.



Although beyond the ambit of the research project's objectives, on reflection, the research team considers that in view of its relationship with the fishing committee, it should have provided guidance to the committee on financial reporting and auditing requirements of donor agencies.

#### Lack of long-term government support

A concern that has been constantly raised by the project team is the need for institutional support from a large-scale government agency to provide capacity building, technical advice and funding support to co-management initiatives such as the Olifants River project, on an ongoing basis. This is identified in the international literature as a key condition for co-management to succeed (Agrawal 2001, Berkes *et al.* 2001, Ostrom 1990, Pinkerton 1994, Pomeroy 1999, Pomeroy *et al.* 2001).

Financial support for this initiative was obtained from different research agencies subsequent to 1994, and much of the input from research personnel was provided on a voluntary basis. Since funding from research or development agencies had to be applied for on an annual or biannual basis, there was no guarantee that funds would be forthcoming for research and community development activities that emanated from such participatory research approaches. This co-management initiative (that evolved from initial research activities) should have been supported by a department or unit within DEAT that was responsible for subsistence fisheries management or charged with fostering partnerships between government and resource user groups. The legislative and institutional changes that occurred during the mid-1990's certainly contributed to the lack of government support. However, now that estuarine and fisheries management responsibilities have been clarified, MCM should provide long-term support and commitment to revive the Olifants River harder fishery co-management initiative.

#### CONCLUSION

There are clearly a number of factors that have contributed to the breakdown of co-management efforts for the Olifants River harder fishery. Some of these factors, such as the illegitimacy of certain rules, can be addressed. Others, however, are part of South Africa's socio-political legacy and it will take decades before institutions transform and attitudes and behaviours change. Although there were tensions amongst the fishers, and organisational weaknesses within the fishing committee, the overriding factor that led to the breakdown of the co-management initiative was the institutional vacuum created by the new legislative framework that assigned responsibility for estuarine management to national government. The lack of capacity within MCM to manage subsistence

fisheries and engage in collaborative projects means that since 1998 there has been virtually no government involvement in the management of the Olifants River harder resource. Over this period, two meetings were held with MCM officials regarding access rights, harvesting strategies and existing regulations. However, to date, no final decisions have been taken and the fishers remain unclear regarding their current and future rights. The newly established Subsistence Fisheries Management Unit within MCM (Harris *et al.* 2002) has identified the predicament of subsistence fishers utilising the Olifants River estuary and surrounding coastal waters as an issue needing urgent attention. Discussions are underway to revive the co-management project in this area that will enjoy the full support of national government.

Although this action is positive, it is inevitable that the fishers of Ebenhaeser will be cautious in their engagement with MCM, in view of their previous experiences with CNC and MCM over the past few years. Furthermore, if co-management is to succeed in this instance, it is imperative that government fully embrace the principles and approaches of co-management and be willing to embark on a long-term process. In particular, issues surrounding rules and regulations, a sustainable harvesting strategy, procedures and criteria for access rights and decision-making powers of the fishers, will need to be carefully negotiated. A solid foundation for co-management already exists amongst the fishers of Ebenhaeser and with commitment and support from national government, it is likely that revitalisation of the co-management initiative can be achieved.

## NOTES

- 1 Ebenhaeser – According to historical records, Ebenezer was the name given to the Mission station in 1837, while Ebenhaeser was the tract of land bought by the government in 1925 onto which the people of Ebenezer were resettled (McLeod 1990). For simplicity, the name Ebenhaeser has been used throughout this chapter.
- 2 A treknet is trawl or seine net.
- 3 ‘Walskipper’ loosely translates from Afrikaans to ‘marine or coastal monitor’.
- 4 ‘Vissers Vereeniging’ is the Afrikaans for Fishing Association.

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# Lessons Learned from Nine Coastal and Fisheries Co-management Case Studies

*Merle Sowman, Maria Hauck and  
George Branch*



Community monitors from Sokhulu, appointed by the joint committee, oversee harvesting in the subsistence zone and record data on the harvest (weight, size structure, etc.).

*Photograph Charles Griffiths*

## INTRODUCTION

The advent of a participatory democracy in South Africa in 1994 and the adoption of a new progressive constitution have catalysed new forms of governance. A process of re-orientation and restructuring of government at all levels, and the transformation of many semi-government and private sector institutions is underway. In all sectors, including the management of coastal and fisheries resources, new policies and legislation have been promulgated and fresh approaches to governance are being sought. These shifts in policy and legislation advocate new styles of management that promote communication, participation, cooperation and coordination in order to foster shared responsibility for natural resource management amongst all stakeholders (Glavovic 2000, Hauck and Sowman 2001, Urquhart 2001, Wynberg 2002). The establishment of appropriate and effective institutional arrangements that involve users in management decisions is now required to give effect to these new policies and laws.

Several initiatives are exploring and experimenting with various partnership arrangements where government and user groups are working collaboratively to manage coastal and fisheries resources. Known as co-management, this cooperative approach to natural resource management has been explored and implemented in many parts of the world over the past decade as an alternative to centralised and top-down forms of management (Baland and Platteau 1996, Berkes *et al.* 1991, Berkes *et al.* 2001, Castilla and Defeo 2001, Hara 2001, Jentoft 1989, McCay and Jentoft 1996, Pinkerton 1989, Pinkerton 1993, Pomeroy 1995, Pomeroy and Williams 1994, Pomeroy and Berkes 1997, Pomeroy *et al.* 2001). In essence, co-management is a partnership arrangement in which government, resource users and other recognised stakeholders share, according to their respective capabilities and capacities, the responsibility and authority for resource management. This cooperative or co-management approach is advocated in many of the global documents (Bruntland World Commission on Environment and Development 1987), agendas (United Nations 1993) and agreements (Rio Declaration 1992) guiding the nations of the world in pursuing a more sustainable path.

Creation of partnerships between government agencies, resource users and the private sector is not only advocated but is considered necessary in view of the rationalisation of government departments and decreasing budgets available for management activities. Furthermore, there appears to be a growing realisation that a management system that involves resource users should improve legitimacy and result in greater compliance (Hara 2001, Hauck and Sowman 2001, Sutinen and Kuperan 1999).

However, in South Africa a vital question facing policy makers, resource managers and user groups is: Under what conditions is co-management likely

to succeed? This chapter seeks to answer this question by providing an overview and analysis of co-management in South Africa, based on the findings and lessons learned from the preceding nine selected coastal and fisheries co-management case studies. The analysis is cast against the background of the socio-political history of the country and the legacy of the policy and legislative framework governing natural resource management – topics that provide the essential context for this analysis (see Hauck and Sowman 2001 and Chapter 3). We begin by providing a brief overview of the status and characteristics of co-management in South Africa. Thereafter, key issues emerging from the case studies are highlighted and conditions considered necessary for co-management to be successfully implemented in South Africa are identified. Local factors that inhibit wider application of co-management are also discussed. The conditions identified as ‘key’ in the South African context are then compared with conditions found to be ‘critical’ or of ‘high importance’ for successful co-management elsewhere. Those unique to the South African context are discussed in detail. Finally, this closing chapter highlights some of the outcomes, both positive and negative, of co-management efforts to date, and provides some ideas regarding evaluation.

## METHODS

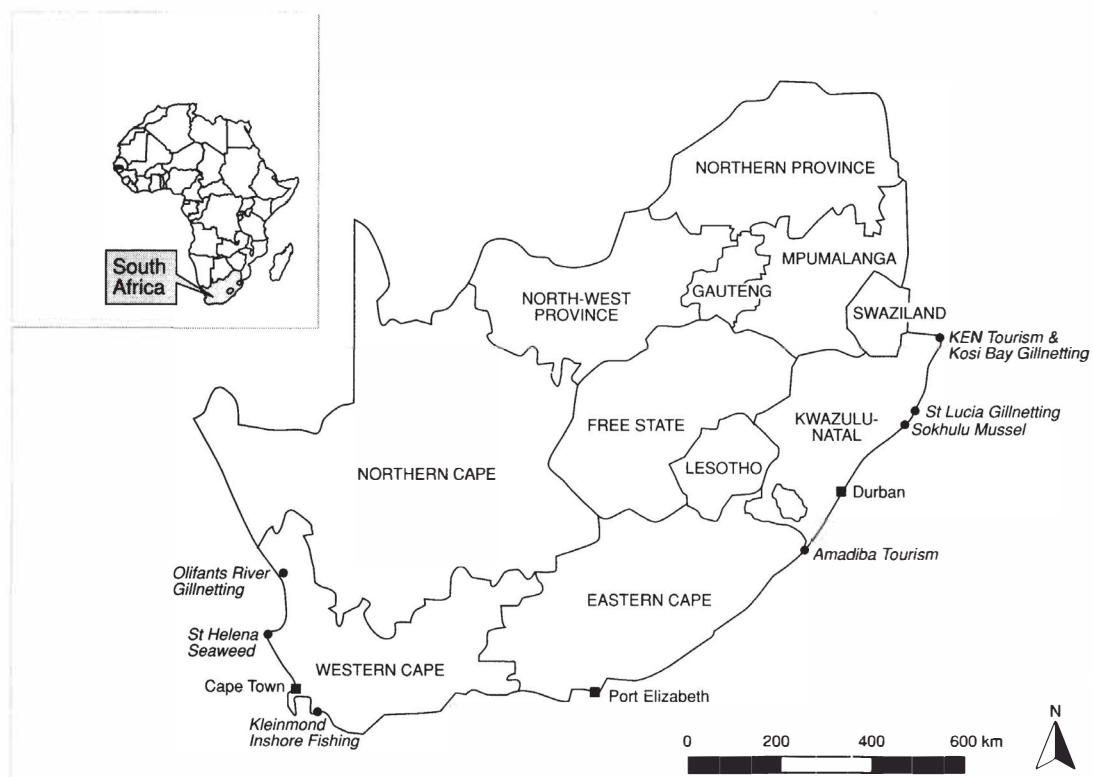
Information for this overview was obtained from the nine case studies described in this book. To facilitate this analysis, a research framework was developed (adapted from ICLARM and IFM 1998, Jentoft 1989, Raakjær Nielsen *et al.* 1996) to guide the authors in the preparation of their case study reports. The use of a common research framework allowed information to be collected and analysed in a standardised and systematic format, common themes to be identified, and findings and key lessons to be compared and contrasted. To facilitate a comparative analysis, the editors of the book visited all of the case study sites. All nine cases were subject to external review by individuals with expert knowledge relevant to the projects. In addition, a workshop was held to discuss findings and explore lessons learned and was attended by the authors of the case studies. The authors were also asked to respond to a questionnaire survey in which they expressed their opinions on: (a) conditions that were present in the co-management projects being investigated, and (b) the outcomes of the co-management initiative. The systematic analysis of the case histories, review of the co-management literature, input received at the workshop as well as the feedback obtained from an ‘outcomes’ questionnaire, all informed this analysis.

The case studies were initially chosen to represent South Africa geographically and to provide a diversity of coastal co-management arrangements with respect to the different sectors (fisheries, mariculture,



tourism) and the different stages (including planning, implementation and evaluation) in the co-management process. However, an initial review revealed that relatively few South African examples of co-management exist that involve coastal and fisheries resources. Indeed, all but one of the coastal co-management case studies that were known in South Africa at the time were incorporated into this study, despite some of these still being in the preliminary stages of planning and implementation. Figure 13.1 and Table 13.1 provide a brief overview of the localities and characteristics of each case study reviewed.

Figure 13.1 Location of case studies



## CO-MANAGEMENT EFFORTS IN SOUTH AFRICA

### Rationale for co-management

In line with international trends (Baland and Platteau 1996, Berkes *et al.* 2001, Pomeroy and Berkes 1997, Sen and Raakjær Nielsen 1996), coastal and fisheries co-management arrangements in South Africa have largely been initiated in response to a crisis situation. Over-exploitation of resources, an increase in illegal activities as well as other critical issues such as forced removals from land and growing tensions between conservation authorities and local communities, have resulted in alternative management strategies

Table 13.1 Summary of coastal and fisheries co-management case studies examined in this study

Project	Co-mgmt Sector	Stage of Co-mgmt	Type of Co-mgmt	Scale	Resources involved	Time frame
Sokhulu Mussel (Chapter 4)	Fisheries (Subsistence)	Implementation/Evaluation	Cooperative	Local	Intertidal mussels	5 years
St Lucia Gillnetting (Chapter 5)	Fisheries (Subsistence/small-scale commercial)	Implementation now terminated	Consultative	Local	Fish	2 years
Kosi Bay Gillnetting (Chapter 6)	Fisheries (Subsistence)	Implementation	Cooperative	Local	Fish	7 years
Amadiba Tourism (Chapter 7)	Tourism	Implementation	Cooperative	Local	Cultural & scenic; (intertidal)	2 years
KEN Tourism (Chapter 8)	Tourism	Collapsed		Local	Cultural & scenic; (fish)	5 years
Industry-Government (Chapter 9)	Fisheries (Commercial)	Implementation	Consultative	National	Hake fishery	20-25 years
St Helena Seaweed (Chapter 10)	Mariculture	Planning	Consultative	Local	Seaweed ( <i>Gracilaria</i> sp)	2 years
Kleinmond Inshore Fishery (Chapter 11)	Fisheries (Small-scale commercial)	Planning now terminated	Consultative	Local	Inshore fish	1 year
Olifants River Gillnetting (Chapter 12)	Fisheries (Subsistence)	Implementation	Cooperative while operating	Local	Fish	6 years

being explored. Furthermore, given the vastness of the South African coastal zone (some 3 000 kilometres (km) in extent), government departments are beginning to realise that they have limited capacity to implement natural resource management policies and enforce regulations, especially in remote coastal settlements (Glavovic *et al.* 2002, Glazewski and Sowman 1998, Shackleton *et al.* 1998). In addition, the benefits of involving users in resource management are being increasingly recognised. But ultimately, South Africa's new political dispensation requires government to decentralise, devolve power to local level institutions, and embrace the principles and approaches of

sustainable development (Glazewski 2000, Turner and Meer 2001, Urquhart 2001). However, whereas this is the general trend in the policy and legislative framework governing most natural resources, marine resources specifically remain a national competence, controlled by national government.

As discussed in Chapter 3, in certain sectors of the commercial fishery in South Africa, there is a well-established history of co-management between industry and government. However, as has been recognised elsewhere (McCay and Jentoft 1996), involvement of other stakeholders and resource users (such as subsistence fishers) in partnership arrangements with government, has been limited (Harris *et al.* 2002a and b). Thus, with the transition to a more decentralised approach and calls for increased user participation in resource management, community-based co-management initiatives are being explored and implemented.

### The nature of coastal and fisheries co-management in South Africa

Several features of the case histories of co-management reviewed here need to be emphasised. First, most co-management arrangements in South Africa, whether in the nature conservation sector (Turner and Meer 2001), water resources management, or fisheries and coastal management sector, are in their *infancy*. The socio-political background to user involvement in natural resource management in South Africa is outlined in Chapter 3. As is evident from Table 13.1, the longest-standing partnership arrangement in the fisheries sector is between industry and government, with most community-based and community-government partnership projects having been initiated and implemented within the last five years. Given this, it is difficult to provide conclusive statements about the long-term viability of co-management as an alternative approach to natural resource management and to evaluate under what conditions co-management is likely to succeed.

Furthermore, the erosion of local level institutions and the lack of rights and powers afforded these institutions during the apartheid era has meant that many of these emerging local management structures require capacity building and support before they can function effectively. Research from case studies in the Philippines, West Indies and Bangladesh suggests that a time period of between three and ten years is required to effectively organise communities to develop self-governing institutions (Berkes *et al.* 2001, Pomeroy and Berkes 1997). In addition, a shift from a centralised and highly regulated system of resource management to an arrangement characterised by stronger participatory governance cannot occur overnight (Berkes *et al.* 2001, Meinzen-Dick *et al.* 2001). This analysis of co-management efforts in South Africa is thus based on lessons learned primarily from projects in the initial stages of planning and implementation.

Second, co-management has been initiated and is facilitated largely through the intervention of people from outside of the community. This pattern is evident throughout the world in areas experimenting with co-management (Berkes *et al.* 2001, Pomeroy and Carlos 1997, Pomeroy *et al.* 2001). In many instances, the *external agents* are researchers investigating a particular question related to the case studies, and the development of co-management arrangements has evolved from this research process. Two of the longer-standing projects (Kosi Bay Gillnetting and Sokhulu Mussel) were initiated and facilitated through the provincial nature conservation agency, whereas most of the other projects were launched and supported by either academic institutions or non-governmental organisations (NGOs).

Third, the *diversity* of co-management arrangements in South Africa is evident from Table 13.1. It is widely accepted that there is no single model of co-management, and different institutional models, characterised by varying degrees of user involvement and decision-making powers, will always emerge (Berkes *et al.* 2001, Borrini-Feyerabend 2000, McCay and Jentoft 1996, Pinkerton 1994). Moreover, experience from case studies worldwide shows that the nature of co-management arrangements changes and evolves over time, depending on the political context, socio-cultural factors and local conditions and capacities (Borrini-Feyerabend 2000, Pomeroy and Berkes 1997, Sen and Raakjær Nielsen 1996). Co-management arrangements are also influenced by the management approach and style of the relevant government agency and the capabilities of the resource users (Berkes *et al.* 2001, Meinzen-Dick *et al.* 2001, Pinkerton 1994, Sen and Raakjær Nielsen 1996).

Fourth, all of the case studies, with the exception of the industry-government partnership, rely on *external funding*. This reliance on donors is common in developing countries and has been identified as a factor that either hinders or contributes to success in a number of case studies throughout Africa and Asia (Normann *et al.* 1998, Pomeroy and Carlos 1997, Pomeroy *et al.* 2001). Although this funding does allow the development and implementation of projects, it also carries with it a number of potential problems including donor-driven objectives, imposed and unrealistic time frames and dependence on uncertain resources for project continuation. Many of the projects reviewed have been affected by funding shortages. One of the case studies (Kleinmond inshore fishery), which was the only example where national government provided funding support, was terminated after a year due to unexpected budget cuts. This raises serious concerns regarding government's commitment to co-management and undermines efforts to foster trust and cooperation with local communities.

Fifth, although South Africa's policy and legislative framework is broadly supportive of user involvement in resource management, advocates partnerships between government and resource users, and embraces the



principle of equitable access to marine and coastal resources, there is no coherent *policy framework* for co-management nor a clearly-developed strategy guiding its implementation. Consequently, co-management is usually interpreted in different ways by government departments responsible for natural resource management as well as communities eager to develop partnership arrangements with other stakeholders. International experience indicates that policies favouring co-management are a necessary but not a sufficient condition for the success of co-management (Berkes *et al.* 2001, Pomeroy and Berkes 1997). In fact, in a recent evaluation of three community-based co-management conservation projects in South Africa, Turner and Meer question whether the policy framework can in fact be considered favourable given that 'it is still so incoherent, internally inconsistent, so inaccessible and so confusing to ordinary South African citizens ...' (Turner and Meer 2001, p. 14).

Finally, all of the case studies have been significantly affected by *government restructuring processes*. With substantial political transformation, the promulgation of new legislation and policies and the lack of clarity regarding roles and responsibilities of different government departments, all levels of government are experiencing difficulty in translating policy recommendations into action on the ground. As a result of these uncertainties and changes, decisions have been delayed and rights and responsibilities of resource users are unclear (Olifants River Gillnetting, Amadiba Tourism, Kosi Bay Gillnetting, Sokhulu Mussel, St Helena Seaweed). This state of affairs has had a profound impact on communities, especially the poor and marginalised (Glavovic *et al.* 2002, Sowman and Wynberg 2002, Turner and Meer 2001). These inefficiencies, uncertainties and difficulties, coupled with growing demoralisation within certain government departments, contribute to the lack of state support for and commitment to co-management processes and initiatives.

## ANALYSIS: LESSONS LEARNED FROM THE CASE STUDIES

Based on a preliminary review and analysis of the nine case studies (Hauck and Sowman 2001), field visits and a workshop conducted with the case study researchers, a number of key findings and lessons have emerged.

### Securing access rights to resources – a fundamental requirement

Although co-management arrangements in South Africa have focused on increased user participation in management, a fundamental first step in the process has been the need to clarify and secure access rights to resources. In many of the cases, 'user participation' applied to those people who previously did not have formal access to resources (Sokhulu Mussel, Kosi Bay

Gillnetting, St Lucia Gillnetting, Kleinmond Inshore Fishery, St Helena Seaweed). As a result, it was necessary to secure access rights before the users could participate in management. Although co-management does not need to occur within a specific property rights system (Jentoft *et al.* 1998), a sense of 'ownership' and control over the resource results when users have 'priority access' to resources that are adjacent to them (Noble 2000, p. 71) and when they derive benefit from asserting these rights (Pinkerton and Weinstein 1995). In the province of KwaZulu-Natal, where certain fisheries management responsibilities were assigned to the provincial conservation agency (prior to the Marine Living Resources Act of 1998, DEAT 1998a), rights were allocated to groups of subsistence fishers who had previously been fishing illegally (Sokhulu Mussel, Kosi Bay Gillnetting, St Lucia Gillnetting). In each of these cases, co-management was explored as a means to regulate fishing. Gaining access to the resource was the first issue that needed to be resolved.

It is argued that securing rights to a resource provides an incentive for users to manage the resource sustainably (Berkes *et al.* 2001, Foltz *et al.* 1996, Jentoft 2000, Katerere 2000, Meinzen-Dick *et al.* 2001, Turner and Meer 2001). As Hutton states in the case of large-scale industry (Chapter 9), users are more willing to spend time and money on management processes if their rights are secured. Thus, one of the key incentives for most of the users to participate in co-management arrangements is obtaining, increasing or securing access to resources. This was true in all nine case studies. However, this has been particularly problematic in the South African context due to past management practices in which many resource users were denied access to coastal resources (see Chapter 3) and were thus considered criminal. A further problem relates to the lack of clarity regarding land tenure and resource rights in the communal areas comprising largely the former 'homelands' (Turner and Meer 2001). This is an issue that is complicated by the unresolved power relations that exist between traditional and modern government structures. Nevertheless, legislation such as the Marine Living Resources Act (MLRA) does create opportunities to grant access where none existed before, and this constitutes a huge incentive to enter into some form of co-management arrangement.

At present (and subsequent to the promulgation of the MLRA), the allocation of rights over resources, and the procedures and criteria for allocating such rights, are functions of central government. However, legislation does permit devolution of management responsibilities to provincial or even local authorities when there is sufficient capacity among lower tiers of government to accept this responsibility. Until very recently, marine resource rights were awarded on an annual basis with no guarantees of gaining legal access to the resources in subsequent years. Allocation of rights has become

highly political and frustrating delays have been experienced due to cumbersome application and allocation processes. As a result, a significant objective of co-management in South Africa is not only to transfer management responsibilities to users, but also to secure resource rights through appropriate rights allocation procedures and structures. This, of course, rests in the political realm and access is not necessarily guaranteed at the onset of project planning (as was evident in the Kleinmond Inshore Fishery). This raises the major dilemma facing resource users, NGOs and other external agents working with coastal communities: Does one first resolve the issue of resource rights or does one initiate co-management structures and processes, and through this process seek to secure access rights? The issue of access rights and securing rights over resources is integrally linked to the issue of 'user participation' and the devolution of power in resource management. Nevertheless, it has been stressed that if co-management is to be seriously explored in this country, government needs to address the fact that a significant number of people utilising resources do not have formal rights to do so (Branch *et al.* 2002a, Clark *et al.* 2002, Harris *et al.* 2002b, Katerere 2000).

### Benefits must exceed costs

There is no simple way to balance benefits and costs because they are measured in different ways, and some factors, such as personal prestige, are intangible and unmeasurable. Nevertheless, for co-management to be embraced by the various stakeholders, there must be clear benefits that outweigh any costs or disadvantages (Berkes *et al.* 2001, Pomeroy *et al.* 2001). Possible benefits that users gain from participating in co-management include: the opportunity to gain legal or officially recognised access to resources, a fairer distribution of rights, a greater chance of long-term sustainable yield, empowerment, enhancement of personal or group status, influence over legislation, increased knowledge, resolution of conflicts and opportunities to acquire exclusive or preferential rights over the resource. Set against these benefits are the costs, which include: restrictions on exploitation levels, limits on harvesting gear and times, expenses associated with participation in the process, time spent on the process and the risk of conflict with other competing sectors. Other stakeholders, such as government, may be motivated by different incentives that include: addressing unsustainable harvesting practices, reducing illegal fishing, improving relationships with the users and reducing transaction costs related to compliance. From a political perspective, government may enter into co-management arrangements as a means of highlighting its commitment to participatory governance, with the aim of strengthening political support (Pomeroy *et al.* 2001).

Whether the benefits of adopting co-management are greater than the costs will largely depend on the extent to which other conditions, such as

commitment of government to the process and existence of legitimate, accountable and representative local structures, are in place. Our analysis reveals that a variety of benefits result from entering into co-management arrangements, although these differed among cases. What is not certain at this stage is whether the overall benefits of co-management outweigh the costs. In any event, the real issue is whether or not the users perceive that the overall effect is that the gains exceed the costs. If this is not realised, commitment to the process will soon erode.

### Participation in and commitment to co-management processes

Fundamental to the concept of co-management is the active involvement of resource users and their commitment to the co-management process (Berkes *et al.* 2001, Borrini-Feyerabend 2000, Jentoft and McCay 1995, Pomeroy *et al.* 2001). Commitment includes acceptance of the principles of sustainability, compliance with rules and fulfilment of any tasks that become the responsibility of the user group. As Berkes *et al.* (2001, p. 11) summarise, 'responsibility means fishers have a share in the decision-making process and bear the cost of getting the benefits of those decisions'. Our analysis reveals that, in most case studies, resource users were highly motivated and actively involved in the discussions and planning for co-management. However, ongoing commitment to co-management efforts was lacking in some cases (Olifants River Gillnetting, St Lucia Gillnetting, KEN Tourism, Kosi Bay Gillnetting). There are various reasons for this, including a lack of accountable and representative local structures, limited tangible benefits, a lack of financial and technical support and inadequate commitment from national government to directly engage with local communities.

However, it is important to recognise that government's reluctance to devolve authority may be linked to its scepticism of the ability and desire of users to responsibly manage resources themselves (Baland and Platteau 1996, Meinzen-Dick *et al.* 2001, Pomeroy and Berkes 1997). As Pomeroy and Berkes (1997, p. 467) argue, this scepticism may be well-founded and 'part of the responsibility falls on the resource users themselves', to convince the authorities that local-level management is possible. As a result, co-management requires users to have both the desire, and the ability, to share responsibilities for management. However, in the South African context, due to the erosion of traditional systems and historical restrictions placed on the formation of local civic structures, government, with assistance from NGOs, will need to assist with revitalising or establishing new local-level resource management institutions.

In specific cases, where commitment to co-management processes jeopardised the short-term economic interests of users (St Lucia gillnetting), or where local elites sabotaged the goals of the user group (KEN),



participation was difficult to sustain. This analysis suggests that despite incentives being in place to encourage participation, initiators and facilitators of co-management need to mobilise users to actively participate in resource management and support the development of representative institutional structures. However, this preparatory phase of co-management, in which the foundation is laid for negotiating management responsibilities (Borrini-Feyerabend 2000), is a time consuming process (Pomeroy and Berkes 1997). Nevertheless, without the commitment and willingness of resource users to participate in the co-management process, sharing of management responsibility cannot be achieved.

### Legitimate, accountable and representative local structures

In all of the case studies, resource users established local-level institutions that provided a voice for their contribution to management decision making. In seven out of nine case studies reviewed, the establishment of local arrangements was facilitated by external agents from NGOs and/or academic institutions. Many of the local structures and organisations were established when the project was launched and committee representatives were elected by the resource users. However, a key concern arising from at least half of the case studies reviewed, was the lack of fair representation on the user group structures. In many cases, the committees that were elected to represent the interests of the users failed to adequately involve the users in crucial issues (such as procedures for electing resource monitors in the Olifants River case and distribution of benefits in the Kleinmond initiative). In the case of the KEN Tourism project, a Development Committee was elected, comprising representatives from the three areas involved in the project. However, the power relations between the different groups, and the overwhelming power of a local traditional authority-linked elite, meant that the systems did not operate democratically or in an open and accountable fashion (see Chapter 8). In some cases, this translated into mistrust and suspicion between the users and the so-called representative committees (Olifants River Gillnetting, Kleinmond Inshore Fishery, St Lucia Gillnetting). Lack of government support (in terms of technical assistance) for these local structures, capacity building and funds also contributed to their unstable nature.

Inadequate representation plagued several of the case studies reviewed. The critical importance of establishing a system of accountability was also highlighted. Our analysis suggests that the establishment of a broader stakeholder structure can provide the necessary checks and balances (Amadiba Tourism) as well as give legitimacy to the needs and concerns of resource users especially when lobbying government (Kleinmond Inshore Fishery). It is also necessary to emphasise the importance of obtaining buy-in from the traditional authorities as a means of securing both political will and

accountability (Sokhulu Mussel, Kosi Bay Gillnetting, St Lucia Gillnetting, Amadiba Tourism). Since the legitimacy and sustainability of these partnerships depends to a large extent on how representative the community structures are, or are perceived to be (Jentoft and McCay 1995, McCay and Jentoft 1996, Pomeroy 1999), greater attention will need to be given to representivity and accountability of co-management structures in South Africa if co-management is ultimately to be viable.

### Objectives must be agreed upon by all parties

It is clear from the case studies that co-management was initiated as a result of varying objectives. Although most co-management initiatives were developed as a result of a crisis, the objectives of the projects ranged from promoting economic development and upliftment (Amadiba Tourism) to addressing fishers' perceptions regarding reduction in catches (Olifants River Gillnetting) to achieving biological sustainability (St Lucia Gillnetting, Kosi Bay Gillnetting, Sokhulu Mussel). Project objectives were not always jointly agreed upon, understood or supported by the different stakeholders. This was particularly problematic in the St Lucia gillnetting case study where it was evident from the outset that the users and the government authority had different expectations of the co-management process. These differences in expectations were not resolved (e.g. with respect to whether the fishery should be subsistence or small-scale commercial – Branch *et al.* 2002b, Chapter 5). In other cases it was recognised that agreeing on objectives at the outset of project planning was critical to the achievement of buy-in and commitment from the different stakeholders (Kleinmond Inshore Fishery, Sokhulu Mussel, Kosi Bay Gillnetting). In order to agree on a common management vision, application of conflict resolution strategies was often necessary (Kleinmond Inshore Fishery, Sokhulu Mussel, Kosi Bay Gillnetting). There have been suggestions that a formal signed document recording objectives should be drawn up at the start of any initiative, but this did not happen in many of the case studies. Formal minutes of decisions proved a more versatile means of documentation. Translation of the minutes into the language of the local community ensured that they were understood. Overall, a key lesson from the case studies is that people who are affected by management decisions must be involved in developing the objectives and setting the parameters of the project.

### Government's reluctance to devolve management authority

There has been a general trend towards decentralisation and the devolution of management responsibilities to lower spheres of government in response to South Africa's constitutional requirements and policy guidelines (see Chapter 3). This trend is less obvious in the marine and fisheries sector. In terms of the Constitution, environmental management is categorised as a national and

provincial competence, and local government is charged with certain environmental responsibilities. However, marine resources and their management are identified as a national competence. Although provisions exist to enable delegation and assignment of certain marine and coastal management functions to other spheres of government, since 1998 the Directorate of Marine and Coastal Management (MCM) within the Department of Environmental Affairs and Tourism (DEAT) has elected to remain the authority responsible for most aspects of marine resource management. The exception to this is the province of KwaZulu-Natal, where the provincial conservation authority (Ezemvelo KwaZulu-Natal Wildlife) has been assigned fisheries compliance responsibilities in terms of a contract with national government.

Although the logic of maintaining national oversight for certain management functions such as setting the Total Allowable Catch for wide-ranging or broadly-distributed species is sound, the state's reluctance to transfer or cede certain powers and responsibilities to other spheres of government closer to the people, or to the user groups themselves, is a major stumbling block to co-management efforts in South Africa. This centralised approach to fisheries management is particularly problematic for communities harvesting intertidal and estuarine resources that have been identified as suitable for subsistence use (Cockcroft *et al.* 2002). Internationally, there has been a major trend towards the devolution of management authority and responsibility for natural resources, including fisheries resources, from government agencies to user groups (Meinzen-Dick *et al.* 2001, Pomeroy *et al.* 2001), which 'may well be more effective than the management efforts that distant, understaffed and under-funded national government fisheries agencies can provide' (Berkes *et al.* 2001, p. 5). However, relinquishing a large degree of power is one of the most difficult challenges facing governments, especially if they are wary of the capacity of local people to manage resources (Berkes *et al.* 2001, Knox and Meinzen-Dick 2001, Pomeroy and Berkes 1997, Pomeroy *et al.* 2001, Turner and Meer 2001).

As discussed in Chapter 3, prior to 1998 certain decision-making powers and management responsibilities were devolved to provincial nature conservation departments. Under these governance arrangements, local communities could more easily engage with authorities simply because the provincial officials were more accessible and directly responsible for matters pertaining to coastal and marine resource management. However, since 1998, when MCM resumed full management responsibility for marine resources, including estuarine resources, there has been very little direct interaction between the national department and local coastal and fishing communities. This change in governance arrangements has had implications for the continuity and viability of several of the co-management projects reviewed in

this book since roles and responsibilities of the government agents have become unclear (Kosi Bay Gillnetting, Olifants River Gillnetting, St Lucia Gillnetting, Sokhulu Mussel). For example, in the case of the Olifants River Gillnetting project, co-management arrangements virtually collapsed when the provincial conservation department was relieved of its management responsibilities. At present MCM simply has neither the capacity nor the resources to engage with the hundreds of individual communities in any meaningful or long-term way. Nor has MCM showed a willingness to devolve any decision-making power to local communities, although it welcomes their involvement in taking on certain management responsibilities such as monitoring (Sokhulu Mussel, Olifants River Gillnetting, Kosi Bay Gillnetting).

### The importance of training, capacity building and empowerment

Many resource users involved in the nine case studies still live in conditions of abject poverty (Branch *et al.* 2002a). Their focus on survival means that they have little time to engage in formal processes relating to governance and resource management. Furthermore, South Africa's political history has resulted in an imbalance of capacity and power between potential partners in resource management initiatives. Consequently, decisions are often discussed and negotiated in an environment where resource users are intimidated and overwhelmed by bureaucratic requirements and scientific rationale. The case studies have all highlighted the importance of incorporating a capacity building component into the co-management process.

A number of the cases highlighted the necessity of resource users obtaining an understanding of the concepts and principles of sustainable resource use (Sokhulu Mussel, Kosi Bay Gillnetting, St Lucia Gillnetting, Olifants River Gillnetting). Training and capacity building interventions included teaching basic life skills such as literacy, business and organisational management – including the operation of committees (KEN Tourism, Olifants River Gillnetting, Sokhulu Mussel) – and the principles of resource management (St Helena Seaweed, Sokhulu Mussel, Olifants River Gillnetting, Kosi Bay Gillnetting, Amadiba Tourism). The most effective process of building capacity appears to have been through a process of 'learning by doing' (Sokhulu Mussel) that involves resource users in research and monitoring activities (Sokhulu Mussel, Kosi Bay Gillnetting, Olifants River Gillnetting, St Helena Seaweed). Arranging exchange visits between communities engaged in co-management or wishing to embark on co-management, seems to be particularly effective (Sokhulu Mussel). The value of such exchange visits in enhancing enthusiasm and strengthening commitment of coastal communities to engage in similar initiatives has also been emphasised in the international literature (Borrini-Feyerabend 2000, Foltz *et al.* 1996).



Failure to allocate sufficient time and resources to developing institutional and human capacity was identified as one of the main obstacles to implementing effective co-management arrangements in the case of the Olifants River Gillnetting project. In the case of the KEN Tourism project, lack of effective community structures and skills training for KEN residents was considered to be a contributory factor to the eventual collapse of the project. In light of acknowledging South Africa's past, our view is that building requisite human and organisational capability among communities and government departments at various levels should be an integral component of any co-management process.

In addition to targeting resource users, the case studies clearly identified the need to build greater capacity amongst government officials. Such training interventions should cover a range of topics including participatory approaches to management, techniques of conflict resolution, understanding the reasons behind rules and regulations, appreciating the value and role of indigenous knowledge, making sense of traditional structures and systems as well as mechanisms for coping with change (change management). Sharing a common understanding of the concepts and principles of co-management is fundamental to building working relationships, trust and communication.

Building the capacity of users and local institutions should result in greater and more meaningful participation in planning and decision-making processes. Increased involvement and meaningful inclusion ultimately foster empowerment. Empowerment is secured when resource users are in a position to participate as equal partners in negotiations, give input on management decisions and ultimately achieve self-control (Pomeroy *et al.* 2001, Turner and Meer 2001). This process would also be strengthened through the allocation of rights and responsibilities to users and the incorporation of local knowledge into management decisions (Baird *et al.* 1999, Berkes *et al.* 2001).

### The need to consider supplemental and/or alternative economic opportunities

A key finding to emerge from the case studies was the importance of adopting a holistic and integrated approach to resource use and economic development in the coastal areas under consideration (Sokhulu Mussel, KEN, St Lucia Gillnetting, Amadiba Tourism). For example, in areas where the demand for resources exceeds the supply or where over-exploitation is evident, supplemental or alternative economic opportunities that provide tangible benefits need to be explored (as occurred in the Sokhulu Mussel, Amadiba Tourism and Olifants River Gillnetting programmes). This is particularly important in areas where users rely on natural resources for subsistence needs. In the case of the Amadiba Tourism project, for example, where people were

struggling to meet their basic needs, the project first focused on providing immediate economic benefits to the community through a tourism initiative (Chapter 7). Through the benefits derived from this tourism venture, participating communities were able to appreciate the economic value of the local natural resources and the links between sustainable harvesting and sustainable livelihoods.

Only once benefits become tangible can people afford the luxury of adopting a long-term view about using resources sustainably, rather than embracing a short-term perspective based on the need to simply meet day-to-day requirements (Stocking *et al.* 1995, United Nations 1994). The state needs to play a facilitating and coordinating role and form strategic alliances between the various government departments working in the area. Officials responsible for resource management do not necessarily see their role extending to the consideration of other economic development initiatives in situations of resource scarcity. Linkages need to be explored and created with other relevant government agencies, in particular at the level of local government, in order to achieve an integrated and holistic approach to resource management (especially in areas where the demands on resources exceed sustainable levels).

### Effective enforcement and compliance

The enforcement of government-derived rules has been, and continues to be, controversial due to past policies and practices. In many instances draconian law enforcement led to poor relations, conflict and sometimes violence between the authorities and resource users (Olifants River Gillnetting, St Lucia Gillnetting, Kosi Bay Gillnetting, KEN Tourism, Sokhulu Mussel). The allocation of access rights via co-management processes, meant that users were given access to resources that they were historically arrested for harvesting (Kleinmond Inshore Fishery, St Lucia Gillnetting, Sokhulu Mussel, Kosi Bay Gillnetting). Although this has been a significant step towards creating ownership and responsibility for resources, the issue of who makes the rules still needs to be addressed. For example, in the case of St Lucia, although access to resources was granted, the rules and regulations governing the harvesting and management of resources were largely determined by the conservation department and were consequently not considered legitimate by the users (Chapter 5). However, from the government's perspective, where existing scientific information indicated over-fishing, rules and limits had to be imposed otherwise the resource could have collapsed.

The issue at stake is not whether authorities should be responsible for developing and enforcing regulations. The real issue is that users should be consulted and actively involved when regulations are developed. Their

inclusion would be a means of increasing the legitimacy of the management system, and would thus improve the likelihood of compliance (Jentoft 1989, Sutinen 1996, Sutinen and Kuperan 1999). For example, in the case of the Olifants River Gillnetting project, rules restricting the access of gillnet fishers to particular sections of the estuary were originally developed to prevent conflict between trek net and other fishers. As the project progressed these conditions ceased to apply, yet the historical rules were still enforced and the users were never consulted about their desirability. Resource users bring a wealth of experience and local knowledge to the table and should be actively involved in the rule-making process (Baird *et al.* 1999, Berkes *et al.* 2001).

In those case studies in which users were involved in joint decision making, there was mutual agreement that law enforcement is an essential attribute of effective co-management (Sokhulu Mussel, Kosi Bay Gillnetting, Olifants River Gillnetting), and there was also widespread agreement that responsibility for this should lie in the hands of the authorities. Unfortunately, coastal and fisheries enforcement in South Africa is weak along many sections of the coast, and this undermines implementation of management strategies that have been jointly developed (St Lucia Gillnetting, Olifants River Gillnetting, Kosi Bay Gillnetting). Furthermore, enforcement is jeopardised by the influx of outsiders (Kosi Bay Gillnetting, Kleinmond Inshore Fishery) and organised illegal groups (St Lucia Gillnetting, Kleinmond Inshore Fishery). A lack of trust and confidence in enforcement procedures can undermine co-management efforts and mechanisms need to be established within the management system to address this (Hønneland 2000). Although it is recognised that budget cuts within government have had an impact on enforcement capabilities, initiatives such as the implementation of a community monitoring system that provides a presence and visibility on the coast (e.g. Sokhulu Mussel), need to be widely explored and tested.

In sum, the case studies highlight the importance of effective enforcement to support co-management arrangements, and reinforce the importance of mutual agreement on what constitutes legitimate rules as a means of fostering trust and increasing compliance.

### Monitoring and evaluation

A system of monitoring and evaluation should be an integral component of the co-management process and should include an assessment of the activities of the users, the state of the resource and the progress of the co-management process itself. As Berkes *et al.* (2001, p. 1) explain, 'projects must be monitored if they are to be kept on track, and evaluated if we are to learn from our successes and failures'. It is important to establish mechanisms and criteria for evaluation, including a baseline study, as a means of evaluating project

objectives in relation to results (Berkes *et al.* 2001). In addition, monitoring is important in order to assess whether project activities are progressing as planned, and whether set objectives are being realised. Feedback from formative monitoring may lead to adaptations to project objectives and changes in activities as a better understanding of local conditions, systems and dynamics develops. In several of the case studies reviewed, periodic monitoring and evaluation (albeit informally) of the co-management *process* was shown to be important and resulted in modifications to project objectives, management procedures and even structures (specifically Kleinmond Inshore Fishery, Olifants River Gillnetting, Sokhulu Mussel). Some of the case studies (in particular the Olifants River Gillnetting, KEN Tourism, Kosi Bay Gillnetting) experienced a series of ‘peaks and troughs’; there were times when the co-management system worked effectively, and other times when the system came close to collapse. It is important to recognise the nature of these cycles and to establish a management system that is able to adapt and respond to changing conditions and needs (Berkes *et al.* 2001).

Resource monitoring was also identified as an important element of co-management in cases that relied on the consumptive use of resources (St Lucia Gillnetting, Sokhulu Mussel, Olifants River Gillnetting, Kosi Bay Gillnetting, Industry-Government). Resource monitoring involves gathering, recording and analysing data to establish sustainable harvesting levels and the ecosystem effects of harvesting. Involvement of local resource users in monitoring serves an essential educational purpose and also instills a sense of ‘ownership’ and stewardship. Attempts were made to integrate local indigenous knowledge into management decisions in the projects that implemented resource monitoring programmes (Olifants River Gillnetting, Sokhulu Mussel, Kosi Bay Gillnetting, Amadiba Tourism). However, we found that scientists were sceptical of data collected by users who had not been integrally involved in the design and implementation of the monitoring system (Olifants River Gillnetting). Monitoring also encouraged compliance due to the visibility of monitors along the coast (Sokhulu Mussel, Kosi Bay Gillnetting) and generated income within the community through employment (Sokhulu Mussel, Kosi Bay Gillnetting, Olifants River Gillnetting). The process of appointing community monitors, the mechanism of holding them accountable for information, and the debate as to whether or not they should be remunerated from government coffers, are all issues that require further investigation, experimentation and discussion in the South African context.

### Long-term ‘champion’

A number of cases illustrated the important role played by one or two dedicated persons intimately involved with the project. A project ‘champion’,



whether in the community (Amadiba Tourism), in the responsible management agency (Kosi Bay Gillnetting, Sokhulu Mussel) or in an external NGO or academic institution (Olifants River Gillnetting, St Helena Seaweed), was key to motivating partners, encouraging commitment and providing continuity and support to the partners during the ‘ups and downs’ experienced in the planning and implementation of these co-management arrangements. These ‘champions’ or mentors frequently facilitate communication and interaction between communities and relevant government departments and other stakeholders and broker the co-management arrangements. They also play an important role in keeping local users up to date on relevant legislative, administrative and political changes and initiatives.

### The role of external agents

External agents are generally held to play a positive role in the development of co-management, providing impartiality, knowledge, training, logistical support and financial aid, and they often act as intermediaries between the users and the authorities (Agrawal 2001, Berkes *et al.* 2001, Foltz *et al.* 1996, Pinkerton 1994, Pinkerton and Weinstein 1995, Pomeroy 1995). External agents, located within NGOs, academic institutions and government agencies, played a pivotal role in all of the case studies by facilitating the co-management process and acting as catalysts for partnership development. Their role has been particularly significant with respect to securing funds for project activities, lobbying for access rights, mediating disputes, implementing training initiatives and exploring alternative economic opportunities. It must, however, be recognised that external agents can also play a negative role if they pursue their personal agendas at the cost of the process.

In addition, Pomeroy *et al.* (2001) caution that external agents should not act as ‘leaders’ in the sense that communities become overly dependent upon them. Too much reliance on external agents was identified as a weakness in two of the cases (Olifants River Gillnetting, St Helena Seaweed). Transferring responsibility from the ‘project team’ to the users or management committee was identified in some of the cases as a critical step in achieving sustainable co-management (Sokhulu Mussel, Amadiba Tourism).

### Lack of commitment and support from government

One of the most significant obstacles to successful implementation of co-management in many of the cases reviewed, was the absence of committed buy-in from government. Commitment from users to participate in co-management activities and arrangements was far greater than from government. A key finding emerging from this comparative analysis is that in

general government has not embraced the concept and principles of co-management. Nor has it put in place the institutional mechanisms needed to give effect to co-management principles and cooperative arrangements with coastal resource users. The policy and legislative framework exists to support various forms of cooperative resource management, but moving towards a more participatory style of governance requires a fundamental shift in mindset, attitude and behaviour. In some instances, the lack of government commitment was due to a lack of capacity and resources within government to support these initiatives. In others, it was due to confusion regarding roles and responsibilities that has resulted from the restructuring processes occurring in government (St Helena Seaweed, KEN Tourism, Olifants River Gillnetting, Kosi Bay Gillnetting, Kleinmond Inshore Fishery). In addition, analysis suggests that there is a high level of scepticism amongst government scientists in South Africa about the capability of users to take responsibility for aspects of coastal and fisheries resource management. Consequently, there are high levels of frustration amongst coastal communities because of inconsistent support provided by government at the different levels. For example, in certain cases, provincial and national government officials directly involved with the users in negotiating management approaches and decisions have not been supported by top-level management and politicians (Sokhulu Mussel, Kleinmond Inshore Fishery, Kosi Bay Gillnetting, Amadiba Tourism, KEN Tourism, St Helena Seaweed, Olifants River Gillnetting). This has led to confusion, and often fuelled the mistrust that already existed between users and authorities due to past authoritarian management practices (Sokhulu Mussel, St Lucia Gillnetting, Olifants River Gillnetting, Kosi Bay Gillnetting, KEN Tourism, Kleinmond Inshore Fishery, Amadiba Tourism).

A central finding of this review is that as long as there is a high level of compliance, government officials support the concept and practice of co-management and play the role of partner. However, where there are low levels of compliance (St Lucia Gillnetting), or sporadic illegal activities (Olifants River Gillnetting, Kosi Bay Gillnetting), officials tend to revert to old styles of management. This threatens the legitimacy and sustainability of newly formed co-management arrangements that have been negotiated between government and users. Compliance by users and continuing governmental support for co-management are thus intertwined.

#### Limited funding and unrealistic time-frames

All of the case studies reviewed (except industry-government arrangements), were funded by external agencies. Whether projects are donor dependant or funded through government, it is critical to recognise the time and resources required to develop and implement co-management arrangements (Berkes *et*

*al.* 2001, Pomeroy *et al.* 2001). This requires a commitment from funders to provide support for a sufficient time period for the project objectives to be realistically achieved. In a number of cases, preliminary research revealed the importance of an in-depth understanding of local socio-economic circumstances, institutional arrangements and power relations prior to the development and implementation of co-management arrangements. In addition to research requirements, the time and resources required to launch, plan and establish co-management arrangements cannot be underestimated. As Noble (2000, p. 74) argues, 'co-management strategies require a significant amount of time just to include marginalized groups in decision-making and build strong local coalitions'. Conflict resolution, training, securing access rights, developing communication channels and garnering political support are all necessary preparations for effective co-management. This process, known as the 'planning stage' (Sen and Raakjær Nielsen 1996), 'pre-implementation phase' (Berkes *et al.* 2001) or 'preparatory phase' (Borrini-Feyerabend 2000), requires a significant amount of time and resources *before* management decisions can be jointly negotiated.

Unreliable funding can create significant obstacles to collaborative working relations between government and user groups. In the Kleinmond case, for example, the proposed three-year period to initiate and establish the co-management project was terminated after twelve months due to a lack of funding from the government donor. The momentum achieved over this period was consequently jeopardised by the withdrawal of external facilitators and researchers. A lack of government commitment and uncertain funding also threaten projects that employ local people to assist with monitoring activities. This is particularly acute where funds for monitoring are either uncertain (Sokhulu Mussel, Kosi Bay Gillnetting), or no longer exist (St Lucia Gillnetting). Adequate funding and realistic time-frames thus appear to be key conditions for co-management to be secured in South Africa.

## DISCUSSION

Management of living coastal and marine resources involves a 'tug-of-war' between three goals: sustainability, equity and efficiency. The first of these lies in the realm of the natural sciences, the second in the socio-political arena, and the third is determined by economics. A multi-disciplinary approach is therefore necessary. Our review and analysis encompasses all three goals, and has provided a better understanding of the characteristics of co-management, the factors facilitating or obstructing the adoption and implementation of co-management, as well as the conditions that appear to be key for co-management to be developed and sustained in the South African context.

Rather than begin with a preconceived notion of the conditions required for successful co-management (based on international experience), our approach has been to allow the case studies to reveal the problem areas, stumbling blocks, enabling factors and opportunities. As such, the conditions highlighted below represent an independently derived set of specifications. Based on our case study analyses, fieldwork and workshops with researchers, 14 conditions emerged from the analysis as ‘key’ for the development and implementation of co-management in South Africa (Table 13.2a), and a further six were regarded as ‘relevant’ although of lesser importance (Table 13.2b). The term ‘key conditions’ is used in the sense of Ostrom (1990, p. 90) as ‘an essential element or condition that helps to account for the success of these institutions in sustaining common-property resources and gaining the compliance of generation after generation of appropriators to the rule of use’. Berkes *et al.* (2001) regard them as conditions that emerge as being central to the chances that co-management can be developed and sustained. We use the term ‘relevant’ for conditions that were present, or considered supportive of co-management, in more than half of the case studies examined, but that were not identified by case study authors as ‘key’ for co-management to succeed in the South African context.

Table 13.2a ‘Key’ conditions required for co-management in South Africa

	Condition				International References
	Met	Partly Met	Not Met	N/A	
1. Access rights to resources	4	3	2	–	1, 5, 6, 10, 11
2. Benefits of involvement exceed costs	5	2	1	1	1, 2, 5, 6, 7, 9, 10, 11
3. Participation in & commitment to co-management processes	7	2	0	–	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
4. Legitimate, accountable & representative local structures	3	5	1	–	1, 2, 3, 4, 5, 9, 10, 11, 12
5. Agreed objectives amongst partners	6	1	2	–	2, 6, 9, 11
6. Decentralised & devolved authority	2	2	5	–	1, 2, 4, 5, 9, 10



	Condition				N/A	International References
	Met	Partly Met	Not Met			
7. Training, capacity building & empowerment	6	3	0	–	4, 6, 7, 9, 10, 11	
8. Identify supplemental or alternative economic opportunities	4	2	2	1	6	
9. Management rules effectively enforced	2	5	0	2	1, 5, 7, 8, 9, 10, 11, 12	
10. Effective monitoring & evaluation	2	6	1	–	3, 5, 10	
11. Presence of long-term 'champion'	6	2	1	–		
12. External agents provide needed support	7	2	0	–	2, 3, 4, 6, 9, 10, 11	
13. Long-term government commitment	1	4	4	–	1, 2, 6, 9, 11, 12	
14. Adequate finances & realistic timeframes	3	4	2	–	6, 9, 10, 11, 12	

Table 13.2b Conditions that are 'relevant' but not considered 'key'

	Condition				N/A	International References
	Met	Partly Met	Not Met			
1. Appropriate scale & clearly defined boundaries	7	2	0	–	1, 2, 3, 5, 7, 8, 9, 10, 11, 12	
2. Membership is clearly defined	6	2	0	1	1, 2, 3, 4, 5, 7, 9, 10, 11	
3. Community cohesion, homogeneity of goals & interests	4	3	2		1, 7, 9, 10, 11, 12	
4. Social preparation & assessment	3	3	1	2	2, 9, 11	

	Condition				International References
	Met	Partly Met	Not Met	N/A	
5. Conflict management mechanisms in place	3	3	2	1	2, 5, 8, 9, 10, 11
6. Enabling policies & legislation	9	0	0	–	4, 7, 8, 9, 11

Note: The number of case studies in which the conditions were met, partly met, or not met (or were considered not applicable or unknown) are indicated. The table represents conditions as they were, at the time the research was undertaken.

Source: 1 = Ostrom 1990 and 1992; 2 = Pinkerton 1994; 3 = Pinkerton and Weinstein 1995; 4 = Pomeroy 1995; 5 = Baland and Platteau 1996; 6 = Foltz *et al.* 1996; 7 = Pollnac 1998; 8 = Hutton and Pitcher 1998; 9 = Pomeroy 1999; 10 = Berkes *et al.* 2001; 11 = Pomeroy *et al.* 2001; 12 = Agrawal 2001.

Previous attempts to specify conditions for co-management are outlined in the work of Ostrom (1990, 1992), but there have been important additions (Agrawal 2001, Baland and Platteau 1996, Berkes *et al.* 2001, Hutton and Pitcher 1998, Pinkerton 1994, Pinkerton and Weinstein 1995, Pollnac 1998, Pomeroy 1995, Pomeroy 1999, Pomeroy *et al.* 2001). Our review of the international literature has focused on those conditions that have been highlighted as being ‘key’ or of ‘high importance’ to successful co-management by several authors documenting case studies or undertaking reviews of co-management programmes. There are many other conditions that have been considered in the literature, and Berkes *et al.* (2001) provide a review in which they list up to 36 possible conditions. Agrawal (2001) has made an incisive contribution, pointing out two central deficiencies in previous work. One concerns the absence of rigorous quantitative statistical analyses of the effects of different conditions on the success of co-management. Deriving data and conducting accurate quantitative analysis is admittedly not an easy task because of a multiplicity of factors, the interactions that occur between them, and the difficulty of holding some of them constant while exploring the effects of others. The other problem addresses omissions of approach, notably the limited attention given to: (a) consideration of resource characteristics (e.g. mobility and storage), and (b) the external social, economic and political context of some case studies.

Tables 13.2a and 13.2b show that there was broad agreement between conditions listed as ‘key’ and ‘relevant’ in our study and those identified in the international literature. In fact, the majority of conditions that emerge as ‘key’ to successful co-management in South Africa have been identified as such in

the international literature. However, there are some additions, omissions and important differences identified within the South African context that need to be emphasised. Many of these can be traced to South Africa's socio-political past (see Chapter 3).

Firstly, our list of 'key' conditions includes two variations that either have not been previously considered or have received little attention. The first is the importance of a 'champion' who promotes the cause of co-management. In virtually all of the case studies reviewed, the development and implementation of a co-management approach was largely due to the efforts and commitment of one or two individuals or 'champions', variously located in government, community-based organisations or tertiary institutions. In a way, this is similar to leadership, which is a 'key' condition identified by others (Agrawal 2001, Baland and Platteau 1996, Ostrom 1990, 1992, Pomeroy 1999, Pomeroy *et al.* 2001), but usually refers to leadership within the community or resource user group. In the South African context, a 'champion' is the one person that people single out as making the difference between success and failure, particularly when a co-management programme is going through difficult times. 'Champions' inspire and cajole, play a critical role in mobilising resource users and other stakeholders, provide critical information on new government policies and trends, provide links between the community and the authorities, and establish themselves as trusted, respected and fair persons who will provide long-term support.

We believe that the pivotal role of 'champions' is largely attributable to South Africa's past political dispensation. Prior to 1994, most coastal and fisher communities had no voice, no access to decision-making structures, limited access to information and severely restricted freedom of expression and association. Because of this, most coastal communities have developed antagonistic relationships with the authorities and have previously not been in a position to contribute to the management of coastal and marine resources. Consequently, it is now difficult for these coastal communities to become co-management partners rather than act in ways that circumvent regulations imposed by the authorities. After years of marginalisation a 'champion' is required to generate enthusiasm and support for participatory initiatives and to facilitate the building of trust between fishers and authorities.

The second variation to our conditions is the need to identify supplementary or alternative economic opportunities. Few other authors have highlighted this as a key condition for successful co-management (Foltz *et al.* 1996). Its importance in South Africa is again related to our historical and political context. Many coastal communities are very poor (Branch *et al.* 2002a), are living in over-crowded conditions on marginal lands, are heavily reliant on coastal resources for their livelihoods and cannot afford the luxury of a long-term view based on principles of sustainability (Glavovic *et al.* 2002,

Sowman *et al.* 2002, Turner and Meer 2001, Wynberg 2002). This has led to over-exploitation of resources in many coastal areas (Cockcroft *et al.* 2002, Hockey and Bosman 1986, Lasiak 1998) and exacerbation of already high levels of poverty (Aliber 2001, Glavovic *et al.* 2002, May 2000). Consequently, poor people are relying more and more on pensions, government grants, remittances from the mines, production of goods (e.g. crafts), and agricultural production to survive (Glavovic *et al.* 2002). If co-management of coastal and fisheries resources is to succeed in these stressed areas, it is critical that alternative economic opportunities be investigated so that resource users who cannot be accommodated in a fishery, for example, can engage in other income-generating activities. This requires coherence on the part of government and collaboration on and across all levels and departments (for example, Tourism, Public Works and Agriculture), as well as cooperation with private sector players in the region, in order to develop alternatives and/or supplemental livelihood opportunities. Exploration and development of community-based tourism ventures along the Wild Coast (see Chapter 7) and mariculture enterprises along the Northern and Western Cape coastal zones are good examples of such efforts (Glavovic *et al.* 2002, see also Chapter 10). Pursuing alternative livelihood strategies also provides an opportunity for resources to recover, and permits the establishment of appropriate and sustainable harvesting strategies and management rules that are supported by users.

Another interesting difference between the South African case studies and international experience that emerges from this comparative analysis is that all conditions identified as 'relevant' in the South African context, except for social preparation and assessment, have been identified in the international literature as 'critical', 'key' or of 'high importance' to successful co-management (see Table 13.2b). For instance, enabling policies have been considered by some authors as 'critical', yet many of the case studies in South Africa were initiated prior to the promulgation of policies and legislation advocating participation of users in resource management. In fact, even though an enabling policy environment now exists to support co-management initiatives across all natural resources, there are major obstacles to implementing these policies (see Chapter 3). Although an enabling policy and legislative environment can be harnessed to support co-management efforts, having such policies in place is not a sufficient condition to ensure co-management principles and processes will be broadly supported and effectively implemented (Sowman *et al.* 2002, Turner and Meer 2001).

Similarly, issues of appropriate scale, clearly defined boundaries, clear membership, community cohesion and homogeneity, and conflict-resolution mechanisms are highlighted as 'key' or of 'high importance' in most of the international texts. Yet, these conditions were not explicitly identified in the



South African case studies as 'key' to establishing or sustaining co-management. These conditions were present in some or even all cases, or were mentioned as obstructing or facilitating co-management efforts (e.g. either the lack or the presence of conflict management mechanisms), but were not consistently highlighted as necessary for the development and implementation of co-management in all case studies investigated. Other conditions were considered more critical in present-day South Africa, perhaps because their absence frustrates co-management efforts or their presence contributes to positive outcomes, which consequently exaggerate their significance.

We now turn to those conditions that were identified as 'key' to successful co-management by both this review and the international literature, but which need to be examined and interpreted in the context of South Africa's unique socio-political past and emerging democratic dispensation. Political changes associated with the democratic elections of 1994 have led to the promulgation of a suite of new laws relevant to coastal and marine resources, including the Marine Living Resources Act of 1998 (MLRA, DEAT 1998a), the National Environmental Management Act (NEMA) of 1998 (DEAT 1998b) and a Policy on Sustainable Coastal Development of 2000 (see Chapter 3).

Although these policies and laws are considered progressive and promote principles of equity, participation and sustainability, they have not been met with efficient and appropriate action. Central government has been hesitant, perhaps even reluctant, to embrace co-management. Decentralisation and devolution of authority have been sluggish. In some cases central government has even taken over previous provincial functions rather than delegate more of its functions. External agents have assumed an extremely important role in promoting co-management. Apartheid-derived poverty in certain sectors and areas has trapped people in a situation in which it is difficult to withdraw from short-term over-exploitation. Illegal fishing has been justified on the grounds of unfair allocation of user entitlements, despite the fact that access has been broadened and resource rights re-allocated. Nevertheless, despite these problems, the passage of the MLRA, NEMA and the Coastal Policy serve as a major stimulus to involve users in a range of co-management programmes.

Three things need emphasis at this point. Firstly, South Africa's democratic government has promulgated a plethora of extremely progressive policies and laws that are supportive of the principles and practices of co-management (see Chapter 3). However, translation of these policies into practice, through the establishment of supportive regulations, appropriate administrative procedures and authority structures remains a major stumbling block. For genuine co-management, national government must demonstrate commitment to and support for the principles and approaches of co-management. This will require that the state: (1) decentralise management authority for coastal and fisheries resources to lower spheres of government (i.e. to a provincial and

local government level where capacity exists), (2) be willing to devolve certain powers and responsibilities to local level community-based institutions in accordance with capabilities, (3) shift its position from one of rhetoric to one of active support for co-management, and (4) harmonise its stance on co-management between departments charged with coastal and fisheries resource management within DEAT.

In addition, government must be willing to allocate sufficient resources to co-management efforts and put in place necessary administrative procedures to support local initiatives. For many government officials, this requires a fundamental shift in thinking, attitude and behaviour and a move towards participatory and cooperative styles of governance. A significant challenge to government, therefore, is that it display a willingness to devolve certain decision-making powers and management responsibilities to local actors and institutions in a way that has been negotiated and agreed to by all stakeholders. Clearly, such devolution can only take place if the provincial or local bodies possess sufficient capacity to accept and undertake these responsibilities. Training, equipping and adequately funding people for the task will be necessary in some regions before this is possible. In the case of the province of KwaZulu-Natal, however, where the provincial conservation authority has managed marine and coastal resources in the past and has worked closely with coastal communities, decision-making powers should be devolved without delay, restoring the powers that existed prior to the promulgation of the MLRA.

The other side of the coin is that central government authorities are cautious about devolving power to local communities until they show that they are capable of accepting responsibilities and willing to comply with regulations aimed at sustainable resource use (Berkes *et al.* 2001, Meinzen-Dick *et al.* 2001, Pomeroy *et al.* 2001). However, it is too easy to slip into a catch-22 situation in which central government is unwilling to devolve power until local agents or communities show they are willing to act responsibly, and communities are unwilling to do so until they have gained power and access to resources. To break out of this unending negative feedback will require bold steps and trust from both sides.

Secondly, the issue of transferring and securing property rights over resources remains one of the most controversial issues in coastal and fisheries management in South Africa and is possibly one of the biggest stumbling blocks to implementing co-management. It is acknowledged worldwide that the process of devolving power, rights and management responsibilities to local users is complex and involves trade-offs, but if implemented appropriately, can yield many benefits including poverty reduction, greater democracy and empowerment, less costly and bureaucratic government administration and fewer conflicts (Berkes *et al.* 2001, Meinzen-Dick *et al.*

2001). South Africa's coastal and fisheries managers need to be guided by experience gained in other developing countries and must at least be prepared to devolve some powers and rights to community-based organisations in selected localities or for specific resources for a reasonable period of time. Although there has been some redistribution of rights in the commercial fishery, and allocation of some subsistence rights in South Africa, these allocations need to be done within a co-management framework, where the responsibilities of resource management and enforcement are negotiated between local user groups and the relevant government agency in terms of their respective capabilities and resources.

Finally, active and genuine participation by users and authorities is vital if co-management is to succeed. Although South Africa's policy framework requires greater user participation in resource management, our case studies revealed that there are several significant stumbling blocks to achieving this. A lack of capacity at the local community level as well as the government-managerial level, inadequate training, mistrustful attitudes of authorities towards users, and suspicion amongst users of the authorities' motives, are all legacies of the country's history of inequality and exclusion. At the community level, leaders and committees charged with representing fishers' interests and negotiating on their behalf are often motivated by self-interest. On the other hand, authorities fear the intent of users and doubt their commitment to sustainability. This is coupled with an entrenched philosophy of achieving compliance by enforcement alone rather than by education and involvement. Unless genuine and tangible benefits of participating in co-management processes accrue to all groups, disillusionment will result and participation will wane. This points to the need for clear guidelines and action plans for initiating, developing and implementing co-management in South Africa. Furthermore, it reinforces the need to adopt holistic and integrated approaches to coastal and fisheries management to ensure that processes are inclusive and address the needs of all users wishing to participate in such initiatives. This requires a fundamentally different approach by government to addressing poverty and managing coastal resources – one that fosters strategic alliances with other government departments in order to address needs in an area, that forms partnerships with other players including the private sector, and that actively seeks and sustains the involvement of resource users and other relevant stakeholders in such processes.

### Towards evaluating co-management in South Africa

Effective monitoring and evaluation (M&E) have been identified as a key condition for co-management to be successfully implemented in the South African context. Yet, none of the case studies reviewed incorporated a formal

and rigorous M&E programme. Although resource monitoring and selected elements of a M&E programme were evident in a few of the case studies (refer to previous section), most lacked essential baseline data and were without ongoing monitoring systems and measurable indicators against which co-management progress and performance could be evaluated. Furthermore, the fact that most projects were still in the early planning and implementation stage meant that 'key' features of a co-management arrangement were not yet in place. However, the major difficulty in undertaking a formal evaluation of the nine case studies reviewed, is that the 'key' principles underpinning the concept of co-management, most notably participation and devolution of power and management responsibilities to resource users, were not embraced in most of the case studies.

To embark on a process of evaluating an alternative management approach, where the key parties involved have themselves not fully understood, embraced or committed themselves to the fundamental concepts and principles underpinning the approach, is likely to yield confusing results. Under these circumstances evaluating the success or failure of the *model* of co-management, as an alternative approach to existent coastal and fisheries management, is problematic. Nevertheless, this review and analysis has provided an understanding of the nature of co-management in South Africa, has highlighted the conditions under which co-management is likely to succeed in the South African context and has provided an indication of the range of costs and benefits associated with pursuing and/or implementing co-management approaches.

Although evaluations of co-management programmes and projects have been conducted in various parts of the world (see, for example, Horemans and Jallow 1998, Pomeroy *et al.* 1996, Pomeroy and Carlos 1997, Pomeroy *et al.* 2001), rigorous techniques to evaluate co-management models, and the conditions that are believed to be important for success, have not yet been developed. Berkes *et al.* (2001) note that further research is necessary to establish evaluative criteria for outcomes. Nevertheless, evaluation is being undertaken, not necessarily by quantifying the impacts and effectiveness of co-management, but by scrutinising the outcomes – whether positive or negative – of co-management (Sen and Raakjær Nielsen 1996).

To provide an indication of the range of benefits that can accrue from implementing co-management, as well as an outline of its potential negative consequences, case study authors were asked to highlight the positive and negative impacts and outcomes associated with co-management efforts to date. In addition, authors were asked to complete a series of questions that were specifically developed to begin exploring potential outcomes in terms of social equity, economic viability and biological sustainability ensuing from the co-management process. The list was not comprehensive. For instance, the



absence of baseline data for a number of parameters, in particular socio-economic data, meant that questions relating to people's changing poverty levels and livelihood status were not included. Moreover, the individual criteria were not fixed: they could have been adopted, adapted, omitted or added to, depending on local circumstances. Nevertheless, Table 13.3 provides an indication of the range of social, economic and resource management outcomes that resulted from pursuing or implementing co-management or similar arrangements in the case studies reviewed. The overriding response suggests that initiation and/or implementation of co-management approaches has resulted in a range of positive outcomes across the social, economic and resource management spectrum. However, there are a few responses that indicate that the situation for some issues has in certain respects remained the same or even worsened relative to conditions prior to the initiation of co-management projects (see Table 13.3).

The outcomes in Table 13.3 provide a broad-based qualitative overview, and illustrate certain basic trends. In all case studies, the pursuit of co-management principles and approaches led to improved communication between government and resource users, the establishment of appropriate local level institutions, improved access to information as well as an enhancement of scientific knowledge about the resources among resource users. Other positive outcomes identified by many of the case study authors were: improved understanding and capability of resources users through training interventions, improved commitment by resource users to co-management, improved understanding of resource use on the part of scientists, as well as improved access to or security of resources. However, Table 13.3 suggests that there was little or no improvement in several case studies regarding issues such as the use of local indigenous knowledge by managers in decision making, devolution of decision-making power and responsibility to users, buy-in by authorities, equitable access to resources, and most of the measures relevant to effective resource management. Failure to make progress on the above issues, despite policy pronouncements, is largely attributable to national government's reluctance to embrace and implement the principles and approaches of co-management. Despite this, it is striking that there were relatively few instances in which conditions were considered to have worsened after co-management was initiated. Indeed, co-management efforts resulted in a wide range of positive outcomes that did not exist under previous management scenarios and, in the majority of the case studies, there was a net improvement over prior conditions.

However, before we can comment with any certainty on the viability of co-management as an appropriate alternative model for coastal and fisheries management in South Africa, a systematic and rigorous evaluation of the impacts and effectiveness of selected operational co-management models

Table 13.3 Outcomes of the co-management intervention

OUTCOMES	CASE STUDIES: + = IMPROVEMENT ; 0 = NO CHANGE; - = WORSE THAN BEFORE; ? = UNCERTAIN								
	1 Sokh	2 Kosi	3 St L	4 Olif	5 Klein	6 Seaw	7 Amad	8 Ken	9 Ind
<b>SOCIAL ISSUES</b>									
1. Has communication improved between government & resource users?	+	+	+	+	+	+	+	+	+
2. Has trust between partners improved?	+	+	0	0	+	+	+	0	+
3a. Have appropriate institutional structures been put in place?	+	+	+	+	+	+	+	+	+
3b. Are these structures representative & accountable?	+	+	0	+	0	+	+	0	+
3c. Has cooperation & leadership in the community been improved?	+	+	0	+	0	+	+	0	+
4. Are there agreed objectives amongst project partners?	+	+	-	0	+	+	+	+	+
5. Have resource users gained greater access to information?	+	+	+	+	+	+	+	+	+
6a. Has training enhanced understanding & capability of resource users?	+	+	+	+	n/a	+	+	+	+
6b. Has training enhanced understanding & capability of managers?	+	+	+	0	n/a	+	?	?	+
6c. Has knowledge about the socio-economic circumstances of the users improved?	+	+	0	+	+	0	+	?	+
6d. Have resource users gained greater scientific knowledge about the resource?	+	+	+	+	+	+	+	+	+
7. Has indigenous knowledge been acknowledged & used by the authorities?	+	+	0	0	0	0	0	?	+
8. Have resource users gained greater decision-making power & management responsibility?	+	+	0	+	0	0	0	+	+
9a. Has there been buy-in (commitment) by authorities to co-management?	+	+	0	+	0	0	0	+	+

OUTCOMES	CASE STUDIES: + = IMPROVEMENT ; 0 = NO CHANGE; - = WORSE THAN BEFORE; ? = UNCERTAIN								
	1 Sokh	2 Kosi	3 St L	4 Olif	5 Klein	6 Seaw	7 Amad	8 Ken	9 Ind
<b>SOCIAL ISSUES (continued)</b>									
9b. Has there been buy-in (commitment) by resource users to co-management?	+	+	-	+	+	+	+	+	+
10. Has compliance improved amongst participating resource users?	+	+	-	+	0	n/a	0	n/a	+
<b>ECONOMIC ISSUES</b>									
11a. Has access to resources been secured or improved?	+	+	+	0	+	0	+	+	+
11b. Has resource allocation been equitable?	+	+	0	+	+	0	0	?	0
12. Has there been sufficient funding for the process to be sustained?	0	+	-	+	-	0	+	0	+
13. Has access to alternative or supplemental livelihoods been improved?	+	+	0	+	0	0	+	+	n/a
<b>RESOURCE MANAGEMENT ISSUES</b>									
14. Is there broad agreement on the rules governing resource management?	+	+	0	+	n/a	0	0	0	+
15. Has resource monitoring been improved?	+	+	-	+	0	0	0	n/a	+
16a. Has there been an improvement in the scientific knowledge about the resources?	+	+	+	+	0	+	0	?	+
16b. Has this knowledge been applied by managers to improve management?	+	0	0	+	0	+	0	?	+
17a. Is use of resources now more sustainable?	+	+	-	0	0	0	+	0	+
17b. Has co-management reduced any adverse effects of human activities on the ecosystem?	+	0	-	0	0	0	+	0	+

Note: The case studies are: 1. Sokh = Sokhulu Mussel; 2. Kosi = Kosi Bay Gillnetting; 3. St L = St Lucia Gillnetting; 4. Olif = Olifants River Gillnetting; 5. Klein = Kleinmond Inshore Fishing; 6. Seaw = Seaweed Mariculture; 7. Ama = Amadiba Tourism; 8. Ken = KEN Tourism; 9. Ind = Industrial Fisheries. (The assessment of Industrial Fisheries was based on conditions in the early 1990s prior to transformation of the industry. These conditions do not necessarily presently occur.)

needs to be undertaken. Research to inform the development and implementation of an appropriate monitoring and evaluation system is now urgently required. Such a system would need to include:

1. Guidelines on methods for gathering baseline data (across all relevant variables);
2. Guidelines on the design and implementation of ongoing monitoring systems including the identification of performance indicators; and
3. Approaches to and methods for undertaking formative evaluation to gauge progress, for providing ongoing feedback and for contributing to a summative evaluation after completion (in order to guide policy development).

If South Africa is serious about exploring the viability of co-management as an alternative form of management, the government should be willing to implement a series of carefully selected pilot co-management projects across the country and give its full support and commitment to these projects for a five to seven year period. This would necessitate a fundamental shift in attitude and behaviour of government staff charged with natural resource management responsibilities. Only then will South Africa be in a position to evaluate whether co-management can succeed as an alternative approach to managing coastal and fisheries resources.

## CONCLUSION

The radical political changes and legislative reforms that have occurred in South Africa since 1994 have provided an ideal opportunity to explore approaches that involve user groups in coastal and fisheries resource management. The key focus of this chapter has been to systematically review and analyse the processes of co-management occurring within nine coastal case studies in South Africa, to gain a better understanding of the progress made and the conditions that need to be in place for successful co-management to operate and be sustained. We have also highlighted the actions and commitments needed to evaluate the appropriateness and suitability of co-management as an alternative approach to coastal and fisheries management.

None of the 'key' conditions in our analysis can be regarded as an absolute requirement for successful co-management. Eight out of the fourteen 'key' conditions were absent from at least one of the case studies, without serious questions being raised about the success of co-management. This accords with the view of Berkes *et al.* (2001), who argue that no conditions are absolute (in the sense that co-management will automatically fail if they are not present), and that co-management can still succeed if not all of the conditions are met. The greatest value of the conditions is that they serve as a 'check-list' that



should compel consideration of the 'key' factors during the initiation and development of co-management programmes. The more 'key' conditions fulfilled, the greater the chance of success.

Despite the enabling legislative framework within South Africa, relatively few genuine co-management initiatives were identified in the coastal and fisheries sector. Co-management in South Africa is still in its infancy and although the underlying principles and approaches are enshrined in policy and legislation, many of these principles, approaches and preconditions are not fully understood, espoused and institutionalised by government and/or user groups. There is an urgent need for government to develop a coherent policy framework that provides clear guidelines for planning, implementing and evaluating co-management processes and initiatives in order for co-management to be seriously considered as an approach to fisheries and coastal management. In other words, practical steps need to be put in place to implement co-management on the ground.

At this stage it is therefore extremely difficult to evaluate the viability of co-management as an alternative management strategy in South Africa but, overall, our qualitative exploration of indicators of its success point to it being an improvement over previous top-down approaches in the majority of case studies. Our review highlights some of the key conditions that are required for co-management to operate effectively and some of the existing obstacles to achieving these conditions at a practical level. Further, our research has shown that initiating and implementing co-management-type arrangements does lead to a range of positive outcomes, which go beyond resource sustainability considerations. However, monitoring and evaluation processes need to be designed and implemented to provide clear answers about the successes and limitations of co-management. If co-management is to be seriously entertained there need to be efforts to move from probability (negative or positive) to certainty.

Although the *principles* of co-management are largely supported by government officials, managers, researchers and users alike, there are concerns about the practical implications of *implementing* co-management. The possibility exists that co-management efforts may fail (or succeed) for reasons that have nothing to do with the model itself, but the institutional and social dynamics of implementation (Jentoft *et al.* 1998). Instead of discarding co-management because of these uncertainties, particularly in a country such as South Africa in which co-management is still emerging, it is important to experiment. This would best be achieved in situations in which there are already 'key' conditions necessary for co-management to function efficiently. The identification and implementation of a suite of pilot projects that fulfill these basic conditions, is thus urgently needed. Government will need to lend its full support and commitment to these projects if useful results are to be achieved. Furthermore,

South Africa should not be afraid of learning from mistakes: 'failures should be accepted as the inevitable price to pay for the discovery of more effective ways of tackling this extremely complex problem' (Baland and Platteau 1996, p. 352). Success is more likely to be achieved if stakeholders involved in these various co-management initiatives share experiences, learn from past mistakes and are willing to modify their management strategies and rules to suit changing circumstances and management capabilities.

Finally, co-management must be understood as a dynamic and interactive process that experiences 'ups and downs' and evolves and changes over time in response to a variety of factors (Jentoft *et al.* 1998, Pomeroy *et al.* 2001, Sen and Raakjær Nielsen 1996). It is not a panacea for all coastal and fisheries management problems, and should only be considered in situations where the 'key' conditions highlighted as necessary for successful implementation in South Africa are present, or can at least be put in place. Genuine co-management is a time consuming *process* that requires long-term government support and commitment, but ultimately should lead to management approaches that are more efficient, equitable, empowering and sustainable.

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# Glossary

## Technical Terms & South African Terminology

**Accountability** – Responsibilities are carried out in an open and transparent manner, in which there is the capacity and willingness to respond to one's actions and to accept relevant consequences.

**Advisory** – A type of co-management regime where resource users advise government of decisions to be taken and government endorses these decisions.

**'Black'** – Refers to a general classification in South Africa of those ethnic groups identified by apartheid policy as 'Indian', 'African' or 'Coloured'.

**Capacity building** – The enhancement and nurturing of the skills and capabilities of people and institutions at all levels toward a particular goal.

**Catch per unit effort (CPUE)** – The catch per unit effort is the catch per unit of effort over a specific time interval.

**'Coloured'** – Refers to an ethnic group in South Africa that was defined by apartheid policy racial classification, and differs from other groups such as 'Indian' or 'African'. This ethnic group, which largely resides in the Northern and Western Cape provinces, is considered part of the 'disadvantaged' sector of South Africa due to historical injustices.

**Co-management** – a partnership arrangement in which government, resource users and other recognised stakeholders share, according to their respective capabilities and capacities, the responsibility and authority for resource management.

**Commercial fishers** – According to the South African Subsistence Fisheries Task Group (SFTG), commercial fishers fish for profit and earn an income sufficient to meet more than their basic needs of life, may employ staff or operate as profit-sharing collective groups, focus on resources that are managed by Total Allowable Catch or Total Allowable Effort and which have high value or can be caught in large quantities, and may use capital-intensive high-technology gear and methods of processing.

**Common property resources** – Those resources for which exclusion (or control of access) is difficult, and where each user has the potential of subtracting from the welfare of all other users.



**Community** – A social group possessing shared beliefs and values, stable membership and the expectation of continued interaction. It can be bounded geographically, by political or resource boundaries, or socially as a community of individuals with common interests.

**Community-based natural resource management** – The management of natural resources by local user groups, or local level institutions with minimal state intervention.

**Consultative** – A type of co-management regime where mechanisms exist for government to consult with users but all decisions are taken by the government.

**Cooperative** – A type of co-management regime where government and resource users cooperate together as equal partners in decision making.

**Decentralisation** – Delegation of power and responsibility from central government to lower spheres of government (provincial or local level authorities), or to local level institutions (such as community organisations).

**Devolution** – The transfer of power and responsibility, to perform specific functions, from national government to lower spheres of government (provincial or local level authorities), supported by legislation.

**Empowerment** – Having the power and responsibility to do something; the ability of a person or a group to people to control or to have an input into decisions that affect their livelihoods.

**Environmental impact assessment (EIA)** – A process whereby prediction is made of the effects of a proposed development project on the environment and natural resources. Such assessments generally include a consideration of options for reducing or mitigating adverse environmental effects and of alternative courses of action.

**Exclusive Economic Zone (EEZ)** – All waters beyond and adjacent to the territorial sea up to a maximum of 200 nautical miles. In the EEZ, the coastal nation has sovereign rights and responsibilities.

**Fishing effort** – the amount of time or fishing power used to harvest fish. Fishing power can be expressed in terms of gear size and quantity, boat size, horsepower, fuel consumption, manpower, etc.

**Fishing mortality** – A mathematical expression of the rate of deaths of fish due to fishing.

**Governance** – Includes the actions and involvement of government (of different scales), civil society and business (formal and informal) in managing, regulating and enforcing how a society is run. It is differentiated from government (what officials and elected representatives do) by the involvement of a wider range of stakeholders.

**Historically Disadvantaged Communities** – Historically ‘Black’ communities in South Africa that have suffered from the impacts of segregation and other apartheid policies. As a result, many people in these communities live in abject poverty, with lack of access to and ownership of natural resource, lack of economic opportunities and little access to water and sanitation.

**‘Homelands’** – The ‘homelands’ were apartheid constructs in South Africa that consisted of rural areas into which ‘black’ people were forced by the state. They were intended to be ‘self-governing territories’ or ‘independent states’ but were in fact mechanisms of exclusion, where there was often overcrowding, extreme poverty and a dire lack of services. The coastal ‘homelands’ of the Transkei and Ciskei were incorporated into the Eastern Cape Province, and KwaZulu was incorporated into the province of KwaZulu-Natal when the Interim Constitution of 1993 established nine new provinces.

**Indicator** – A variable, pointer or index. Its fluctuation reveals the variations in key elements of a system. The position and trend of the indicator in relation to reference points or values indicates the present state and dynamics of the system. Indicators provide a bridge between objectives and action.

**Indigenous knowledge** – Local knowledge held by a group of indigenous people, or local knowledge unique to a given culture or society.

**Induna** – In South Africa, the term used in the traditional authority for a Headman or councillor of an area.

**Informative** – A type of co-management regime where government has delegated authority to make decisions to user groups who are responsible for informing government of these decisions.

**Institutions** – Socially constructed codes of conduct that define practices, assign roles and guide interactions; the set of rules actually used.

**Instructive** – A type of co-management regime where there is only minimal exchange of information between government and resource users. It differs from centralised management only in that mechanisms exist for dialogue with users, but the process tends to consist of government informing users of decisions they plan to make.

**Integrated coastal management** – A continuous and dynamic process by which decisions are made for the sustainable use, development and protection of coastal and marine areas and resources.

**Local level institutions** – Refers to organisations and their procedures and rules at community, village or local area level.

**Management authority** – The legal entity that has been assigned by a state or states with a mandate to perform certain specified management functions in relation to a particular resource, or a specified area.

**Mariculture** – Growing sea plants and animals in a marine environment.

**Marine protected area (MPA)** – Areas of coastal land or water that are specially designated to protect coastal and marine resources, primarily to preserve biological diversity.

**Monitoring** – The collection of data and information for the purpose of assessing progress and analysing trends over time.

**Natural mortality** – Deaths of living resources from all natural causes.

**Nkosi** – In South Africa, the term used in the traditional authority for the chief of an area. The *Nkosi* usually rules over many *indunas*.

**Open access** – Resources are freely open to any user; absence of well-defined property rights.

**Property rights** – Claim to a benefit stream that is collectively protected, in most cases by the state.

**Public participation** – The process whereby the public are actively engaged in decisions and activities that affect their lives.

**RDP (Reconstruction and Development Programme)** – A government driven initiative with strong micro-economic policies, with a labour intensive outlook, and aimed at wealth redistribution, job creation, and encouraging effective and sustainable development.

**Quota** – a share of the Total Allowable Catch (TAC) allocated to an operating unit (individual, company, etc.).

**Spatial Development Initiative (SDI)** – SDIs are strategic attempts by the national Department of Trade and Industry, in conjunction with the private sector, to unlock the inherent development potential of specific geographical areas in the Southern African region.

Small-scale commercial fisher – According to the South African Subsistence Fisheries Task Group (SFTG), small-scale commercial fishers are a unique category of fishers that need to be distinguished from subsistence and commercial fishers as they have unique needs and management problems. These fishers are different from subsistence users in that they primarily harvest resources for the purpose of sale and would generally prefer to gain commercial rights to more lucrative resources such as rock lobster and abalone. However, these fishers are considered different from commercial fishers in that they live on or close to the coast, have small enterprises with low capital and turnover, have a history of involvement in fishing and are involved in hands-on day-to-day running of the enterprise.

Subsistence Fisheries Task Group (SFTG) – A task team appointed by the Chief Director, Marine and Coastal Management (Department of Environmental Affairs and Tourism) to develop recommendations for the future management of subsistence fishers in South Africa.

Stakeholders – Individuals, groups or organisations who are interested in, involved with or affected by a proposed action (policy, plan, project) or decision. They are people with an interest or claim.

Subsistence fisher – According to the South African Subsistence Fisheries Task Group (SFTG), subsistence fishers in South Africa are poor people who personally harvest marine resources as a source of food or to sell them to meet the basic needs of food security; they operate on or near the shore or in estuaries, live in close proximity to the resource, consume or sell the resources locally, use low-technology gear (often as part of a long-standing community-based or cultural practice), and the kinds of resources they harvest generate only sufficient returns to meet the basic needs of food security.

Sustainable use/harvesting – Sustainable use of renewable resources means not consuming resources at a rate faster than they can replace themselves.

Sustainable development – Development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.

Total Allowable Catch (TAC) – Total catch allowed to be taken from a resource in a specified period.

Traditional (Tribal) Authorities – Traditional authorities are the leadership structures of the traditional systems of governance that prevailed amongst the various African ethnic groups in South Africa.



Traditional management – Management practices based on the traditional knowledge of indigenous peoples.

Transaction costs – The costs of implementing fisheries co-management. Three major categories have been identified: information costs, collective fisheries decision-making costs, and collective operational costs. The latter item includes: (1) monitoring, enforcement and compliance costs; (2) resource maintenance costs; and (3) resource distribution costs.

Transformation – Processes to bring about change that address racial and economic imbalances. In the fisheries and coastal sector, transformation aims to achieve the fair and equitable distribution of rights, access to resources, and broad and accountable participation in decision making.

‘White’ – Refers to an ethnic group whose ancestors are of European origin.

The major sources for the technical terms in this glossary were:

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## WAVES OF CHANGE

The oceans that meet along the southern African coast contain a diversity of ecosystems ranging from tropical coral reefs to cool-water kelp forests. Many of the coastal and marine species living in these waters are resources that are harvested by coastal communities to provide important sources of nutrition, income and livelihood.

However, ongoing over-exploitation of fisheries resources, the degradation of coastal areas and conflicts among coastal resource users, call for urgent intervention. Co-management is being explored as a possible strategy to address these problems. This approach reflects a worldwide trend to involve local user groups and communities in the management of coastal and fisheries resources.

This book provides an overview and analysis of nine coastal and fisheries co-management case studies in South Africa. It outlines the concepts and theoretical underpinnings of co-management and examines the policy and legal framework governing coastal and fisheries resource management in South Africa.

*Waves of Change* provides policy makers, resource managers, researchers, learners and environmentalists with a comprehensive understanding of co-management in South Africa. Case studies examine co-management in action, highlighting the conditions conducive to success, as well as the positive outcomes and principal challenges of this approach. The viability of implementing coastal and fisheries co-management in the South African context is explored and comparisons are made with international experience.

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