

# GUIDELINES FOR INTEGRATING SOCIAL SCIENCE INTO MARINE AND COASTAL RESEARCH

Prepared for SANCOR  
November 2005

## 1. Background

The South African Network for Coastal and Oceanographic Research (SANCOR) has a mandate to integrate social science into research in the marine environment. The term social science is used here as an umbrella term for a range of knowledge fields that relate to social activities and processes, such as law, archeology, economics, and the humanities. Research in the *marine environment* has up till now been predominantly undertaken by researchers in the natural science disciplines such as Biology, Zoology, Oceanography, and Environmental Science who together occupy the multi disciplinary niche of *marine science*. The aim of this paper is to provide a rationale for integrating social science into marine and coastal research and broadening the range of disciplines undertaking research in the marine environment. It has been accepted through deliberations around the draft SEACChange research programme that the sea and the coast comprise the marine environment and it is in this environment that 'excellence in science' is being facilitated and funded, rather than more narrowly only marine science (Sea &Coast III National Meeting, 6/10/05).

SANCOR "has been intensely involved in marine research and management for over thirty years", has developed two phases of the National Sea and Coast Programme, and has commenced with the process of developing a third phase which will be called SEACChange (SANCOR, 2005). SANCOR is funded predominantly by the National Research Foundation (NRF), which has requested that SANCOR implement the NRF policy of broadening the knowledge fields. The NRF has a strong mandate to broaden the agenda of research in South Africa and to specifically facilitate more research undertaken in the Social Sciences, Humanities and Law. This means facilitating and supporting social research and integrated research by teams including both social and natural science researchers in the marine environment. To this end, SANCOR has invited two social scientists to become members of the SANCOR Steering Committee. These members have been tasked with providing a set of guidelines for SANCOR to enable this body to promote and stimulate social and integrated research in the marine and coastal zone of South Africa.

Marine and Coastal Management (MCM) of Department of Environmental Affairs and Tourism (DEAT), has also along with the NRF been a funder of the Sea and Coast research Programmes. There is at present very little research that is framed within social science and related to social processes and human activities in the marine environment that has been funded through the Sea and Coast 1 and II Programmes. In some cases natural scientists have attempted to undertake social research as 'add on' components on natural science projects, for example, in the field of utilization of marine resources.

MCM funds its main marine research through a separate programme under the Marine Living Resources Fund (MLRF) that is mainly based on a grant system from central government, as well as through donor funded programmes. MCM has recognised the importance of undertaking social research in the marine environment to provide the basis for management decisions resulting in a growing number of social and integrated projects being funded

through this channel. An example here is the funding of socio-economic research to ascertain the impacts of the 4X4 ban on beach driving, and a study of poverty in coastal communities as part of the Sustainable Livelihoods Programme.

Broader reasons for expanding the fields of knowledge in the marine environment and engaging in multi-disciplinary and interdisciplinary research are: good scholarship; the need to address increasing complex environmental problems; globalization and the liberalization of the economy; and the knowledge requirements for a developing country in transition to democracy. These are discussed below.

More broadly at a global level there is a move to break away from the strict production of knowledge within disciplines. Harriss (2002, 487) notes that disciplines are necessary for creating “‘systems of rules’ ... for defining subject matter and the way it is to be studied”. In this way they become productive, accumulating and deepening knowledge about the natural and social world. However, Harriss (2002, 487-88) makes the point that such ‘discipline’ can become ‘constraining’ and “repressive rather than productive”. He thus concludes that “good scholarship must involve a tension between ‘discipline’ and ‘anti-discipline’” (Harriss, 2002, 488). He calls for *multidisciplinary research*, “where arguments within different disciplines are set side by side” and disciplines work in parallel, or through more *interdisciplinary research* efforts where attempts are made to “integrate the theoretical and methodological frameworks of different disciplines” (Harriss, 2002, 488). The synergy obtained through these processes provide for greater creativity and productivity.

Another argument for the engagement in more integrated and holistic research programmes is the increasing complexity of the contemporary world (Dryzek, 1997). The growing concern about environmental issues has led to the emergence globally since the 1980s of the concept of sustainability which proposes a holistic account of the ecological, social, economic, political and governance dimensions of development and management decisions (Urquhart, 2000). The concept of the environment is now generally accepted as including the ecological, social, economic and political dimensions of the environment. This broader definition is embedded in the framework environmental Legislation in South Africa, i.e. National Environmental Management Act (Republic of South Africa, 1998b). This calls for multi-disciplinary and interdisciplinary research to be strengthened and varying approaches to knowledge being pursued to provide answers to different facets of problems.

Furthermore, Castells (2000) maintains that ‘a new world is taking shape’, with a restructured global economy, and a new dominant social structure in the form of a network society (Castells, 2000, 367). This has led to the shift of South Africa’s macroeconomic policy from a ‘people centred’ reconstruction and development policy towards the acceptance of the Growth, Employment and Redistribution (GEAR) policy in line with the global neoliberal economic order. These shifts have led to major impacts on poor and vulnerable people and have led to de-industrialization, unemployment, privatization, loss of subsidies and the informalisation of the economy (Hart, 2002, Isaacs et al, 2005). A result of this is greater poverty and vulnerability of marginalized communities and certain social groups in South Africa, and in the marine environment zone where populations are concentrated. These social processes have led to increased pressure on natural resources as people seek to diversify their livelihoods. Pro-growth strategies as part of GEAR have in turn resulted in the rapid development of coastal zones for residential and recreational usage. Thus the shift in global processes has social and economic implications not only for local communities along the coast and the marine environment, but for the environmental impacts of private sector

development initiatives resulting from the integration of South Africa into the global economy. Knowledge of the impacts of global process on people and resources is urgently needed to be able to sustain the resources and biodiversity of the marine environment.

With the transition to a democracy in South Africa in 1994, large scale legislative and policy reform commenced followed by institutional reforms. In line with global shifts and the shift towards democratization of decision making and from government to governance, participatory and democratic forms of decision-making have been institutionalized in all sectors including fisheries and coastal zone management (Hauck and Sowman, 2003; Scott and Oelofse, 2005). The range of stakeholders in the marine and coastal environment who have rights to both resources and to decision-making processes around these resources has increased and new forms of governance, such as co-management has been introduced to provide for more equitable decision-making (Hara, 2003; Hauck and Sowman, 2003). The shift to governance has led to increased conflict around coastal issues, whether they are fishing rights, tourism plans or coastal golf estates and gated communities. This changing political, social and economic context necessitates research in a range of disciplines to provide knowledge for decision making and a better understanding of the changing realities of the marine environment. Furthermore, in an environment of participatory decision making, the identification of a knowledge base that “would serve to build agreement and acceptance between fishers, researchers, management authorities and other users” is critical (Degnbol, 2003, 46). Degnbol (2003) highlights the emerging research in the field of indicators, which add social, economic and political dimensions to the standard stock assessment procedures traditionally used, while Wilson (2003) calls for a greater understanding of local and indigenous knowledge as part of stakeholder deliberations.

In terms of marine resources, most of the world’s fisheries, including some South African fisheries are suffering from the effects of over-exploitation and declining resources (FAO 2004, in Degnbol et al, 2005). Fishery management is under increasing pressure to find more effective solutions to the biological, economic and social problems of the fisheries they manage. Jentoft (2003) notes that the top down state and expert driven approach to fisheries management has not had much success world over. He states that ignorance and marginalization of indigenous and local knowledge regarding fisheries management practices is largely to blame for this. Whereas marine science has been the domain of marine biologists there is great potential for social scientists to become involved in this field and facilitate greater understanding and co-operation between stakeholders and regulators.

Natural science alone cannot provide the answers to many of these problems as they require a synthetic approach which requires a contextualization of problems within the historical, political and social context of South Africa as it engages in the global economy and is subject to the processes of globalization.

The *management* of the marine environment will thus require the balancing of the protection of this environment with its use. The management will thus require a sound knowledge base to enable the shift away from ‘fortress conservation’, expert led management style of the marine environment towards more participatory approaches which allow for sustainable use and social acceptability of management regimes. The governance of the marine environment is a relatively new enterprise in South Africa with little precedent to follow. In such a context where there are no ‘rules’ or guidelines, social research is necessary to draw on international best practice and to provide insights into the constraints and challenges of such processes (see Wilson, 2003).

*Applied research*, which has a “practical problem-oriented approach”, is relevant to South Africa as a developing country as it will produce knowledge that is relevant to the solution of social and/or environmental problems and focuses on these issues and their solutions (Robinson, 1998, 4).

However, although there is a great political pressure to undertake relevant applied research to contribute to the development of South Africa as a developing country, there is recognition by SANCOR, and the academic community that basic research is equally important. Basic research fulfills a “purely academic role” and can be defined as research that produces knowledge which seeks to explain or interpret the world (Robinson, 1998, 4).

This document sets out to provide some preliminary comments and policy recommendations with regard to putting social science on the marine and coastal research agenda. Having outlined the broader global and societal context in which research is taking place in South Africa in the Introduction, Section 2 provides an overview of the differences in the approach to knowledge in the social and natural sciences. Section 3 then illustrates some of the main theories and applications of social science to natural resource management and case studies which provide examples of the application of social science in the marine environment in South Africa. The paper concludes with Section 4 which lists a set of recommendations to SANCOR that would help facilitate the integration of social science into research being undertaken in the marine environment.

## **2. Differences between the natural and social science approach**

In order to integrate social science into marine and coastal research it is necessary to make explicit some key aspects of the conceptual framework of social science in relation to natural science. It is a truism today that there are many approaches to knowledge and not only one way of producing knowledge and knowing the world (Kitchen and Tate, 2000). Approaches to knowledge differ according to the assumptions they make with regard to how the world can be known, what is the reality that can be known, and associated methodologies based on these assumptions (Kitchen and Tate, 2000).

Natural scientists are trained to produce knowledge through the application of the philosophy of positivist science and use established methodologies and techniques developed in this framework. Each discipline or sub-field within disciplines has well documented methodologies developed specifically for the questions being addressed (Cloke et al, 1991). Natural scientists seldom make this conceptual framework explicit as it is assumed that all other scientists are working within this established framework. It could be said that positivist science is a ‘hidden framework’ (Johnstone, 1983). Positivist science is the most appropriate conceptual framework to understand components of the biophysical world and aims to construct theories to gain explanatory and predictive knowledge of the external world. It is a powerful and highly successful framework for this purpose (Cloke et al, 1991).

The methodology of positivist science is concerned with describing and explaining biophysical phenomena and the causal relationships between such phenomena through the deductive testing of hypotheses. Scientific methodologies are aimed at collecting *quantitative* data, which is then statistically analyzed or graphically represented (Harvey, 1969; Robinson, 1998).

Social sciences adopt a wide range of approaches to knowledge and related methodologies for the construction of knowledge about social realm, including the positivist approach (Kitchen and Tate, 2000). Social scientists are employing positivist science less frequently as it is found to be increasingly inappropriate to understand the complexities of the social world. Social scientists are trained in the application of a range of theoretical frameworks and methodologies to understand social, economic, political, spatial and cultural processes and relations in society. These processes and relations occur in many settings, both urban and rural, and often are linked to the natural environment or particular ecosystems, which is the context in which they are framed.

Social research is people-centered. Social scientists are trained to construct knowledge about social fabric of society, which includes the processes related to state, business and industry and civil society. For example, in relation to the marine environment, research could include topics such as the development of environmental policy, compliance and non-compliance to regulations, user involvement in management, tourism, NGO activities, stakeholder forums set up to monitor marine pollution, indigenous knowledge, development of golf estates, Environmental Impact Assessment processes and many others.

Social scientists collect *qualitative* data through engagement with individual actors or representatives of various groups related to the issue they are researching. Social scientists also seek to understand broader societal processes, such as power relations between groups in society or state/civil society relations (Castells, 2000). The sources of data range from interviews with individuals/groups which are then transcribed, newspaper articles, documentary materials such as reports, census data, minutes from meetings, attendance of meetings, participant observation etc Thus much of the analysis is the interpretation of context specific situations through verbal engagements and *texts*. The study of *language* or discourse used by various social actors, and the meanings contained therein, is therefore important (Hajer, 1995).

Social scientists usually employ methodologies through which they engage closely with the people/groups they are seeking to understand. In doing so they have an impact with all whom they come into contact with. For example, she or he may undertake 'action research' and work with groups and communities in order to contribute to the development or empowerment of those groups. Both researcher and researched become transformed through this process.

Social research is viewed essentially as a social process as it takes place within multiple and overlapping sets of social relations and is influenced by them. The researcher here becomes part of what she/he is studying. Contemporary social scientists acknowledge that they, as researchers, are not impartial in the knowledge construction process and that they are involved in the 'co-construction' of knowledge with those being 'researched' (Visser, 2001). Thus social research is not value free but rather can be termed 'situated research' (Kitchen and Tate, 2000).

Social scientists acknowledge that their research practices are highly politicized. Research itself is an exercise of power, over the type and use of the knowledge produced, the power over those being 'researched' or power within research teams. Researchers are actors, who have agency and are able directly or indirectly to influence policy and decision-making with regard to the marine environment and its resources.

In the South African context particularly, researchers should adopt appropriate participatory methodologies in order that communities become active participants in the research rather than objects of research. This would reduce the power differential between researchers and ‘researched’.

Social scientists are not specifically trained to work in the marine environment but have knowledge and skills that could be applied to social, political, economic and cultural issues in this zone. Thus one would seldom find a ‘marine social scientist’. However, a social scientist may focus on a specific issue, such as co-management of marine resources, and become knowledgeable about the resources of marine environment in order to work with communities towards sustainable management.

Frequently the answers to environmental questions and solutions to environmental problems require inputs from both the natural and social sciences. This would require the application of both natural science and social science approaches to knowledge and their related methodologies in an integrated programme (Degnbol, et al 2005).

From the above it is clear that natural and social scientists approach knowledge from very different paradigms. Historically, social science has been viewed as ‘soft science’ by natural scientists because of the use of qualitative data, which is not statistically analysed, and what is termed a more ‘subjective’ approach. This elitist position adopted by the natural sciences can form a barrier for integrated team work (Harriss, 2002).

What is clear though is that just like natural science, social science is based on grounded theory, proven methodological approaches and techniques for analysing both the qualitative, quantitative and ethnographic data. Such work is presented at conferences and published in accredited journals. As Harriss (2002:489) points out, “anthropologists have developed exacting standards and subject the inferences derived from observation of what people do, and listening to what they say in different contexts, to rigorous scrutiny.” Thus natural science does not have the monopoly of rigor as claimed. Social science does have a ‘qualitative hardness’ (Harriss, 2002).

Both natural and social scientists would need to undergo a ‘paradigm shift’ and move into a position where there is mutual understanding of the need to adopt of different approaches to knowledge to understand different problems and issues.

One of the challenges in such a shift is to overcome some of the divisive dualities that characterise the conceptual and practical terrain of research and management in the marine environment (Scott, et al, 2003). Some of these dualities are:

- a. Natural and social science
- b. Science and management
- c. Quantitative and qualitative data
- d. Objective and subjective research
- e. Conservation and development
- f. Basic and applied research

Research in the marine environment has been dominated in the past by ‘expert’ natural scientists and technicist managers with a lack of multidisciplinary and interdisciplinarity. The goal is therefore to shift the actors towards a more *integrated approach* that conceptualizes the marine environment as being inextricably linked to local residential

communities and stakeholders, contextualized within a globalised and neo-liberal global economy and part of a developing country that is undergoing the transition to democracy. This approach is based on the understanding that there is a need to include social scientists and local people as actors with natural scientists and managers in the knowledge production process, and integrate development with conservation.

### **3. Application of Social Science to Marine Environment Management**

This section provides some examples of social science research that is applicable to questions raised in relation to the marine environment. Section 3.1 examines Natural Resource Management models, and Section 3.2 examines the application of social science in policy formulation and regulatory frameworks in the South African context.

#### **3.1 Natural Resource Management models**

In natural resource management, three social science based models, namely the *tragedy of the commons*, *prisoner's dilemma game* and *the logic of collective action*, derived from political science and economics 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.

##### *Tragedy of the commons*

The understanding and analysis of common pool resources both as an area of social science study and in formulation of public policy have been profoundly influenced by Hardin (1968), Gordon (1954) and Scott (1955) through the theory popularised as the 'Tragedy of the Commons'. The conventional wisdom derived from this classic theory, is that 'all resources held in common will inevitably suffer over-exploitation and degradation'. Users of a resource would collectively be better off if they all exercised restraint; any given individual, however, could do better for himself by cheating on the collective agreement. Two basic solutions to the problem were proposed: the transfer of the resource either to private ownership or to state control (Hardin, 1978; Bajema 1991). The logic of the argument in the 'Tragedy of the Commons' is that only private owners or the state can manage resources successfully.

##### *Prisoner's dilemma game*

The Prisoners Dilemma game is one of several analytical models that have been developed in 'Game Theory'. The main use of 'games' is to study problems of collective action. 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. The outcome of one player's decision affects the result of the other's decision. Two lessons can be derived from the Prisoners Dilemma game; firstly that the tendency to defect is stronger than the desire to co-operate and if possible people will try to maximise their own benefit by moving costs on to others. In game theory this is termed "free-riding". Secondly, the main fascination of the prisoner's dilemma game lies in the paradox that individually rational strategies lead to collectively irrational outcomes.

##### *Rational choice theory*

One of the central problems in social theory is the divergence between individual and collective rationality. Rational choice theory is mainly based on Olson's (1965) classic work on the theory of groups, i.e. *The Logic of Collective Action*. The author challenged the

optimism expressed in group theory that 'individuals with common interests would voluntarily act so as to try to further those interests'. Olson argued that unless the number of individuals is quite small or unless there is coercion or some other special device to make individuals act in their common interests, rational self-interested individuals will not act to achieve their common or group interest. Olson's 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.

These three models have defined the way many problems that individuals face when attempting to achieve collective action had been viewed since the middle of the last century. 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 to free-ride on the efforts of others. The models, when applied to natural resource management in the marine environment are useful for explaining how perfectly rational individuals can produce, under certain circumstances, 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 these three models is the call for an external agent or authority to regulate the resource or parcel out its use. Two approaches have generally been advocated; public (central government) control or privatisation of the resource. In the last ten to fifteen years, there has been increasing evidence that state-run natural resource management schemes have not been producing the intended goals of sustainable exploitation. In addition, such schemes have tended to be economically inefficient and costly to implement, leading to dissipation of resource rent.

In addition there has been rejection of the 'Tragedy of the commons theory' in recent years especially by social anthropologists (McCay and Acheson, 1987; Jentoft, 1989; Ostrom, 1990; Bromley, 1992). It is argued that resource users are not driven by profit motives alone but that their activities are deeply embedded in, and conditioned by, social networks, institutions and culture. Resource users are driven by norms, obligations and responsibilities as members of families, communities and social groups. This perspective is largely based on faith in organisations as coordinating devices. It is thus argued that individual behaviour is neither always strategic nor nakedly self-interested. Most poignantly, these authors have pointed out the 'Tragedy of the Commons' mistakenly equated 'common property' (a resource owned or controlled by an identifiable group of people) with 'open access' (a situation whereby no one can claim control or ownership for a specific resource).

These concerns have fuelled interest in alternative institutional mechanisms that could both improve the efficiency (biological, economic and social) of exploitation and reduce transaction costs. Models and schemes based on the involvement of users are increasingly being seen as providing the most potent alternative. As a result, there have been increased references to governance models that involve users in management such as co-management or Community Based Management.



## **2. Applications of social science in policy formulation and regulatory frameworks in South Africa**

### *Fisheries Co-management*

In recent years, worldwide, there has been a strong move towards a more holistic, ecosystems and people-centred approach to managing natural resources as a result of failure of conventional management approaches (i.e. a centralised, top-down and resource-orientated approach). This approach is seen as better suited for dealing with critical issues of overexploitation of resources, user conflicts, disruption of social systems and increasing levels of poverty and food insecurity (Hauck and Sowman 2003). Greater participation of resource users in management activities and decisions is now recognised as necessary and beneficial. Governments often do not have the resources, capacity and local knowledge to manage resources that are frequently dispersed and spread over large distances. Coastal communities and resource user groups seldom have the resources and institutional mechanisms and capacity to deal with complex management issues alone. However, government, local resource users and other stakeholders can jointly tackle these complex issues and make decisions that benefit both the resource and the resource users. As a result, governments are increasingly developing policies and laws that enshrine participation in management decisions and give greater authority and responsibility to resource users. NEMA and the South Africa's constitution are examples of such laws. In addition the MLRA (1998) also alludes to the need for involving people in decisions that affect them. This approach is commonly referred to as co-management. Under the Norway/South Africa Cooperation agreement (NORSA) MCM has been piloting co-management in selected fishing communities and some valuable research outcomes have emerged (Hauck and Sowman, 2003).

Since democracy in 1994, DEAT has been involved in management and development projects with a social orientation. Some of these are; the *Sustainable Coastal livelihoods project* and the *Knowledge Base for Fisheries Management Project (KnowFish Project)*.

### *Livelihoods approach*

The DFID funded Sustainable Livelihoods Programme provides an example of alternative approach to coastal zone management. Past policy prescriptions have been based on sector-specific analyses that do not address the role of the various sectors in the coastal wide economy on the livelihoods of people. For example fisheries policy has historically been based on the 'equilibrium' view of fisheries resources, where fishing capacity should be matched with the resource in order to achieve maximum sustainable yield (Allison and Ellis, 2001). Empirical observations challenge these prevalent sectoral and equilibrium views though. South Africa's *White Paper for Sustainable Coastal Development in South Africa* (DEAT, 1999) proposed a new approach to coastal management – that is, the pursuit of sustainable coastal development through integrated coastal management. It was recognised though that effective implementation of the principles advanced by the White Paper would be dependent on dealing with issues of the deep poverty and inequalities that are found along the coast. The lack of understanding of coastal poverty meant there was need to develop a greater insight into this issue in order to deal with the problem. In 2001, MCM within DEAT

commissioned a study to improve our understanding of coastal poverty, the associated opportunities and constraints and also to identify the practical interventions to improve livelihood prospects for poor people living along the coast. The study used the Livelihoods Framework (Chambers and Conway, 1992). The findings were intended to be used as a basis of implementing the DFID funded Sustainable Livelihoods Programme. “The concept of a ‘livelihood’ comprises the assets (natural, physical, human, financial and social capital), the activities and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household.” (Chambers and Conway, 1992, 379).

#### *KNOWFISH Project*

Effect management of marine resources has to be based on knowledge that meets two related but independent tests: it must be accurate, and it must be perceived as accurate by stakeholders. The incongruence between this knowledge base and management institutions is an important reason for over-exploitation and the resulting impoverishment of fishing communities. Many experiences in fisheries development point to a need to rethink and rework the conventional management approaches (Degnbol, et al, 2005). There is need to develop new types of research based knowledge that are more appropriate to the complexity of aquatic ecosystems and the way management institutions actually work in specific contexts. One very critical need is the development of less complex indicators of ecosystem health and exploitation status that are both scientifically valid and widely acceptable by fisheries stakeholders. The objective of the KNOWFISH Project was to improve our understanding of the information needs and appropriate institutional structures for fisheries management by bringing together natural and social scientists in order to develop indicators together. The objective was to evaluate indicators of resource sustainability using a multidisciplinary team through the lens of how both research based and local knowledge of the ecosystem can be integrated to establish sustainability indicators which are considered valid by all stakeholders. The project drew on expertise from fisheries biology, aquatic ecology, anthropology, economics and sociology.

In South Africa, the small pelagic sector was case study used for the project. As a starting point in the integrated methodology for this project, open-ended, qualitative local knowledge interviews were conducted with fishermen and natural scientists involved in research pertinent to the pelagic resources. These interviews were used to generate a map of the catches and a timeline of changes in catch locality, and included a general discussion in order to get ideas for possible indicators.

#### *Important questions for future social science research in the marine environment*

Two aspects within the fishing industry can be highlighted as examples where inputs from social science disciplines would be invaluable. These are an evaluation of the transformation of the fishing industry and the decline of the abalone fishery through illegal fishing and the piloting of co-management.

The evaluation of *transformation of the fishing industry* over the past ten years is one area where other approaches could be usefully applied to understand the impacts of transformation initiatives in the fishing industry. This would require investigations into:

- Changes in corporate ownership and governance structures within companies. This was one of the main conditions for award of medium term fishing rights
- The performance of new rights holders in terms of forming SMMEs that could create employment and wealth generation within fishing communities.

- Which people or groups of people have benefited from transformation? The questions of whether transformation has resulted in improvements in the lives of those that transformation was suppose to target and whether transformation has assisted in alleviating poverty in fishing and coastal communities need to be addressed.

*The abalone fishery:* The plunder of the abalone resource, despite all the knowledge about its biological and ecological character and huge amounts of funding into its policing highlights the need for other types of knowledge and information. These would answer questions such as why illegal fishing is so prevalent; who is involved in these activities; how does illegal fishing operate (commodity and value chains); and what incentive structures are required to reverse this situation. This is the type of research that other disciplines, such as economics, sociology, geography and anthropology are much better equipped to carry out than natural science.

#### **4. Recommendations**

The previous sections of the paper have examined the global and national background in which research in the marine environment in South Africa is taking place; highlighted the philosophical and methodological differences between the natural and social sciences and provided some examples of applications of social science in the marine environment. With this understanding the paper now turns to provide recommendations to SANCOR about how the integration of social science could be achieved. It is recognized, and was stated at the National Sea and Coast III workshop, that the process of integration will not take place overnight but through a slow process. The recommendations presented here are divided into two groups. Firstly, those related to the process of developing the Sea and Coast III Programme, and secondly, a broader set of recommendations.

##### **4.1 Recommendations regarding the Sea and Cost III Programme**

###### a) *The introduction of a new research theme.*

The first draft of this paper proposed that a research theme that links society with the marine environment be created. This recommendation has indeed already been achieved through the theme of the Sea and Coast III Programme which is titled '*Society, Ecosystems and Change: SEACHange*'. The draft proposal states that this theme reflects

- a) the central place of human beings in the dynamic marine ecosystem
- b) the need to shift to an ecosystem-based approach to management and
- c) The facet that both the natural environments and human influences on ecosystems are changing at an unprecedented rate (SANCOR, 2005, 1).

This broad theme makes provision for both natural and social science, and also for integrated *interdisciplinary* projects that integrate theoretical and methodological frameworks of natural science disciplines and those of social science disciplines. This theme will serve to overcome the almost complete research division between natural and social science studies in the marine environment that currently prevails. There is evidence that SANCOR and the marine science community consulted during the Sea and Coast III workshops have already bought into this shift in the research agenda.

###### b) *Workshops to build capacity in multidisciplinary and interdisciplinary research*

It is further proposed that three facilitated capacity building regional workshops be held (W. Cape, E. Cape and KZN) prior to the submission date for research projects for the

SEACChange Programme. The purpose of these would be to introduce the concept of integrated research, to unpack the concepts of multi-disciplinary and interdisciplinary research, and to present possible processes and methods for undertaking integrated research. The facilitator would be an expert in the field and a possible methodology would be to workshop actual possible projects brought to the workshop by researchers. The goal would be to attract natural and social scientists as well as managers to these meetings and some prior caucusing with scientists and management institutions would need to take place to achieve this.

This intervention would create opportunities for natural scientists, social scientists, and research managers to engage with each other and leave the safety of their known and well-defined space (conceptual or operational) into the unknown 'third space' - a shared space of engagement (Scott et al 2003; Scott, 2005). This concept is useful for understanding the purpose of this intervention. Degnbol et al (2005) note that

'Science culture needs to be changed. People would need to rethink their assumptions, values, and ambitions, and the way they speak to each other. The arrogance that often prevail among sciences, and which is nurtured through their disciplinary blinders, is a factor to be reckoned with.'

The workshops would provide for engagement, debate, networking, exploration and innovation. The challenge is for participants to move beyond their institutional positions and their conceptual and operational frameworks for understanding and managing the world and move into a more transformative mode. It is proposed that often the 'first spaces', the disciplinary homes in which scientists are embedded, are sites of dominant power structures and actors fear to lose both power and identity by moving beyond this site. This is particularly the case in the natural sciences.

It is further suggested that research teams of natural scientists and social scientists that decide to submit integrated research applications be provided with additional seed funding to facilitate the development of research applications. This is a new terrain and a difficult task.

It is proposed that the NRF be approached to assist with funding for both the regional workshops and the integrated research proposal development funding as this is the core business of the NRF to expand knowledge fields.

It is further proposed that MCM be lobbied to support the regional workshops and allow their researchers and managers to participate.

c) *Revision of funding criteria*

The draft SEACChange Programme brief allows for social science, natural science and integrated research applications. However, at the National Sea and Coast III meeting (6/10/2005) it was clearly requested by natural scientists that they not be forced to integrate with social scientists but were happy that social scientists could apply for funding in their own right. There is no mechanism in the funding at present that provides incentives for truly interdisciplinary, integrated projects that combine social and natural science. It is proposed that SANCOR consider devising a funding mechanism that would reward projects of an integrated nature. The status quo approaches at present are not conducive to working towards integrated research.

- d) *Inclusion of social scientists on SANCOR proposal development, funding and project approval committees.*
- It is proposed that there needs to be representation of social scientists in the process of developing and applying the Sea and Coast III Programme. This recommendation has partially been approved as the social science SANCOR Steering Committee members have been an integral part of the development of the SEACHange Programme brief.
  - It is proposed that SANCOR should include a social scientist on the Programme Management Committee of SEACHange
  - It is proposed that SANCOR should lobby the NRF to have social scientists on the NRF Review Panels that are tasked to review all applications for funding in the SEACHange Programme
- e) The Sea and Coast III: SEACHange Programme brief needs to be amended to include some of the recommendations suggested here if SANCOR subscribes to them.

#### **4.2 Other recommendations**

It is recommended that SANCOR lobby MCM to create a high profile post for social science and build a social science unit within MCM, and that this unit should be housed with and be integrally linked to the natural science research unit.

It is recommended that SANCOR engage with the relevant University departments to notify them of the thrust towards integration of social science into research in the marine environment and encourage these departments to build modules into Marine Science programmes that would foster integrated thinking.

#### **5. Conclusion**

This set of guidelines has provided an argument for and a background to the need to integrate social science into research in the marine environment. Some examples of social science employed in this environment as well as pointers to the gaps in such research in South Africa have been provided. Finally a set of recommendations are listed for SANCOR to be able to take steps to bring about a shift in approach to research in the marine environment. It is already evident that SANCOR has begun to undergo a 'paradigm shift' to facilitate social science being integrated into the forthcoming SEACHange Programme. It is hoped that this document will provide some guidance to SANCOR as it undergoes this shift.

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