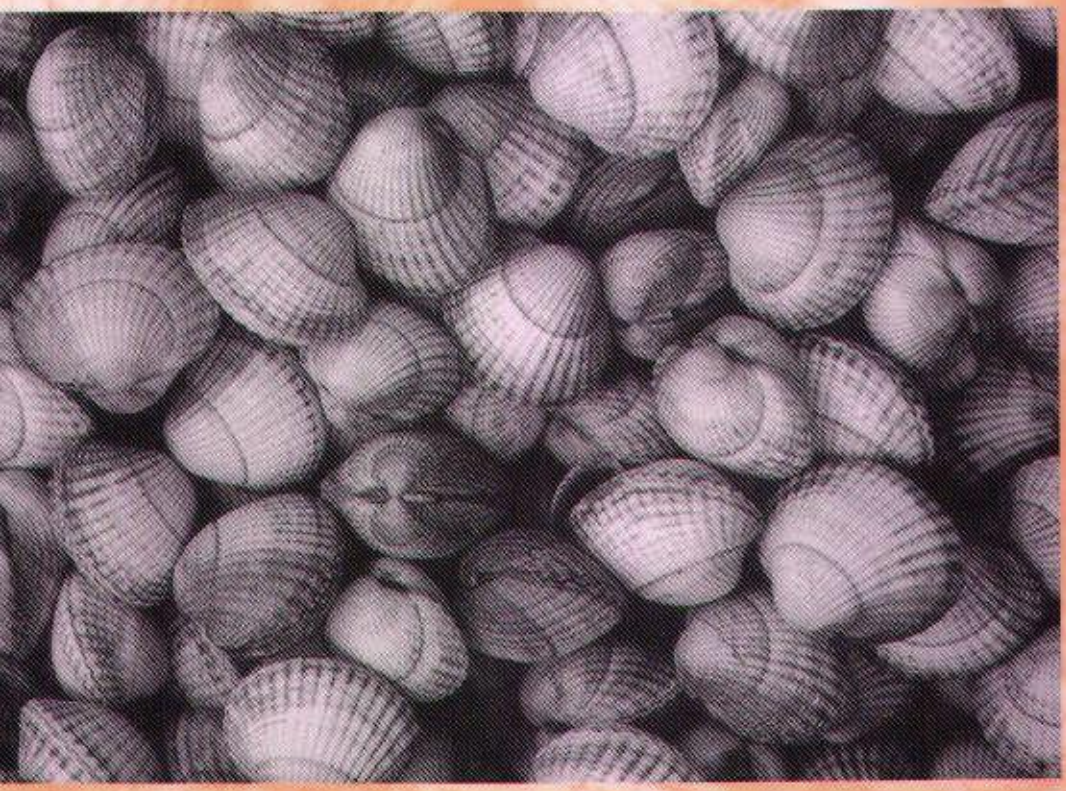
ALL HANDS ON DECK

An interactive perspective on complex common-pool resource management based on case studies in the coastal waters of the Isle of Wight (UK), Connemara (Ireland) and the Dutch Wadden Sea



Nathalie A. Steins

Stellingen (propositions)

1. The theoretical notions and frameworks of CPR (common-pool resource) theory are increasingly being applied to analyse 'real life' collective action situations that are far more complex than the ones they were originally developed for. This practice can no longer be justified.
   This thesis.

2. The strong focus on "success on the commons" encourages the lack of contextual analysis in CPR theory.
   This thesis.

3. In using a fixed model of strategic action and by focusing on institutional procedures for collective action, CPR theory creates a divide between the actor and the social and moves collective action away from the arena of everyday sociotechnical interaction in which stakeholders in a common-pool resource find themselves.
   This thesis.

4. Although the CPR design principles are increasingly seen as the ingredients for successful collective action, it is naïve to expect that 'success' will be achieved once they are implemented.
   This thesis.

5. The notion of platforms for resource use negotiation as developed in the knowledge systems perspective is in conflict with the essence of the asserted social constructivist nature of this approach, since it prescribes desired outcomes for platform processes rather than letting its participants construct the outcome.
   This thesis.

6. Platforms for common-pool resource use negotiation are not a panacea to solve all the perceived resource management problems, they are merely a way of mediating these problems.
   This thesis.

7. "The term 'holistic' refers to my conviction that what we are concerned with here is the fundamental interconnectedness of all things. [...] The connections between causes and effects are often much more subtle and complex than we with our rough understanding of the physical world might naturally suppose" (Dirk Gently, in: D. Adams. 1988. *Dirk Gently's holistic detective agency*. London: Pan Books Ltd., pp.115).

8. "Thinking, acting, writing, loving, earning - all the attributes we normally ascribe to human beings are generated in networks that pass through and ramify both within and beyond the body" (J. Law, 1992: 384).

9. Fifth rule of method: "the name of the game will be to leave the boundaries open and to close them only when the people we follow close them. Thus, we have to be as undecided as possible on which elements will be tied together, or when they will start to have a common fate, on which interest will eventually win over which. In other words, we have to be as *undecided* as the actors we follow" (B. Latour, 1987: 175).

10. In Europe, at least 25 international meetings and workshops focussing on the need for integrated coastal zone management have been held from 1973 onwards (Rigg, 1996). Yet a concerted practical action plan at European level has still not been achieved.

11. Volgens een lid van een Nederlandse natuurbeschermingsorganisatie zijn "kokkelvissers zo slecht als de oceaan diep is". Aangezien kokkels overwegend op droogvallende platen worden gevist, valt het met de slechtheid van die kokkelvissers dus best wel mee.

12. Politiek-biologisch onderzoek zal binnenkort een verband aantonen tussen de mechanische kokkelvisserij op de Waddenzee en het aanspoelen van potvissen.

Stellingen behorende bij het proefschrift (Propositions doctoral dissertation):

All hands on deck: An interactive perspective on complex common-pool resource management based on case studies in the coastal waters of the Isle of Wight (UK), Connemara (Ireland) and the Dutch Wadden Sea.

Nathalie A. Steins, Wageningen, 1 oktober 1999

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Proefschrift

ter verkrijging van de graad van doctor
op gezag van de rector magnificus
van de Wageningen Universiteit,
dr. C.M. Karssen,
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Preface

'All hands on deck' is what a skipper calls for when all his/her crew are required aboard to help manoeuvring the ship. It means that everybody has to join forces to overcome navigational difficulties: 'All hands on deck' means 'collective action'.

This book is about collective action; not aboard a ship, but in the management of the coastal waters. Growing demands for entry to the coastal waters by a variety of uses, such as fisheries, aquaculture, shipping, recreation and nature conservation, have resulted in a number of problems, including resource degradation and conflicts. The presence of a range of management regimes to co-ordinate different claims has not prevented these problems from occurring. Increasingly, stakeholders all over the world are realising that to deal with such problems all hands are needed on deck. The book follows coastal fishermen in the United Kingdom, Ireland and The Netherlands in their interactions with other stakeholders in their fishing grounds, and the way collective management of resources, spaces and people take place in different local, regional and national contexts. It hopes to contribute towards an understanding of the complexities involved in collective action amongst different stakeholders. Such an understanding is crucial if we want to pursue the idea that a collective action approach is an alternative means to deal with complex resource management problems.

The proposals in this book may seem radical to some of its readers (and perhaps modest to others). Many of the traditional, descriptive notions developed in collective action theory have been abandoned. Building on social constructivist approaches and particularly actor-network theory, old notions are transformed and new ones are introduced. If I 'shock' people by the proposals in this book, it is to make them reconsider traditional, pre-defined and often prescriptive categories of collective action and the social; it is to make them realise that collective action is both a process and an effect, both of which are shaped by interactions amongst a multitude of people and material resources, and which, as John Law (1992: 390) notes, "could and often should be otherwise".

Delivering this book would not have been possible without the contribution of a great number of people. I would like to take this opportunity to thank everybody who had a hand in this book or who supported me. Some of them I wish to thank explicitly.

About six years ago, Niels Röling gave me a copy of Michel Callon and John Law's article 'On the construction of sociotechnical networks' (1989). The empirical part of the article is on scallop farming in the Bay of Saint Brieuc in Brittany. Niels thought that it might be of use for my master's dissertation at Wageningen Agricultural University, for which I was about to carry out fieldwork at an Irish shellfish farming co-operative. I do not think Niels ever realised that by giving me this article, he instigated my 'love-hate affair' with actor-network theory! Later he

enrolled me in taking up the challenge of writing this book. His enthusiasm and ability to get a grasp of what I was attempting to do and ask the 'right' questions have been crucial in shaping my ideas and this book. Thank you! Similarly, Victoria Edwards has played a crucial role in delivering this project. She enrolled me in the world of multiple-use common-pool resources and encouraged me to further develop my ideas. I greatly value her insightful comments to earlier versions of this book and related research projects. I also thank her for editing this book in the week before her wedding! Yet, most of all, I thank her for her friendship.

I wish to thank the fishermen in the Medina Estuary, Ballynakill and Killary Harbour and the Wadden Sea and their representatives for sharing their feelings and experiences with me and for the opportunity they gave me to appreciate their way of life. I also thank the other user groups and interest groups in these research areas, as well as non-governmental organisations and government authorities in the three countries for their invaluable assistance. John Coyne of the Forum project in Connemara and Tomás Burke, local aquaculture development officer of An Bord Iascaigh Mhara, have been of great assistance in offering me office space and providing me with contacts for the research. Wim Davidse of the Fisheries Division at the Institute for Agricultural Economics helped me in setting up my research project in The Netherlands. Norbert Dankers of the Institute of Forestry and Nature Research (Texel) invited me as a 'guest researcher'. I thank Hanna and Paddy Walsh (Connemara) and Han and Marja Keyser (Texel) for making me part of their family.

My gratitude also goes to the Department of Land and Construction Management of the University of Portsmouth for giving me the opportunity to work on this project. My special thanks go to my former colleagues of the Centre for Coastal Zone Management, and in particular Caroline Davis and Jane Taussik, for their support, stimulating debate and friendship.

I also wish to thank Gerard Verschoor of the Rural Development Sociology Group, Department of Social Sciences, at Wageningen University for further introducing me to actor-network theory and for his never failing enthusiasm to respond to my questions and comments either personally or by e-mail. Berry Lekanne dit Deprez, former academic member of staff of this department stimulated my interest in the complex problems associated with common-pool resource management when I was a student. His encouragement has been of great significance for my personal development.

My participation in the post-graduate Research School 'Fishing Matters', which was fully funded by the Nordic Academy for Advanced Studies, enabled me to share my research experiences with doctoral students from other disciples in fisheries research. I thank all the students and tutors for their valuable comments and particularly Poul Holm and David Starkey for organising the workshop.

My membership of the International Association for the Study of Common Property (IASCP) and the European Social Science Fisheries Network (ESSFiN) enabled me to discuss and develop my ideas with a broad audience of academics and practitioners. I wish to acknowledge the following colleagues: Susan Buck, Katia Frangoudes, Rob van Ginkel, Ellen Hoefnagel, Petter Holm, Marleen Maarleveld, Ruth Meinzen-Dick, Elinor Ostrom, Jeremy Phillipson, Evelyn Pinkerton, Laura Píriz, Stein Arne Rånes, Helle Munk Ravnborg, David Symes, Mireille Thom, Jamie Thomson, Tanja Verbeeten and Torben Vestergaard. In addition, I thank Eva Roth, for finally making me understand the value of economics.

I am very grateful to my current employer, the Dutch Fish Board (Productschap Vis) for giving me the opportunity to finalise this project. Without this support, it would have taken me many more months to complete this book. I wish to thank all my colleagues, but in particular Dick Langstraat and Bert Keus, for their support.

A book would not be a book without illustrations and a cover. I thank Rosemary Shearer of the University of Portsmouth for designing the maps in the present, as well as in past and future publications, and for making me think about them! I thank Denis Groot of the Dutch Fish Board for the cover design.

My friends supported me in many ways. Thank you: Alice, Andrien, Ben, Bouke, Camiel, Camilla, Caroline, Carolyne, Clem, Edwin, Harry, Jessica, Joyce, Liz, Marcel, Matt, Nicole, Paul and Sonja.

This book is not only the effect of my interactions with a lot of people, but also with a vast number of non-humans, some of which deserve mentioning: the books and articles that nourished my ideas; the e-mail that closed distances; the planes, trains, ferries and bikes that (without too many delays) transported me between research areas and interviews; and my laptop with which I developed an affectionate relationship.

Finally, I wish to mention three people who mean a lot to me. I thank Hub and Lies for being who they are and for never failing to support the choices their daughter makes. Last but not least, I thank Rob. He knows why.

Nathalie Steins
The Hague, 1 August 1999

Chapter One

Setting the scene

Coastal resource management and collective action

This book is about the management of coastal resources. It is about fishermen, shellfish cultivators, salmon farmers, yachtsmen, cargo operators, nature conservationists, researchers, development agents and authorities. It is also about fish cages, fairways, birds, fishing vessels and 'vacuum cleaners'. In particular, the study is about collective action processes amongst multiple stakeholders in the coastal waters and how such processes are shaped in time and space as a result of interactions amongst such stakeholders (and non-human entities).

The study is the outcome of several research projects carried out while I was working at the University of Portsmouth, United Kingdom (February 1996 - August 1998). Some of the projects were driven by a purely academic interest in the collective management of natural resources. Others were part of consultancy work or programmes funded by the European Union. The thread of all these projects is the management of coastal resources that are used in common by multiple users for multiple *types* of use, and, more particularly, the problems associated with multiple-use and the users' strategies to deal with these problems through collective action.

Managing the coastal common-pool resource

From single use to multiple use

In the debate on the sustainable exploitation and development of the global natural resource base, the coastal zone takes an important position. Although it comprises only 10% of the earth's surface, approximately 50% of the world population now lives and works within a close distance of the coastal zone (Buisman, 1996). Once a domain where only fishermen, privateers, merchants and the navy ventured, the sea is now increasingly being used for purposes other than fishing and shipping. This applies to the coastal zone in particular. The intensive exploitation of the coastal resource base has for many countries become an important basis for economic growth and socio-economic development. The rapid increase in activities such as marine leisure, aquaculture, the extraction of petroleum and gas, and housing development has resulted in a variety of externalities, such as exhaust emissions, disposal of sewage, heavy metal impacts, damage to salt marshes and artificial reefs, and disturbance to birds and wildlife (May, 1996). In addition to these physical impacts, the development of new activities has also affected traditional user groups in these marine areas, most notably fishermen (Mondardini Morelli,

1998; Van Ginkel & Steins, 1998). Growing demands for entry to the coastal zone have brought about competition and conflicts amongst various interest groups, stakeholders and claimants over access to, allocation of and control over coastal space and resources. These contemporary problems in the coastal zone can only be appreciated by understanding the historical context of its use and management.

Historically, the majority of coastal resources were governed under common property regimes, i.e., co-operative management, by local communities who depended on the resource for their livelihood. The Dutch invention of the 'freedom of the seas' in the 17th century was a first step towards the end of the traditional governing institutions for coastal common-pool resources. Most European monarchs imposed their Sovereign Rule and the enclosure of coastal resources for specific uses began (Sandberg, 1995).

Present European coastal resource management strategies and institutions cannot be understood without comprehending "the long term hidden agenda of European nation states in reducing the role of collective property rights in the governing of resources" (Sandberg, 1995: 6). This strategy has both political and moral dimensions. First, nation-building was promoted by limiting the degrees of local self-governance, by surpressing collective property rights and ensuring the loyalty of the people through state guarantees of private property rights. Second, the strengthening of private property rights was seen as a process of emancipation, based on the principle of *Nemo in communione potest invitus detineri*, meaning 'no one can be kept in co-proprietorship against his will' *(ibid.)*.

The privatisation of the coast has accelerated through the last three centuries. For example: the freedom of enterprise allowed large companies and harbours to occupy vast seashore areas; aquaculture development was facilitated by issuing licences to secure private property rights to certain areas; and, in the recreational sector, an increasing number of marinas, hotels and resort villages have enclosed the coastal commons (Sandberg, 1995). These processes, in combination with an increase in general industry waste, household sewage and human activities such as mineral extraction, dredging, land reclamation and recreation, have led to the degradation of the coastal resource base and the alienation of local resource users from their traditional activities.

With a majority of European coasts under pressure, a new type of enclosure has emerged: the entrenchment of state property rights to the coast (Sandberg, 1995). To safeguard marine habitats and to secure public access from the effects of the privatisation of the coastal zone, an ever increasing number of coastal sanctuaries, marine reserves, Special Areas of Conservation, Special Protections Areas, public coastal paths and public beaches, have been established. This entrenchment of public property rights by the state has resulted in the further alienation of local user communities from the coastal resource base, while increased public access to coastal resources causes further institutional and physical deterioration encouraged by the prohibitive costs of policing public areas and the lack of self-disciplining incentives among the public *(ibid.)*.

Thus, in the coastal zone, we are dealing with complex situations: different uses may be mutually incompatible; one activity may be damaging to some interests but beneficial to others; some activities cause effects elsewhere and are themselves affected by different activities; others cause effects without themselves being interfered with; still other activities only suffer interference without themselves causing any effects on others; and different uses are regulated through different management regimes (Van Ginkel & Steins, 1998).

Common-pool resources

The complexities associated with the management of the coastal resource base over time are directly related to its status as a common-pool resource. First of all, the coastal zone has no clearly defined boundaries. At best, it can be described as a band of land and sea on either side of the shoreline, which is defined in a different way in different localities and national contexts according to physical, biological and cultural criteria (Jones, 1998; Sorenson, 1984). Different perceptions of the coastal zone have been known to frustrate the development and implementation of management strategies. The coastal zone, and particularly the seaward side, is often perceived as a 'free for all' resource. Although, for instance, private ownership rights may be attached to coastal resources such as shellfish beds or beaches, their physical characteristics may make visible delineation difficult to achieve, if not impossible. Furthermore, as a result of the dynamic interacting physical processes in the coastal zone, in combination with the dynamics of human activity, boundaries are constantly changing. All these characteristics make it difficult, often costly, and sometimes impossible to exclude other people from using the resource. Second, the coastal zone produces a variety of so-called resource units (Ostrom, 1990), such as fish, minerals and clean seawater, which are exclusive and, ultimately, finite. Once caught, a plaice cannot be fished by another fisherman. *Common-pool resources* (CPRs) are resources (i) for which joint use involves subtractability; that is: use by one user will subtract benefits from another user's enjoyment of the resource system, and (ii) for which exclusion of individuals or groups involves high transaction costs.

When CPRs are used by an increasing number of people, often for different purposes, and agreements governing resource use are absent, collective use may lead to overexploitation, degradation and eventual ruin of the resource, which is attributed to the user's incentive to maximise his own utility. This thesis, commonly known as The Tragedy of the Commons (Hardin, 1968), has dominated the debate about the management of CPRs. The debate has, however, been blurred by a conceptual misunderstanding about the nature of such resources, caused by Hardin's unfortunate use of the term 'the commons' to describe an 'open access' regime. Resources used in common are variously referred to as 'open access', 'common-pool', 'common property' and 'the commons'. However, Hardin's 'common', a pasture open to all, is essentially an 'open access' resource, where decision-making arrangements governing access to, allocation of and control over the resource are absent. This is of particular importance, since empirical research has

shown that it is exactly these decision-making arrangements, or institutions, which may prevent the resource from degrading (e.g., Bromley, 1992; Ostrom, 1990; Wade, 1987).

Thus, CPRs may or may not have formal or informal property rights attached to them concerning control of their use. By terming a resource as a 'property', we identify it as a reservoir or flow of benefits to which rights can be attached. 'Property rights' are social institutions which have evolved as a means of enforcing claims to that benefit stream (Edwards & Steins, 1998a). There are four basic classifications of property rights for CPRs[1]:

1. *open access:* no use rights are attached to a specific group, resulting in a general 'free for all';
2. *public property:* access for the public are held in trust by the Crown or state;
3. *common property or 'commons'*[2]: use rights are attached to a specified user group;
4. *private property:* tradable rights are owned by an individual, household or company *(ibid.)*.

The concept of property *rights* to the CPR must be distinguished from the notion of a property *regime*. The latter refers to the decision-making arrangements that define the conditions of access to, allocation of and control over a range of benefits arising from a collectively use resource; in other words, the institutions (Edwards & Steins, 1998a).

The management regimes for common-pool resources are characterised by three levels of decision-making arrangements or institutions (Ostrom, 1990). At the top level, the so-called *constitutional level*, decision-making arrangements form the legislative framework within which stakeholders in the resource have to operate. For example, fisheries management in the European Member States is governed by the Common Fisheries Policy through, amongst others, a system of Total Allowable Catches (TACs) for commercial species. At the middle level, the *collective-choice level*, decision-making arrangements determine the rules for interaction *amongst* management organisations and user groups, and *within* such groups. To follow up on the example of the TACs: the Dutch government has divided the national allocation of the European TACs among the fishing industry by means of Individual Transferable Quotas (ITQs) and has delegated responsibility for their management to the industry through the establishment of quota management groups. At the lowest level, the *operational level*, the purpose of decision-making arrangements is to provide resource users with day-to-day rules controlling access to, allocation of and control over the resource. The members of the quota management groups are obliged to transfer their ITQs to the board of the group and then have the right to use their ITQs under the conditions that have been agreed upon in a fishing plan made by the group.

Thus, the operational rules are made within the collective-choice regulatory framework, which in turn is determined by legislation at constitutional level. This

means that the decision-making arrangements at different levels are 'nested': change at one level is the result of patterns of interactions at another level (Edwards, 1996). At all three levels, authority structures are present that "sanction rights, enforce rules, and define the contexts in which conventions and contracts are negotiated" (Swallow & Bromley, 1995: 109). These authority structures are considered to be vital to the operation of the decision-making arrangements.

The above discussion suggests that the problem facing the users of CPRs is that of organising; that is:

> "how to change the situation from one in which [users] act independently to one in which they adopt co-ordinated strategies to obtain higher joint benefits or reduce their joint harm" (Ostrom, 1990: 39).

This process of organising requires some form of collective action to design a joint management strategy and to maintain the common resource.

Multiple-use management of the coastal zone

The development of the coastal resource over time has coincided with the development of CPR management regimes. As a consequence, the coastal resource is now used and managed under a vast number of different management regimes, turning it into a true complex, multiple-use CPR. The Dutch Wadden Sea, for instance, used to be the access route for the merchant and naval fleet to the North Sea, and, until the beginning of the century, was primarily exploited by fishermen. The state adopted a *laissez-faire* policy towards the fishery in its waters; only in the oyster and eelgrass industry, common property regimes (limited entry schemes) and privatisation of plots (through leases) were introduced in 1840 and 1880 respectively. In 1932, the role of the Wadden Sea for coastal defence was articulated with the completion of the Enclosure Dike, cutting the Zuyder Sea from the Wadden Sea, which contributed to the loss of the eelgrass industry and herring fishery in both areas (Van Ginkel, 1995a; 1995b). In the 1950s, the mussel industry in the south-west of the country was hit by disease problems and obtained permission to lease cultivation parcels (private property) in the Wadden Sea. In the 1960s, the modern cockle fishery was developed. All fisheries, except mussel cultivation, were at the time managed under virtual open access conditions (except for the licence requirements set by the state). At the same time, sailing and nature-based tourism witnessed increasing development, with no restrictions on access. In 1959, the presence of gas was detected and a number of trial drillings were made. Commercial drilling for gas started in 1988. The seabed in the mining area is owned by the state; the ownership of the gas has been transferred to the mining company through a concession. Between 1988 and 1994, a moratorium on gas drilling, which was a voluntary measure by the mining companies, was in place for all but one mining area (Verbeeten, pers.comm.). The Wadden Sea is also an important shipping route and a military training area. From the 1980s onwards, nature conservation gained a profound role, particularly through the

implementation of international wetland and habitat designations. Pressures on the natural environment caused by the combination of these uses have resulted in the introduction of new management regimes. Areas have been closed or are subject to limited entry under statutory regulations. For example, the shellfish fisheries are now governed under a common property regime in collaboration with the state, quota have been set for the number of tourists allowed to go for the popular walks on the tidal mud flats and only six trial drillings for gas are permitted in the period 1995-2000. The multiple uses in the Wadden Sea are thus managed under a mixture of property regimes within state ownership.

The presence of a multitude of management regimes to co-ordinate multiple uses has, however, not prevented externalities, such as environmental impacts and conflicts amongst different user groups, from occurring. For example, increasing pressure on coastal waters by fishermen, tourism and industries in combination with impacts from land-based uses, is posing a threat to coastal habitats. This has become a growing concern not only for conservationists, but also for user groups, scientists and governments. Consequently, marine protected areas have been established within national programmes or designated in accordance with European habitat directives. Sardinia, for instance, has witnessed the establishment of marine parks, where 'zoning' has been the strategy to co-ordinate tourism and fishing activities in the protected area. As habitual patterns of fishing and usufruct have largely been ignored by the governing authorities and fishermen perceive that the parks benefit the tourism sector only, while taking their livelihood from them, the establishment of the parks has brought about "a polarisation of interests rather than a dialogue between the interested parties [...], creating instances of tension and conflict" (Mondardini Morelli 1998: 188).

Another example of externalities resulting from multiple-use is the west of Ireland, where the establishment and expansion of salmon farms in several estuaries has caused a serious conflict between fishermen and salmon farms. Fishermen feel that they have lost access to important fishing grounds to the farms. Their frustration is aggravated by the fact that public consultation about the designation of salmon production sites has hardly taken place. The conflict reached a peak in the summer of 1996 when the fish cages of one salmon farm in the Connemara region were sabotaged, releasing IR£ 250,000 worth of juvenile salmon (Steins, 1998a).

These examples emphasise a crucial aspect of multiple-use: the activities/actions of one user group influence activities/actions by other user groups; multiple uses are closely interconnected. Thus, it is the very nature of multiple-use resources that makes collective action a necessity to deal with adverse impacts associated with multiple-use. However, in a multiple-use CPR scenario, collective action becomes increasingly complicated. Typically, the different uses will be regulated through different decision-making arrangements by different groups. Common property regimes may co-exist with public property regimes and private property. In addition, areas of the CPR may be accessible to all. For the stakeholders in a common property resource, the characteristic of multiple-use implies that not only they are involved in collective action processes with other users of the common, but also

have to co-operate with other, different user groups of the CPR in order to avoid problems associated with multiple-use. This means, amongst others, that the institutional framework within which collective resource use takes place has to be re-negotiated to avoid adverse impacts associated with increased access of new users to the resource system.

The severe and continuous decline of coastal zones resulting from the combined effects of multiple resource uses has been an international concern for over two decades. The concept of coastal zone management (CZM) has been developed as a 'tool', or decision-making process, for managing the use and exploitation of the landward and seaward side of the coastline (Jones, 1998). In the United States, the federal government established a CZM Act in 1974, providing an institutional and supportive framework for integrated CZM in its coastal states (Hildreth & Johnson, 1985; Imperial *et al.*, 1991). Canada's Coastal Action Programme follows a co-management framework, where community-based coastal zone management strategies are developed and implemented through a collaborative process involving authorities and local stakeholders (Burton, 1997; Chouinard & Vanderlinden, 1997; Robinson, 1997). In Europe, at least 25 international meetings and workshops, focusing on the need for integrated action and conservation, have been held from 1973 onwards (Rigg, 1996). A concerted European action plan for CZM is, however, still lacking and integrated CZM initiatives remain dependent on the efforts of the Member States, with England, the west of France and Sweden taking leading roles. At global level, the importance of integrated CZM is articulated by Agenda 21, the global action plan of the 1992 Earth Summit, which devotes an entire chapter to coastal and ocean management issues. Chapter 17 stresses the need to reach integrated management, to apply preventive and precautionary approaches and to aim at full participation of the public (Cicin-Sain & Knecht, 1993).

These international meetings have prompted the call to go beyond conventional CZM strategies, which deal with resolving conflicts among the coast's many uses and are concerned with determining the most appropriate use of coastal resources (Sorenson *et al.*, 1984). *Integrated* CZM is now widely considered to be the future policy strategy to alleviate problems related to the (over)exploitation of the coastal resource base. Integrated CZM is directed at the sustainable management of coastal resources, respecting natural processes and indigenous/local resource management strategies, and is based on an active participatory approach (Clark, 1992, in Buisman, 1996). The OECD (1993: 16) defines it as:

> "the management of the coastal zone as a whole in relation to local, regional, national and international goals. It implies a focus on the interactions between the various activities and resource demands that occur within the coastal zone, and between coastal zone activities in other regions".

This implies that management policies should aim at integrating: (i) policies related to different sectors, (ii) policies relating to water and land in the coastal zone, (iii) local, regional and national authorities, (iv) international policies, and (v) different

scientific disciplines (Buisman, 1996). What is more, as Glaeser & Píriz (1998: 164) emphasise, "the concept of management in Sustainable Coastal Zone Management is not only concerned with managing the natural resources, but also people"[3].

Although the call for integrated CZM has widely been accepted, 'integration' is often limited to the combined pursuit of ecological and economic objectives and fails to address the social issues that are at stake (Steins, 1997a). Furthermore, at the local and regional level, much coastal policy and resulting management has been established on an *ad hoc* basis, involving a multitude of organisations that often do not take into account the complexity of the coastal zone in proposing new plans for its management (Scott, 1996). This is reinforced by poor communication between policy-makers at the legislative level and a top-down approach, resulting in an absence of integrated resource management policies (Buisman, 1996; Röling, 1994a; Steins, 1997a). Illustrative of the institutional struggle over integrated CZM is the long-term failure to achieve a concerted practical action plan at European level.

In many areas around the world, these circumstances have given rise to the development of various initiatives, such as coastal forums (Coastal Forum, 1997; Scott, 1996), coastal Landcare groups (Campbell, 1994), estuary management initiatives (CCZM, 1997), and co-management strategies for fisheries (Pinkerton, 1994; this book, Chapter Seven) in which coastal resource management issues are considered from a broader perspective and stakeholders work collectively towards an understanding of the coastal resource and the solution of perceived problems.

These initiatives share an important common feature: they comprise voluntary or statutory 'platforms' of multiple stakeholders who acknowledge that *collective*, or *concerted action* is the key to CZM. In such platforms, resource management issues are considered from a multiple-use perspective and social actors exercise collective agency in working in concert towards adaptive resource management through (i) fostering understanding about the resource base, (ii) minimisation of social dilemmas associated with collective resource use, and (iii) implementation and fine-tuning of action strategies with respect to perceived problems.

The rapid emergence of platforms to negotiate and co-ordinate collective CZM around the world suggests that the dominant strategic narrative, which views people as rational individuals who find themselves in a continuous struggle with others to achieve their aim of maximising their own utilities or realising their own projects, and which underpins our ideas about society and most of our policies (Röling & Maarleveld, 1999), needs reconsideration. The complexities and interconnectedness of resource management problems has triggered growing awareness that a collective action approach is an alternative means to deal with complex, interdependent resource management problems.

Collective action as an alternative strategy

How 'rationality' causes 'tragedy'

For a long time, conventional ideas about collective action and the management of common-pool resources were nurtured by Hardin's Tragedy of the Commons (1968). The thesis probably presents the most famous example of a 'commons dilemma', which can be defined as a situation in which it is rational for individuals not to co-operate, even though everyone would be better off if they did.

Game theorists have formalised the commons dilemma as a Prisoner's Dilemma. Imagine two suspects who have committed a crime together and who are interrogated individually. They know that if they both stay silent, each will receive a light sentence. If one stays silent, while the other confesses, the first will receive a long sentence while the other goes free. If they both confess they will each receive a long sentence. Each suspect can only choose once and does not know the other suspect's choice. This creates the dilemma: it is in their mutual interest to co-operate; that is, to stay silent. But the outcome is that they both defect and confess. Thus, in the game, each player has a dominant strategy - to defect - since in that case he[4] is always better off, no matter what the other player chooses. The paradox inherent in the Prisoner's Dilemma is that individually rational strategies lead to collectively irrational outcomes (Ostrom, 1990; Wade, 1987).

Collective action problems and their solution have been subjects of extensive debates amongst researchers, policy-makers and practitioners, resulting in a number of theories of collective action. The crux of classical theories is the individual's willingness to contribute voluntarily towards maintaining a collective good (co-operation) versus his incentive to defect or free-ride. The empirical basis for collective action theories is either laid by research in controlled, laboratory circumstances or by research into real life cases of the management of common-pool natural resources.

The driving force behind collective action theories as well as scientific and policy solutions to problems associated with the 'common good' is the notion of rational choice. Rational choice theory is based on the conception of rationality employed in economics. The rationality principle is based on the notion that human actors attribute different utility to different actions and goods and is accompanied by the principle that actors choose the action that maximises their utility (Coleman, 1994).

A rational actor is defined as:

> "one who comes to a social situation with preferences over possible social states, beliefs about the world around him, and a capability to employ these data intelligently. Agent behaviour takes the form of choices based on either intelligent calculation or internalised rules that reflect optimal adaptation in experience" (Shepsle, 1989: 135).

In the past decade, rational choice theory has moved beyond the economic realm and has been applied increasingly to the realm of sociology, using the notion of the rational or purposive actor to explain social phenomena and societal change (Münch, 1992). Coleman's *Foundations of Social Theory* (1994, first published in 1990) is probably the most renown example of this shift in rational choice theory. From a rational choice perspective, social interaction is essentially an economic transaction that is guided by the actors' rational choices between alternative outcomes of their actions in terms of their costs and benefits (Münch, 1992), or in Coleman's words:

> "Actors are connected to resources (and thus indirectly to one another) through only two relations: their control over resources and their interest in resources. Actors have a single principle of action, that of acting as to maximise their realisation of interests. Such action can be simply consumatory, to realise the actor's interest; if it is not, the maximisation principle leads most often to a single kind of action - exchange of control (or rights to control) over resources or events" (Coleman, 1994: 37).

Since each actor aims to maximise his own private values, co-operation towards collective objectives becomes increasingly problematic. Rational choice theorists believe that credible commitments[5], combined with mutual monitoring and the establishment of authority relations through the transfer of rights over control of certain actions, can motivate individuals to become engaged in collective action towards the realisation of shared goals (Coleman, 1994; Ostrom, 1990; Robertson & Tang, 1995).

The Tragedy of the Commons and the Prisoner's Dilemma, which are both based on the rational choice paradigm, have proven strong mechanisms in the policy-making process concerning common-pool resources. Privatisation of CPRs or state regulation are generally seen as the only ways to prevent tragedies from happening. After all, from a rational choice perspective, the chances that individuals facing a potential Tragedy organise themselves and work together to avoid it, are limited. In many localities where CPRs had survived the enclosure of the commons by the nation state or the colonisation process by foreign nation states and were still managed under common property regimes, such regimes have slowly been eroded by the dominant ethos of external control. This was reinforced by the fact that, in many of these areas, common property regimes were not formalised, but were based on informal regulations or conventions, which were deeply embedded in existing cultural and religious systems, and which were either not visible to external agents, nor understood, or considered 'primitive' (and therefore inappropriate).

Privatisation and state regulation have, however, not in all cases lived up to the expectations; sometimes even causing or accelerating degradation of the CPR. For example, in 1870, the Dutch government decided to lease the state-owned oyster beds in the province of Zeeland, which were accessible to local fishermen in return for a small licence fee, to the highest bidders. Although the limited entry strategy led to many social problems, privatisation initially appeared to be extremely successful in that it "contributed tremendously to the capitalisation and

industrialisation of the oyster industry and to the boom in production" (Van Ginkel, 1988: 313). However, a decade later, over-investment, an increasing number of cultivators and drop of the price due to a saturated market, resulted in lower profit margins. To ensure profits, the cultivators increased production. The combination of these factors led to resource deterioration: the carrying capacity of the estuaries was reached, resulting in deteriorated growth and high mortalities (*ibid.*). Equally, in the Dutch sea fishery sector, the implementation of the ITQ system to divide the national allocation of the European TACs, resulted in overfishing of the quota, a strained relationship between the government and the industry, fishermen standing on the barricades and the eventual resignation of the Minister for Fisheries.

An alternative strategy to deal with complex problems

World-wide awareness that the unseen side-effects of our industrial society can no longer be regarded as "a problem of the world surrounding us", but rather are "a profound institutional crisis of industrial society itself" (Beck, 1994: 8), was triggered at the first global environmental conference in Stockholm in 1972. Initiatives such as the 1992 Earth Summit in Rio show that the sustainable exploitation and development of the earth's common-pool resource base has become a priority on the international political agenda. The predominant strategies of privatisation of resources and enforcement of state regulations, have not prevented further degradation and depletion of local, national and global CPRs. This process has been accelerated by increasing pressures on CPRs, resulting from, amongst others, demographic changes, technological developments, changes in life style patterns, changing markets and the articulation of new interests. CPRs world-wide have become complex, multiple-use resources characterised by the presence of a set of management regimes to govern multiple stakes. While such management regimes may sufficiently govern the specific use they target, the interdependent relationship with other uses is often hardly or not reflected in these regimes.

For example, until 1992, the mussel and cockle fisheries in the Dutch Wadden Sea were managed under a *de facto* open access regime; fishermen who possessed the required licences could fish as many mussel seed and cockles as they pleased. In the early 1990s, limited availability of shellfish seed and a number of consecutive cold winters, resulted in low shellfish stocks, which are also the most important food source for oyster catchers and eiders. Of course, fishermen 'won' the competition over shellfish from the birds, contributing to high mortality rates in the bird population. The existing fisheries management regime did not take into account the dependency of other users (birds, represented by nature conservationists), leading to externalities. Consequently, the management regime for fisheries was adapted, including the closure of areas for fishing, a reservation of the shellfish stocks for birds, shellfish quota and the implementation of annual fishing plans for which responsibility lies with the fishing industry.

Thus, many local, regional and national natural resource management problems are not isolated problems, but are interconnected. This also applies to global levels. Global problems, such as environmental degradation, scarcity of natural resources and poverty, are not isolated problems but are closely linked. This means that global problems must be solved at a global scale. Again, the nature of such problems implies that they can only be solved through collective action.

Towards the research problem

Understanding the processes that shape collective action amongst the multiple users of natural resources will be of vital importance in relation to the aforementioned issues. One group of collective action theorists has taken up the position that individuals with an interest in a CPR are not, by definition, locked in a position that eventually leads to The Tragedy, but can collectively organise, enforce and adapt systems of rules governing the resource. The core argument of these scholars is that institutions, or decision-making arrangements, provide the mechanism whereby individuals can transcend the commons dilemma. Based on a large number of empirical studies, they have developed a considerate body of literature and theoretical notions on collective action in CPR management (e.g., Bromley *et al.*, 1992; McCay & Acheson, 1987; Ostrom, 1990). I use the term 'CPR theory' to refer to this body of literature.

This book is concerned with the emergence, management and facilitation of collective action efforts in the management of the coastal waters. The empirical basis is laid by three case studies in the waters of England, Ireland and The Netherlands. In each of these case studies, inshore fishermen[6] were confronted, and affected, by the arrival of other activities and/or the articulation of other interests near and in their fishing grounds. The cases focus on interactions amongst fishermen and their representatives on the one hand and other marine users and agencies on the other hand, and the way that management of resources, spaces and people takes shape in different local, regional and national contexts.

Developing an understanding of the complexities involved in collective action amongst different stakeholders will assist the facilitation of collective action to promote sustainable resource use. In this context, CPR theory, which is explicitly concerned with the analysis of collective action in 'real life' CPR management scenarios, can provide useful insights. However, CPR scholars have only recently focussed attention to more complex management scenarios, applying existing notions developed for single-use scenarios to multiple-use management situations.

The theoretical problem at the heart of this study is that CPR theory, in its present form, is not sufficiently developed to study collective action processes in complex resource management scenarios.

Institutions as the mechanism to transcend social dilemmas

Rational choice and the new institutionalism

The Prisoner's Dilemma and The Tragedy of the Commons are probably the most well known examples of a classical collective action situation. Individuals who find themselves in such a situation are strategic actors. The core of a strategic decision is the effort to depend one's own decision on how to act on "the anticipation of decisions on the part of at least one additional goal-directed actor" (Habermas, 1987: 85). As discussed in the previous section, the foundation of classical collective action theories lies in the notion of 'rational choice'.

Rational choice theory has been subject to criticism. First, it is criticised for being a normative theory, since it assumes implicitly that rational choices are the *correct* choices (Etzioni, 1992). The shortcomings of using the concept of purposive action based on the narrow principle of economic rationality have been acknowledged by rational choice theorists; they argue, however, that its main benefit is its power to *measure* the outcomes of human action (maximisation vs. minimisation of utility) specifically[7] (Coleman, 1994). Second, many rational choice theories tend to place human behaviour within a framework of calculated rationality rather than one of bounded rationality[8]; this does not do justice to the dynamics of people's actions in a changing environment (March, 1986). Third, in more traditional rational choice approaches, the rational individual is studied in isolation from his social and cultural status and society (Shepsle, 1989). Particularly in response to the third criticism, a group of rational choice theorists followed a new avenue: the new institutionalism (*ibid.*).

In the new institutionalism, institutions or decision-making arrangements are considered to provide the mechanisms whereby individuals can transcend social dilemmas; characteristics of social outcomes are not only explained by individual preferences and the optimisation of behaviour, but also on the basis of institutional preferences (Acheson, 1994; Bates, 1994; Shepsle, 1989). Following Ostrom (1990: 51), institutions are defined as:

> "the set of working rules that are used to determine who is eligible to make decisions in some area, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what payoffs will be assigned to individuals dependent on their actions".

In a review of institutional economics, Acheson (1994) outlines the assumptions of the new institutionalism. First, in contrast to neo-classical economists, who view the decision-maker as a perfectly rational individual with perfect knowledge engaged in the exchange of homogenous goods, the new institutionalists assume a situation of bounded rationality, imperfect knowledge and highly variable goods. This situation increases uncertainty. Given these assumptions, opportunism and free-rider problems often exist. The second assumption is that the co-ordination of economic

activities involves more than transactions in markets in which price is the sole consideration. Institutions play a role in constraining and presenting opportunities to individuals, and have a strong influence on the operation of the economic system. New institutionalists consider institutions to be a substitute for accurate information. Institutions reduce uncertainty in that they embody credible commitments. Third, the new institutionalists assume the presence of significant transaction costs, which are defined as "the effort, time and expense necessary to obtain the information necessary to make an exchange, negotiate the exchange and enforce the exchange" (*ibid.*: 11). Such costs are influenced by (i) opportunism, (ii) the frequency of exchange, and (iii) asset specificity, i.e., transaction costs are high when exchange depends on a specific person, location or physical assets. New institutionalists believe that transaction costs can be reduced by institutions, since they make the activities of others more predictable.

The new institutionalism covers a wide area of interests, including the institution of property rights and their effects on economic performance; the conditions under which people organise groups to achieve a collective interest; the relationship between rules and interaction; elementary transactions and the development of firms and markets in capitalist societies; and the development of evolutionary models to explain the development of institutions over time (Acheson, 1994). The CPR research community has embraced the new institutionalism to explain collective action processes in the management of common-pool resources. The evolution of institutions for collective action is a key focus in this work (e.g., Ostrom, 1990; Bromley *et al.*, 1992).

The new institutionalism has been criticised for, *inter alia*, violating the assumption of rationality (Bates, 1994). By new institutionalist reasoning, people who encounter a social dilemma, i.e., "circumstances under which their individually rational choices fail to elicit allocations of resources that maximise the social welfare" (*ibid.*: 53), will forge new institutions in an attempt to transcend it. However,

> "the demand for institutional solutions to collective dilemmas does not imply their supply; the solutions themselves pose collective dilemmas. Individuals, behaving rationally, would fail to provide them [for rational individuals would not be willing to pay the costs of their provision]" (*ibid.*: 54; cf. Olson, 1982).

According to Bates (1994), a basic contradiction is inherent in the new institutionalism: the approach was devised to *extend* neo-classical reasoning beyond the realm of markets, yet it *violates* the neo-classical axioms of the individual as the unit of analysis and rational choice as a theory of decision. He proposes the adoption of an alternative approach, a so-called "new anthropology" to deal with this contradiction (*ibid.*: 54). This new anthropology is based on the individual as the unit of analysis and the premise of rational choice. Rather than the provision of "hard incentives" (monetary inducements, legal actions), it emphasises the role of soft phenomena, such as social reputations, cultural symbols and the establishment of trust, in overcoming social dilemmas and in encouraging desirable behaviour.

The new institutionalist perspective that has been embraced by the CPR community largely follows Bates' approach to solve the problem of supplying new institutions for common-pool resources through establishing trust and a sense of community (Ostrom, 1990).

CPR theory

In a CPR scenario, collective action typically occurs if resource users seek to overcome the problems associated with The Tragedy of Open Access, and agree on decision-making arrangements governing access to, allocation of and control over the benefits produced by the resource system. Thus, the problem facing CPR users is that of organising (Ostrom, 1990).

The first merit of CPR theory is the development of a common vocabulary on CPRs. As discussed earlier in this chapter, common-pool resources are resources (i) for which joint use involves subtractability; that is, use by one user will subtract benefits from another user's enjoyment of the resource system, and (ii) for which exclusion of individuals or groups involves high transaction costs. The CPR as such is referred to as a *resource system*. The resource system (e.g., a fishery) produces *resource units*, in other words, the benefits that users take from the resource system (e.g., fish). The process of withdrawal of resource units or benefits, is called *appropriation*, and the individuals who are involved in it, are named *appropriators* (Ostrom, 1990). Earlier in this chapter, the different management regimes under which CPRs can be managed; that is, open access, common property, public property and common property, were explained. It was also discussed that each of these management regimes involves a set of decision-making arrangements, or institutions, at three nested levels: (i) the constitutional level, (ii) the collective-choice level, and (iii) the operational level.

The second merit of CPR theory is the emphasis that a set of well-established decision-making arrangements alone does not necessarily guarantee collective action. Based on extensive empirical studies, a large body of literature about the organisation of collective action in natural resource management has been developed (e.g., Bromley *et al.*, 1992; McCay & Acheson, 1987; Ostrom, 1990). Two critical themes can be identified. First, based on Ronald Oakerson's work (1992), analytical frameworks have been developed. These frameworks are a tool to study the outcomes of CPR management by exploring patterns of interaction amongst: (i) the physical and technical characteristics of the CPR, (ii) the institutional framework for CPR governance, and (iii) the social characteristics of the user community (Edwards & Steins, 1998a).

Its second critical theme is the focus on the formulation of conditions or design principles underlying successful collective action. This practice was initiated at the Panel on Common Property Resource Management at the National Research Council Conference in 1986, where Elinor Ostrom, based on discussions with participants, produced a list of variables "associated with the establishment of co-

ordinated or organised strategies for managing common-pool resources" (Ostrom, 1992: 294). The original list has since been further developed, based on CPR management studies world-wide (e.g., Hanna *et al.*, 1995; Libecap, 1995; Ostrom, 1990; Pinkerton & Weinstein, 1995; Wade, 1987; White & Runge, 1995). Table 1.1 gives an overview of these principles.

Table 1.1
Design principles for successful collective action in CPR management

Wade's conditions for successful common property resource management (1987):
1. the nature of the resource;
2. the costs of exclusion technology;
3. the relationship between resources and user groups;
4. the characteristics of the user group;
5. noticeability of cheating; and
6. the relationship between users and the state.

Ostrom's design principles characterising robust, simple common-pool resource systems (1990):
1. clearly defined boundaries;
2. congruence between allocation and access rules and local conditions;
3. users' ability to modify the operational rules through collective-choice arrangements;
4. monitoring of management system;
5. graduated sanctions;
6. conflict resolution mechanisms; and
7. management rights of resource users are not challenged by external agents.

Hanna, Folke and Mäler's design principles of property rights regimes (1995):
1. definition of legitimate interests in the CPR;
2. articulation of rules for user participation;
3. congruence of rights and responsibilities;
4. incentive structure of rules reflects long-term sustainability of CPR;
5. congruence of boundaries;
6. distribution of decision-making authority; and
7. provision of monitoring, sanction and enforcement mechanisms.

Pinkerton & Weinstein's basic criteria for fruitful collective resource management (1995):
1. accountability;
2. effectiveness;
3. representativeness; and
4. adaptability.

This study departs from the position that, due to a number of methodological and philosophical shortcomings, the application of CPR theory to both single-use and multiple-use CPRs is problematic.

The problems of contemporary CPR theory

Most of the studies that form the foundation for CPR theory were carried out in non-western societies and involved the analysis of management regimes for a

single resource unit in the resource system (e.g., fisheries management, management of common grazing land). The assumption of single-use poses a methodological problem. A resource system generally produces a multitude of products. It is not realistic to assume that a user will use a resource for only one purpose, for example cutting timber, if the same resource can be used for grazing cattle (Selsky & Creahan, 1996; Edwards & Steins, 1998a).

Furthermore, as Meinzen-Dick & Bakker (1999) point out, even if the collective management of a CPR evolves around one resource unit, for example water in an irrigation system, this resource unit can be subject to, sometimes conflicting, multiple-uses (irrigation water, drinking water, domestic water) for which different management regimes are in place. Thus, present theoretical notions in CPR theory are based on an oversimplified representation of the internal characteristics of use and management of common-pool resources. In this light, I identify a second problem.

In the list of design principles in Table 1.1, variables linking collective action and the external world are remarkably absent. Another example where no link is made with the external world, is the widely used Oakerson framework for the analysis of common-pool resources, which assumes that outcomes of collective resource management are the result of patterns of interactions between the physical and technical attributes of the resource and the decision-making arrangements for resource management (Oakerson, 1992). Later, the framework was further developed to include 'the social characteristics of the user community' as a variable (Feeny, 1994). However, the adapted framework still focused on the *internal dynamics* of collective resource management only (Edwards & Steins, 1998a). Although the external world has been recognised as one of the sources of uncertainty that make the organisation of collective action processes regarding CPRs a complex undertaking (Hanna *et al.*, 1995; Ostrom, 1990), it is regarded as a given fact in CPR analysis.

Based on earlier research we carried out at the University of Portsmouth, there is reason to believe that the explicit absence of external or contextual factors in conceptual tools for the analysis of CPR management seriously limits our understanding of collective action processes. Local resource users will base their decision to co-operate or defect not only on the expected social and economic costs and benefits generated by the CPR, but will also consider the expected costs and benefits from opting for alternatives (Edwards & Steins, 1998a). In this book, I will elaborate on this second problem of CPR theory.

The third problem of contemporary CPR theory is related to its definition of collective action. Although CPR scholars embrace the notion of bounded rationality rather than employing a narrow economic rationality principle, collective action (or the lack thereof) is still regarded as primarily strategic behaviour aimed at the maximisation of utility. Collective action is commonly defined as "action taken by a group (either directly or on its behalf through an organisation) in pursuit of members' perceived shared interests" (Oxford Dictionary of Sociology, 1994: 64).

Although this definition represents the core issue concerning collective action theories, that of voluntary co-operation, it follows the familiar assumption that

> "if everyone in a group of individuals or firms had some interest in common, then there would be a tendency for the group to further this interest" (Olson, 1982).

Thus, the individual members' perceived *shared* interests are considered to be the catalysts for co-operation. According to collective action theorists, this assumption is problematic. Firstly, Mancur Olson (1982), in his *Logic of Collective Action* (first published in 1965), showed that, in the absence of special arrangements, large, heterogeneous groups of rational individuals will *not* act in their group interest. Secondly, collective action is considered to be frustrated by the pursuit of individual interests. This can be illustrated by the importance collective action theorists attribute to the concept of the 'free-rider' - a social actor who perceives that he will receive a higher individual payoff for a socially defecting choice than for a co-operative choice, even though all individuals engaged in collective action would, on the long term, be better off by working together (Hardin, 1968; Mannix, 1991). Interestingly collective action theorists rarely recognise that the pursuit of individual interests does not necessarily inhibit collective action, but can also initiate co-operative efforts. For example, when the Dutch government proposed to dam the Eastern Scheldt as part of a large flood defence project in the 1960s, two 'born enemies', fishermen and nature conservationists realised that they could only achieve their individual objectives - protecting their fishing grounds and an important marine ecological area respectively - by working collectively in influencing public opinion and exercising political pressure. Their collective action proved successful when the government decided to construct a surge barrier rather than damming the estuary.

The complexities involved in defining collective action are apparent: collective action is neither simply the pursuit of individual interests through voluntary co-operation nor is it merely the pursuit of a collective interest by individuals. I take the position that it is a combination of the two, shaped differently in different circumstances. Sometimes, collective action embodies the classical Prisoner's Dilemma; in other scenarios, it will take the shape of concerted action, where different stakeholders agree to work together to achieve a joint or individual objective.

My thesis is that by focusing on this process of shaping and reshaping of collective action without using pre-defined models of collective action, the contingencies involved in collective action will become more easily apparent, which leads me to a fourth problem of CPR theory.

A substantial part of CPR seems to be based on a post-positivist or critical realist ontology in assuming that, although different natural and social realities exist, outcomes of collective action processes are probabilistically apprehensible, i.e., determined by a number of pre-defined conditions for successful collective action (Table 1.1). The design principles are increasingly considered to be *requirements* for

the organisation of collective action[9]; that is, if governing institutions meet these criteria, "successful" collective action is likely to prevail and the institutions will then form "a critical component of environmental outcome" (Hanna *et al.*, 1995: 20). Although Ostrom (1995: 43) stresses that "there is no blueprint that can be used to create effective local institutions", she grants design principles a prescriptive status by recommending that

> "[design] principles can be taught as part of extension programs. Associations of local units can be created to learn more from one another about how successes have been achieved or how to avoid some kinds of failures".

Analysing collective action in terms of 'successes' (and 'failures') raises questions related to normativity: (i) what is "successful CPR management", (ii) are the researcher's or policy-maker's definition of 'success' the same as those of the local resource users, and (iii) for whom is a certain outcome desirable? Part of the 'normativity problem' is directly linked to the formulation of design principles. Although I acknowledge that any form of evaluation of CPR management is necessarily value-laden, I put forward the thesis that the development and use of prescriptive design principles inevitably results in the establishment of normative criteria for measuring outcomes, taking attention away from the users' construction and perception of CPR management and the process through which collective action evolves.

A final problem of present CPR theory is related to its recent application to the collective action problems associated with complex, *multiple-use* CPRs. As was outlined throughout this chapter, changing demands made on the CPR have resulted in the world-wide evolution of CPRs into complex, multiple-use resources. Existing common property regimes may become subject to new types of use that are not necessarily managed by the traditional user groups and for which new institutional frameworks may have to be devised, turning the CPR into a multiple-use resource characterised by different *types* of uses governed under different *regimes* by different user *groups*.

Increasingly, CPR scholars are acknowledging that the important resource management issue for common-pool resources is balancing multiple interests (Barrett, 1991; Edwards & Steins, 1998a; Feeny *et al.*, 1996; Selsky & Creahan, 1996; Van Ginkel, 1995a). Consequently, scholars have started to apply existing theoretical notions and frameworks, which were originally developed for relatively simple, single-use CPRs, to the problems associated with management of both global CPRs, such as air quality, global warming and the internet, and to local CPRs that have become subject to multiple-use (Hess, 1995; World Development, 1991). However, if existing concepts and frameworks, which are already suffering from a number of shortcomings, are going to be applied to complex, multiple-use common-pool resources in both non-western and western societies, further development of CPR theory is required in order to study collective action processes in complex natural resource management scenarios.

There is a growing realisation within the CPRs research community that a theory of complex management regimes for common-pool resources is urgently needed. Research that explores the development of CPRs with multiple ownership, use and management structures will become increasingly relevant as a foundation for such a theory. Our research interest at the University of Portsmouth was the re-development of Oakerson's analytical framework for common-pool resources (1992) for application to complex, multiple-use management regimes; work which continued after I left the university in September 1998 (Edwards & Steins, 1998a; forthcoming). In light of the need for a theory for complex management regimes for CPRs, this study forms part of the above initiative. Its objective is to address the aforementioned problems of contemporary CPR theory by shedding light on the emergence, management and facilitation of collective action processes amongst multiple, often competing, users, claimants and other stakeholders in complex CPR management scenarios.

Research focus and organisation of the study

In this introductory chapter, I argued that the ongoing development of the coastal zone for, amongst others, industrial, commercial, recreational and conservation purposes, has resulted in a variety of externalities, such as physical and environmental impacts and competition and conflicts amongst various user groups. In the coastal zone, we are dealing with complex situations as different activities may be mutually incompatible or cause externalities for other users. Furthermore, different uses in the coastal zone are generally managed under different property regimes. While such regimes may sufficiently govern the specific use they target, the interdependent relationship with other uses is often hardly or not reflected in these regimes.

External control and privatisation were, for a long time, regarded as the only viable solutions to deal with the problems associated with common-pool resources, such as the coastal zone. This belief drew heavily on, what Röling & Maarleveld (1999) call the strategic narrative, which views people as rational individuals who find themselves in an ongoing struggle with others to achieve their aim of maximising their own utilities or realising their own projects. Privatisation and state regulation have, however, not lived up to the expectations. Increasingly, stakeholders at different governance levels are realising that the important issue is balancing the interests of multiple stakeholders and that the complexities and interconnectedness of resource management problems demands a collective or concerted approach.

At the constitutional level a growing number of international meetings are being held, focussing on collective strategies for coastal and natural resource management. In this context, integrated coastal zone management is considered as one of the most promising strategies. At regional and local levels, platforms to negotiate and co-ordinate collective CZM strategies are rapidly emerging. In such platforms, resource management issues are considered from a broader perspective and social actors exercise collective agency in working in concert towards

adaptive resource management through (i) fostering understanding about the resource base, (ii) minimisation of social dilemmas involved with collective resource use, and (iii) implementation and fine-tuning of action strategies with respect to perceived problems.

The empirical part of this study is concerned with the emergence, management and facilitation of collective action efforts amongst fishermen and other stakeholders in the coastal waters of the Isle of Wight (England), NW Connemara (Ireland) and the Dutch Wadden Sea. Developing an understanding of the complex processes that shape collective action amongst different stakeholders is of crucial importance for the facilitation of concerted efforts aimed at sustainable resource management. In this context, CPR theory, which is concerned with the analysis of collective action in common-pool resource management scenarios, can provide useful insights. The theoretical problem at the heart of this study is that CPR theory, in its present form, is not sufficiently developed to study collective action processes in complex, multiple-use scenarios, such as the coastal zone, and, consequently assist the facilitation of collective action.

In this study, I address the problems of contemporary theory on collective action in common-pool resources. My objective is not to falsify existing theories, but rather, on the basis of a grounded theory approach, to use existing work as a foundation for the construction of a grounded perspective for the study of *complex, multiple-use* CPR management that will assist the development of further theory. In doing so, I use four strategies. First, as will be elaborated upon in Chapter Three, I will not consider the individual involved in collective action as a *homo economicus* or rational actor; rather I will consider him as a *social actor*, a capable and knowledgeable agent who has the ability to make decisions based on social experience and the capacity to manipulate social relations and to enrol others into his projects in order to cope with life (Long, 1992; Verschoor, 1997).

Second, I will not only look at interaction processes amongst social actors, but, following actor-network theory (Chapter Three), I will also take into account interaction processes between social actors and the non-human resources involved in resource management (Law, 1992, 1994; Latour, 1987). Collective action not only involves people and their obligations, dreams, desires and priorities, but also a variety of non-human entities such as a common good or problem, technologies, paperwork, money, and so on. These non-human entities play a key role in collective action processes in that they form part of the *network* that a social actor constitutes and in that they pose opportunities and constraints to social actors' engagement in collective action[10]. For example, what makes a Dutch cockle fisherman a cockle fisherman is his possession of a 45m vessel with little draught and equipped with hydraulic suction dredges, graders and a 'black box' registering all fishing positions and activities. Without this vessel he would not be a cockle fisher; take away his black box, the technology that 'controls' his compliance with collectively formulated nature conservation regulations, and his credibility as a 'complying fisherman' would be jeopardised.

Third, following actor-network theory (Chapter Three), I will adopt the notions of generalised agnosticism and symmetry in studying collective action processes. This means that I will leave aside any pre-defined models and conditions for collective action and will approach everything I seek to explain (e.g., 'successes', 'failures') in the same way in order to understand the complexities involved in the emergence and evolution of collective action processes and appreciate their dynamic and interactive nature.

Fourth, as will be discussed in Chapter Three, I will adopt an *action*-oriented perspective; that is, I will go beyond sociological 'story-telling'. By following the social actors in the case studies in their efforts to act in concert, or to counteract such attempts, I will develop methodological proposals for the facilitation of collective action processes in multiple-use CPR management settings.

The next chapter presents a case study of CPR management in Cowes Harbour in Britain's Isle of Wight. It demonstrates the complexities involved in multiple-use CPR management by showing how different activities and interests in the harbour are interdependent and why in a complex CPR management scenario, the presence of individual management regimes for the different uses is not a sufficient strategy. The chapter follows the oyster fishermen in their collective action aimed at securing access to the fishery, which was threatened by a closure in the interests of safety and navigation, and nature conservation considerations. The chapter assists the grounding of the conceptual framework used in this study (Chapter Three).

In Chapter Three, I will outline how existing notions in theories on collective action in common-pool resource management will have to be reshaped to further our understanding of collective action processes in complex, multiple-use resource management scenarios. For this purpose, I will draw on the observations from the Cowes Harbour study and on the notions developed in critical theory and in social constructivist approaches, such as actor-network theory and knowledge systems thinking. My objective is not to reach an integrated theoretical approach to collective action, but rather to provide a conceptual framework that will help me to understand the collective action processes that are being shaped and reshaped in the case studies presented in this study.

Throughout the study, I will adopt a 'grounded theory approach' to the study of collective action processes in complex, multiple-use common-pool resource management. Chapter Four, which discusses the research methodology, explains this approach and its implications for this study.

Chapters Five and Seven present case studies of collective action processes in the coastal waters of Northwest Connemara (Ireland) and the Wadden Sea (The Netherlands), respectively. The chronological order in which the field work for this study was undertaken implied that the notions I had developed in each study were taken aboard for subsequent studies. In this sense, the field work was truly grounded.

Considering this grounded approach, Chapters Six and Eight are 'theoretical intermezzos', which discuss the preliminary theoretical implications of the preceding case study and inform Chapter Nine.

The concluding Chapter Nine forms the synthesis of the study. It discusses the outcome of the project and its implications for collective action theories on common-pool resource management.

Notes

[1] In reality, most CPRs can be classified under more than one definition of property rights.

[2] Traditionally, the term 'commons' was used to refer to 'common property resources', which are common-pool resources that are characterised by the presence of decision-making arrangements granting user rights to a specific user group, allocating the benefits from the resource and giving the users control over the resource. An example of such a common is the New Forest in the UK, where, for over 900 years, a group of commoners have the exclusive rights of, amongst others, grazing cattle on Crown land and where the commoners are responsible for the design and implementation of management rules (Edwards, 1996). Nowadays, the term 'commons' is synonymous with 'open access'. In this study, 'commons' refers to its traditional meaning: a common property resource.

[3] Van Ginkel & Steins (1998) make clear that we usually speak of *resource* management when referring to situations where people exploit common pool resources under certain management regimes. However, it is rarely the resources *per se* that are managed; management often concerns geographical space and people. Space management refers to the locations where particular types of resource use are allowed. People management relates to the question of which categories of groups and individuals are entitled to use which resources where, when and how. Here, exclusion mechanisms restrict the number of people who are allowed access to the marine space and the resources in it. Thus, the management of multiple use situations relates to three dimensions: (i) resource management; (ii) space management; (iii) people management. All three dimensions - which are not mutually exclusive - are potentially conflictual at local, regional, national and international levels.

[4] Unfortunately our language does not make provisions for personal pronouns that refer to both female and male actors. Throughout the study, I will use the words 'his' and 'him' to refer to actors and their activities in a general sense. Only if I explicitly refer to a female actor, I will use the appropriate 'her' or 'hers'.

[5] According to Ostrom (1990), credible commitments can be made when individuals are presented with rules that meet a number of criteria or design principles: (i) clearly defined boundaries; (ii) congruence between allocation and access rules and local conditions; (iii) users are able to modify rules; (iv) monitoring by accountable individuals; and (v) non-compliance is followed by graduated sanctions. "The commitment is to follow the rules so long as (1) most similarly situated individuals adopt the same commitment and (2) the long-term expected net benefits to be achieved

by this strategy are greater than the long-term expected net benefits for individuals following short-term, dominant strategies" (*ibid.*: 186).

[6] In this study, inshore fishermen are defined as seasonal, part-time and full-time fishermen targeting species that are subject under quota restrictions under the European Union's Common Fisheries Policy and/or non-quota species in the 12 mile zone.

[7] A second reason for Coleman to use the concept of purposive action is its simplicity. His social theory comprises three components: (i) macro-to-micro; (ii) individual-action; and (iii) micro-to-macro. To make his social theory manageable, he considers it important that the individual-action components remains simple (Coleman, 1994).

[8] The principle of bounded rationality refers to the idea that actors are incapable of conforming to a model of absolute rationality because they cannot apprehend all the possible choices, on the one hand, and because they reason sequentially and synoptically, on the other hand (March & Simon, 1958, in Crozier & Friedberg, 1980).

[9] When the idea of design principles was introduced in the late 1980s, CPR scholars were reluctant to identify them as requirements for "success". For example, in a footnote to the *original* list of variables associated with organised co-ordination of CPR management, Ostrom (1992) emphasises that none of them were a required and sufficient condition either for or against the emergence and continuation of CPR management organisations.

[10] Actor-network theory insists that people are networks. "If human beings form a social network, it is not because they interact with other human beings. It is because they interact with human beings *and* endless other materials too" (Law, 1992: 382). Thus, the heterogeneous networks of the social are made up of human beings and non-human entities, and all contribute to the patterning of the social *(ibid.)*.

Chapter Two

Multiple stakes and multiple players

Collective management in Cowes Harbour, Isle of Wight

The waters of The Solent, a 5km wide channel that separates the Isle of Wight from the English mainland (Figure 2.1), have a long history as a multiple-use common-pool resource. Due to its favourable geographical location, The Solent was home to a number of activities from as early as Roman times and possibly dating back even further. Fishing, trade and military defence were the main activities in these days. Settlements such as Portsmouth and Southampton became major urban centres, further encouraging the development of the coastal zone. In the 19th century, the Solent's development for recreational purposes, such as sailing and beach holidays began. At the Isle of Wight, the Medina Estuary was the gateway for commercial and recreational traffic movements into and out of The Solent.

The ever-growing hustle and bustle in The Solent (and in other coastal areas in Britain) demanded that agreements were made to govern resource use. The 19th century in particular, witnessed the inception of formal management institutions to regulate resource use. For example, the 1888 Sea Fisheries Regulation Act divided the English and Welsh coasts out to 6 nautical miles into twelve Sea Fisheries Districts and handed over fisheries management responsibilities to Sea Fisheries Committees. In 1875, the Royal Yachting Association was established to provide nation-wide regulations for regatta races. These governance institutions dealt, however, with sectoral interests only. In areas characterised by a concentration of different activities, for instance in harbours, a more holistic approach was deemed necessary to co-ordinate the various activities. For this purpose, umbrella organisations were established. For example, management responsibilities for harbour areas increasingly changed hands from local councils to port authorities, as was the case for the ports of Cowes and Newport in the Medina Estuary.

This chapter presents a case study of multiple-use CPR management in the harbour of Cowes. The harbour, with: (i) its long tradition as a multiple-use resource, (ii) the dominance of two non-extractive uses, (iii) the presence of various layers of decision-making, (iv) the presence of an umbrella authority to co-ordinate different uses, and (v) the recent articulation of integrated management, provides a unique setting to demonstrate the complexities involved in the management of complex CPRs. In doing so, it presents some preliminary insights into the main thesis put forward in the first chapter that CPR theory is not sufficiently developed to study collective action processes in complex, multiple-use CPRs. The chapter first introduces the Medina Estuary, in which Cowes Harbour is located, and gives a brief overview of its management. It then focuses on the port of Cowes, its institutional framework and the role of its dominant user groups, the yachting and

shipping industry. The main empirical part of the case study follows the oyster fishermen in their collective strategies to influence decision-making processes within the harbour in order to secure their livelihood, which was threatened by a potential closure of the fishery in the interests of safety and navigation, and nature conservation. Based on an exploration of the different uses in the context of the institutional framework for the aggregate multiple uses in Cowes, the preliminary conclusions inform the development of a conceptual framework in the next chapter. This framework forms the frame of reference for the construction of a grounded perspective for the study of collective action in complex, multiple-use CPR management.

The Medina Estuary

The River Medina rises as a chalk spring from the southern tip of the Isle of Wight. The river is 17km long with a catchment of 71km^2 (NRA, 1995). The head of the Medina Estuary is located at Newport; its mouth is approximately 7km to the north, at Cowes. The waters of the Medina Estuary have always accommodated different water-based and land-based uses, the latter including irrigation and domestic water supply. Being the gateway to the English mainland, commercial shipping from the ports of Newport and Cowes has been a particularly important activity for many centuries. In addition, the flat oyster fishery (*Ostrea edulis*) dates back to post-Roman times. Along with the development of marine-based recreation in The Solent in the 19th century, the Medina also witnessed the development of leisure activities. Recently, the estuary has been receiving growing recognition as an important site for nature conservation. Extensive areas are designated as a Site of Special Scientific Interest and listed as proposed sites under the European Natura 2000 framework (CCZM, 1997).

Before 1897, the Medina Estuary belonged to the town of Newport and was managed on its behalf by the Corporation of Newport. The harbour of Newport was the central distribution for products from the mainland. The port of Cowes primarily dealt with the imports of coal for the island's power stations. In the late 19th century, Newport was busy developing its harbour for cargo trade and Cowes became a popular yachting centre. The yachtsmen, many of whom were influential people, opposed the Corporation's decision to develop Newport Harbour rather than to provide facilities for yachts and steamers in Cowes. This conflict of interests resulted in a compromise: the Corporation handed the northern half of the Medina over to the Crown. The Crown then gave the jurisdiction of this area to the Cowes Harbour Commissioners under the Cowes Harbour Act 1897.

Newport remained the island's cargo port until the 1970s. With a growing population, demands for commodities such as petrol, oil, timber increased. Large cargo ships of over 500 tonnes were no longer able to dock at Newport, since the fairway was too shallow. It was decided to move the imports of timber, oil and staple food, such as grain, to Cowes. At the same time, the ferries to the mainland were modernised so that they could carry lorries. With this development Newport

lost its role in food transport completely. It currently fulfils an only minor role as a commercial harbour and is being redeveloped for recreational craft.

The management of the Medina Estuary as a whole is characterised by the presence of multiple authorities and agencies. In its northern half, harbour jurisdiction lies with the Cowes Harbour Commissioners and with Newport Harbour Board in its southern half. The ownership of the seabed and foreshore is in the hands of the Crown and is managed on its behalf by the Crown Estate Commissioners[1]. The harbour authorities therefore have to pay a lease to the latter authority. The Environment Agency, a state agency, is responsible for the protection of areas subject to actual or potential flooding, for strategic catchment planning and for the management of fisheries in rivers and estuaries. English Nature is the state agency responsible for nature conservation designations. The provision of storm drains and other means of evacuating and discharging run off is the responsibility of Southern Water Services. Isle of Wight Council, the island's local government authority, holds the final responsibility for all developments in and around the estuary. Thus, management of the Medina Estuary is the responsibility of sectoral interests. It was not until 1995 that the first attempt was made to develop an integrated management strategy.

In 1995, the Cowes Harbour Commissioners commissioned the development of the Medina Estuary Management Plan (MEMP). The plan provides a strategic framework for estuary management and aims to:

> "achieve the sustainable use of the Medina Estuary through the integrated management of its resources by ensuring that a balance is secured between the protection and enhancement of the natural and man-made environment and the continued development of the local economy" (CCZM, 1997: v).

Its development must be seen in the context of the increasing attention the United Kingdom is paying to integrated coastal zone management (CZM). Although there is no comprehensive national framework for CZM, and initiatives heavily rely upon a combination of sectoral management with informal local collaboration, the recognition of European habitat directives, the acceptance of Agenda 21 and formal recognition by the Government of the need to adopt a strategic approach to estuary and coastal management[2], have prompted the development of regional CZM initiatives.

The MEMP was developed in response to the 1992 Report on Coastal Zone Protection and Planning by the House of Commons Select Committee on the Environment, the recognition of habitat directives and a recommendation for its development by the Ports Industry (CCZM, 1997). It was formulated on the basis of consultation and participation of user groups and other parties with an interest in the estuary. The development of the plan was guided by a Steering Committee, comprising representatives of the Cowes Harbour Commissioners (2), Southern Water Services (1), English Nature (1), the Environment Agency (1) and Isle of Wight Council (3).

The formulation of the MEMP involved four stages: (i) announcements in local newspapers, (ii) two public meetings to inform the public and to enable them to identify areas of concern, (iii) the formulation of seven Topic Groups, comprising local interests, responsible for the production of Topic Reports on the various physical characteristics and socio-economic uses of the estuary, (iv) public consultation of the consultation draft of the plan, which was based on recommendations in the Topic Reports, and (v) presentation of the final plan. Throughout the process of plan preparation local communities were kept informed via a newsletter and local media.

The MEMP was delivered in 1997, presenting a strategic framework for future integrated management. In January 1999, Isle of Wight Council employed a project officer to work on the implementation of two estuary management plans, including the MEMP. In the meantime, the Steering Committee have been meeting and have been progressing actions in relation to the organisations they represent (Davis, pers.comm.). Although the strategic framework of the MEMP has not yet been fully implemented, the development of the plan in itself has had a major impact in that it empowered different stakeholders to express their needs and that it brought various stakeholders and organisations together. One example are the oyster fishermen for whom the MEMP was a catalyst that empowered them to identify their needs and create awareness about the fishery's socio-economic and ecological importance among the relevant authorities. Their experience is discussed in detail later in this chapter.

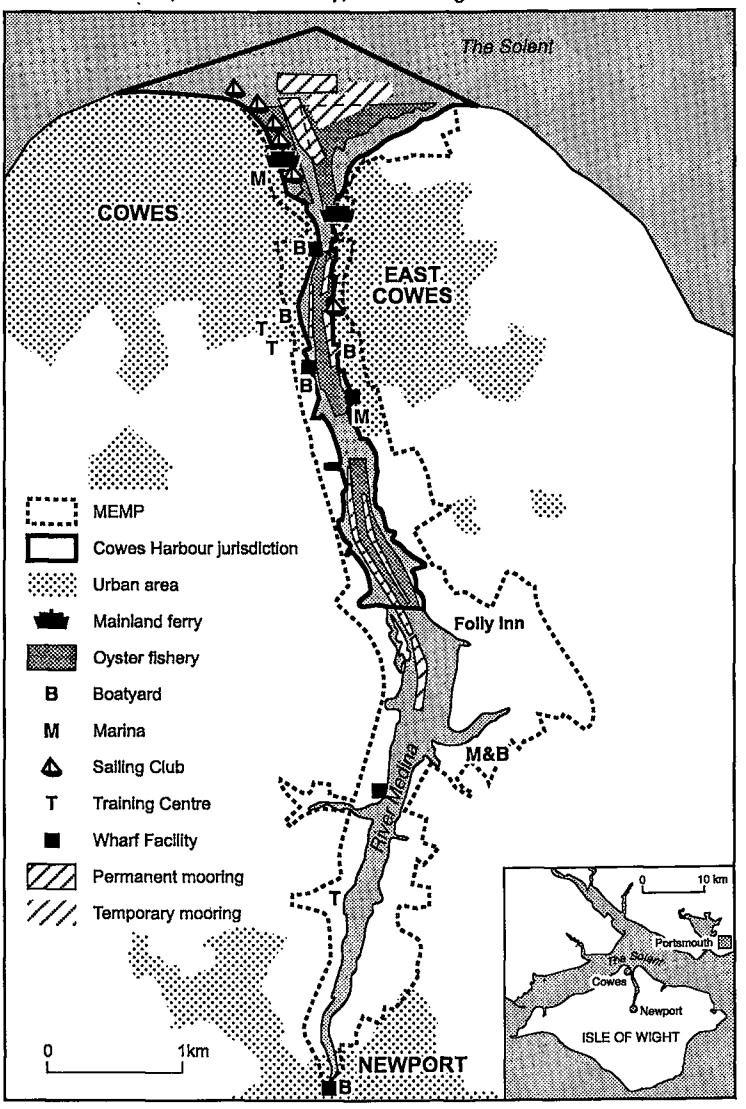
Harbour governance in Cowes

Cowes Harbour is located at the mouth of the Medina Estuary, adjacent to The Solent. The harbour covers an area of approximately 7.5ha and stretches approximately 4km inland (Figure 2.1). Cowes is the only deep water port at the Isle of Wight and fulfils a vital function in the transport of cargo to and from the English mainland. Due to its strategic geographic location adjacent to The Solent, Cowes has been an internationally renown yachting centre from the late 19th century onwards. In addition, the harbour has a multitude of other commercial and recreational users, such as oyster fishermen, shipbuilders, passenger ferries, watersports training centres, marinas, boatyards, and anglers.

The multiple uses of Cowes are sectorally managed under different management regimes at the operational level. For example, the oyster fishery has traditionally been managed under an informal common property regime within the national regulatory framework for those fisheries. The cargo wharves lease areas of the foreshore and seabed from the Crown Estate Commissioners in combination with private ownership. The harbour is openly accessible to yachtsmen and recreational users, while at marinas, which are generally privately owned in combination with leased areas, yachtsmen can rent access rights. Institutional arrangements at the constitutional and collective-choice level determine the operational rules of each individual use. The cargo shipping industry, for instance, has to abide by, *inter*

alia, rules on bulk freight handling by Isle of Weight Council and legislation by national government, such as the Department of Environment, Transport and the Regions (DoETR).

Figure 2.1
Cowes Harbour , Medina Estuary, Isle of Wight



The presence of a large number of individual users within the confined waters of the harbour demands some form of co-ordination of the multiple activities in the interests of safety and navigation. This was already appreciated in the late 19th

century when the Corporation of Newport handed over the northern part of the Medina Estuary to the Crown. Recognising the need to co-ordinate the movement of cargo traffic to the port of Newport and the development of yachting facilities in Cowes, the Cowes Harbour Commissioners (CHC) were established to regulate the activities in the port on behalf of the Crown. The Cowes Harbour Act 1897 gives the CHC:

> "the exclusive jurisdiction, management, control over and in the Harbour, with the powers and authority [...] for the improvement, regulation and the management thereof" (IoWDB & CHC, 1990: 2).

For the multiple user groups of Cowes Harbour, the implication of the Cowes Harbour Act 1897 is that they not only have to comply with regulations governing their particular use, but also with regulations stipulated by the CHC. The Cowes Harbour Commissioners is thus an 'umbrella organisation' responsible for the co-ordination and monitoring of the various activities in the interests of safety and navigation.

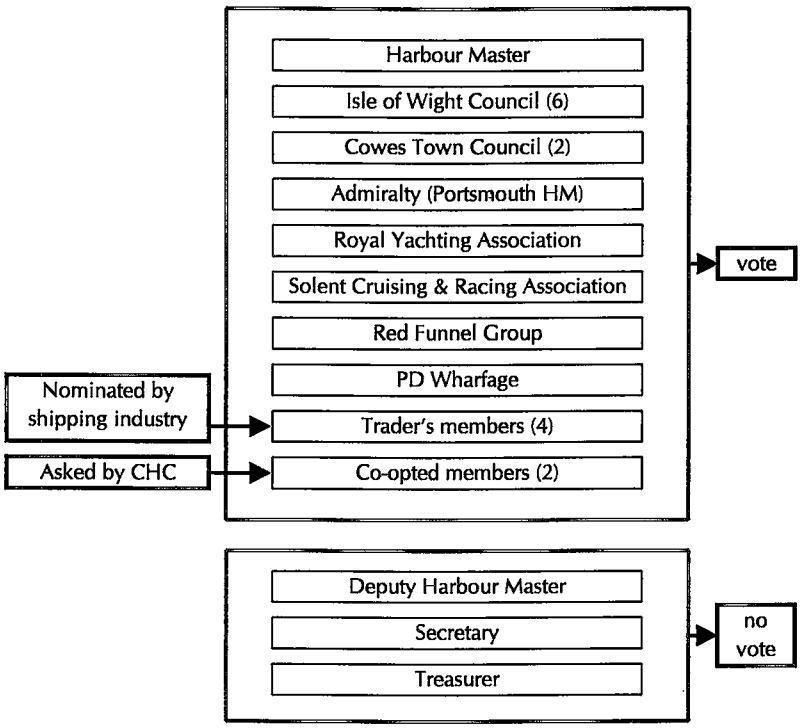
The CHC lease the seabed within their area of jurisdiction from the Crown Estate Commissioners by means of a Regulating Lease, which covers a period of seven years at an annual rent of £ 17,500. The Harbour is self-sustaining and receives its annual income of approximately £ 500,000 from harbour dues from marinas, wharves and own moorings.

The CHC consist of a total of 23 representatives of which 20 are allowed to vote. Figure 2.2 gives an overview of the CHC's constitution. Under the provisions of the Cowes Harbour Act 1897, the CHC have the power to make Bye-laws[3] for the regulation and control of vessels and boats in the port in order to achieve the statutory obligation on them to provide a safe, navigable fairway. In order to meet changes in the nature of the harbour, the CHC can apply for Revision Orders. The objective of a Revision Order is to repeal old laws or to make new ones. The Commissioners need to hold a public inquiry before an Order can be accepted by the government.

Day-to-day management is the responsibility of the Harbour Master, assisted by the Deputy Harbour Master. The Harbour Master can make rules about navigation and safety within the harbour under the Dangerous Vessels Act 1985 and the Dangerous Substances in Harbour Areas Regulations 1987 without the CHC's permission (IoWDB & CHC, 1990). The latter only needs to give its permission in case of more structural proposals affecting the port, such as maintenance dredging, new Bye-laws and changes in rates of harbour dues. Some of these proposals also require approval from other authorities such as the Isle of Wight Council, the DoETR, and the Environment Agency.

With the commissioning of the MEMP in 1995, the CHC's role has extended from the regulation of the multiple uses in the harbour in the interests of safety and navigation, to include integrated and sustainable resource management.

Figure 2.2
Constitution of Cowes Harbour Commissioners (1996)



Flying high: The yachting and shipping industry in Cowes

Yachting

Cowes Harbour has been an important base for yachting for 150 years, due to its strategic location adjacent to The Solent. It is an internationally renown yachting centre with extensive support facilities. Yachting is the backbone of Cowes' economy and social life. It is impossible to walk through the town's high street without noticing the large number of specialised yachting shops and marine industry services, or to walk on the beaches on the mainland side of The Solent without seeing at least one yachting race in the Cowes area.

Cowes has a racing itinerary extending from April to October, with Cowes Week, an eight day event for up to 25 classes of craft, at its climax. Races are held both at the weekends and at the mid week, utilising the 20 racing buoys to the north of the Harbour. There are approximately 1,000 courses available. In 1992, yachting accounted for 33,000 visiting craft to the Harbour, over 154,000 yachtsmen, who spent an estimated £ 10,000,000 on local goods and services during their stay, and

a focus for 131,000 visitors (in addition to general tourism in the town) (STB, 1992). The Harbour has 16 slipways and a capacity of some 1,700 moorings. Approximately half of the moorings are designated for visitors; 650 are residential moorings. The CHC are responsible for half of the total moorings; the others are owned by two large marinas and a number of smaller boatyards (Figure 2.1). In addition to slipways and moorings, Cowes provides a wide range of marine industry services, such as boat building and repair, riggers, sailmakers, engineers, electricians, chandlers, brokers and towing (Pieda, 1994).

The importance of yachting to the local economy is reflected by the many facilities for yachtsmen, and the continuous promotion of the profile of Cowes and the Island for yachting. The CHC, yacht clubs, local authorities and Isle of Wight Tourism are supporting a number of initiatives, such as Cowes Yachting, an agency established to promote Cowes as an international yachting venue on a professional basis, and Cowes Waterfront Trust, a consortium of local authorities and local business interests who own Cowes Yacht Haven and whose aim it is to develop this venue for events and berthing facilities. In an attempt to extend the yachting season, additional sailing events, such as a Winter Series ending the week before Christmas, are being promoted as part of new policies aimed at increasing the harbour's profile (CCZM, 1996a).

Operational rules are made by a large number of collective-choice organisations, representing the interests of individual yachtsmen, yacht clubs, marinas and training centres. At (inter)national level, the Royal Yachting Association (RYA), British Marine Industry Federation and The Yacht Harbour Association, are the most important representatives. At regional level, the Solent Cruising and Racing Association (SCRA) and the Solent Area Advisory Committee, are the main organisations representing yachtsmen and industry. Finally, Cowes Combined Clubs, Cowes Waterfront Trust, Medina Mariners Associations, and individual yacht clubs, are the main organisations at local level. The RYA and SCRA both have a seat in the CHC. However, many negotiations amongst representatives from the yachting industry and the CHC take effectively place at an informal level, and co-operation amongst the various clubs, associations and sectoral representatives in the CHC means that the interests of those who have no seat in the CHC will be represented in harbour decision-making.

Within (and outside) the Harbour, yachtsmen follow Codes of Practice set by these associations, and the international sailing and navigational regulations. RYA-approved boating and boating-related courses provide an educational background for anyone with an interest in yachting. Information on Cowes Harbour rules and regulations is abundant through the Cowes Port Handbook, Notices to Mariners, newsletters published by the various representatives organisations and information from yacht clubs. The various clubs and associations also organise and co-ordinate the racing events in Cowes.

In general, the individual yacht clubs and marinas seem to operate in peaceful isolation from each other and other users of the port. Communications amongst

the yacht clubs go via consultative bodies such as Cowes Combined Clubs, which organises Cowes Week, or via the informal circuit. None of the representative organisations mentioned any problems in their relationship with the other users of the harbour, such as the shipping industry and the oyster fishermen. Interestingly, the latter activity was not a known resource use to the vast majority of the representatives from the yachting industry. Concerns were, however, raised about the continuous increase in commercial traffic in Cowes and The Solent, which may jeopardise the yachting activities and, consequently, the local economy:

> *"I appreciate the constraints the commercial users have [lack of harbour space, narrow fairway, time tables], but a large part of the economy evolves around sailing; to loose this trading would be a great shame"* [Director of a watersports training centre].

> *"The main industry of Cowes is sailing. Anything that jeopardises that industry is wrong. A good example is the strong focus on the development of Cowes and The Solent for commercial traffic"* [Secretary of yacht club X].

Besides the increase of commercial traffic, the recent attention for nature conservation in the Medina Estuary causes concern, or as the secretary of one of the yacht clubs mentioned:

> *"The designation of Sites of Special Scientific Interest and European designations in the estuary affect a small number of nature lovers as opposed to a large number of recreational craft"* [Secretary of yacht club Y].

> *"Nature conservation people are trying to turn parts of the area into nature reserves. It's a European idea that is being taken further than necessary by the English; I think we managed to inject some sense into it. We are not against birds, but humans are more important than birds. It's important that people have a happy relaxation. We have to find a balance; wildlife should be able to stay but the rights of man should not be removed" [Representative of SCRA].*

The importance of yachting for Cowes Harbour is reflected in the MEMP. Out of eight marine-based users' representatives in the Topic Group on recreation and leisure, five represented yachting interests. Four of the five recommendations in the Recreation and Leisure Action Plan in the final MEMP addressed improvements benefiting the yachting industry, including the provision of adequate and appropriate access onto the water and the improvement of facilities for yachtsmen within the estuary.

Cargo

Until the 1970s, Cowes Harbour was primarily used for shipbuilding, passenger transport and recreational activities. Its commercial activities were restricted to the handling of coal for the island's powerstations. When these imports died off in the 1960s, it lost an important commodity. Moving imports from Newport to Cowes in

the 1970s, was an important step in the revitalisation of the latter's commercial function. Physical separation from the mainland has created a self-contained market for minerals and aggregates extracted on the Isle of Wight. Since the costs of transporting materials in bulk are high, there has not historically been an export trade, a situation which is likely to continue (NRA, 1995).

Since Cowes is the only deepwater port and ferry transport is too expensive for the majority of goods, the cargo industry is of major importance to the island. The relative small size of the harbour, compared to the ever-increasing size of the cargo vessels, and the use of the fairway for other activities, means that the regulation of cargo traffic in the interests of safety and navigation is a prime concern. At present, Cowes Harbour handles approximately 400,000 tonnes of cargo per annum, including marine aggregates, sand, rock, coal, timber, fertilisers, grain and fuel oil (CCZM, 1996b). The cargo is handled at two large sites, which are partly leased to and partly owned by a total of six wharves (Figure 2.1).

At the operational level, the six cargo wharves operate in isolation of each other. There is no consultative body for cargo industries within the harbour. Unlike yachting, where communications are safeguarded through the organisational level and where these communications are vital to protect the interests and safety of a large number of individual users, contacts amongst cargo operators are of less importance. The activities of the cargo industry take place at clearly defined sites using fixed products. The wharves are, however, well-represented on the CHC; in June 1996, seven out of 23 seats on the Commission were taken by representatives of the commercial shipping industry. At the (inter)national level, the British Marine Industries Federation is the main collective-choice organisation representing the interest of the wharves. The Solent Area Advisory Committee is a regional collective-choice organisation that has the objective to establish a link between commercial and recreational activities in the Solent, and to achieve solutions to problems between these user groups. Whereas the CHC are the responsible authority for the control of vessel movements, the wharves also have to comply with of Isle of Wight Council regulations on bulk freight handling, and with national and EU regulations.

Communications amongst the cargo wharves and other users operate through the Harbour Master. For example, the wharf managers notify the Harbour Master when large vessels are meant to be coming during the racing season, so that the sailing activities can be planned accordingly. The shipping industry expressed concern that the development of Cowes for yachting activities would adversely affect access of commercial ships within the Harbour. Already dangerous navigational situations involving yachts and cargo vessels have occurred in the narrow fairway. A statement by one wharf manager sums up the feelings of the shipping industry:

> *"The Medina has become busy with yachts and that's sometimes a problem. Yachts coming from the Newport direction sometimes sail too close to the cargo ships that are berthed and this can be dangerous when the tidal stream catches them. [...] The*

oyster fishermen only dredge a couple of weeks a year and when they see a cargo vessel coming to berth, they will stay aside; they know the river and the yachtsmen don't and that makes a hell of a lot of difference".

The shipping industry perceives that leisure development will eventually get in the way of the harbour's commercial function:

"I always say: yachting and commercial shipping should be a happy marriage, they should be balanced. It's not good if either of them has more priority. But yachtsmen are very well-represented so that makes it difficult for us" [Co-opted member of the CHC and wharf owner].

In the MEMP the importance of the cargo industry to Cowes Harbour is well-recognised. The Topic Group on commercial and economic uses comprised a total of 15 member, nine of which represented the cargo industry. The Commercial and Economic Use Action Plan identified six issues of recommendation. Three of these were directly aimed at the cargo industry, including the maintenance of access channels and wharves.

Joining forces: The oystermen in Cowes

The fishery for flat oysters (*Ostrea edulis*) in Cowes Harbour was developed in medieval times and peaked towards the end of the 19th century when two companies leased oyster beds in the estuary from the Corporation of Newport. With the introduction of the Cowes Harbour Act in 1897, the beds within the Cowes Harbour jurisdiction became an open access fishery. Commercial fishing in this century started again in the early 1980s, 60 years after the oyster population in the Medina Estuary and The Solent, became virtually extinct due to pollution and overfishing. Although the annual output from the Cowes fishery is only an estimated 16-20 tonnes, representing an annual value of £ 25-36,000, the fishery is of important social and economic value to the ten licence holders, who are facing a number of challenges arising from the European Common Fisheries Policy.

Since the fishery is located in Cowes Harbour (Figure 2.1), the fishermen have to comply with the navigational rules set by the CHC, stipulated in the Oyster Dredging Licence. The objective of this licence is to control access to the fishery in the interests of safety and navigation. Internationally, fishing within fairways is prohibited. Through the implementation of a Bye-law, the Harbour Master has enabled the fishermen to carry out their activity. The Oyster Fishing Licence stipulates that fishing in the designated areas is only allowed one hour either side of the low tide in the period when all buoys are cleared for winter maintenance. No more than three vessels are allowed to fish at the same time. Thus, the Oyster Dredging Licence only controls the movements of fishing vessels to prevent hazardous situations between fishing vessels on the one hand and cargo ships (berthed at low tide) and yachts on the other hand. It does not provide a regulatory framework for fisheries management.

In England and Wales, fisheries management out to 6 nautical miles from the mainland is the statutory responsibility of twelve regional Sea Fisheries Committees (SFCs). However, fisheries in estuaries and rivers flowing into the sea do not fall within the jurisdiction of the SFCs, but are the statutory responsibility of the Environment Agency. For reasons that have not been made clear, the Environment Agency does not wish to act as the competent fisheries authority for the oyster fishery in Cowes Harbour. Past attempts by Southern Sea Fisheries Committee (Southern SFC), the competent authority in The Solent area, to gain fisheries jurisdiction within the Medina failed. Consequently, formal fisheries regulations other than national fisheries legislation are absent.

Following the absence of a competent fisheries authority, the fishery was managed through an informal code of conduct until the 1996/97 season. Minimum oyster sizes and gear type are based on regulations Southern SFC stipulated for the oyster fishery in The Solent. The informal compliance with Southern SFC rules can be explained by the fact that eight out of ten licence holders for the Cowes fishery hold a licence for the area designated under the Solent Oyster Fishery Order 1980, which is a common property fishery regulated by Southern SFC. The fishermen perceive that Southern SFC, rather than the Environment Agency, should be the competent fisheries authority for the Medina Estuary. The informal nature of the collective rules means that, should an individual fishermen start to dredge oysters smaller than the agreed minimum size, there is nothing the others can do about it.

The informal common property regime for fisheries management has, as far as the fishermen are aware, always been respected. Compliance with the CHC's *navigational* regulations is more problematic. Two licence holders repeatedly failed to abide by the navigational regulations stipulated by the CHC and one fisherman fished the oyster beds without owning a licence. Since non-compliance with the navigational regulations did not lead to dangerous situations in the fairway and it is difficult to catch fishermen 'in the act', the Harbour Master only warned the fishermen and did not impose severe sanctions. This situation changed with the commissioning of the MEMP; suddenly, fishermen perceived that they were facing a closure of their fishery for navigational and nature conservation considerations.

Like the other stakeholders in the estuary, the oyster fishermen also participated in the MEMP. They were represented in the Topic Group on the estuary's commercial and economic uses. Unlike the other members of this group, who were approached by the Steering Committee to participate, the fishermen only found out about the estuary management plan initiative in one of the public meetings. When they voiced their concern, they were asked by the Project Officer to join the Topic Group. There are two possible explanations for their initial non-involvement. First, the representatives from the Environment Agency, English Nature and Isle of Wight Council in the Steering Committee were not aware of the presence of an oyster fishery within the estuary. Second, at the time the Harbour Master was considering to stop issuing the navigational licences because of the non-compliance of three fishermen with the harbour regulations:

> [Harbour Master:] *"In future, I doubt whether or not we will grant [the oyster fishermen] licences again. A number of individuals have not followed the rules. ... If they don't abide by the terms and conditions on the licence, I will take the licence away. ... As a Harbour Master you have to do your best to talk to all the groups and satisfy everybody, but in the end it's me who has the final say and responsibility [...] for safety and navigation".*

Considering the increasing commercial and recreational traffic movements in the harbour, non-compliance with the navigational rules may lead to dangerous situations. Fishermen feared that the gradually increasing number of commercial recreational craft will have a negative impact on their perceived *"right to dredge"*. They believe that, eventually, the oystering activities will be squeezed out in the interests of traffic control. Since the fishery only contributes an annual £ 70 to the CHC (licence fees), closure would not result in a serious economic loss for the CHC.

Increased traffic in the port is not only a concern to fishermen in terms of traffic control, but is also associated with the fear for water pollution and the accumulation of waste on the sea bed and their potential implication for the placing on the market of oysters, which is regulated by European directives[4]. However, the results of the six weekly water quality monitoring scheme have shown that, with the completion of a sewerage treatment plant, water quality has improved significantly and has met B-standards a few times. In addition, the Harbour Master and a number of state agencies stressed that stricter regulations on discharges by recreational and commercial vessels have come into effect. The fishermen's concern about water quality standards is thus not widely shared and is perhaps more a perception than reality.

In addition to the threat of closure in the interests of safety and navigation, another problem emerged. Nature conservation and ecological sustainability were a key aspect of the MEMP. Once English Nature and other nature conservation interests became aware of the presence of a fishery, they cautiously began to talk about closing it[5]. Nature conservation interests believed that oyster dredging is harmful for the sea bed and perceived that oyster fishing would have a negative impact on biodiversity within the estuary.

The closure of the fishery would result in an important socio-economic loss to the fishermen. Fishermen estimated that approximately 40-50% of the potential catch was fished illegally by the three 'free-riders' and felt that it was not fair to punish the whole group for the misbehaviour of a minority. They perceived a general lack of interest from the authorities to protect the fishery through enforcement and control of regulations, water quality control and the protection of the seabed, as is illustrated by the following extract of a conversation between two fishermen:

> [John[6]:] *"We must keep the oyster fishery in shape, but the Harbour Commissioners rely too much on fishermen for policing and telling everybody what's going on. They could have a water warden to make spot checks".*

> [Paul:] *"I don't agree; that's the job of the Environment Agency, but they would only do it if they would get money out of it. But that's probably the way the Harbour Commissioners feel too".*
> [...]
> [John]: *"There is a conspiracy between the authorities to close the fishery down".*
> [Paul]: *The CHC knows who breaks the rules, but they don't do anything about it. They can use the lawbreakers as an excuse to stop the whole fishery".*
> [...]
> *[John]: "There is a concerted lack of commitment from their part for any form of policing. Lots of people are fishing without a licence in Bembridge* [east of Isle of Wight] *and Yarmouth* [west of Isle of Wight] *and nobody does anything about it. If they really wanted they could catch them, they could. It's all to do with commitment of authorities. Even in Southern Sea Fisheries District, there is a problem because the fishing authority doesn't have money. There are more illegal oysters being dredged in The Solent than in the Medina. The only place were it works is in the Several Order areas* [private areas] *in Southern Sea Fisheries District were [the co-operatives] have their own warden and members patrol at night.*

From the perspective of the Harbour Master, policing the fishery is economically not feasible in view of the minor returns it generates. The fishermen and the Harbour Master have made an informal agreement that the former will report violations of the navigational regulations stipulated in the Oyster Dredging Licence. In practice, however, fishermen find it impossible to take the responsibility for policing the fishery, since sanctioning 'rule-breakers' is equal to 'shopping one's mates'. Thus, fishermen found themselves in a dilemma situation. In addition to a socio-economic loss, a closure would also affect biodiversity through the inevitable siltation of the beds and consequent oyster mortality.

Faced with a potential closure driven by safety and, to a lesser extent, ecological considerations, the fishermen felt that action was urgently needed. However, their lack of representation in the CHC was felt to be a serious constraint. Contacts with the CHC are restricted to occasional informal meetings with the Harbour Master, and tend to be centred around perceived problems, such as non-compliance with navigational rules. The Isle of Wight Commercial Fishermen Association, a voluntary organisation concerned with the impact of legislative level policy decisions on fishermen's activities, is not represented in the CHC. Its capacity to represent fishermen is complicated by a lack of professional leadership, inactive membership and a lack of consultation by legislative organisations[7].

Communications between fishermen and the authorities are restricted to informal contacts, and fishermen feel that the authorities fail to consult them about proposed plans affecting the estuary and the oyster fishery:

> [John:] *"There is a general lack of consultation".*
> [Paul:] *"The reason why they contacted fishermen for the Medina Estuary Management Plan was because I happened to be at one of the public meetings and raised the issue".*

[John:] *"At a public meeting about the new [Unitary Development Plan], I raised the issue about the fishery and they told me that the University of Portsmouth was working on a plan for the river. I didn't even know!".*

Representatives from two key authorities and organisations with an interest in the estuary, Isle of Wight Council and the local office of the Environment Agency, were unaware of the existence of an oyster fishery in the Medina. In this context, and in view of the absence of a competent fisheries authority, the fishermen felt that they were facing a nearly impossible task.

One evening, while having a drink with Paul after we had completed some work for the MEMP, he told me that about fifteen years ago, the fishermen made an application at the Ministry for a Several Order for the oyster fishery. A Several Order gives the grantees within the part of the fishery in which the rights is exercisable "the exclusive right of depositing, propagating, dredging, fishing for and taking shellfish of any description to which the Order applies" (HMSO, 1967: 1920).

Several Order are usually granted to co-operatives. In The Solent, two oyster fisheries, Stanswood and Calshot, have been managed under Several Order from 1973 and 1982 respectively. Five of the licence holders for the Cowes fishery are members of one of these co-operatives and, consequently, have access and allocation rights in the Several fisheries.

When I asked Paul why the Several Order was not granted for the Cowes fishery he replied:

"I wasn't fishing at the time so I don't know much about it, but I'll ask Steve, he'll know. I think that the Harbour Commissioners were afraid that it [Several Order] would interfere with dredging and mooring. [...] But it would be a solution".

The next weeks, I asked the 'older' fishermen and the Harbour Master about the application:

"The idea was to relay oysters and use the Medina as a fattening area. It would have a lot of advantages. If all fishermen had a share in the fishery you could have two boats doing all the dredging; you wouldn't have any hassle with boats that want to dredge. We could also get a better market price [through collective sales]. *The Harbour Master didn't like the idea. I think it is a mistake that we didn't put it through"* [Matt, fisherman].

"We could enhance the fishery and get a better yield. Control would be easier: in Stanswood Bay [one of the Several Order fisheries in The Solent]*, all landings go through the co-operative and you have a fixed amount of dredging per licence. If you don't comply you get fined and the fines are deducted directly from the share. They also have their own patrol"* [Steve, fisherman].

"A couple of years ago, the fishermen formed a group and applied for a Several Order. The CHC objected because the oyster beds are in the main fairway. If we

> *would have to do maintenance dredging or fairway maintenance in the Several area, we would have to ask the fishermen for permission. We thought about applying for a Several Order ourselves and sublease it to the fishermen, but it would be too complicated and be too much trouble"* [Harbour Master].

In the end, in view of the CHC's opposition, the fishermen never put the application through. However, in those same weeks, Paul rang me and said:

> *"Remember when we talked in the pub about this Several Order. I've been thinking a lot about it and have spoken to some of the others. We have to do something to prevent the fishery from being closed, so we're having a meeting tomorrow. Like to come?"*

At the meeting, Paul explained that an estuary management plan was being made for the Medina and that he was involved in one of its Topic Groups. He told the fishermen of the potential closure and that he thought they should do something about it. He then mentioned the application for a Several Order fifteen years ago and suggested that this might be an idea to protect the fishery. A discussion followed and it appeared that the idea appealed to everybody, and particularly to those who had experience with fishing in the Several fisheries in The Solent. The fishermen agreed that, even if they would not apply for an Order, the fishery needed to be controlled to secure future access. They also agreed that it would be important to talk to all parties with an interest in the area before they started the application. After some discussion, it was decided that Paul and John would make an appointment with the Harbour Master. The negotiations had begun.

The next couple of weeks witnessed several important events. What nobody expected happened: the Harbour Master welcomed the fishermen's initiative and a number of meetings followed, in which the fishermen and the Harbour Master exchanged their ideas on the Several Order. The latter's greatest concern remained the Order's interference with the duties of the CHC to maintain the fairway in the interests of safety and navigation. He agreed, however, to support the application for a Several Order, provided it would incorporate a clause that the CHC would maintain the right to undertake their duties (after consultation with the fishermen).

In August 1996, the fishermen formed the Medina River Oyster Company Ltd. They decided that only fishermen who had a Cowes Harbour Oyster Dredging Licence could become members. A few years before, the fishermen had already made an informal agreement with the Harbour Master that such licences would only be granted to fishing vessels registered at Cowes. They also agreed on a fixed quota per member on the basis of an annual stock inventory and on minimum oyster sizes. Negotiations with an oyster buyer were also in progress. Since the application for a Several Order (with a clause protecting the CHC's rights), was going to be a long and cumbersome task, the Harbour Master and the Company decided on a provisional contract to formalise the outcome of the negotiations. The other users of the area near the oyster beds, such as the cargo wharves, commercial cargo vessels, ferry services and watersports training centre, supported the fishermen's initiative.

In the meantime, the preparation of the MEMP was in full swing. Paul, the fishermen's representative in the Topic Group on commercial and economic uses, identified a large number of concerns to be addressed by the plan. The potential closure of the fishery, the lack of a consistent institutional framework for fisheries management, and marine pollution were their greatest worries. The fishermen's concerns were recognised as 'issues' for the strategic framework provided by the MEMP. The oyster beds were identified as an important part of the habitat on intertidal mud flats and, in this context, the need for water quality improvement and minimisation of habitat disturbance were emphasised. Fishermen's and Southern Sea Fisheries officers' knowledge on the need of dredging the beds to prevent oyster mortality was taken aboard, and no actions were taken to close the fishery for nature conservation purposes. However, it was recommended that research into the impacts of shellfish dredging on marine habitats should be carried out. The Fisheries Action Plan in the MEMP seeks to (i) improve the quality of the fishery through a voluntary concerted action by local authorities, water companies, SSFC and the Environment Agency, and (ii) to expand the knowledge of fisheries in the estuary through a concerted action by the fishermen and Southern SFC, Environment Agency and other relevant authorities (CCZM, 1997).

In sum, facing a potential closure of the fishery in the interests of safety and navigation, and nature conservation, fishermen have made a concerted effort to protect their fishery by seeking long-term privatisation of the fishery. By exploring the place of the fishing industry in the context of the multiple uses of Cowes Harbour, the next section questions whether or not the fishermen's call for privatisation has been forced by existing multiple-use decision-making arrangements. The analysis results in a number of preliminary conclusions regarding the shortcomings of CPR theory and will inform the conceptual framework for the construction of a grounded perspective for the study of complex, multiple-use CPR management.

Multiple stakes and players in CPR management

In Chapter One, I defined a common-pool resource as a resource for which joint use involves subtractability and for which exclusion of individuals or groups involves high transaction costs. The Medina Estuary is one such CPR. Formally, its seabed and foreshore are the Crown's private property and are managed on its behalf by the Crown Estate Commissioners. However, the public right of navigation still applies and use rights to Crown property can be allocated through licences and leases. With multiple stakes and multiple players with an interest in its waters, the estuary has had a long tradition of CPR governance. In 1897, the role different stakes can play in resource management was articulated when it was split up in two jurisdictional areas, Cowes Harbour and Newport Harbour, so that both areas could develop their dominant economic activity, yachting and cargo transport respectively.

The different uses of Cowes Harbour are managed under a mixture of management regimes, granting it the status of a complex, multiple-use CPR. For instance, for the yachting industry, the operational management regimes vary from open access for sailors to private property management at marinas and boatyards. The same situation prevails in the cargo industry. The oyster fishery was, until recently, the only use managed under an informal common property regime. At the collective-choice and constitutional level, a number of regulations form the basis for operational management of each activity. With a variety of activities taking place in the confined space of the harbour, the co-ordination of the multiple uses in the interests of safety and navigation is a prime concern.

In the absence of a competent fisheries authority, the oyster fishermen have been managing their fishery on the basis of informal agreements for almost twenty years. Access to the fishery is regulated through the navigational Oyster Dredging Licence. The informal fisheries management rules, which are based on fisheries regulations for the oyster fishery in The Solent in which eight of the Cowes fishermen participate, have never been challenged. With clearly defined boundaries, a large noticeability of cheating, a small user group who all know each other well and consequent effects of social sanctions, the common property regime contains the basic conditions that CPR scholars have identified as factors contributing to successful collective action (Table 1.1). Yet, despite these design principles and the satisfactory experiences with informal common property fisheries management, the fishermen became engaged in collective action to formalise fisheries management through privatisation. The place of the fishermen in the context of the decision-making framework for the aggregate uses of the harbour and the commissioning of the MEMP, are two crucial factors triggering this call for privatisation.

When comparing the place of the yachting industry, the cargo industry and the oyster fishermen in the umbrella institutional framework, it is evident that, in contrast to the yachting and cargo industry, the oyster fishermen are neither formally nor informally represented. These differences in representation can be explained by a number of factors. In the case of the yachting industry, numerous associations act as intermediaries amongst the three institutional levels and in organising and co-ordinating the large group of largely unconnected yachtsmen. The associations generally have substantial means and are professional organisations, employing skilled and highly educated staff. Thus, the transaction costs of organising the yachtsmen are low. In Cowes, strong co-operative links between the various yachting organisations ensures that the voices of those who are not members of the CHC are heard. The sheer magnitude of the yachting activities justifies the regulation of traffic movements and co-ordination of the racing itineraries. The presence of regular 'milestones', i.e., the various races, facilitate collective actions at and amongst the various institutional levels. They provide a focus for negotiation and decision-making about collective rules (e.g., the racing rules for the various classes) and co-ordination of yachting activities with other uses to avoid conflict and dangerous situations. The importance of yachting for the local economy is another factor explaining the weight given to this

industry. The same goes for the cargo industry, whose interests are well represented in harbour decision-making. However, unlike yachting, where communications are safeguarded through the large number of representative organisations and where these communications are vital to protect the interests and safety of a large number of individuals, contacts between the cargo operators are of less importance as their activities take place on clearly defined sites, using fixed products.

If we compare the yachting and cargo industries with the fishing industry, a pattern that explains misrepresentation emerges. Although the fishery is of substantial socio-economic importance to the fishermen, its closure would not be an economic disaster to the CHC. Considering the fact that annual harbour dues from moorings, marinas and wharves account for £ 500,000, the CHC will not have sleepless nights over loosing a total yearly amount of £ 70 in licence fees. The oyster fishery only re-emerged in the 1980s and although Cowes is the port of registration for all Isle of Wight fishermen, 75% of the fleet is tied up in the town of Yarmouth. The fishermen never have been a strong lobbying group in Cowes.

In cases where one or more user groups are not represented in the umbrella organisation for resource management, one of three scenarios might emerge: (i) the misrepresented user group peacefully co-exists with the other users without being part of the umbrella management structure, (ii) the misrepresented user group is in conflict with other interests, but does not become part of the umbrella structure and ultimately looses the battle, and (iii) the misrepresented user group is in conflict with other interests and a strategy is developed, either by the user group or the umbrella organisation, to become involved in collective decision-making.

For the oyster fishery, the first scenario prevailed. However, after a number of offences of the navigational licence involving two fishermen, the Harbour Master considered to stop issuing it. This consideration must be seen in the context of the interdependency of the different harbour users in the fairway. The access rules in the Oyster Dredging Licence are made in such a way that oyster fishing only takes place one hour either side of the low tide, when the cargo vessels are constrained to enter the fairway by their draught, and when all buoys are cleared for winter maintenance, i.e., the time when yachting activity is at its lowest. With increasing commercial and recreational traffic, congestion in the narrow fairway is a harsh reality and hazardous situations may occur if the navigational rules are not complied with.

At the time when the Harbour Master was considering a closure for navigational reasons, preparations for the MEMP were in full swing. With the identification of the different activities in the estuary and their integration with its nature conservation values, the interdependency between oyster fishing and biodiversity of the seabed was questioned. Fishermen perceived that nature conservation interests posed another threat to their access to the oyster beds, but realised that their involvement in the MEMP could also assist the articulation of their interests.

In response to the potential closure, one fisherman assumed the leadership and started a process that was aimed at making the other fishermen act in concert to secure their income. By making the problem visible to the fishermen, he enrolled them in a co-operate effort not only to secure access to the fishery, but also to formalise fisheries management. The fishermen then acted collectively in trying to get the Harbour Master, other users in the area adjacent to the fishery, and the architects of the MEMP, on their side. If the fishermen had been formally represented in the CHC and, in that case, formalised and mutually agreed upon umbrella management structures to support fisheries management had been in place, they could have retained their common property regime. Since they were aware that obtaining a seat in the CHC was a utopian dream, the only way of dealing with misrepresentation was to call for privatisation of the fishery through a Several Order. This was an attempt to continue their activity in isolation from the CHC, yet in such a way that access to the fishery could never be threatened again.

The fishermen's strategy proved successful. More than a decade earlier, the same attempt had failed (although access to the fishery was retained at the time). In 1996, the fishermen succeeded in making a provisional contract with the Harbour Master and they could begin to explore the possibility of obtaining a Several Order. The reasons why they did not complete the trajectory in the past can only be speculated upon. In the present context, a number of explanations can be given. First, the fishery was seriously threatened from closure, while in the early 1980s the only reason to apply for the Several Order was to improve the fishery. The potential closure, and the perceived 'socio-economic crisis' associated with it, made a sustained concerted action more urgent. Second, the MEMP was a catalyst which empowered fishermen to identify their needs. Although the MEMP had always been intended to provide a strategy for estuary management and the final plan did not make provisions for securing access to the fishery, it created awareness amongst a wider audience, and particularly the relevant authorities, that: (i) there was a fishery in Cowes Harbour, (ii) that it could be exploited in harmony with nature, and (iii) that there were people depending on it. Third, the role of the CHC has shifted from acting in the interests of safety and navigation only, towards ensuring a balanced and integrated use of the harbour. The MEMP formed an important contextual factor that prompted the Harbour Master to enter a constructive discussion with the fishermen, who, following a first explorative meeting, decided that a concerted effort was undoubtedly worth its while.

Grounding preliminary theory (1)

In Chapter One, I put forward the thesis that CPR theory, in its present form, is not sufficiently developed to study the management of complex, multiple-use CPRs. First, I argued, existing theory is founded on the unrealistic assumption of single use, i.e., based on the analysis of common property regimes that target the management of one resource unit. The case study of Cowes Harbour shows how common-pool resource systems produce a multitude of resource units, such as oysters, the fairway and nature conservation values, which may or may not be

governed under the same management regime. The case study also shows how different uses within a resource system are interdependent; the combined use of a variety of resource units will, at a certain level of exploitation, reach a critical point, whereby the development of one use will affect an other use. For instance, the increasing growth in commercial and recreational traffic in the fairway is associated with congestion problems, occasionally resulting in dangerous situations. For the oyster fishermen, increasing traffic growth means that fishing activities in the harbour are in jeopardy. International regulations prohibit fishing within fairways, but through the implementation of a Bye-law, the Harbour Master has enabled the fishermen to carry out their fishing activities. If his professional judgement is that continuing the fishing activities involves too many hazards, the licence that gives fishermen access to the fishery will be withdrawn, resulting in the end of the fishery. Another example of the interdependency amongst different resource uses is the discussion on the effects of oyster fishing on the seabed. Nature conservationists perceived that oyster dredging negatively impacts on the seabed, while fishermen are of the opinion that a closure of the fishery would lead to the eventual disappearance of the oyster beds due to siltation.

The recognition of interdependency means that the different uses have to be balanced in order to prevent externalities from occurring. In Cowes Harbour, multiple-use CPR management is aimed at the co-ordination of the various activities in the interests of safety and navigation. For this purpose, an umbrella organisation was established as early as 1897. The oyster fishermen, who have an important stake in the harbour, are not represented in the Cowes Harbour Commissioners. This means that they are not involved in the decision-making process governing the basic condition of resource use: access to the CPR. For over a decade, the informal common property regime for the oyster fishery was not contested, until increasing traffic movements in the area where the fishery is located became an issue.

In this light, my first preliminary conclusion concerns the status of the design principles for successful collective action as developed in CPR theory. In Chapter One, I put forward the thesis that prescriptive principles draw attention away from the process through which collective action evolves. The case study showed that the common property regime for the oyster fishery included the basic design principles for collective action and, for its users, was a satisfactory arrangement. However, despite the presence of these principles, the fishermen deemed a collective privatisation strategy necessary to secure future access to their fishery, since their livelihood was threatened from external forces. Their motives could only be appreciated by exploring the different uses in the context of the institutional framework for the aggregate multiple uses. This leads me to a second insight.

When I explored the different uses in the context of the institutional framework for the aggregate multiple uses in Cowes Harbour, the importance of contextual factors in shaping collective action processes became apparent. In CPR theory, the external world is recognised, yet considered a given factor. The lack of

representation in the umbrella institutional framework and the preparation of the MEMP are two (obvious) significant contextual factors influencing the fishermen's collective action. However, although these contextual factors form part of the explanation for a collective action effort, the collective action cannot be fully understood without an explanation of this lack of representation.

The case study shows how a number of contextual factors are of crucial importance in explaining representation in the umbrella organisation and the extent to which representatives can influence decision-making processes at this collective-choice level, including:

1. the historical background of the specific use within the overall management system;
2. the socio-economic value of the specific user group's activity within the common-pool resource and the wider political economy in which it is embedded;
3. the number of social actors involved in the specific use;
4. the level of organisation between users and representative bodies;
5. the extent to which relationships between user groups and the umbrella authority are formalised through participation in the latter's authority structure;
6. the strengths and skills of the organisation representing the interests of the user group in policy-making;
7. the extent to which informal relationships between the user group and the umbrella authority are established.

These contextual factors only became visible when I explored the different uses in the context of the umbrella framework for the aggregate multiple uses in Cowes. Therefore, my third preliminary conclusion is that focussing the analysis on one user group is not a satisfactory approach to explain either the representation of users in umbrella structures for multiple-use management or the strategies they employ to influence decision-making processes in these umbrella organisations.

A fourth insight is related to the emergence and development of collective action efforts. It was only when the fishery was threatened with closure when the oyster fishermen perceived the expected gain to be made from the transaction costs incurred in collective action to be substantial enough to warrant joint action. The significance of a perceived crisis as a contextual factor encouraging collective action is interesting in view of the theoretical argument put forward by economists that, for collective action to occur, *marginal* gains must be more than *marginal* costs, i.e., collective action should take place if there is a net gain/improvement to be made. In reality, however, it seems that often there has to be a threat of a *total* loss before collective action is generated.

Finally, on the basis of the case study, the reliance on the model of purposive or strategic rationality underlying collective action theory can be questioned. Although, in the end, the fishermen's quest for privatisation was a strategic action,

the rationalities they employed throughout the collective action process differed. When convincing the other fishermen about the need for collective action, the fisherman who assumed the leadership emphasised that, in order to pursue their individual goals (fishing the Cowes oyster beds), they would have to develop and agree upon a joint plan of action on the basis of a collective assessment of the problem. As a result, they mutually agreed that a Several Order was the best way of securing access to the fishery. This process of negotiating a mutually agreed upon strategy goes beyond the boundaries of strategic rationality. On the basis of an open discussion, the fishermen decided that, to increase the chances of success, they would have to get the relevant others (the CHC, users adjacent to the oyster beds) on their side, before they applied for a Several Order. This action was thus based on the concept of strategic rationality; that is, the expectation of the behaviour of the relevant others. If the oyster fishermen had started an application before they had consulted the Harbour Master and other actors, it was unlikely that they would succeed in obtaining the Several Order. In their discussion with the Harbour Master, the two fishermen representatives and the Harbour Master went beyond strategic rationality in making a compromise that benefited all parties; they agreed upon a provisional contract with the Harbour Master, decided to establish a company and, on the long-term, apply for a Several Order. My preliminary conclusion is that the model of purposive rationality in collective action theory is too narrow to explain the emergence and development of collective action processes. In this context, I also draw attention to my thesis that collective action never follows a pre-determined strategy; that is, can be explained on the basis of pre-defined principles. Strategies are shaped and reshaped throughout the collective action process, and therefore, vary from context to context.

In the next chapter, I will construct a conceptual framework that will form the frame of reference for the analysis of two case studies of multiple-use CPRs in Ireland and The Netherlands and the grounding of theoretical and methodological concepts for the analysis and facilitation of collective action in multiple-use CPRs. The preliminary conclusions from this chapter form the basis for (i) developing the concept of the social actor(-network) to replace that of the purposive actor, (ii) introducing a broader conception of rationality, (iii) adjusting the status of the design principles and including contextual factors in the analysis through the adoption of the principles of generalised agnosticism and symmetry, and (iv) presenting the notion of platforms for resource use negotiation as a conceptual and methodological tool for the facilitation of collective action.

Notes

[1] The 1829 Crown Lands Act transferred the Crown's interest in the foreshore, along with its land revenues and management and improvement responsibilities to the Crown Estate Commissioners (CEC). The CEC retain about 50% of the United Kingdom's foreshore. Although there is a public right of navigation, the Crown has claimed the seabed as its property. The Crown's rights to the seabed and its mineral resources are

also vested in the CEC. Through licences and leases, the CEC can transfer use rights to Crown property to individuals and companies (Seabrooke & Pickering, 1994; see also for a detailed discussion on property rights to the coastal zone in the United Kingdom).

[2] Coastal zone management in the UK is a heavily debated issue. Despite strong professional support, proposals by the House of Commons Select Committee on the Environment in 1992 for a comprehensive framework of national, regional and local organisations to co-ordinate CZM policy processes, the Government decided to only partially implement the Select Committee's proposals.

[3] Bye-laws are operational laws or regulation made by local government authorities or by statutory bodies with resource rights.

[4] Directive 91/492/EEC lays down health conditions for shellfish products and placing on the market of bivalve molluscs and requires that certain bacteriological criteria must be met in shellfish harvesting areas. The Directive identifies for classifications of shellfish harvesting areas; based on the classification of the fishing area, shellfish can be placed directly on the market (A-areas) or have to undergo purification treatment (B and C areas). D areas are closed for harvesting. The fishery in Cowes is a C classified area. Should the bacteriological condition of its waters deteriorate and reach D quality, the fishery will be closed.

[5] Discussions about a potential closure of the fishery in the interests of nature conservation only took place among nature conservation interests and were never formally discussed in the MEMP's Steering Committee. The rumour went round after one nature conservation interest had contacted one of the fishermen.

[6] To protect the identity of those concerned, the names all persons are fictitious.

[7] In a comparative study on devolved management systems for fisheries in Denmark, Norway, Spain and the United Kingdom, Symes *et al.* (1996: 5) found similar conclusions: "At the local level [Fishermen's Associations] tend to suffer form a weak financial base, partial and inactive membership and non-professional leadership [...]".

Chapter Three

Constructing concepts

A conceptual framework for the study of collective action

Our modern society is a 'risk society': we have arrived at a phase in which the social, economic, political and individual risks associated with industrialisation increasingly tend to escape the existing institutions for monitoring and protection. Certain features of our society have become socially and politically problematic. On the one hand, we still make decisions and take action according to the pattern of the old industrial society; on the other hand, the interest organisations, judicial system and politics are clouded by debates and conflicts that stem from the dynamics of our risk society (Beck, 1994).

The degradation of our global natural environment is just one of the effects of the risk society. The destructive impact of our science-based industrial system on the natural resource base, together with the permanent gross imbalances and inequalities amongst people, constitute a major threat to human survival, and "form the leading contradiction of the material culture of our age" (Funtowicz & Ravetz, 1990: 13). A new sort of science will form an integral part of the actions that have to be undertaken to deal with this threat. Funtowicz & Ravetz (*ibid.*: 14) propose the term "second order science", which is complementary to existing science and technology and, based upon reflexiveness, develops

> "new conceptions of the objects, methods and social functions of knowledge about the material world, and its interaction with structures of power and authority".

In this second order science, the prevailing positivist and reductionist paradigms, in which technical means are considered to be mechanisms to achieve given and uncontested goals, are no longer relied upon to provide solutions to environmental and social problems. Radical new perspectives about nature and its human management are needed, in which reality is no longer considered to be predictable (Maarleveld *et al.*, 1997) and in which technology and the social are not considered in separation, but as a heterogeneous web (Bijker & Law, 1992). As I discussed in Chapter One, the interconnectedness of many local, and indeed global, problems associated with our risk society requires a collective approach to problem resolution and sustainable management strategies.

In Chapter One, I gave a summary overview of the current approach to collective action in common-pool natural resource management scenarios. I showed that common-pool resources (CPRs) and their management regimes have evolved into complex, multiple-use resources as the combined result of internal and contextual factors, affecting the demand for and supply of products extracted from the CPR. I indicated that theoretical notions and frameworks that were originally developed

for the analysis of management regimes for relatively simple, single-use common-pool resources, are increasingly being applied to complex, sometimes global, CPRs. This practice is particularly problematic in view of a number of shortcomings of CPR theory. Existing theoretical notions are based on a reductionist representation of reality, both in assuming that CPRs are only used for one single type of use and in regarding the external environment of the resource as a 'black box'. In this context, the case study of Cowes Harbour in the previous chapter showed how the interdependency among navigational movements by different uses threatened the common property oyster fishery and how, for example, the estuary management was an important contextual factor that set a collective effort aimed at privatisation of the fishery in motion. Since existing theoretical notions provide no heuristic tools to study the complexities of multiple-use resources, their application to multiple-use problems may lead to the adoption of inappropriate, deterministic 'solutions'.

In addition, I argued, a substantial part of present theory seems to be based on a post-positivist or critical realist ontology in assuming that, although different natural and social realities exist, the outcomes of collective action processes are probabilistically apprehensible; that is, they are determined by a number of pre-defined conditions (thus, making such outcomes predictable). I also put forward the thesis that the strategic model of rationality underlying most collective action theories, including CPR theory, diverts attention from the complex process through which collective action is shaped.

New concepts and methodologies are urgently needed to study collective action processes in multiple-use scenarios. I take an action-oriented position in advocating that methodologies are also required to facilitate collective action amongst multiple user groups in CPR management scenarios to overcome problems associated with complex use. The critique on contemporary CPR theory as summarised above, forms the foundation for the development of such concepts and methodologies. In this chapter, I will discuss some of the notions developed in critical theory and in actor-oriented and social constructivist approaches, such as actor-network theory and the knowledge systems perspective, that provide useful insights for the study of collective action processes in multiple-use scenarios and the analysis of the following basic empirical questions:

1. how do concerted action efforts emerge;
2. how do individual stakeholders influence collective resource management;
3. how are collective action processes amongst multiple stakeholders shaped;
4. how 'effective' are collective action initiatives for coastal zone management; and
5. how can concerted action processes in multiple-use resource management situations be facilitated?

In this chapter I will develop a conceptual framework that helps me further an understanding of the collective action processes that are being shaped and reshaped in the case studies presented in this book.

The rational versus the social actor

In Chapter One, I discussed that collective action theories heavily built on the notion of economic rationality in explaining human behaviour in collective action situations. Since individuals pursue the maximisation of their own utility, co-operation towards collective objectives becomes increasingly problematic. By embracing the new institutionalism, CPR theory has 'discarded' the neo-classical assumption of economic, calculated rationality and, instead, assumes a situation of bounded rationality as the driving force behind individual behaviour. This implies, amongst others, that individual behaviour is studied in the context of complex and uncertain situations that affect the actor's decisions and the value he attributes to certain courses of action:

> "An individual's choice of behaviour in any particular situation will depend on how the individual learns about, views, and weighs the benefits and costs of actions and their perceived linkage to outcomes that also involve a mixture of benefits and costs" (Ostrom, 1990: 33).

In CPR theory, individual choice of action strategies is affected by four internal variables: (i) expected benefits, (ii) expected costs, (iii) internal norms, and (iv) discount rates (Ostrom, 1990). While this model of a broad conception of rationality may be useful as a heuristic tool to study individual behaviour, the difficulty is that it 'individualises' human action through the explicit assumption that only *shared norms* of behaviour in a community/society affect individual choices.

This assumption is problematic for two reasons. First, it marginalises the role of the social world to an entity that prescribes a normative context for action; that is, social interaction is aimed at setting norms for action. Second, it regards the actor-world relation as a subject-object model, where the actor is a 'lonely subject' who has to survive in an objective world, which he tries to manipulate, and where co-operation takes only place to the degree that it fits with his egocentric calculus of utility (Habermas, 1997; Kunneman & Keulartz, 1985; cf. Wilson & Jentoft, 1999).

The division of the actor from the social, through the concept of the 'rational actor', can be illustrated by the use of the word "appropriator" to refer to those individuals who withdraw (or appropriate) products from a CPR (Ostrom, 1990: 30). The term 'appropriation' implicitly suggests that the relationship between the individual and the resource is determined by the individual's incentive to maximise his own utility at the expense of the resource. It suggests a non-dynamic relationship between the resource user and the resource system, in which the user withdraws products from the resource and does not give anything back[1] (for example, undertaking conservation work to the CPR). In other words, the resource user is represented as an active individual in using the resource, but as passive in responding to the challenges associated with his use. Paradoxically, the same CPR theorists have shown that individuals *have* been able to sustain CPRs for their own benefit and for next generations through collective resource governance, thereby

responding to challenges posed by social practices and societal changes and challenging the principle of *homo economicus*.

The divide between the individual and the social is also evident in the view that collective action is essentially seen as an institutionalised set of procedures to guide or regulate human action (cf. Long & Van der Ploeg, 1995). The individual himself does not seem to matter (except for his role in appropriation). Central in CPR theory is "the institutional capacity to make the 'machinery' of [collective action] run smoothly and effectively" (*ibid.*: 74). The focus on institutionalised sets of procedures for collective action (such as, for example, the formulation of design principles, Chapter One), moves collective action away from the arena of everyday sociotechnical struggle in which resource users find themselves (cf. Young, 1995). The case of the Cowes oyster fishery is illustrative: the basic design principles for collective action were part of the common property regime, yet the claims over the fairway in which the fishery is located by other stakes, affected the continuation of this regime and resulted in a concerted effort aimed at privatisation.

The aforementioned problems can partly be addressed by introducing the notion of 'social actor' as developed in actor-oriented approaches (see Long, 1992), to replace that of the (broadly) rational individual. Perhaps the most important (emergent) property of a social actor is his 'agency', which refers to an individual's capacity to process social experience and realise at least part of his intended actions through his strategic interactions in a network of social relationships (Long, 1992; Long & Van der Ploeg, 1995). In this process individuals are continuously *learning* to use the material and cultural entities available to them in a manner suited to the constraints and opportunities of the situation (Crozier & Friedberg, 1980). Agency requires 'knowledgeability', which Giddens (1993: 375) defines as:

> "everything which actors know (believe) about the circumstances of their action and that of others, drawn upon in the production and reproduction of that action, including tacit as well as discursively available knowledge".

Knowledgeability develops through the "rationalisation of action", which refers to the actor's capability to supply reasons for his activities[2] (Giddens, 1993: 5) Social actors continuously monitor their own and others' activities, as well as the context in which they move. Therefore, they maintain a continuing understanding of the grounds for their activity; in other words, if a social actor is asked what he is doing and why he is doing it, he will be able to explain most of his actions.

Agency does not refer to the capacity to make decisions based on knowledge of one's own and of others' projects alone, but also to the capacity to *enrol* other people in one's own projects[3]; in other words, agency also requires organising capacity (Long, 1992; Verschoor, 1997). In addition, Remmers (1998) considers creativity - the ability to appreciate the relevance of contextual factors for achieving one's project - to be an important characteristic of a social actor.

The concept of agency is ineradicably tied to power. Following Foucault (1979), I consider power to be a *strategy*. Power "is exercised rather than possessed" (*ibid.*: 26) and is constituted in social relationships, such as networks, alliances and conflicts.

> "[Power] is not a thing nor is it something that people have in a proprietorial sense. They 'possess' power only in so far as they are relationally constituted as doing so" (Clegg, 1989: 207).

Thus, the powerful have achieved that power "by boxing others in, borrowing from them, and misrepresenting them" (Bijker & Law, 1992: 292). If a social actor succeeds in 'winning over' or enrolling others to his point of view, then these others 'delegate' power to him (Long, 1992).

The concept of social actor does not refer to individual human beings only, but also embodies different types of organisations. Organisations too make decisions and have organising capacity to enrol others in actions that make a difference to pre-existing states of affairs, which is when actor-oriented approaches recognise effective agency (Long, 1992). Again, the Cowes oyster fishermen are a good example: they enrolled the Harbour Master in their project of securing access to the fishery, formed a company, made agreements for fisheries management and made a provisional contract about access rights with the Harbour Master.

The introduction of the notion of social actor does not mean that the concept of rationality is discarded, for "*every* [...] theory of society encounters the problem of employing a concept of rationality" (Habermas, 1987: xxlii). In rational-choice theories, the new institutionalism and, implicitly, in the actor-oriented approach, the model of strategic action serves as the (given) prime mover for individual behaviour. In the social actor perspective as developed in Long's actor-oriented approach (1989, 1992), rationality takes the shape of the *rationalisation of action*, or the actor's capacity to supply reasons for his behaviour. By focusing on the struggles that take place at the 'interfaces' where different social actors interact and where they devise "ways of 'bridging', accommodating to, or struggling against each other's different social and cognitive worlds" (Long, 1989: 14), actor-oriented approaches try to *explain* social action. Their focus on the 'encounters at the interface' is guided by a strategic conceptualisation of rationality. However, the concept of rationality is not explicitly recognised in actor-oriented approaches, which weakens their explanatory power beyond the level of the individual, i.e., when actors exercise collective agency or, as Remmers (1998) describes in the context of regional development in Spain, when actors 'interlock' their individual projects in order to shape a collective performance. In the case of Cowes Harbour, the interlocking of different individual projects - securing access to the fishery and guaranteeing a safe navigational situation - took place, in the first instance, at the level of the fishermen, who recognised the need for a collective strategy to secure their perceived access rights. At a later stage, fishermen and the Harbour Master interlocked their projects when they jointly agreed on access regulations to the fishery.

In this book, I depart from the position that rationality, like agency, knowledgeability, organising and decision-making capacity, and power, is an *emergent* property of a social actor and can take a *number of forms*. I will discuss why these are *emergent* (rather than *given*) properties later in this chapter. At this point, Jürgen Habermas' distinction between 'purposive rationality' and 'communicative rationality' is useful to identify the different forms of rationality social actors employ in their actions.

Habermas (1997) explains universal features of human interaction through the study of linguistic communication. The reasons for choosing this route are two-fold. First, language is the primary medium of communication. Second, language obeys universal rules and norms. Central to his theory is the notion of the 'speech act', which at the simplest level is a sentence, expression or intelligible utterance. However, Habermas gives the term a more complex meaning by making it refer to any type of sustained social interaction, such as conversing, watching television or being a spectator of an event (*ibid.*; Rojek, 1985). Habermas (*ibid.*) considers rationality to be the predicate of social action. It can be measured against three criticisable *validity claims*:

1. *propositional truth*: the objective truthfulness of an expression uttered by actor A upon which B bases his goal-directed action (and therefore the 'effectiveness' of the means chosen to attain the goal);
2. *normative rightness*: the recognition of norms regulating social action; and
3. *subjective truthfulness*: the sincerity of expressions uttered by the social actors based upon their individual, subjective worlds.

Rationality can take two major forms. The first, *purposive rationality*, is "a point of view from which actions can be more or less rationally planned and carried out, or can be judged by a third person to be more or less rational" (Habermas, 1997: 86). Two types of action belong to this category: (i) cognitive-instrumental action, and (ii) strategic action.

Instrumental action refers to nomological (non-social) actions that achieve set goals through the effective organisation of certain means, or standard techniques. Instrumental action follows an 'if...then' logic; for example, if one wants to bake a pie, then one has to follow a certain procedure (in this case, the recipe). In *strategic* action, the actor makes a decision between alternative courses of action to achieve the realisation of an end. The actor's calculation of the most successful decision is guided by goal maximisation and by the prediction or anticipation of the decisions made by at least one additional goal-directed actor (Habermas, 1997; Koningsveld & Mertens, 1986). The Prisoner's Dilemma described in Chapter One is an example of strategic action. Habermas argues that social theories that are built around instrumental and strategic action concepts (e.g., rational-choice theories) presuppose an actor-world relation in which language is conceived one-sidedly, for example as a medium through which speakers oriented to their own success can enrol others to their projects, or as a medium that transmits cultural values.

The second form of rationality distinguished by Habermas (1997) is *communicative rationality*. Communicative action[4] presupposes language as a medium of uncurtailed information whereby social actors, outside the context of their pre-interpreted world,

> "pursue their individual goals under the condition that they harmonise their plan of action on the basis of a common situation definition" (*ibid.*: 286).

An example of a communicative action is the development of a mutually agreed upon, joint plan of action (application for a Several Order) by the oyster fishermen in Cowes Harbour.

Negotiating a common situation definition is essential for communicative action and is based on the participants' mobilisation of the rationality potential embedded in the three validity claims of propositional truth, normative rightfulness and subjective truthfulness. In doing so, they refer simultaneously to three worlds:

1. *the objective world*: the totality of all entities about which true statements are possible;
2. *the social world*: the totality of all legitimately regulated interpersonal relations;
3. *the subjective world*: the totality of the experiences of the speaker to which he has privileged access (Habermas, 1997: 100).

The notion of the 'ideal speech situation' is crucial to communicative action. The ideal speech situation reflects a scenario in which each participant engages in communicative action on the basis of: (i) a rational agreement rather than force, (ii) complete mutual understanding, and (iii) an acceptance that each participant has the right to communicate openly (Rojek, 1985). It must be emphasised that communicative action is not the same as communication:

> "[...] the communicative model of action does not equate action with communication. Language is a medium of communication that serves understanding, whereas actors, in coming to an understanding with one another so as to co-ordinate their actions, pursue their particular aims. [....] Communicative action designates a type of interaction that is *co-ordinated through* speech acts and does *not coincide with* them" (Habermas , 1997: 101).

Habermas uses the action concepts driven by purposive and communicative rationality to develop his critical theory. In brief, he claims that social theories that are based on purposive-rational action and on a subject-object model to describe actor-world relations are insufficient to explain the reproduction of society, and that social theories should be based on the broader rationality principle of communicative action (Kunneman & Keulartz, 1985). He argues that society can be divided into two domains: (i) 'system', constituting the economy and the state, and (ii) 'lifeworld', which offers individuals resources for communicative action (culture, institutions, personality). Modern societies have evolved through the rationalisation of the lifeworld, which refers to a process whereby the control that

these resources exert over communicative action decreases, so that they become subject to criticism and argumentation. This rationalisation process runs parallel to the disconnection of system and lifeworld, which results in a process whereby the system increasingly 'colonises' the lifeworld; it incorporates instrumental rationality into the lifeworld at the expense of communicative rationality, resulting in a process of 'bureaucratisation' which transforms social actors into clients of the welfare state. To combat colonisation, communicative rationality has to be encouraged and secured, and is usually manifested through the emergence of social movements and platform processes (Habermas, 1997; Kunneman & Keulartz, 1985).

Habermas' theory of communicative action has been subject to well-founded criticism. First, the concept of the ideal speech situation is so rarefied that its application to social life is very limited (Leeuwis, 1993; Rojek, 1985). Second, Habermas is criticised for portraying a pedagogic view of human relations which stands above the day-to-day struggles in communication and social life, and therefore fails to engage meaningfully with them (Anderson, 1983, in Rojek, 1985). Third, Gadamer (1975, in Rojek, 1985) argues that Habermas marginalises the historical dimension of social relationships, thereby undermining the role of class and tradition in structuring all instances of communicative action.

Despite these criticisms, I believe that Habermas' introduction of the concept of communicative rationality and its distinction from purposive rationality is particularly useful for the study of collective action processes in CPR management scenarios. First, although the ideal speech situation underlying communicative action may be difficult to achieve in practice, social actors engaged in collective action efforts do not act on the basis of purposive rationality alone. In *reaching agreement* about governance rules, and thereby creating a situation in which members of a group are *entitled* to expect a certain behaviour (Habermas, 1997), compliance (or non-compliance) is partly guided by normatively regulated social action, one of the limit cases of communicative action (*ibid.*). For example, in Chapter Two I showed how, through the membership of representative organisations like the Royal Yachting Association and the Solent Cruising and Racing Association in the Cowes Harbour Commissioners, the yachting industry and the yachtsmen have a voice in governance rules for the port. This means that, on the one hand, the industry and yachtsmen are informed about new regulations and agreements and know what is expected from them within the boundaries of the harbour and, on the other hand, the Harbour Master knows what to expect from the yachtsmen and industry.

Second, the concept of communicative rationality helps us to deal with the shortcomings inherent in the use of the strategic model of action as the driving force behind the explanation of collective action in CPR theory, namely the marginalisation of the social world and the neglect of the subjective world, in the actor's decision to embark on a certain course of action.

Finally, Habermas' distinction between purposive and communicative rationality further develops the notion of social actor as developed in actor-oriented approaches. Such approaches recognise rationality implicitly through the concept of rationalisation of action, but do not explain the different reasons driving social interaction and the choice for certain strategies, nor recognise rationality explicitly as one of the many emergent properties of a social actor.

The discussion so far can be summarised as follows: Human beings and organisations are *social actors*, i.e., capable, knowledgeable and creative agents who have the ability to make decisions about alternative courses of action based on social experience, and the capacity to manipulate social relations and to enrol others into their projects through their organising skills in order to cope with life and realise (at least part) of their projects. In this process, social actors draw upon both purposive rationality, which is oriented at successful maximisation of their own utility, and on communicative rationality, which is oriented at reaching understanding, to co-ordinate their activities.

Thus, social actors can employ two rationalities - purposive and communicative - in deciding on their action strategies. This puts them in a social dilemma position, since what actually happens depends on the actions of a whole range of other actors and contextual factors. Bijker & Law (1992: 10) use the analogy of chess:

> "the strategies developed by the players are shaped by the rules of the game - the pieces, their relationships, and the possibilities they embody".

However, unlike chess, "where the rules of the game are fixed before the game starts", in real life those rules are not fixed; the same actors who are shaped by the context in which they act, also help shape this context. This implies that the strategies social actors employ as well as the consequences of those strategies should be treated as emergent phenomena (*ibid.*).

This recognition has some implications for the notion of social actors as has been developed so far. It first of all means that the material and social means that form part of actors' strategies should be included in sociological analysis; in other words, the above definition of what a social actor constitutes is based on "the humanist assumption that agency is the property of individuals" (Verschoor, 1997: 24). However, as Law (1994) points out, we do not consider human beings as mere organisms but as people (or social actors), because they have material properties (e.g., a fishing vessel, nets, oilskins, navigation equipment) and a history of social relations (e.g., family, friendships, feuds, competition, authority relations), which they may have some control over, but on which they equally depend; for instance, without his vessel, nets, the oilskin, navigation equipment, fishing licences, crew, competing colleagues, and buyers of his catch, the fisherman would not be a fisher. Thus, social actors "are composed of, or constituted by our prop[erties], visible and invisible, present and past" (*ibid.*: 33).; they are an effect of the context in which they act. For this reason, the notion of the social actor needs to be extended to include non-human entities. This leads to a second

implication: if social actors are shaped by, and help shape, the context in which they act, agency is not a *given* property of humans (and things), but an *emergent* property, which is dynamic and continues to evolve. In the next section, I elaborate on these proposals.

The next section explores some of the concepts introduced in actor-network theory to further develop the concept of the social actor and to address some ontological and epistemological questions concerning the study of the social - or collective action processes for that matter.

Collective action as an actor-network

Actor-network theory is one amongst a number of approaches that can be categorised as 'social constructivism'. Social constructivism entered sociology through Berger & Luckmann's work *The social construction of reality* (1968). From a social constructivist perspective, society, the object of sociological inquiry, is perceived as

> "part of a human world, made by men, inhabited by men, and, in turn, making men, in an ongoing historical process" (*ibid.*: 189).

Thus, human reality is conceived as a socially constructed reality, rather than naturally given or merely taken for granted. Later, Berger & Luckmann's "men" were called 'social actors'.

The foundation of actor-network theory lies in the sociology of science and technology, in which knowledge is considered to be "a *social product* rather that something generated through the operation of a privileged scientific method" (Law, 1992: 381). Actor-network theory (ANT) is a theory of agency, knowledge and organisation. What distinguishes ANT from other social constructivist perspectives is that it studies the state of affairs in an action arena as the effect of interactions amongst social actors *and non-human entities,* thereby breaking with the essentially humanist sociology proposed by Berger & Luckmann (1968). Inherent in ANT is that reality cannot be defined in terms of a single social order. This notion has three implications:

1. there is no order, rather there is *ordering*;
2. there is no *single* order, rather sociologists have to be concerned with multiple and incomplete processes of social ordering; and
3. the idea that social ordering is merely social disappears: the social is considered to be an effect of interactions between human and non-human entities (Latour, 1987; Law, 1994; Callon & Law, 1995).

In sum, the social world is seen as "a set of more or less related bits and pieces" (Law, 1994: 101). In this social world, actors build "disorderly networks composed of social, economic, political and technical elements" (Verschoor, 1997: 26).

In ANT, the social actor, the family, the organisational structures for the management of CPRs, the economy, science, technology and other institutions in social life are considered to be *ordered networks of heterogeneous materials*[5]. This means that networks are composed not only of people, but also of machines, animals, texts, money and so on, since all of our interactions with other people are mediated though objects. For example, a lecturer mediates communication with his students through an overhead projector; the projector helps to define the student-lecturer relationship (Law, 1992). If human beings form a social network, it is because they interact with human beings and endless non-human entities. If these material entities were to disappear, then so would the social order disappear. Thus, actor-network[6] theory says that order is an effect generated by heterogeneous means:

> "By taking this position, actor-network theory avoids making the common-sense assumption that people [...] and things are naturally occurring categories - the first endowed with agency, the second devoid of it" (Verschoor, 1997: 26).

The explicit recognition of the role of non-human entities in shaping the social, raises the question of whether or not non-humans (objects) can have agency and, indeed, if agency is something we possess, i.e., is a granted property of individuals. After all, conventional sociology considers agency to be a property of humans alone. ANT starts from the position that non-human agency is not a contradiction in terms (Callon & Law, 1995). Rather, agency is a property that emerges through interactions of people and objects, through relational networks. Agency is the emergent property from what Callon & Law (*ibid.*) call *'collectifs'*[7]. Crucial here is the recognition that *"by themselves*, things don't act" (*ibid.*: 485), and that the same can be said for humans. This can be illustrated by an example Latour (1994: 35) uses:

> "It is by mistake, or unfairness, that our headlines read 'Man flies' and 'Woman goes into space'. Flying is a property of the whole association of entities that includes airports and planes, launch pads and ticket counters. B-52s do not fly, the US Airforce [the *collectif*] flies".

The implication of ANT is that we must consider social structure as a verb (order*ing*), not as a noun (order). Social structure is "a site of struggle, a relational effect that recursively generates and reproduces itself"[8] (Law, 1992: 386). The generation of ordering effects is called 'translation':

> "translation [is the] process in which sets of relations between projects, interests, goals, and naturally occurring entities - objects which might otherwise be quite separate from each other - are proposed and brought into being" (Callon & Law, 1989: 58-59).

In other words, translation is the process in which actors attempt to constitute themselves as social actors or *collectifs* (Law, 1994). An example of such a translation process is presented in Callon & Law's article on the development of scallop (*Pecten maximus*) farming in the French Bay of St. Brieuc (1989). The

authors show how the demand for scallops by the French consumer is linked up with the aim of three scientists who wish to increase their knowledge about scallop habitats in order to develop farming techniques. The connection between the consumers and the scientists is forged through the following translation process: the scientists claimed that in order to satisfy consumer demands, it is first necessary to study the behaviour of scallops and then organise their domestication through the development of farming methods. In this way a link between economy and science was created. However, as Callon & Law (*ibid.*) point out, it is more than a link. In order to achieve their objective (development of scallop farming), the scientists had to convert themselves into *spokespersons* for (i) local fishermen (who had overfished the native scallops and would benefit from the development of farming techniques), (ii) consumers (who would like to have scallops on their plates) and (iii) local government (interested in economic benefits for the area), and then had to *mobilise* and *link* these groups together through an *intermediary*[9]: the scallops.

The example illustrates that translation is a complex process. Callon (1986, in Clegg, 1989, and in Verschoor, 1997) identifies four stages in the translation process:

1. *problematisation*: the translators define the nature and problems of global actors and attempt to enrol them by positing the indispensability of their solutions (or project);
2. *interessement*: the translators attempt to impose and stabilise the identity of the actors defined in the first stage of problematisation by making them interested in the project;
3. *enrolment*: the translators seek to construct alliances/coalitions with the global actors identified in the problematisation stage; and
4. *mobilisation*: the translators have successfully translated a network of entities through successful interessement and enrolment and have ensured that the 'enrolled others' do not betray or undermine the project.

Thus, during the translation process social actors are, as it were, 'agency-ised' by the material and social means they employ to achieve their objectives. These objectives as well as the strategies to achieve them are not fixed, but are continuously reshaped as new people and things enter the translation arena (Latour, 1994; Verschoor, pers. comm); as Bijker & Law (1992: 291) point out: "neither technologies nor social institutions move along inexorable trajectories".

Illustrative is the strategy by the Cowes oyster fishermen who recognised the need of winning over other relevant stakes in the fairway to achieve their project of securing access rights to the fishery; in enrolling the architects of the Medina Estuary Management Plan (MEMP) they used 'oysters' as an intermediary, focusing on their role in preserving biodiversity. In enrolling the Harbour Master, the intermediary was 'compliance with and control over navigational rules'. In the end, the fishermen succeeded in translating the Harbour Master, by adjusting their initial strategy of applying for a Several Order to joint agreements on a provisional

access contract and the architects of the MEMP through the incorporation of a Fisheries Action Plan in the strategic framework.

The tasks that actor-network theorists have set themselves are, first of all, to explore the tactics of translation, or "how it is that potential translators assemble the bits and pieces needed to build a coherent actor" (Law, 1994: 101), and, secondly, to study translation processes across time and space[10] (*ibid.*; 1992). Hence, the name 'the sociology of translation' to refer to ANT. In this process, they employ two principles, which are of crucial importance to this study.

The first principle is that of *"generalised agnosticism"* (Callon & Law, 1989: 77). In the sociotechnical studies ANT is concerned with, this principle tells the researcher not to take sides about either the technical or the social aspects of the controversy under study; in other words:

> "a *priori* distinctions between 'social' and 'scientific' categories are [...] abandoned in favour of an analysis of the heterogeneous objects put together by translators" (*ibid.*).

The second principle is that of *"generalised symmetry"* (Callon & Law, 1989: 77). This principle was developed by sociologists of science, who opposed the conventional belief that only *false* scientific knowledge needed sociological explanation. This belief stems from the assumption that, if scientific knowledge is false, this is caused by distorting social factors; social factors therefore appear at the end of the trajectory, when something went wrong. The very nature of *true* scientific knowledge thus makes it exempt from sociological analysis. David Bloor was one of those arguing against this 'asymmetric explanation' and proposed that both false and true scientific knowledge deserve sociological analysis and, moreover, that they deserve analysis in the same terms (Latour, 1987; Law, 1994). Thus,

> "to insist on symmetry is to assert that *everything* deserves explanation and, more particularly, that everything that you seek to explain or describe should be approached in the same way" (Law, 1994: 9-10).

The reason for adopting the symmetry principle is that judgements about truth and falsity, or right and wrong, or success and failure, are socially constructed. Any research that starts with the assumption that some knowledge is true and other is false, or that some form of collective action is successful while another is a failure, "will never get to analyse how the distinction is constructed and used" (Law, 1994: 10). The principle of symmetry "erodes distinctions that are said to be given in the nature of things, and instead asks how it is that they got to be that way" (*ibid.*: 12).

To summarise, ANT is a relational and non-reductionist sociology in that it considers society, social actors and technological artefacts to be *effects* generated in patterned networks of human and non-human entities, or *collectifs*. Agency is an emergent property of such relational effects and therefore is neither a property of human beings nor of things. ANT is process-oriented in that its main concern is

with translation processes, the generation of ordering effects, or the process through which actors constitute themselves as social actors or *collectifs*. These translation processes can only be studied by (i) abolishing the conventional sociological (and other social scientifical) practice of studying phenomena in terms of pre-defined categories, and (ii) insisting on symmetry.

The radical stance ANT takes in explaining the ordering of the social has been subject to criticism, most notably from British sociologists of science. The main argument is that ANT's "practical effect on the use of empirical material is prosaic, reactionary, and dangerously confusing" (Callon & Latour, 1992: 345); ANT is accused of taking a realist position to explain scientific facts and of technical determinism to account for artefacts (*ibid.*). This critique has been the start of an on-going debate between the 'Bath School' and actor-network theorists[11].

Second, ANT has been criticised for its one-sided focus on the world-views of (heroic) translators, or, in other words, for having a "managerial bias" (Summerton, 1997: 1). In particularly, the ANT methodology of 'following the actors' is considered to be problematic, since the conscientious following of certain actors (and not others) leads to (i) the exclusion of those actors who are marginalised by the 'master actor' in order to further his own interest, and (ii) the exclusion of invisible work contributed by countless other actors (*ibid.*).

Another criticism is related to the vocabulary created by actor-network theorists. Although ANT insists on abolishing existing ontological categories for the study of the social, a very complex vocabulary has been developed in ANT to refer to the same sort of categories (e.g., 'actor' becomes 'actant' or 'collectif', 'proof' becomes 'immutable mobiles', 'data' are 'inscriptions' and 'interaction' is 'translation'). Although Callon & Latour (1992) rightly argue that this new vocabulary essentially differs from existing concepts in that it comprises *hybrid* terms, i.e., neutral terms that do not *pre-define* categories of the social or the natural, one cannot escape the impression that ANT vocabulary is somewhat 'artificial'.

Finally, ANT's current 'identity crisis' deserves some attention. ANT was developed in the context of sociotechnical studies, but has since been spread to other fields such as medicine, anthropological and cultural studies, social geography, feminism and organisational analysis. Although this spread has furthered the development of ANT, it also poses a problem in that attempts have been made to convert ANT into "a fixed point, a specific series of claims, of rules. or a territory with fixed attributes [...] into a singularity", thereby denying ANT a heterogeneous identity (Law, 1997a: 4). In the ongoing debate about the future of ANT[12], Latour (1997: 1) even goes as far as stating that the term ANT should be buried altogether "so that from the ashes something else can resuscitate". He argues that each of the four components of the name 'actor-network theory' are (or have become) problematic, giving ANT the image of a theory of the social, rather than "a theory of space in which the social has become a certain type of circulation" (*ibid.*: 2).

Despite these controversies, I believe that the basic ontological and epistemological concepts developed in ANT are extremely useful for the study of collective action processes. First of all, the explicit recognition that a social actor or *collectif* is shaped through (or is a relational effect of) interactions of human and non-human entities is essential for the explanation of co-operative behaviour. By assuming that collective action is a result of 'people power' only, collective action theories take a reductionist view, ignoring that collective action always evolves around and is mediated by non-human entities. For example, Chapter Seven shows how collective action amongst Dutch shellfish fishermen is mediated through mussels and cockles, involving a struggle between, on the one hand, birds and their spokespersons (nature conservationists) and, on the other hand, fishermen and their Producers' Organisations (POs). The POs have, first of all, successfully enrolled the fishermen to manage the fishery under a common property regime rather than under open access, which nature conservationists perceived to have caused the fisher-bird competition in the first place. Second, the POs have enrolled the government in making them agree on a co-management approach in which collective resource management has been secured.

Thus, collective action is a process involving people and a lot of non-human entities, and, be it in a single-use or multiple-use scenario, is therefore a *collectif*, a relational effect of the interaction of all these elements[13]. Collective action will be 'reshaped' in time and space through the process of collective action itself, by new translation processes as new opportunities/constraints arise and new spokespersons come forward.

For the notion of the social actor developed in the previous section, this implies that 'things' have to be integrated with the 'humans' of the initial definition. Thus, social actors are *collectifs*, they are a fusion of people and things. Their objectives and strategies are continuously reshaped as new people and things enter the arena of translation. In the translation process, when individual and/or collective agency becomes emergent, these social actors draw upon four tactics - problematisation, *interessement*, enrolment and mobilisation - using communicative resources inherent in purposive and communicative rationality[14]and mediation.

Secondly, I will adopt the principles of generalised agnosticism and symmetry. This means that categories used in collective action theory, such as 'free-rider', 'design principle', 'success' and 'failure' cannot be used as *a priori* categories to explain collective action. Rather, the free-rider and the 'perfect contributor' are an outcome or effect of ordering processes. *A priori* distinctions between, for example, success and failure hinder the explanation of collective action, since such distinctions are *socially constructed* by the actors involved, thereby attributing a different meaning to these categories. Thus, the fact that collective action is 'successful' cannot be the source of explanation (for example, by 'defining' conditions for collective action on the basis of successful cases), but is *that* which needs explaining.

The principles of agnosticism and symmetry will help me to be sensitive to both internal and contextual factors influencing an actor's decision to adopt a certain strategy, by examining *how the outcomes of CPR management can be explained* rather than merely describing them.

I want to emphasise that adopting the basic ontological and epistemological notions of ANT does not mean that I am going to tell a number of 'heroic actor-network stories'. Although some of the *collectifs* I follow have successfully enrolled others in collective resource management strategies, and therefore may deserve a 'hero status', those who were enrolled in the translation process and have delegated power to the translators may think differently and, indeed, may be 'heroes' themselves. After all, the definition of a hero is socially constructed also.

Now that I have outlined the basic theoretical assumptions underlying this study and have defined a social actor as a *collectif* (a fusion of people and things), the final task for this chapter is to examine the *collectif* through which collective action in CPR management (in many different shapes) operates. I will call this *collectif* the 'platform for resource use negotiation' (Röling, 1994a; 1994b). The notion of 'platforms' was originally developed in agriculture extension science. The construction of the platform concept applied in this study therefore has to start with an examination of its roots.

Platforms as *collectifs*

The notion of the 'platform for resource use negotiation' has been developed by the Communication and Innovation Studies Group at Wageningen University[15], The Netherlands. Its development was triggered by two factors. First, the transfer of technology approach to agricultural extension, which assumes that research first generates knowledge/innovation, which is then transferred to farmers, had appeared to be a failure world-wide. Second, there was a growing recognition that natural resource management problems are the outcome of imbalanced use by interdependent user groups, and can only be solved through some form of co-operation. It was in this context that a knowledge systems perspective to agricultural extension was developed.

The knowledge systems *perspective*[16] draws heavily on soft systems thinking, as developed by Peter Checkland (1981, 1989), in which a distinction is made between 'hard systems' with given boundaries and assumed goals (e.g., plants, ecosystems) and soft systems[17].

> "Soft systems are deliberate social constructs; that is, they exist only to the extent that people agree on their goals, their boundaries, their membership and their usefulness. The crucial assumption is that system goals are not given, but contested, and that system boundaries are negotiated. The crucial assumption for a soft system to exist is agreement among its members on its goals" (Röling & Wagemakers, 1998: 16).

As Röling & Wagemakers (1998) make clear, a soft system can also be defined as a human activity system, such as, for example, an organisation or a task force[18].

The knowledge systems perspective is aimed at developing a diagnostic framework for analysis, design and management of policy decisions and helps land users in becoming experts at managing complex ecosystems in a sustainable manner. A knowledge (and information) system is a soft system and can be defined as:

> "the articulated set of actors, networks and/or organisations, expected or managed to work synergically to support knowledge processes which improve the correspondence between knowledge and the environment, and/or the control provided through technology use in a given domain of human activity" (Röling, 1992: 48).

According to Röling & Wagemakers (1998), the knowledge systems perspective can be used as an empirical, normative and analytical tool. It is a diagnostic framework that helps to develop participatory proposals for action in practical situations through joint reflection on a number of salient issues and joint construction of intervention. (Agricultural) Innovation is thus seen as a social process (Engel, 1995).

In the knowledge system perspective, an important role is attributed to 'social learning'. A social learning perspective

> "aims to convey the manner in which people learn and need to learn how to gain insight into, predict, and control the way their actions affect the natural and human domains to ensure a sustainable future" [19] (Maarleveld & Dangbegnon, 1999: 268).

The social learning perspective is regarded as a "guiding framework for realising ongoing adaptation in managed resource systems" (*ibid.*). Maarleveld & Dangbegnon (1999) identify four questions that form the basis for the analysis of learning processes: (i) who learns, (ii) what is learned, (iii) how is it learned, and (iv) why is it learned? By focussing on these questions, it is possible to identify both limitations and potentials to learning that emerge from interactions amongst resource systems and social actors, and which might form starting points for future adaptations in management practices.

The importance of encouraging social learning processes is of increasing importance in public participation theory and practice in order to address the complexities and controversies inherent in, for example, public land management. In this context, it is often referred to as collaborative learning (Daniels & Walker, 1996). The use of forums comprising stakeholders to encourage mutual learning with the objective of solving problems and improve the situation is an essential aspect of collaborative learning strategies (*ibid.*). In the knowledge system perspective, such forums are referred to as platforms for resource use negotiation. They emerge when stakeholders experience the negative impacts of their own and other users' use of a natural resource and become aware that these problems require "building human institutions and a capacity for collective learning and decision-making about the ecosystem perceived to be under threat" (Röling & Jiggins, 1998: 301). Thus, in the

case study in Chapter Two, the Cowes Harbour Commissioners have been a platform for negotiating resource use for different stakeholders in the interests of safety and navigation for over a century; the agreements between the Harbour Master and the oyster fishermen are another example of how platforms emerge to negotiate resource use.

From a knowledge system perspective, the *facilitation* of platforms is crucial.

> "The use of a natural resource is usually contested among stakeholders [...]. Therefore, the only way to manage it in a sustainable manner is to construct a soft system among the stakeholders based on social learning, negotiation and accommodation [...] so as to take stakeholders along a learning path towards effective platform management" (Röling, 1997: 18).

Thus, the facilitation of a platform as well as the action strategies evolving from it, are part of a translation process - a problem is being defined, other actors have to be made interested in doing something about it; then they have to be enrolled as a participant while taking care that they do not undermine the project.

A platform is always a social construct, and, as Crozier & Friedberg (1980) observe:

> "exists through time only to the extent that it is supported by mechanisms which make it possible to integrate the different strategies and outlooks of its members, and thus to regulate their conduct and interaction. These mechanisms - or [...] constructs - constitute the group's collective capacity [...] restricting the group's behaviour by restricting or enlarging the range of possible choices".

The desired effect of a platform process is 'innovation', which Röling (1992) systematises as enhancing instrumental, strategic, communicative and propositional rationality[20]. Conflict resolution is thus seen as an innovation.

Experiences in agricultural extension world-wide suggest that the application of the knowledge systems perspective with its emphasis on platform processes has a great potential for dealing with natural resource management problems (see, for example, Campbell, 1994; Engel, 1995; Röling & Wagemakers, 1998). However, the perspective has also been subject to criticism related to: (i) the problematic position of power relations in developing participatory proposals for action based on joint learning[21] (Engel, 1995), (ii) its emphasis on developing practical tools rather than providing an ontological understanding of the social organisation of innovation[22] (Engel, 1995; Leeuwis, 1993), (iii) the emphasis on formal institutions, organisations and relationships in innovation processes at the expense of informal ones (Engel, 1995), and (iv) the role it attributes to Habermas' theory of communicative action in explaining and encouraging communication processes (Leeuwis, 1993).

From the social constructivist perspective advocated in ANT, a number of comments can be made on the knowledge system perspective and the notion of

platforms. First, it is a humanist approach in that it considers soft systems, and for that matter platforms, as an emergent property of interactions amongst *people*, thereby ignoring that stakeholders and the platform itself are *collectifs*.

Second, although it explicitly recognises that reality is socially constructed, the use of categories such as 'sustainability', 'innovation' and 'intervention' to refer to desired platform effects, and 'facilitation' to refer to the process of achieving these, is problematic. The knowledge systems perspective emphasises that it is the stakeholders who construct their own reality, and therefore should work towards a joint appreciation of a (land use) problem and design proposals for actions. The *outcome* of the platform process is, however, *already constructed for them* - 'sustainability', 'innovation' and 'designing intervention' - which poses a basic contradiction to the essence of the asserted social constructivist nature of the approach and raises questions concerning normativity. It is the stakeholders themselves who should indicate what the outcome of the platform process is (which may or may not be 'farming strategies to achieve ecological sustainability'). By focusing on pre-determined categories, the researcher or the extension worker (the facilitator), will not be able to further their understanding about how such concepts are constructed and used by the stakeholders, hence the ANT notion of 'following the actors'.

Finally, the facilitator (extension worker) has a contradictory role. On the one hand, he acts as a 'translator' through his role in facilitating the (desired) effect of the platform process, while, on the other hand, through adopting an impartial role, he has to ensure that it is the members of the platform who construct a common definition of the problem and work collectively towards its solution.

The above discussion raises the question why the notion of platforms is adopted to explain collective action processes in this study, or even how it 'fits in' with the ontological and epistemological principles adopted from ANT.

In Chapter One, I discussed that natural resource management problems are increasingly being addressed through global, national, regional and local collective action initiatives. Examples in the coastal zone are Agenda 21 initiatives, coastal forums, estuary management plans and fisheries co-management. Understanding the processes that shape such collective action processes and the complexities involved because of their multiple-use nature, is of vital importance to assist or facilitate such initiatives. The notion of platforms has a number of advantages.

First, it provides a neutral name to refer to the whole range of formal and informal, statutory and voluntary, old and new, small and large *collectifs* involved in collective resource management. In CPR literature, such *collectifs* are referred to as 'appropriator organisations', co-operatives, common property organisations, co-management forums, *etcetera*. However, these *collectifs* share one characteristic: they comprise user groups who realise that CPR management has to be organised through collective action in the design, implementation and enforcement of

decision-making arrangements in order to secure long term benefits from the resource. In this light, such *collectifs* are all platforms.

Second, in CPR literature, the importance of social learning in the evolution of decision-making arrangements for the management in local and global CPRs has only recently been recognised (Young, 1995), and has not yet been sufficiently explored. Social learning takes place throughout the four stages of the translation process and is a 'tool' to pass from one stage in the trajectory to another. In the platforms perspective as discussed above, social learning is explicitly recognised and is considered to be essential to the process of collective action that is being shaped (and reshaped) in generation of platform effects. In the context of Habermas' theory of communicative action, social learning is linked to the grounding of arguments which forms an integral part of the actor's capacity to exercise and recognise rationality.

Third, although one can criticise the knowledge systems perspective for being normative, i.e., by emphasising the facilitation of platform processes aimed at sustainable natural resource use, I believe that its *action*-orientedness is, at the same time, its major strength. Instead of telling stories only, which is the enterprise of actor-network theorists and actor-oriented sociologists, the knowledge systems perspective takes these stories a step further, consciously focusing on participatory development of proposals for action and acknowledging the role of marginalised actors in this processes.

However, in order to use the notion of platforms for resource use negotiations within the ontological and epistemological principles underlying this study, a number of adaptations have to be made. First of all, the platform is considered to be a *collectif*, an emergent effect of interactions amongst people and things. Second, I will not grant the platform a desired, pre-defined outcome such as 'sustainability' or 'intervention'[23]. The emergent effect generated by interactions within the *collectif* is constructed by the platform itself and may take many shapes and forms. The outcome, or effect, is thus an emergent property that can only be explained by looking at the whole of interactions of different stages, different actors, different things. Finally, my focus will not be on 'facilitation' but on 'translation', i.e., I will look at (i) how the individual social actors within the platform exert agency, (ii) how the platform itself constitutes itself as a *collectif*, and (iii) how the external facilitators (if present) exert agency over the platform. I will, however, go beyond the 'story-telling' of ANT and link the analysis resulting from the strategy of 'following the actors' to some methodological suggestions for developing translation processes in platforms.

The process of 'following the actors', the principles of constructing a grounded theory, as well as the construction of case studies, will be explained in the next chapter on research methodology.

Notes

[1] Another problem related to the term 'appropriator' is that it does not facilitate the presence of 'non-extractive users', who may use the CPR system but do not actually withdraw products from the resource (for example, amenity users).

[2] 'Rationalisation of action' should not be confused with the concept of rationalisation used in (critical) social theories which, as a basic concept, refers to the 'scientification' of society.

[3] Projects are the goals that social actors try to realise through the mobilisation of resources based upon their vision of the future. They are "grounded in and/or reflect [...] specific sets of interests, commitments and prospects" (Long & Van der Ploeg, 1995: 67).

[4] Habermas (1997: 328) distinguishes three "limit cases" of communicative action: (i) conversation; (ii) normative-regulated action; and (iii) dramaturgical action. Each type is characterised by different forms of speech acts, different functions of speech and different actor-world relations, and addresses different validity claims.

[5] Note the similarity with Foucault (1979) who describes the strategies of ordering 'discipline' in terms of relational effects.

[6] The term 'actor-network' stems from the notion that an actor is an effect produced by a network of heterogeneous relationships (Law, 1992).

[7] In ANT literature a number of terms to refer to the human/non-human relationship are used. Law (1994) uses the word 'agent'. Latour (1987, 1994) proposes the word 'actant' to replace that of agent, while Callon (1986) uses the term 'actor-world'. The notion of *collectif* as developed by Callon & Law (1995) refers to the heterogeneous relations that make up an actor-network, agent, actant, actor-world, social actor.

[8] In this respect, it is very similar to Giddens' structuration theory, which studies the modes in which social systems are produced and reproduced by the knowledgeable activities of human actors who draw upon rules and resources in the diversion of action arenas, and in which the structural properties of social systems are considered to be "both a medium and outcome of the practices they recursively organise" (Giddens, 1993: 25).

[9] Intermediaries are things or people mediating between different actors, thereby defining the relationship between the actors and constructing a network or *collectif* (Verschoor, 1997).

[10] Actor-network theorists refer to *durability* when they study translation processes over time; some materials are more durable than other and so maintain their relational patterns for longer. They refer to *mobility* when studying ordering in space; it explores materials and processes of communication (Law, 1992).

[11] See Callon & Latour (1992) for a detailed discussion.

[12] See Latour (1997) and Law (1997a, 1997b) for a detailed discussion on the 'identity crisis'.

[13] Compare Crozier & Friedberg (1980: 97-98) who consider collective action to be a "problem of relation" (or of the organisation of human relationships) and therefore emphasise that "its fundamental dilemma does not admit solutions reducible to a simple economic-technical logic [...]. The solutions also reflect the *relational, i.e., cultural capacities of individuals*, which derive from their learning experiences in family and society".

[14] Some would argue that the notion of communicative rationality is in conflict with ANT, since the process of translation is essentially a strategic process. However, from an ANT perspective, the strategies actors use to enrol others are never 'mapped out'; these strategies are effects that are context-dependent or as Verschoor (pers. comm.) put it: "for the actors ... strategies are constructions that, in retrospect, justify a certain trajectory". Actions are thus oriented at success, but throughout the translation process objectives (and strategies) change as the *collectif* changes. For a successful translation to occur, actors draw on different rationalities and different intermediaries.

[15] The former Wageningen Agricultural University.

[16] Engel (1995: 52) emphasises that the knowledge systems perspective "is not meant to be a theory, it is meant to be a soft systems perspective: it focuses attention on a domain of inquiry, not on one particular way of explaining what we observe".

[17] In reality, the distinction between 'hard' and 'soft' systems is not that clear-cut. Nearly all conceivable hard systems are sub-sets of (soft) human activity systems. Röling (1997) gives the example of Yellowstone National Park as a soft system-in-the-making, since its goals are contested amongst various stakeholder groups. Another example is a computer, which is produced through interactions amongst people, companies and technologies and has been given a goal through this interaction process. Hence, Röling (*ibid.*) refers to 'coupled systems'.

[18] Political scientists use the term 'institutions' to refer to soft systems.

[19] Social learning has a multitude of meanings depending on different disciplines, theories and object of study. The most fundamental difference is that some researchers refer to social learning as learning by individuals that takes place in social settings and/or is socially conditioned, while for others it means learning by social aggregates (Parson & Clark, 1995). The latter form of learning is of particular importance to the knowledge systems perspective.

[20] Here knowledge systems theory draws heavily on Habermas' theory of communicative action.

[21] In the early stages of its development, the knowledge systems perspective was criticised by 'actor-oriented sociologists' for failing to consider the role of power and agency (see Long, 1989; Villareal, 1990). This criticism formed the basis for the further development of the perspective to include conceptualisations taking into account power and agency. However, as Engel (1995) emphasises, the handling of power

within a soft systems perspective remains problematical, since interventions are necessarily tied into power structures.

[22] This issue can be linked to a general criticism on the new orthodoxy of participatory approaches that such approaches are placing too much emphasis on techniques per se, rather than helping researchers and practitioners to investigate how methods and techniques are selectively used in the pursuit of personal, cultural and political ends (Biggs, 1995).

[23] I do not deny that a platform does not have a 'mission' or 'common purpose' as is assumed in the knowledge systems perspective (Engel, 1995). What I challenge is Röling's assumption that this mission must lead to a desired outcome: innovation, sustainability (1992, 1997). Although Engel (1995: 52) emphasises that "what this mission is, to which degree it is shared by all and whom the 'relevant' actors are, is to be determined along the way by those actors who consider themselves as stakeholders", Röling's assumption implies that the facilitator/extension worker, being one of the stakeholders, translates the proposals brought forward by the platform to what he deems desirable: ecological sustainability.

Chapter Four

Following the actors

A sensitive methodology for a grounded theory

By the inception of this study, I had already completed two research projects: one in England, and as a follow-up, one in Ireland; and had presented and published some of their findings as part of an on-going research project into complex, multiple-use common-pool resources undertaken at the University of Portsmouth, England. It seemed, therefore, a logical step to incorporate this existing work in the present book.

This strategy posed a 'methodological dilemma'. Although the research that had already been undertaken focused on collective action amongst multiple stakeholders and was done on the basis of 'following the actors' as advocated in ANT, it did not address the *translation* of collective action processes *per se*. The first study on collective resource management in Cowes (England) primarily focused on if and how different users could influence decision-making by the collective-choice umbrella organisation for resource management, the Harbour Commissioners. The second study in two estuaries in NW Connemara (Ireland) focused on interaction processes amongst traditional and new users of the estuaries and the strategies user groups employed to negotiate access to the CPR. Both projects were of significant benefit to the research into complex CPRs undertaken at the University of Portsmouth, and contributed to my dissatisfaction with the theoretical notions in CPR theory. However, I questioned whether or not the existing data were of sufficient quality to make a sound contribution to the more specific research problem underlying this study.

This methodological dilemma resolved itself: if a review of existing literature on collective action in natural resource management could lead to the identification of a number of issues that demanded further research, then my own case study material could certainly be used for the same purpose. The next step was to find a methodological approach for such an analysis, which resulted in the adoption of a 'Straussian grounded theory perspective' (Locke, 1996).

The grounded theory approach to my own data generated a number of issues for further investigation. A third case study area, the Dutch Wadden Sea, was selected to explore these issues. I also had the opportunity to (briefly) revisit the research area in NW Connemara to discuss some of the emerging issues from my previous work with local stakeholders. In my new job at the Dutch Fish Board, I had the opportunity to monitor the events in the Wadden Sea. The research process and the methodology I adopted are discussed hereafter.

Straussian grounded theory

Grounded theory is one among many qualitative research methods. The method was first developed by Barney Glaser and Anselm Strauss during a study into the interactions between hospital staff and their patients and was published in their influencing work *The Discovery of Grounded Theory* (Glaser & Strauss, 1967). The book was written as a polemic against the sociological enterprise in the 1960s, which was mainly concerned with the testing of hypotheses derived from the work of a few theorists, with the objectives of: (i) encouraging sociologists to use their own intellectual imagination and creativity in theory development relating to their own field, (ii) suggesting methods for theory development, (iii) offering evaluation criteria for discovered theory, and (iv) proposing a generative rhetoric to balance out the rhetoric of verification in scientific publications (Locke, 1996). Glaser & Strauss took the position that "the adequacy of a theory for sociology today cannot be divorced from the process from which it is generated" (1967: 5).

A grounded theory is developed on the basis of a recursive, process-oriented procedure that has two key analytical features: (i) the constant comparative method and (ii) theoretical sampling. The constant comparative method begins as soon as researchers start forming provisional categories from the data. While coding an incident for a category, it is also compared with previous incidents in the same category. As a consequence, theoretical properties of the categories are generated. As the coding continues, comparison changes from comparison of incident with incident, to comparison of incident with properties of the category that resulted from initial comparisons of interests. At the same time, the coding will prompt the researcher to decide on which additional data are required to further develop the categories, so-called theoretical sampling (Glaser & Strauss, 1967). Locke (1996: 240) correctly emphasises that

> "the grounded theory approach requires not only that data and theory be constantly compared and contrasted during data collection and analysis but also that the materialising theory drives ongoing data collection".

The processes of constant comparison and theoretical sampling continue until data gathering and comparative analysis yield no new examples and properties of a conceptual category, in other words, when the point of theoretical saturation is reached, and the grounded theory can be written (Glaser & Strauss, 1967).

Since the publication of *The Discovery of Grounded Theory*, advocates of the method have developed into two schools, the 'Straussian' (after Anselm Strauss) and the 'Glaserian' (after Barney Glaser) (Annells, 1996; Locke, 1996). The difference between the two schools mainly manifests in their beliefs about the role of the researcher, the use of data sources, and the basic inquiry paradigm to which they adhere.

In 1990, Strauss & Corbin published *Basics of Qualitative Research* in which they radically redefine the role of the researcher in the analytical process. In the

original work, to which Glaser has largely remained faithful, researchers are supposed to keep their distance and independence for the phenomena in order not to contaminate their data and the concepts that are formed. As Drinkwater (1992) rightly points out, this approach is problematic in that it is connected to a positivist theory of knowledge in which the researcher is considered to be value free. Strauss & Corbin made a radical departure from this positivist position in envisaging that a researcher should be actively involved in the research processes, essentially interrogating their data to arrive at conceptual categories (Locke, 1996).

These two views on the role of the researcher also reflect different perspectives on the use of other data sources in conceptualising data. Whereas the Straussian school allows for the potential of existing theory, non-academic publications, and personal and professional experiences to help researchers gain insight into the data, the Glaserian school advocates the position that researchers should not bring any *a priori* knowledge to the research project (Locke, 1996).

The Discovery of Grounded Theory derived its theoretical underpinnings from Pragmatism and Symbolic Interactionism (Corbin & Strauss, 1990). Two principles were drawn from these traditions. Firstly, phenomena are conceived of as continually changing in response to prevailing conditions. Thus, change, through process, is built into the method. Secondly, determinism is rejected; individuals are seen as social actors who are able to make choices according to perceived options. Thus,

> "grounded theory seeks not only to uncover relevant conditions but also determines how the actors under investigation actively respond to those conditions, and to the consequences of their actions" (*ibid.*: 419).

Although these principles remain the basis of both schools, there has been a shift in the paradigm of inquiry for both schools.

Based on a study of the ontology, epistemology and methodology of the 'classic' grounded theory, which is followed by the Glaserian school, and the Straussian school, Annells (1996) concludes that the classic approach follows a post-positivist or critical realist paradigm. This paradigm claims that "different natural and social realities exists, but that both forms of reality are probabilistically apprehensible, albeit imperfectly" (*ibid.*: 385). Objectivity is seen as an epistemological ideal; prediction and control remain theoretical aims. In contrast, the Straussian school has shifted towards a constructivist or relativist paradigm. Constructivism claims that there exist multiple, socially constructed realities ungoverned by any natural laws (Guba & Lincoln, 1989). The 'knower' is subjectively and interactively linked in relationship to what can be known. Consequently, the researcher engages in an inquiry process that *creates* knowledge through interpreted constructions; verification or falsification studies are in antithesis to constructivist methodology (Annells, 1996).

The adoption of a Straussian grounded theory approach has some implications for the research methodology underlying this study and, in particular, for my own role in the research process and the production of this text. Although a number of more 'conventional' sociological research methods were used during the study, a "sensitive methodology" (Knorr-Cetina, 1981: 17), in which the researcher is *engaged* in the inquiry process rather than being a neutral observer, was used. From previous research experience I learnt that objectivity as an epistemological ideal does not do justice to the complexities of social and sociotechnical interaction in the 'real world'. Like Guba & Lincoln (1989: 99), I experienced that research outcomes are "shaped during the course of the inquiry by the interaction of the investigator and the object of inquiry", no matter how hard I tried to 'stay out of the picture'. The implications of a sensitive methodology are discussed hereafter.

A sensitive methodology

In an essay on the constructivist nature of science, Karin Knorr-Cetina (1981: 17) proposes that a "sensitive methodology" is a necessity if we want to get a glimpse of the true character of the phenomena we study. She identifies three distinctive features of such a sensitive methodology. First, she argues, it requires engagement rather than detachment, or methodological intersubjectivity rather than neutrality (cf. Drinkwater, 1992). Second, as opposed to objectivism, a sensitive methodology needs some form of methodological relativism, giving maximum control over the information obtained to the subjects under study in order to give voice to that about which a story, or ethnography, is told. Third, methodological interactionism is needed in order to guarantee that the story, or ethnography, remains interested in the practice of its subjects.

According to Knorr-Cetina (1981: 23), the implications of a sensitive methodology are to "dismiss the methodological intermediaries generally used for collecting data". Rather, she propagates participant observation as a method to record what is happening to the objects under study, with formal interviews as an additional method to collect information on questions arising from the observations.

My own approach differed. Unlike Knorr-Cetina, who spent twelve full months in a laboratory for her ethnography, time was a constraining factor in my research projects. Although I recognise the benefits of using anthropological research methods such as participant observation, I could not rely on participant observation alone to follow the actors to collect primary data. Therefore a number of both anthropological and sociological research tools were used to 'follow the actors', such as: (i) formal unstructured interviews in which the interview was 'constructed' by the interviewee, (ii) informal interviews, (iii) group discussions, (iv) life histories, (v) 'critical incidents' technique, (vi) mapping, (vii) site visits, (viii) questionnaires, and (ix) participant observation. Throughout the field work, my role was to be engaged in the process and to make people construct their own story.

Throughout the fieldwork for the three case studies, 'following the actors' implied that I not only followed the human actors but also the non-human entities that were part of the interaction process and through which actions were mediated[1]. I was also cautious not to adopt pre-defined categories of, for example, 'successful' and 'unsuccessful' collective action, which, in previous research as a master's student and, later, during my research in Cowes Harbour, I found very restrictive; a feeling that was strengthened by reading ANT literature.

One may argue that a sensitive methodology interferes with the research outcomes in two important ways. First, the social actors under study may become very 'aware' of the presence of the researcher and may act or say things in a way they normally would not have done. Socially desirable answers are a good example. Second, the researcher may become so engaged in the research and (some) of the social actors that his representation of the actors' reality becomes 'coloured'. Tackling these externalities is not easy, but they can be minimised by adopting what Drinkwater (1992: 373) calls "a three way sensitivity" to analysis and presentation of the data: (i) sensitivity to the views of the social actors under study, (ii) sensitivity to one's own views, and (iii) sensitivity to the need of the reader to have a basis for evaluating the analysis. Here we enter the field of critical hermeneutics *(ibid.)*.

Hermeneutics can be defined as "the understanding and interpretation of human action, either directly, or indirectly to textual analysis" (Drinkwater, 1992: 373). Drinkwater rightly remarks that social science is characterised by what Giddens (1993: 284) calls a "double hermeneutic" that "derives from the double process of translation or interpretation which is involved". First, the researcher interprets and translates social action into categories or frames of meaning. Second, these categories or frames of meaning on their turn are translated by those to whom they are conveyed, e.g. readers of a sociological publication[2]. Based on a discussion on work in the field of philosophical hermeneutics, which is concerned with the search to understand the process of understanding and interpretation itself, Drinkwater (1992) concludes that critical hermeneutics is concerned with the understanding of social action through our historical experience and a dialogic process of engagement amongst different actors. In this process of engagement, social actors are involved in a learning spiral, in which their understanding advances as they move on and discover that earlier conceptions they held were misplaced and incomplete. Thus, the process of engagement between the researcher and the social actors under study is of vital importance to the researcher's understanding of social action. A performative role of the researcher is a prerequisite to encourage this process *(ibid.)*.

Critical hermeneutics helps us to 'solve' the dilemmas inherent in 'being engaged' in the research in that it tells us that we can make no *a priori* decisions about how far we can intervene is a social situation at the start of a research project (Drinkwater, 1992). Although Drinkwater briefly touches on the implications this has for our interpretation and translation of the social phenomena under study (Giddens' first hermeneutic), he does not further discuss the implications this has

for the second hermeneutic, the interpretation of the research text by the reader. However, it is exactly because of the performative role of the researcher that the reader needs to be given a basis for evaluating the text. For example, when I went out fishing with Dutch cockle fishermen, they asked me what I thought of the way the environmental groups "criminalised" the cockle fishermen. Although I sensed that fishermen felt being criminalised from 'reading between the lines', this was the first time a fisherman openly spoke about it. If I had exercised 'neutrality' I would not have answered the question and would have been deprived of a lot of information. Instead, I told him that I felt that the fishermen had put a lot of effort in regulating their fisheries for nature conservation purposes and that I thought that it was a shame that the environmental groups continued to create a negative image of fishermen in the media rather than support their actions. This resulted in a vivid discussion which was later continued when his colleagues boarded the vessel for lunch. This is one of many examples where I was actively involved in making people construct their story. Another example are the oyster fishermen in Cowes who, encouraged by the development of the estuary management plan that I was involved in as a facilitator and researcher, started a collective effort to negotiate long term access to their fishery. In cases where I suspect that my engagement had a major impact on the data, I will inform the reader.

A further number of evaluative criteria or guidelines are provided by Strauss & Corbin (1994). Although originally developed as criteria for judging a grounded theory study, some of their evaluative criteria for the research process and the empirical grounding of the study are useful for the second hermeneutic, the translation of the text by the reader. These criteria can be summarised as follows: (i) how was the original sample selected, (ii) how did theoretical formulations (categories) emerge, (iii) how were conceptual relations between categories formulated (and tested), (iv) what concepts were generated, (v) how were external factors having a bearing on the phenomenon under study accounted for, and (vi) have specific changes in the research process been identified?

Selecting and constructing case studies

In the introduction to this chapter, I mentioned that two of the cases in this study had already been undertaken as part of a research programme in the management of complex, multiple-use common-pool resources at the University of Portsmouth. Only one case study area, the Dutch Wadden Sea, was specifically selected for this study. This section discusses the process of selecting and constructing the case studies.

Case study 1: Cowes Harbour, Isle of Wight, UK

The management of multiple-use common-pool resources (CPRs) is a complex, and sometimes problematic, issue. Many CPRs are managed under a number of different property rights, including common property, public property and private property. Guaranteeing long term social, economic and ecological sustainability of

the resource means that not only the different activities have to be managed separately, but also that the activities of the separate user groups have to be co-ordinated. In many cases, management of the resource as a whole is carried out through an 'umbrella organisation'. As part of the research into multiple-use CPRs at Portsmouth, we were interested in taking a closer look at those umbrella organisations and, particularly, if and how the different user groups could influence decision-making by the umbrella authorities and the strategies they adopted. A case study area was soon found through my involvement in the Medina Estuary Management Plan (MEMP).

The MEMP was commissioned by Cowes Harbour Commissioners and developed by the Centre for Coastal Zone Management at the University of Portsmouth, with the objective of achieving

> "the sustainable use of the Medina Estuary through the integrated management of its resources by ensuring that a balance is secured between the protection and enhancement of the natural and man-made environment and the continued development of the local economy" (CCZM, 1997: v).

It was formulated on the basis of extensive consultation and participation of user groups and other parties with an interest in the estuary.

One of the stages in the development of the estuary management plan was the formulation of seven Topic Groups responsible for the production of Topic Reports on the various physical characteristics and socio-economic uses of the estuary. The Topic Groups comprised representatives of different users of the estuary. Their responsibility was (i) to collate information about their activities, (ii) to identify key issues and problems, and (iii) to formulate recommendations for dealing with these issues. The Topic Reports formed the basis for the development of the MEMP. My role was to act as the facilitator for the Topic Group on Recreation, i.e., arranging and chairing meetings and assisting in the production of the report. My involvement in the plan meant that I had already established a network with the recreational users and the Cowes Harbour Commissioners, which is the umbrella organisation for resource management. This was the first incentive for selecting Cowes Harbour as a study area.

The estuary also accommodates an oyster fishery that (at the time) was managed by the fishermen under a common property regime based on informal agreements. This was another incentive to select Cowes Harbour. Since information about the oyster fishery was virtually absent, my study would also benefit the Topic Group on Commercial and Economic Uses.

The Medina Estuary, and Cowes Harbour in particular, are characterised by a large number of different user groups. Therefore I decided to select three user groups for the study. The first group was the yachting world. Cowes is an internationally renown yachting centre and yachting constitutes a crucial part of the harbour and town's economy and social life. The continuing growth of the sector has led to a

number of management problems related to safety and navigation. Second, I selected the commercial shipping industry. Cowes is the island's only deep water port and is of prime importance to import and export of goods from and to the mainland. The third group was the oyster fishermen, who were not represented in the Harbour Commission, but managed the fishery through informal agreements.

The field work for the study was carried out over a period of three weeks in May and June 1996. A total of 27 formal unstructured and four telephone interviews were held. Interviewees were selected in such a way that, in the initial stage of the research, I obtained a broad range of different views, both amongst user groups (e.g. fishermen, yachting clubs) and within user groups (e.g., fishermen - fishermen's association; yachting clubs - marinas). Later, I arranged interviews with people who could offer specific views on emerging issues (cf. Guba & Lincoln, 1989 on maximum variation sampling). A short questionnaire was sent to three user groups that were unable to make arrangements for a personal meeting. In addition, informal conversations, group discussions, mapping and participant observation were important methods. An impression of the different activities was obtained during site visits at the wharves and marine, sailing trips, and oyster fishing. Continued involvement in the MEMP after the field work for the case study was a further additional source of information. An overview of the interviews held is presented in Appendix One.

The Topic Reports that were produced for the estuary management plan provided an important source of secondary information. Further information was found in a number of development plans for the harbour, visitor surveys, questionnaires that were undertaken as part of the estuary management plan, brochures, newspapers and the Records Office.

The Cowes Harbour case study specifically dealt with the role of umbrella organisations in multiple-use CPR management. The Cowes Harbour Commissioners, the umbrella organisation, had already been in existence for a century and, consequently, had a long experience in dealing with multiple users and multiple-use management. Many coastal CPRs in more remote areas, however, have only recently become 'true' complex, multiple-use resources. In such coastal zones, new uses such as aquaculture, marine reserves and marine tourism, have only been developed during the past 25 years. As part of our research programme in Portsmouth, we were interested in the impacts of the development of new activities and the responses of traditional user groups to the new demands that developments in the coastal waters places on resource management. NW Connemara in Ireland proved an ideal case study to look into these issues.

Case study 2: NW Connemara, Ireland

In 1994-5, I was working on my Master's thesis in Rural Development Sociology at Wageningen Agricultural University[3], The Netherlands. The subject of the thesis

was the role of shellfish farming as a tool for socio-economic development in NW Connemara (Steins, 1995). I undertook a study of a shellfish farming co-operative in one of the bays in the area, and soon found out that the co-operative's objective of providing coastal fishermen with supplementary income was hindered by a collective action problem: within six months from its inception, two third of the shareholders had become free-riders who did not contribute the compulsory voluntary work at the co-operative's sites. Initially, it seemed as if fishermen were frustrated because of technological problems. However, after several weeks of working at the sites, going fishing and drinking Guinness, the fishermen decided that I was to be trusted and they told me that the hidden objective of the co-operative was to prevent the local salmon farm's application for a new production site. By creating property rights to parts of the bay, they hoped to secure access to their fishing grounds. After they had created the co-operative, their objective was achieved and some of them decided to call it a day. Others soon followed for a variety of different reasons and only the members who were committed to make it work, remained actively involved.

When we were looking for a case study of a CPR that had only recently developed into a multiple-use resource, the conflicts between traditional users (fishermen, wild salmon fisheries) and new users (aquaculture, tourism) in NW Connemara immediately called to mind. I contacted the community development project I worked with during my first stay, and in July 1996 I left for NW Connemara.

On the basis of discussions with the director of the community development project, I decided to study the multiple uses in Ballynakill Harbour were I worked before *and* the different users in Killary Harbour, a fjord-like bay about 15km further up north. Two factors influenced the decision to select a second case study area. First, the Killary had a slightly longer status of a multiple-use resource. Whereas shellfish aquaculture and marine tourism in Ballynakill Harbour had only developed in the 1990s, the Killary's development for tourism and aquaculture already started in the late 1970s. Second, the level of conflict in Killary seemed to be smaller than in Ballynakill and co-operative links amongst the different users had been established. I was interested to see why these differences in users' attitude towards each other occurred.

The field work was carried out over a period of five weeks in July and August 1996. My previous research experience greatly facilitated the field work in terms of making contacts with local stakeholders and my knowledge of the area. The main methods of primary data collection were the semi-structured and unstructured interview. A total of 35 personal interviews and eight telephone interviews were held with 29 different representatives of stakeholder groups at local and organisational level. Seven people were interviewed twice because of their knowledge of the area and their involvement in multiple marine activities. The selection of interviewees took place in the same way as in the previous study (maximum variation sampling). However, due to time constraints because of the fishing season, fishermen were not formally interviewed until the last two weeks of the field research. An overview of the interviews is presented in Appendix One.

In addition to the formal interviews, informal conversations and participant observation were crucial throughout the fieldwork. Fishing trips with both commercial coastal fishermen and sea angling operators, site visits to the different salmon and shellfish farms and one of the freshwater fisheries were important not only for 'getting a feel' for the stakeholders' activities and their concerns, but also in establishing trust and obtaining additional information on sensitive issues. The local pub, which fulfils an important social function in rural Ireland, was another source of information.

Secondary data primarily comprised reports by the community development project, the Irish Sea Fisheries Board and the shellfish co-operatives, a number of academic publications on research carried out in the area and newspaper articles.

In January 1998, I had the opportunity to visit NW Connemara again as part of a study I was working on as a member of the Task Group on Inshore Fisheries Management of the European Social Science Fisheries Network. The Task Group was working on a comparative study of fisheries management systems in the 12 miles territorial waters of the European Member States. During the field work for this study, I spent three days in NW Connemara interviewing eight stakeholders and visiting some of the sites. I also visited the Department of the Marine and Natural Resources and the Irish Sea Fisheries Board in Dublin. Appendix One gives an overview of these interviews. It must be noted that the 16 other interviews that were carried out with various stakeholders along the Irish seaboard (Co. Galway, Co. Kerry, Co. Cork, Co. Dublin) as part of the study were also crucial in furthering my understanding of coastal zone management in Ireland and its problems.

Case study 3: Wadden Sea, The Netherlands

The third case study area, the Dutch Wadden Sea, was selected after I decided to start working on a doctoral dissertation in March 1997. From my previous research into the management of multiple-use CPRs, a number of issues for further research had emerged, which are discussed in detail in Chapters Two and Six. The key issues emerging from the Cowes Harbour study included: (i) the importance of contextual factors for explaining (mis)representation in umbrella organisations at the collective-choice level, and (ii) the reliance on collective action as a strategy by which local stakeholders who are *mis*represented can gain access to the decision-making arena. A key issue emerging from the NW Connemara study was how local resource use was contested as a result of the lack of participation in the development of the marine resource base and how this facilitated (or obstructed) co-operation amongst different local stakeholders. Ideally, I had to find a research area where: (i) local stakeholders had been influential in the coastal policy process at national level, (ii) the CPR was used by multiple stakeholders who had to co-operate to guarantee long-term social, economic and ecological sustainability, (iii) the government played a facilitating in promoting co-operation amongst stakeholders, and (iv) bigger social issues were at stake. Another, but not decisive,

criterion was that the research should not be carried out in Ireland or the UK in order to further the study's international perspective.

Surprisingly, finding a case study area was quite easy. Through my contacts with the European Social Science Fisheries Network, I knew that the Dutch government had adopted a co-management approach to integrate inshore fisheries and nature management, in which management responsibilities are divided between the government and the fishing industry. I also knew that the co-management approach was adopted after the shellfish industry had successfully implemented voluntary regulatory measures after a period of serious conflicts with environmental groups and the public over their alleged overfishing of the shellfish stocks, resulting in high mortality rates of birds in the Wadden Sea, and that resource use is not only contested at local level, but has also become a social concern.

With help of one of my Dutch contacts, I contacted the Institute for Forestry and Nature Research at the Frisian island of Texel, where I was given a warm welcome as 'their' first sociologist. The field research took place over a 10 weeks' period in the months of June to August 1997 during which I collected both primary and secondary data. A total of 38 formal interviews were carried out (Appendix One). Texel's relative remoteness from key actors in the management of the Wadden Sea at the organisational and constitutional levels meant that travel times were a constraining factor in the number of formal interviews that could be held. It also meant that maximum variation sampling was more difficult to achieve. When I started the research, the evaluation of the first phase of the co-management measures (1993-97) had just begun and I found this a big advantage in that interviewees were very willing to assist the research. Arranging interviews was also facilitated by the fact that I had met a large majority of representatives from the fishing industry at a seminar that was held during the second week of the field research. In addition to the interviews, information was obtained during informal conversations at the mussel festival in the village of Yerseke, where all key actors in shellfish fisheries management were present and during a fishing trip with one of the cockle fishermen.

Secondary data included government publications, reports by the various stakeholder groups, reports by consultants, academic publications and newspaper articles.

In my new job at the Dutch Fish Board, which commenced in October 1998, I had the opportunity to monitor the recent developments concerning the co-management strategy for shellfish fisheries in the Wadden Sea.

The case studies that have been constructed on the basis of the field research, complemented by secondary data, are presented in Chapters Two, Five and Seven. The case of Cowes Harbour (Chapter Two) sets the empirical scene for the study; that is, contextualises Chapter One. The empirical chapters Five and Seven are each followed by a 'theoretical intermezzo' in which emerging issues from the

case study are discussed and are taken aboard for the next case study. By doing so, I aim to construct a truly grounded perspective and give the reader a basis for the evaluation of the study.

Notes

[1] The inshore fishermen and their interactions with other *collectifs* were the main actors I followed. In the analysis of complex, multiple-use management, it is imperative that *all* stakeholders and their interactions with other *collectifs* are followed and, following actor-network theory, that they are followed in the same terms (see Chapter Nine). However, because of time constraints, and to facilitate the analysis, the other actors were only followed when their presence or actions influenced the strategies the fishermen employed.

[2] Jiggins and Röling (1998) argue that in the interpretation of the social world of actors under study, there is a third hermeneutic. When social scientific research is used to support policy processes, the third hermeneutic arises in the stage where the research data are passed on to policy-makers, who have to make sense of the researcher's sense-making of the sense-making of the social actors under study, in order to design new policies.

[3] The present Wageningen University.

Chapter Five

Strategies of (mis)representation

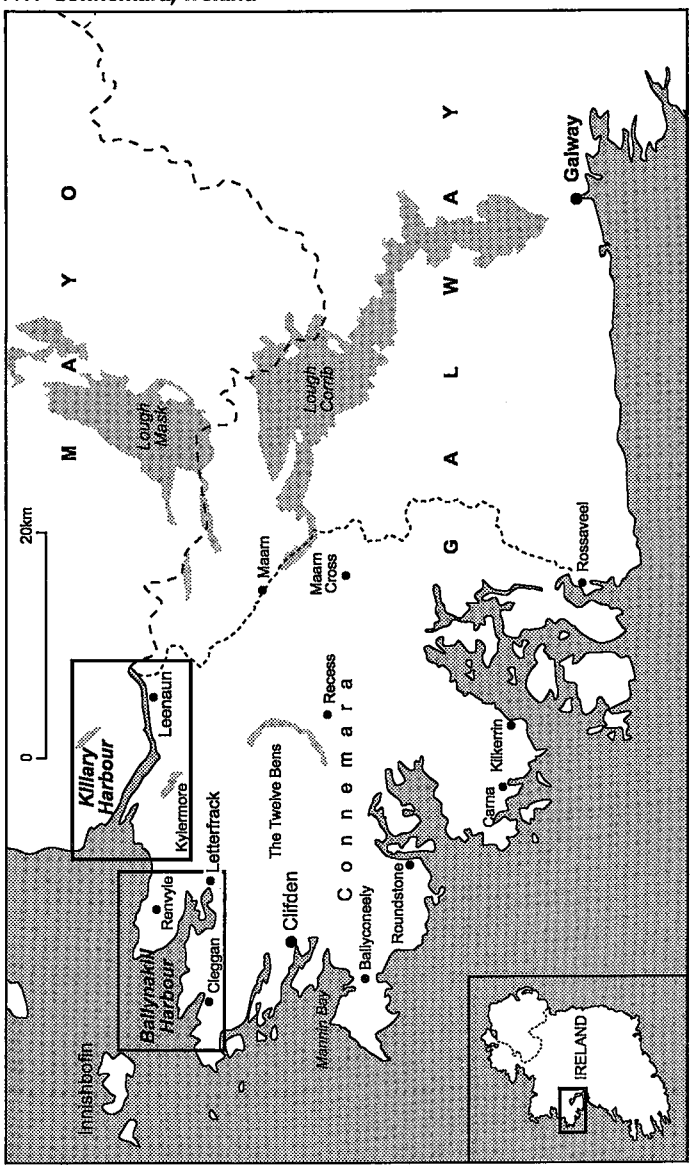
Co-operation and conflict in NW Connemara, Ireland

The hustle and bustle in Cowes Harbour and its surrounding waters has been going on for many centuries (Chapter Two). Other coastal waters have only recently been 'discovered' by new interests and have just started to develop into complex, multiple-use common-pool resource systems. One such area is NW Connemara, on the Irish western seaboard (Figure 5.1). Its rocky coast with its many bays and inlets and sometimes treacherous waters provided a perfect, but dangerous, environment for inshore fishing activities and safe havens for privateers, but were hardly suitable for the development of merchant and naval ports. The mainland, with its rocky mountains and bogs, was not suitable for agriculture and in the period of English rule (1154-1921) was hardly opened up. Today, this is reflected by its large Gaelic-speaking population and its status as an economically peripheral area. The principal source of income is agriculture, mainly oriented towards raising sheep, followed by inshore fishing. Recently, tourism has become an important source of supplementary income. The lack of employment opportunities has resulted in high levels of emigration (Ruddy & Varley, 1991). Through community development programmes and by creating favourable conditions for starting entrepreneurs, the government, assisted by the European Union, attempts to tackle high unemployment rates and migration levels.

The potential of Connemara's coastal space was not appreciated until the 1970s when rising income levels, increased leisure time and changing life style patterns marked the beginning of the area's development for tourism. The breath-taking scenery of the landscape and its unspoilt character are actively being promoted by the tourism industry and attract an ever-increasing number of holiday makers (Bord Fáilte, 1994). Tourism development is seen as an important mechanism to reduce the country's high unemployment level. In the period 1988-93, 25,000 new jobs were created in this sector, involving an investment of IR£ 750 million from national, European and private enterprise funds. In the National Development Plan 1994-99, a total of IR£ 1.6 billion will be invested to generate a further 23,000 new jobs in the tourism sector (Phillips & Tubridy, 1993). Another mechanism that is considered to be a key strategy for socio-economic progress is the development of finfish and shellfish aquaculture. The promotion of aquaculture must also be seen in the context of the challenges inshore fishermen are facing, which result from, *inter alia*, depleted fish stocks, poor landing facilities, poor marketing opportunities and the average old age of vessels (Steins, 1998b). With financial support from the government, aquaculture production has increased from 5,753 tonnes in 1980 to 29,860 tonnes in 1994 and nearly 3,000 people are now employed in this sector (Marine Institute, 1996; O'Connor *et al.*, 1980).

The development of the coastal waters has been dominated by a top-down approach. Public participation is subservient to organisational consultation, and at local level is only conducted on a non-personal basis. As a result, many local people feel that development is imposed upon them and that some new activities are conflicting with local interests (Steins, 1998a).

Figure 5.1
NW Connemara, Ireland



The focus of this chapter is on 'strategies of (mis)representation', i.e., the strategies that social actors employ to negotiate access to a common-pool resource. The difference with the case study in Chapter Two is that in the two study areas in NW Connemara, umbrella authorities for multiple-use CPR management are absent. Another distinction is that in Cowes Harbour, the oyster fishermen had peacefully co-existed with the other users until they themselves violated the collective-choice navigational rules of the umbrella authority and, in response, sought privatisation of their fishery to secure future access and reinforce their bargaining position. In NW Connemara, fishermen felt that their conventions were violated and their resource was threatened by the arrival of newcomers, a process in which they hardly had a voice. However, although the two estuaries are characterised by the same activities and are fished by the same fishermen, there are many contrasts in the way the user groups in the study areas interact, mobilise resources and shape collective action.

Ballynakill Harbour

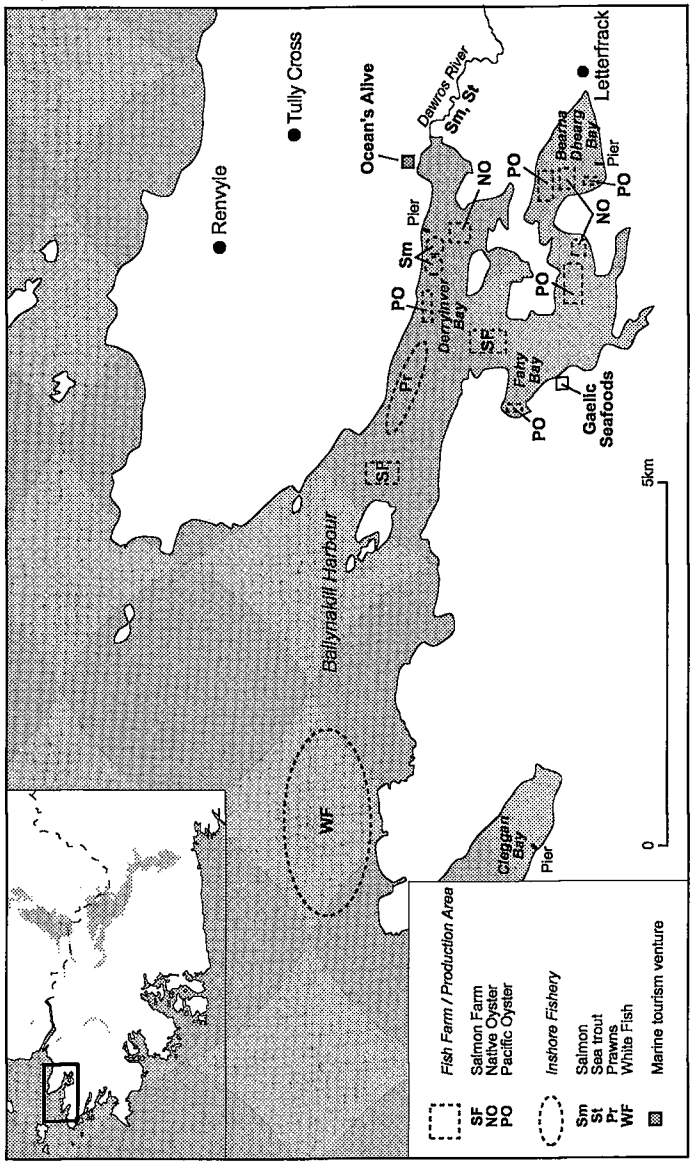
From single use to multiple use

Ballynakill Harbour is located in NW Connemara and includes a number of smaller inlets, such as Bearna Dherg Bay, Fahy Bay and Derryinver Bay. The river Dawros drains into Derryinver Bay from the north-east (Figure 5.2). Traditionally, fishing for domestic and commercial purposes was the most important activity. Nowadays, it has become a less interesting commercial fishing ground. The bay is shallow and not suitable for modern trawlers. In addition, there is no market for the species found in the bay, such as mackerel and herring in the spawning season. As a consequence, fishing in the inner bay has become a domestic activity. The only species that is fished commercially is shrimp (potting), with the season running from September until January. Trawling for white fish mainly takes place in the outer part of the bay. In June and July, three draft net crews target returning salmon from the salmon stands in Derryinver Bay (Figure 5.2). Salmon, which is a migratory species, leave the freshwater in which they are born after a period of one to up to four years, in the period April to June. They migrate to the sea (in this case the mid North Atlantic) where they stay for one or two years, after which they return to their river of origin, with the runs peaking in June and early July.

The majority of the fishermen are 'day fishers' and only use small boats (<10m). They generally do not target species that are subject to quota under the Common Fisheries Policy. Although they require a licence for their vessels, they do not need licences for the species they target. As a result, the coastal fishery, except for areas where a Fishery Order is in existence, is carried out under 'open access' conditions[1]. Salmon is the only species for which fishermen nation-wide require a fishing licence. Since the fishing season is only short and fishermen are experiencing problems resulting from depleting stocks, increased competition and poor landing and marketing facilities, most full-time fishermen in Connemara are

receiving supplementary earnings from their wives or have to avail of unemployment assistance from the government.

Figure 5.2
Ballynakill Harbour, NW Connemara



NW Connemara accommodates some of the best salmon and sea trout fisheries in Ireland. The Kylemore fishery comprises three *loughs* and over three miles of river and drains into Ballynakill Harbour through the river Dawros (Figure 5.2). The

fishery is in private ownership from three owners and can house a total of 16 anglers. The average salmon catch is approximately 200 salmon a year. Its three owners, in collaboration with the Western Regional Fisheries Board and backed up by European funding, have started a salmon restocking project. Kylemore used to be a classic sea trout fishery, but has suffered from the nation-wide collapse of the stocks in 1989; a statutory ban on the taking of sea trout has been in effect from 1990. In order to be able to fish in the freshwater fisheries, anglers need a state licence. The periods the licence covers, vary from one day, multiple days to an entire season. Different freshwater owners charge different prices for the licences.

In 1978, the development of the bay for aquaculture began. Two Dubliners established a finfish farm focussing on the production of rainbow trout (*Salmo giardneri*). Once the company started to expand it shifted to the production of Atlantic salmon (*Salmo salar*). In 1984, it lost all its fish in a heavy storm and the farm faced bankruptcy. With help of the National Development Corporation, that bought 40% of the shares, the company could reinvest. Later, two foreign multinationals became important shareholders. In 1992, Gaelic Seafoods, a Scottish multinational and Europe's largest seafood producer, took over and production capacity was reduced. The farm is a fully integrated company with an own hatchery and processing and marketing line. It employs nine full-time workers and two part-timers. The farm has two sites, which accommodate 16 fish cages (Figure 5.2). The fish cages contain salmon of one single generation of salmon; once a cycle (12-18 months) is completed and the fish are sold, the cages are filled with new juveniles. The production per cycle is approximately 600 tonnes.

Shellfish farming is the other aquaculture use. In 1982, two 'local Frenchmen' started the Ballynakill Oyster Fisheries Company Ltd. The company subleases 20ha of seabed from a private individual whose licence dates back to the beginning of the century. Only 5ha are in actual use. In the first years of its inception, the company successfully focused on the experimental production of Pacific oysters (*Crassostrea gigas*), but experienced a setback in 1985, when the oysters became deformed. In 1986, scientific research revealed that Ballynakill Harbour had the highest concentration of Tributyltin (TBT) - an anti-fouling paint used on the nets of salmon farms and ships - in the country; this partly explained the problems the oyster company was experiencing. After the TBT-ban in 1987, the production of Pacific oysters was continued and the company now has 500 trestles on which these oysters are grown in plastic bags (Figure 5.2). In 1990, the company started to grow flat oysters (*Ostrea edulis*), but production has been kept at a low level after it was discovered that the bay was infested with the protozoan *Bonamia ostreae*, which causes high mortality rates among three and four year old oysters and, consequently, affects recruitment. The company employs one full-time worker and three part-timers.

In 1991, a marine biologist in collaboration with a group of local fishermen initiated the North Connemara Marine Co-operative. The co-operative's main objective was to revitalise the bay's existing flat oyster beds, which had been derelict since 1903 (Wilkins, 1989). The co-operative subleases its sites from

Ballynakill Oyster Fisheries Company. In 1993, it started a second project: a demonstration farm for Pacific oysters with the aims of assessing the bay's suitability for growing this species and encouraging individual members to start off their own farms. The co-operative has 92 members, of whom 75 have a share in the flat oyster restocking project. Their share consists of a cash payment of IR£ 150 plus 18 days of voluntary work at the co-operative. Fully paid up shareholders are eligible for a fishing permit for the oyster beds. Problems with the restocking project, the collapse of the market price for flat oysters in 1992 and a bonamiasis disease scare in 1992-93, prompted the co-operative to diversify, resulting in the production of Pacific oysters and scallops (*Pecten maximus*). The co-operative is illustrative for the government's attempts to bring about socio-economic development in the area. During the period 1991-95, the co-operative received technical, managerial and administrative assistance and an estimated total grant aid sum of IR£ 77,500 from a range of agencies, including the Irish Sea Fisheries Board (BIM), a community development project under the European 'Poverty 3' Programme and the Training and Employment Authority (FAS). Despite this extensive support, the co-operative has experienced numerous ups and downs. Based on a scientific study, its board has decided to abandon the flat oyster restocking project and focus on the production of Pacific oysters. Current annual production of Pacific oysters is 5 tonnes; in addition, the native oyster beds yield approximately 0.5 tonnes (Figure 5.2).

The attempts by the North Connemara Marine Co-operative to stimulate individual members to start their own Pacific oyster farm, were not successful until 1995, when the first member started up with financial assistance from the European PESCA programme[2]. A second member started his own farm in late 1996 (Figure 5.2). There are two more applicants for individual licences. To the individual producers, the co-operative provides a service structure. The individual producers receive technical and administrative assistance from the local BIM Aquaculture Development Officer and obtained grants under PESCA.

Marine tourism development in Ballynakill Harbour is still in its infancy. The majority of tourists are attracted to the area by the beautiful scenery in the Connemara National Park. In the early 1990s, one of the locals started a company offering boat and sea angling trips to tourists. In 1997, he opened a marine heritage centre on the shores of Derryinver Bay with financial assistance from County Galway and PESCA (Figure 5.2).

Thus, the development of Ballynakill Harbour into a multiple-use resource is relatively recent. Although the first 'newcomers' – the salmon farm and the oyster farming company – were established in respectively 1978 and 1982, the nature of these operations at the time can be described as experimental. Its development into a more complex common-pool resource dates back to the late 1980s when the existing aquaculture ventures reached their production phase. The 1990s witnessed a further development of aquaculture and marine tourism. The development of salmon farming, in particular, has caused much conflict amongst

the different user groups, and acted as a catalyst for collective action amongst users of the bay.

Co-operation and conflict in CPR management in Ballynakill Harbour

Salmon farming has become a contentious issue in Connemara, as well as in other areas in Ireland and abroad. Aquaculture development is associated with advantages, most notably the creation of direct and indirect employment, the protection and enhancement of commercial and recreational fisheries and product quality improvements. However, its development may also have adverse effects, such as ecological and environmental externalities resulting from the use of external inputs[3] and a shift in the seafood supply curve through increasing production levels, leading to lower market prices for captured and cultured species (Steins *et al.*, 1998).

When the farm in Ballynakill Harbour, now owned by Gaelic Seafoods, was set up in 1978, the small scale of its operations contributed to its initial local acceptance. However, as its size expanded and public awareness about the extensive use of external inputs increased, concern about its ecological impacts was raised. Local concerns were aggravated when scientific research indicated that the bay had the highest TBT pollution levels in the country. When the detrimental effect of TBT to the marine ecology was discovered, the use of the chemical (except under certain conditions) was banned by all European governments to implement a European directive on pesticides (Ruddy & Varley, 1991). Although the problem of the TBT pollution has been solved, other users of the bay and local communities keep using the salmon farm as a scapegoat for any form of pollution in the bay, despite the presence of other pollution sources, such as sewerage effluent, acidification by the pine forest along the shore of the bay, increases in sheep numbers and the development of tourism. When the sea trout stocks (*Salmo trutta*) collapsed in 1989[4], fishermen and freshwater fishery owners immediately attributed the phenomenon to the practices of the salmon farms.

In addition to environmental issues, local concerns focus on the perceived impact on tourism development:

> *"There is nothing like this area in Europe. We are the most westerly coastline, we've got all these inlets, the islands, a gulf stream and the area is unspoilt. We've got more coastline per head of the country and still the government manages to plunge fish cages in front of scenic bays"* [Manager adventure centre].

Ecological externalities, the presence of *"unsightly cages"* in unspoilt scenic area and restricted access in licensed areas for sea angling and sailing are considered to adversely affect tourism development[5].

A third concern related to the salmon farms is the increasing number of restricted areas for other activities. Fishermen, in particular, feel they are losing territory to the farms:

> *"The salmon farm [in Killary Harbour] put their cages exactly on top of our best [public] oyster beds. I mean, we couldn't make loads of money on those oysters, but there were still enough to earn a few bucks. [...] We objected to their application for a new site, but they got it anyway and now we can't put lobster pots in that area anymore. [...] The politicians don't care"* [Michael[6], fisherman].

In Ballynakill Harbour, local antagonism towards the salmon farm was fed by the general perception that the economic benefits of the farm, once it started expanding and changed hands to foreign multinationals, did not stay in the area. It must be pointed out that the farm, before it was taken over by Gaelic Seafoods, made an important contribution to job provision, employing 36 full-time and 4 part-time workers, 90% of whom were locals.

The fishermen perceive another economic concern:

> *"The prices [for wild salmon] have dropped. They always said that the salmon farms were not going to compete with the commercial fishermen, but they were wrong"* [Michael, fisherman].

Wild salmon prices have dropped to IR£ 2 a pound, which reflects the national trend in the decreasing market prices due to the increasing availability of farmed salmon. For many Irish salmon fishermen, salmon fishing has become more of a hobby since the economic benefits of fishing do not outweigh their costs. Shifting to other fisheries is often not a feasible strategy because of licence requirements and lack of capital and infrastructure:

> *"Fishing has become more of a hobby now. The prices are so low that it would not generate income. If you add the investment up and the time and effort you would probably be fishing for IR£ 1 an hour. That's crazy. [...] The young people are not looking at the sea anymore and they are probably better off in a nine to five job. We are just the last keeping a tradition going. Our family has been in the area for 600 or 700 years and they have always lived off fishing; but I doubt if we are any better off than our great great grandfather. [...] You would be mad if you started fishing now. It would cost at least IR£ 20,000 to buy a boat and everything. The prices are so bad that you would not get any returns from the investment"* (Michael, fisherman].

The frustration over the economic returns of inshore fishing does not only concern the salmon fishery, but also the fishery for other inshore species, such as crustaceans and shellfish.

Antagonism over salmon farming is aggravated by the fact that local communities hardly had a voice in the designation of areas now used by the salmon farms. In fact, the speed by which aquaculture grew meant that many salmon farms in Ireland commenced operations before being issued with the required licences[7], although

statutory regulations for aquaculture development were present (Ruddy & Varley, 1989). Public participation in the designation of areas for aquaculture development was provided for in the 1980 Fisheries Act. However, as public opposition against salmon farming mounted, and nation-wide court decisions ruled against the designation of sites, the Minister reverted to an article in the 1959 Fisheries Act that was not repealed by the 1980 Act. This meant that the Minister was given wide powers to grant aquaculture licences without prior designation of the area for aquaculture. As a consequence, the process of public participation in the designation of sites was abandoned in favour of a top-down approach. Public participation had become subject to institutional consultation, and at community level liaison is only conducted on a non-personal basis (Steins, 1998a).

The presence of the salmon farms has resulted in a strong 'anti-finfish farm lobby' formed of both local communities and users of the coastal resource base. In Connemara, actions by this lobby reached a peak when the new fish cages of the salmon farm in Mannin Bay were sabotaged and IR£ 250,000 worth of juvenile salmon were released, nearly putting the salmon farm out of business (Steins, 1998a).

In 1989, the salmon farm in Ballynakill Bay applied for a third site with the objective of creating rotation and fallowing grounds to control disease problems and to alleviate environmental impacts. Rotation and fallowing are recommended strategies by the Irish Salmon Growers Association. The proposed site was located in the outer bay and, more particularly, in the whitefish grounds. Objections against the application mounted. Fishermen felt they should do something. At the same time, a local marine biologist in collaboration with a group of fishermen called a public meeting to discuss the potential of revitalising the derelict flat oyster beds in Ballynakill Harbour, which would extend the fishing season with a few months and would generate supplementary income. After a few meetings, a Business Plan was written to attract funds and support the licence application. In 1991, the North Connemara Marine Co-operative was established. Although the revitalisation of the flat oyster beds in the bay was the co-operative's first priority, it appeared that the co-operative had a hidden agenda, which I only found out about after having spent considerable time with the fishermen:

> *"Actually, the first objective for the co-operative was to create our own territory which the salmon farm couldn't get"* [Jesse, member of the co-operative and fisherman];
>
> *"The co-op is a good way to stop the [fin]fish farms and big foreign companies from taking over the whole bay"* [Michael, member of the co-operative and fisherman];
>
> *"I became a member because it's a local initiative. It's a good way of opposing the [fin]fish farms and the related pollution"* [Tom, member of the co-operative and former fisherman];

> *"I became a member because I wanted to get some extra income and because I don't like the [fin]fish farms. [...] They are polluting the sea"* [Ken, member of the co-operative and cook].

In accordance with the 1959 and 1980 Fisheries Acts, the co-operative was granted foreshore and aquaculture licences for parts of the bay. Consequently, these sites have become a common property, only accessible to shareholding members of the shellfish co-operative. After this first triumph, the co-operative's members had a second victory over the local salmon farm when the government decided not to grant the licences for the proposed new site in the outer bay. This first successful case of local objections against the expansion of a salmon farm in Connemara is still regretted by the manager of the farm:

> *"Licensing is a big problem. A lot of jobs wouldn't have been lost if we would have been granted the licences for the third site. We didn't get it because of local objection. They were afraid of sea lice and chemicals. The application didn't even make it as far as a public meeting; the objections were all against the Environmental Impact Assessment. It was stupid because we weren't going to increase the tonnage but use it for disease control. It would have been better for the bay. The licence application is still in the works, but I don't know if Gaelic Seafoods wants to invest or help to convince people about the advantages of the third site".*

With the expansion of the salmon farm coming to a halt (that is, temporarily at least) and the decreasing scale of operations of the farm, the strong feelings against its presence have simmered down somewhat:

> *"We don't see much of the [fin]fish farm nowadays. It changed hands. We didn't have a good relationship in the past because of the TBT pollution they caused"* [Owner Ballynakill Oyster Fisheries Company];

> *"The farm in Ballynakill is producing less. The debate is still there, but is under the surface. [...] A lot of people who were opposed to the Connemara farms five years ago, now have family members working there"* [Community development worker]';

> *"Our relationship with the other users in the bay is quite good. When we still had the open days for tourists and it was busy, we worked with the sea angling company to take people to the sites. But I think the majority of the people still wants us out. People are very suspicious about finfish farming"* [Site manager salmon farm].

The salmon farm now operates in isolation from the other users. Co-operation amongst the other user groups is limited and tends to evolve around the membership of the North Connemara Marine Co-operative. The owners of the marine heritage centre (including the sea angling company) and Ballynakill Oyster Fisheries Company are both member of the shellfish co-operative. The latter is a member of the board and, because of his expertise, acts as an advisor. Co-operation amongst the fishermen is limited and only took place at a large scale with the establishment of the co-operative. However, this co-operation was only granted a short life. Soon after the inception of the North Connemara Marine Co-

operative, the first collective action problems emerged: members would only receive their part of the share in the co-operative (a fishing permit) if they had paid IR£ 150 and had contributed 18 days of 'voluntary' labour to the oyster restocking programme. By 1994, two third of the shareholders had become free-riders, who are identified as shareholders who *"don't show up for work at the oyster sites, [so that] the work always comes down to the same group of people"* or who *"still have to pay loads of money to the [co-operative] and have to fulfil their labour obligation"*[8]. In order to keep the work at the resource going, the Board applied for a Social Employment Scheme. From 1992 onwards, the work at the flat oyster beds and Pacific oysters site has been carried out by a team of locals paid by Training and Employment Authority (FAS). The continuation of the co-operative as a whole is attributed to approximately ten committed members.

The future of the North Connemara Marine Co-operative is not very bright. The co-operative has only just reached the production stage and has invested its remaining funds in the purchase of new Pacific oyster spat. The problem with the free-riding members has not been solved and efforts by BIM's Aquaculture Development Officer to structure the co-operative in conjunction with the Irish Co-operative Society have not been successful. The most obvious solution would be to buy them out, but the co-operative's poor financial situation forms a serious constraint. Should the co-operative collapse, the licences to the production sites will be revoked and the fishermen will loose their created territory. In this scenario, the channel is open for potential further privatisation of the bay. Why then is collective resource management at the co-operative such an uphill battle?

First, technical and physical problems caused much disappointment. Restocking the flat oyster beds was carried out through an experimental technique. It soon became clear that only a few seed transfers had been successful due to problems with the spat collectors, bad weather and adverse effects caused by silt and seaweed. In early 1992, bonamiasis was identified in the bay, affecting its production capacity. These setbacks caused much disappointment and was an important reason for a number of shareholders to renege on their agreements, resulting in a 'knock on effect', or as one of them said: *"listen, why should I do the work voluntarily if the others don't do it"*. This was aggravated by the collapse of the market price for flat oysters by 50%: *"my expectation was to make fast money. It just didn't happen"*. When an independent survey revealed that the bay's carrying capacity was only an annual 70 tonnes of oysters rather than the 200 tonnes projected in the Business Plan, a large number of the remainder of the committed shareholders decided to 'call it a day'.

Second, collective action was complicated by socio-economic factors. The period when the shareholders' labour at the oyster sites is needed coincides with the tourist season. One of them put it like this:

> *"If O'Donaghue can make some money by taking some tourists on an inshore fishing trip, he will not take us on his boat to check the scallops even though he is a very active shareholder. He needs the money"*.

The problem of seasonality is aggravated by the fact that while tourism-related activities result in direct economic rewards, returns from the co-operative were not expected until 1995. In the end, many shareholders preferred a direct reward to a postponed one. Furthermore, they could only speculate about the size of their future reward: there was no indication about the quantity of the first yield in 1995, while the market price for native oysters collapsed. In terms of socio-economic considerations, the shareholders perceive the net collective benefit of collective action to be minor.

Third, cultural factors influenced collective action. When the co-operative was established, the shareholders agreed on management rules, some of which were related to sanctioning non-contributors and poachers. In reality, neither of these two free-riding groups have been punished. People perceive that sanctioning a fellow community member will turn *them* into the scapegoat rather than the defector:

> *"My house overlooks the bay and I have seen people picking oysters, but what can I do? It's the bailiff's job to watch the bay and catch them. [...] It is difficult to tell other people what to do or not to do in a community like this; we depend on each other"* [Festy, member of the co-operative].

Fourth, free-riding must be considered in a historical context. In the late 1970s, there was a very successful service co-operative for fishermen in the region. Members sold their fish through this co-operative and also benefited from other services it provided. In the early 1980s, the service co-operative collapsed. At the time of its breakdown, it was managed by some of the initiators and current board members of the shellfish co-operative. When the shareholders were asked about this past experience, they were reluctant to tell why the co-operative failed. The answers were always related to the lack of financial resources. However, in a number of conversations with non-members another perception emerged, summarised by the following statement:

> "There was a lot of struggle within the committee. They didn't listen to [the employed manager], they wanted it their way. One of its members wanted to become chairman, the others didn't agree but in the end he won. [...] The committee became greedy and wanted to make a profit. They became careless. After [the manager] left, they did not check anymore if buyers had enough money but sold on credit" [Will, shop owner].

The prevailing feeling within the community is that the service co-operative was managed badly by its board once the employed manager had left. This negative past experience affects shareholders' willingness to contribute: *"look at what happened to the fishermen's co-operative, the same may happen again"*. The fact that there are some people in the present board who were heavily involved in the collapsed service co-operative influences shareholders' trust in the board's capability and, as a result, their willingness to become actively involved. The lack of trust also negatively affects the board's authority to enforce the rules.

A final set of factors influencing collective action is embedded in the political-institutional environment. The interventions of the external agencies supporting the

co-operative are characterised by a so-called "cargo image" (Long & Van der Ploeg, 1989: 230), the idea that, without external aid, target groups cannot manage their own life circumstances and solve the problematic situations they face. Although shareholders do not value their dependence on external agents positively, a certain opportunism can be identified. There is a particularly opportunistic attitude towards the provision of grant aid, related to the extensive experience Connemara communities have with development projects; while extracting as many benefits from these projects as possible, people's prevailing attitude is "wait and see". The FAS schemes are another example of shareholders' expedient behaviour regarding their political-institutional environment. While the scheme has the advantage that *"it keeps the co-operative going"* and *"provides training facilities for our future benefit"*, a number of shareholders perceive that *"[it] de-motivated the members [...] since the work was going to be done anyway"*.

The impact of all these factors on collective action is exacerbated by the fact that the majority of the co-operative's members had satisfied their main objective once the North Connemara Marine Co-operative was established: they had protected a small part of the bay against the salmon farm. The scenario in which the licences will be revoked because of the co-operative's collapse does not frighten the free-riding members:

> *"For the moment it is going fine because the co-op is virtually paid for by the Government. [...] Anyway, as long as [the three individual producers who are members of the co-operative] are there, the co-op can't really collapse"* [Jesse, member of the co-operative and fisherman].

The fact that for the individual producers the co-operative functions as a service co-operative rather than a production co-operative, and the fact that they have their own independent licences and can therefore continue without the co-operative, does not seem to be taken into account by the free-riders.

Thus, co-operation amongst the different user groups in Ballynakill Harbour mainly evolves around the shellfish co-operative, of which all user groups, except for the salmon company and the owners of the freshwater fishery, are members. The freshwater fishery operates in isolation from the other users, but according to its Fisheries Officer, the relationship with the others is good:

> *"When you work as a Fisheries Officer, you have to be friendly with all users. This year, there was no hassle, relationships were fairly friendly. [...] Ballynakill Harbour has two stands for draft netsmen. There is no problem with the salmon fishermen*[9]*, they have got a licence. The fishermen who are licensed to catch salmon are a kind of guardian [to the fishery] as well"*.

The collapse of the sea trout stocks in 1989, which is associated with a sudden increase in sea lice[10] infestation levels and prevalence of juvenile lice (Whelan, n.d.), has nation-wide resulted in conflicts between freshwater fisheries and salmon farms, which are accused of having caused this problem. For instance, the freshwater fishery in Killary Harbour has taken the local salmon farm to court.

Relationships between the Kylemore Fishery and Gaelic Seafoods in Ballynakill Harbour are less strained:

> *"The salmon farms are as keen to solve the lice problem as the Fisheries Boards."* (Fisheries Officer Kylemore].

In sum, the development of Ballynakill Harbour into a complex multiple-use common-pool resource has not been without it problems. Conflicts amongst different users mainly evolve around the activities of the salmon farm. The small scale of its operation contributed to its initial local acceptance. However, as the size of the farm expanded and the environmental and economic externalities associated with salmon farming became visible, concern amongst user groups of the bay and local communities was aroused. In addition, fishermen experienced a loss of access to their fishing grounds. In general, different user groups operate on a sectoral basis. The shellfish co-operative has the strongest links with fishermen, the private shellfish company and the marine tourism venture, as they are members of the co-operative. The salmon farm acted as a catalyst for collective action amongst the individual user groups through the establishment of the shellfish co-operative, thereby creating common property rights to parts of the bay. Collective action at the co-operative was, however, only granted a short life due to a combination of economic, cultural, historical and institutional factors. If the co-operative does not overcome its problems, it might collapse and access to the bay will once more be jeopardised.

In the next section, the development of *Killary* Harbour into a multiple-use resource is explored. Only 15km apart, fished by the same fishermen and characterised by similar activities, the strategies employed by the different user groups to negotiate access to the resource are completely different.

Killary Harbour

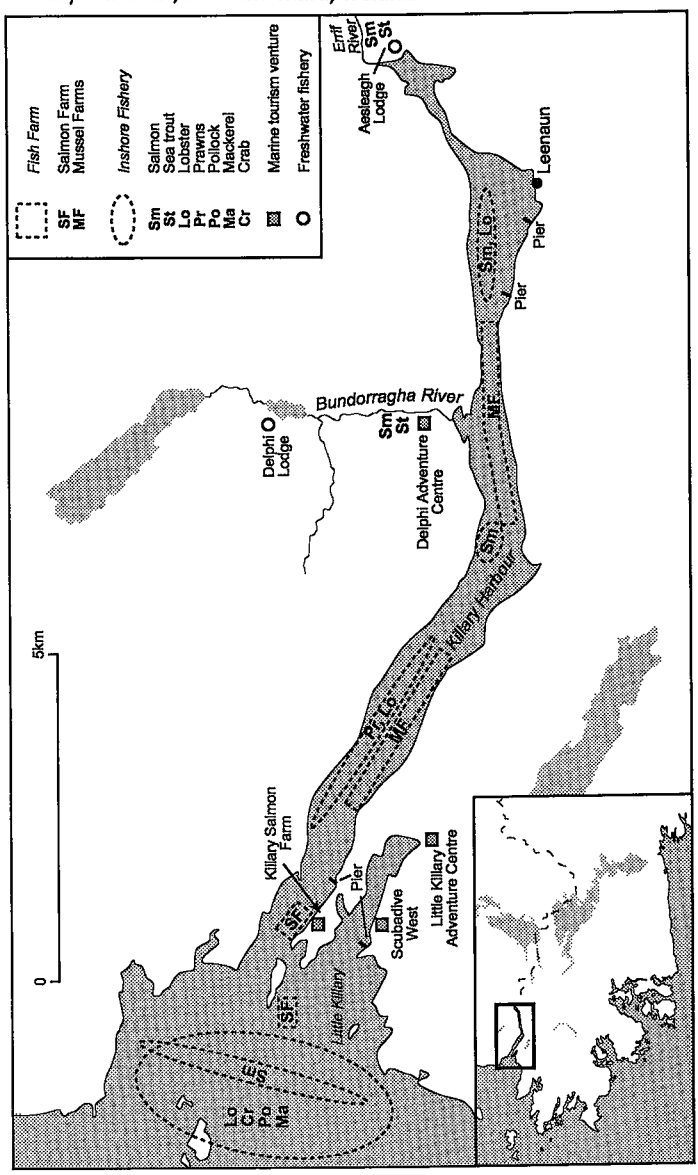
From single use to multiple use

People from the Killary Harbour area are proud to be living along the shores of the only European fjord outside Scandinavia. Killary Harbour, or 'the Killary' in local vocabulary, is an inlet of approximately 14km long and at maximum 1km wide (Figure 5.3). It is located approximately 15km to the north of Ballynakill Harbour. The fjord is divided into three areas: the Inner Killary, Middle Killary and Outer Killary. The Errif River and Bundorragha River drain into the Killary from its north side. To the south west of the fjord, there is a small inlet called Little Killary.

Inshore fishing in the Killary has been taking place from times immemorial. Salmon (draft nets), mackerel, herring, lobster, shrimp, periwinkles, flat oysters and scallops are the main species that are fished inside the fjord (Figure 5.3). Flat oysters and scallops are fished on public beds and provide fishermen with extra

income when the fishing season, which starts in May, finishes in September. Outside the fjord, salmon are fished with drift nets[11].

Figure 5.3
Killary Harbour, N Connemara, Ireland



The Errif and Bundorragha Rivers are among the most important freshwater fisheries in the country. The fishery in the Errif is owned by the state and managed

on its behalf by the Western Regional Fisheries Board. Recreational fishermen can buy a permit that gives them access to the salmon and trout fishery. The Bundorragha River is part of the privately owned Delphi Fishery. Visiting anglers usually spend a few days in the Delphi Lodge, where they can enjoy an angling holiday. As is the case in Ballynakill Harbour, salmon returning to their river of origin are targeted by draft net fishing crews from the stands near to the river (Figure 5.3).

In the early 1970s, when NW Connemara's potential for tourism development was discovered, entrepreneurs from outside the area started to invest in hotels, B&Bs, restaurants and tourism enterprises. In Killary Harbour, two adventure centres, offering a variety of land-based and marine-based activities like mountaineering, canoeing and sailing, were opened (Figure 5.3). Fishing holidays in the Delphi and Errif Fishery, previously an activity for the wealthy, became increasingly popular amongst foreign visitors and the Irish middle class. As the development of tourism initially was driven by non-local investors, locals witnessed how their area was 'taken over' by *"outsiders"* and, as one fishermen pointed out, *"benefits were creamed off to Dublin and did not stay here, where they are needed"*. This created bitter feelings amongst local people, who perceived that the only opportunity of developing a year-round economy was taken away from them. Nowadays, many local families in the area run a B&B, which provides them with supplementary income in summer. Tourism has also resulted in the increasing availability of seasonal jobs. However, large scale investments in the tourism sector in the Killary have only been carried out by non-locals. In 1992, a scuba diving centre was relocated from Dublin to Little Killary (Figure 5.3). Local plans for a waterbus for touristic cruises have so far not been realised although grant aid applications have been submitted.

In 1970, the same marine biologist who was involved in the foundation of the shellfish co-operative in Ballynakill Harbour, suspected that the Killary might be a good location for mussel cultivation. He contacted local authorities and applied for funding at several state and regional agencies. It was discovered that Killary Harbour had an extraordinary potential for mussel farming (Figure 5.3).

From 1975 to 1977, research and experiments were carried out by University College Galway and the development agency *Beirtreach Teoranta*. The latter also organised a series of lectures about mussel farming and a course in which some basic techniques were introduced. The idea was to make the idea of mussel farming accessible to local people. The activities in the Killary were followed with great interest nation-wide. Once the potential of the Killary was confirmed, the locals involved in the course realised that history might repeat itself and that they should protect 'their' resource from outsiders. In 1980, they formed the Killary Fish Farming Co-operative Society Ltd., with the objectives of (i) increasing mussel production, (ii) increasing the number of locals involved in mussel farming and (iii) providing a business and service structure for its members. Although development was slow initially, the co-operative has benefited tremendously from the decision by the Irish Sea Fisheries Board (BIM) to employ a locally-based Aquaculture

Development Officer (who provides technical, managerial and administrative assistance to aquaculture operations), and from funding under PESCA. The co-operative now has 21 members, of whom four are full-time producers. The co-operative's output in 1998 was 500 tonnes.

In 1989, the first and only non-local became involved in mussel production in the Killary. The marine biologist, who discovered the fjord's potential for mussels had started his own farm. His partner, who moved to the area from another part of the country, took over and became owner of the farm. He applied for membership of the mussel co-operative, but was voted against as he was considered an outsider. He then continued as a private company. As will become clear in the next section, this caused a lot of suspicion and hostility amongst local mussel farmers and other local people, who felt that the Department of the Marine and Natural Resources had betrayed them by transferring the licences to a non-local. Killary Fjord Shellfish Ltd., is a one man's business that employs one full-time employee and four part-timers, all sons of local fishermen. Its annual output is approximately 200 tonnes.

Aquaculture development in the Killary is not restricted to shellfish farming alone. In 1986, Killary Salmon Company Ltd. was established by the owners of Connemara-based Mannin Salmon in collaboration with a Norwegian who lived in the area (Figure 5.3). When Killary Salmon applied for the required licences, the locals objected fiercely, as concern about the externalities associated with salmon farming had aroused as a result of the environmental problems in Ballynakill Harbour. Nonetheless, the farm was granted the required licences. With support from the government and the European Union, operations at Killary Salmon began. After a few years, the owners of Mannin Salmon sold their share and, for a while, the farm was Norwegian-controlled. In 1992, Killary Salmon was bought by a local man. The farm now has two sea sites, which accommodate 30 salmon cages, employs 12 full-time and 36 part-time staff, and produces annually 300 tonnes of Atlantic salmon.

Thus, the history of Killary Harbour as a complex, multiple-use resource dates back to the late 1970s when the area was discovered by tourism operators and the development of aquaculture was in its early stages. In the next section, it will become clear how the arrival of these new activities influenced resource management by the traditional users, the inshore fishermen and the freshwater fisheries. Whereas in the past the fishermen had access to the entire fjord, its new multiple-use characteristic has resulted in restricted access to fishing grounds, competition over space, a changing physical environment and changing socio-economic conditions. For the freshwater fisheries, the externalities associated with the production of salmon turned out to be the most critical (perceived) effect of the arrival of a new user. Below, the strategies of the various users to consolidate their position are explored.

Co-operation and conflict in CPR management in Killary Harbour

When the potential of the Killary as a spawning ground for mussels was discovered, the locals instantly realised that they had to protect their access to the resource so that its benefits would stay in the area rather than going to outsiders, as had been the case with tourism development. As a result, the mussel co-operative was established. At the time of the co-operative's inception, local fishermen were extremely concerned that the estuary would be filled up with mussel structures preventing them from accessing their fishing grounds. The co-operative was very aware of the fishermen's fears:

> *"We agreed that we don't move rafts to the fairway and leave room for the boats to go near the shore where lobsters breed. The fishermen were here first and we must respect that. It's no hassle to make some arrangements so that everybody can use the bay"* [Bobby, member of the co-operative].

The agreement between the fishermen and the co-operative to keep the fairway and fishing grounds free from production structures was made despite the fact that the fishing grounds were designated for mussel production by the Department of the Marine and Natural Resources (DoMNR). The members of the co-operative also agreed to restrict the size of the mussels farms to 4ha to guarantee an equal distribution of sites amongst the different members and to provide as many individuals as possible with an opportunity to benefit from the resource. In addition, it was agreed to grant membership to local people only, which made it virtually impossible for non-locals to get the required mussel farming licenses. The co-operative, assisted by a local community development project, convinced the DoMNR to support their policies, however:

> *"There is contention about our policies with the department [DoMNR]: they want to grant licences for larger sites and to non-locals. We consider somebody local when he lives within a 30 miles radius. Last month we got an application from people in County Kerry, which we refused because that wouldn't bring any social or economic benefit to the area. People can still apply for a licence without becoming a member of the co-operative and that's what we object to and the argument with the department is about"* [Sean, member of the co-operative].

DoNMR's decision to grant licences to the owner of Killary Fjord Shellfish, the only private producer, bred bad blood. Although he has been living along the shores of the Killary for ten years and is on very friendly terms with the locals and the other users of the Killary including the fishermen, exchanges with the co-operative are limited. Although some of the co-operative's members acknowledge his success and the co-operative sometimes appeals to his expertise, the fact that the co-operative is unable to control the company's actions is an important issue.

The mussel co-operative's strategy of local preference and avoidance of conflicts over access to fishing grounds through informal agreements has, with the exception of the establishment of the individual mussel farm, worked well.

However, among the local fishermen there is some concern that the gradually expanding co-operative will renege on the agreement:

> *"I'm a bit worried about people getting into mussels in the Killary. I am fishing prawns there and I want my access. I'm not sure they will stick to the agreement once the money starts coming in"* [Joe, inshore fisherman].

> *"The mussel farms continue to expand. [...] The problem is that we can't fish underneath the structures"* [Michael, inshore fisherman].

The mussel co-operative is continuing to expand. With assistance from PESCA, training modules for young locals interested in mussel farming have been set up. The co-operative itself has benefited from the purchase of grading facilities and the setting up of a marketing service. A number of applications for mussel production sites have been submitted to the DoMNR. At the moment, a moratorium on the expansion of mussel farming is in place, as research on the carrying capacity of the fjord for mussel production is being carried out. It is in this context that fishermen are becoming increasingly worried about their access to the fishing grounds.

The other user who causes restrictions to the fishermen's access to the fishing grounds is Killary Salmon Company Ltd. Although some fishermen occasionally grumble about the salmon farm's presence and have expressed concern over potential environmental externalities, conflicts over resource use have been nowhere near the levels they reached in other bays in Connemara, including Ballynakill Harbour:

> *"We have a good relationship with the mussel farmers and the fishermen. We know them all personally and encourage them to use our jetty. They can borrow equipment from us and they help us a lot. We employ four fishermen to police the fish cages at night. [...] We are very open here and stimulate people to have a look around. [The owner] gives three or four guided tours a week"* [Site manager salmon farm].

At the time when Killary Salmon applied for the required licences, the discussion about potential externalities was very vivid. Being a newcomer in turbulent times for the regional fish farming industry, the establishment of links with the other user groups and the local community was an important strategy for acceptance and survival. In addition, Killary Salmon has implemented extensive voluntary measures to reduce potential impacts on the marine ecology, including two controlled feeding systems, the fallowing of production sites and cleaning of the sea bed underneath the cages by divers. In addition, the farm has a policy of local preference by giving preferential treatment to local job applicants and purchasing equipment and external inputs from Irish producers.

Despite their efforts, Killary Salmon has not been spared from conflicts with other users in the Killary. In 1989, the sea trout population collapsed country wide. In the early 1990s, a number of theories explaining the collapse were put forward, including environmental factors, physiological factors, disease and sea lice

infestation. No evidence was found for the first three theories (Whelan, n.d.), but evidence grew that the sea trout problem was closely associated with exceptionally high sea lice levels on returning juvenile sea trout[12] and that "95% of the total nauplius larval production of *Lepeophtheirus salmonis*, the sea lice causing the problem, was of fish farm origin" (Whelan, 1997; n.d.: 3). Consequently, allegations were made that there was a direct correlation between levels of sea lice infestation on salmon farms and sea lice infestation of sea trout and the decline in these stocks. Research on the issue has, however, been interpreted differently by different interests. In 1992, the Save Our Sea Trout (SOS) campaign was launched in Connemara and went nation-wide a year later. In 1993, the government commissioned the Sea Trout Task Force to shed light on the sea lice problem; too late according to the owner of the Delphi Fishery in August 1996:

> *"Delphi is engaged in a law suit that is brought about by five sea trout fisheries against the government and seven salmon farms, including the one in the Killary. The sea trout fisheries are alleging that the salmon farms are responsible for the collapse of the sea trout stocks by causing an explosion in the population of sea lice. The government has failed to do something about it".*

The conflict over the alleged relation between the sea trout collapse and the activities of the salmon farm has resulted in very strained relations between the two users:

> *"The relationship with Delphi is not good. They accuse us of pollution and want us to get out. They use the tourism people as a back up, which is not fair. The only thing we can do is keep going like this and convince them that we are trying to minimise the environmental impact and that we are important for employment"* [Site manager salmon farm].

The poor relationship between Delphi Fishery and Killary Salmon also affects the management of the Killary as a whole. In 1995, the mussel co-operative put forward the idea to work towards so-called single bay management[13], involving all the users of the Killary:

> *"There is a bit of discussion amongst users, but not enough. We have put forward the idea of single bay management where everybody associated with the bay comes together and aims for collective management. Now the discussion is tied up by Delphi, a private fishery, who are suing Killary Salmon for the demise of the sea trout"* [Chairman mussel co-operative].

Since 1994, a considerable national effort has been made to implement a sampling protocol, agreed upon by all relevant partners, on the basis of which conclusions may be drawn about the possible causes of the high infestation rates on sea trout. As concerns were raised over discrepancies in the programme, an independent review was endorsed by the government in 1996. The independent study questioned the validity of the sampling programme and assessment procedure and concluded that

> "despite being formulated with the best intentions, [the sampling programme] is inadequate to meet the needs of the overall project, i.e. to elucidate the potential interactions between lice burden on sea trout and salmon cage farming" (Cowx, 1997: 22).

The study also made a number of recommendations on how to improve the sampling procedure and recommended that a new strategy should be adopted to evaluate the causal factors for the sea trout decline. Based on the independent study, new tighter sampling protocols were put in place (Whelan, pers.comm.). In the meantime, it became clear that problems with sea lice infestations in the vicinity of salmon farms were also reported in Scotland and Norway. Therefore, the International Council for the Exploration of the Seas (ICES) convened a scientific working group to investigate these problems in 1996 (Whelan, n.d.). The working group concluded, *inter alia*, that (i) while it is possible to show high and low mean lice levels on sea trout at sites close to finfish farms, high levels were never recorded distant from fish farms in Ireland, Norway and Scotland, (ii) the data suggest that lice emanating from finfish farms may transfer to wild trout, but as yet cannot be quantified and (iii) the scarcity of wild salmonids in west coast Scottish and Irish inshore waters reduces the possibility that the spring pulse of larval lice was derived from wild sea-going stocks present at this time. The 1993 Sea Trout Task Force also concluded that "sea trout infestation in the vicinity of sea farms [is] most closely associated with the marked incidence of adverse pressure on sea trout" (in Whelan, 1997: 394). In this context, the government has also adopted a number of its recommendations, such as the obligation to cut lice levels down to less than one ovigerous female louse per salmon and stock replenishment in affected sea trout systems (Whelan, 1997).

In February 1997, Delphi Fishery and Killary Salmon agreed to a settlement in the court case against seven salmon farms and the government over their alleged failure to rectify the sea lice problem:

> *"Since the last time I spoke to you [August 1996], we have temporarily resolved the problem with Killary Salmon. [...] The problem with the sea lice is continuing but now there are new experimental chemicals that enable the farms to control the problem better. In the legal battle, a compromise was made: Killary Salmon has two years to maintain improvement of lice levels; if they do we'll drop the lawsuit [against them]. [...] The lice control is much better, we have seen a little improvement in sea trout, both numerically and in the size of the fish. We hope that the salmon farm succeeds in maintaining the lice levels low. But there is much scepticism amongst scientists that lice will develop a resistance against the new dip. Also the ecotoxic consequences have never been investigated. If it kills small crustaceans like lice, it may also kill lobsters and shrimp. With luck and with chemistry we can hopefully resolve the problem. But chemistry cannot be a long term solution"* [Owner of Delphi Fishery].

> *"We settled with Delphi. The court case is still going on between the others*[14]*. We agreed to keep the lice levels down to 0.3 per fish. [Lice levels] are checked every month. We are using a new dip. If we are above the agreed level, they come and check again the next week"* [Employee at Killary Salmon].

Despite the settlement of the court case, the relationship between the two users has only slightly improved. Delphi Fishery accuses Killary Salmon of producing more than it was licensed to do in 1995, and of looking to overproduce in 1996 and 1997. The owner has therefore applied for a High Court injunction. Killary Salmon has applied for an increased annual harvest limit. The state-owned Errif Fishery has also suffered from the collapse of the sea trout stocks. Its Fisheries Officer was, however, unwilling to comment on the alleged relationship of the collapse with the activities of Killary Salmon.

The past three years, a significant recovery in sea trout stocks in the Killary has occurred. The reduction of lice levels close to zero by Killary Salmon, which was agreed in the settlement of the court case, and the re-seeding of the Delphi Fishery with juvenile sea trout from the Salmon Research Agency's brood stock programme have contributed to this recovery (Whelan, pers.comm.).

The relationship of the other users with the salmon farm is generally good. The members of the mussel co-operative all mentioned that the Killary Salmon encouraged them to use their jetty and that they help each other out if there are problems with the boats. The marine tourism operators are very aware of the externalities associated with salmon farming and consider this as a concern. However, they do not experience any problems in their personal relationship with the salmon farm and confirm that there is a fair amount of communication amongst them.

Delphi Fishery also finds itself in a difficult position in relation to the commercial (wild) salmon fishermen. The world-wide decline of wild salmon stocks due to industrialisation, pollution, overfishing and habitat destruction, has prompted the question on how to regulate the stocks. Internationally, there has been a strong movement away from stock exploitation by interceptory fisheries to the benefit of freshwater fisheries, which are easier to control and are economically more viable (Fingleton & Whelan, 1994). In Ireland, this debate has been held for over 60 years, but has hitherto not resulted in the ban of commercial fisheries, as has been the case elsewhere in Europe. Stricter regulations have, however, been introduced.

The decline of the salmon stocks and the question how to manage the fishery has been a great area of tension between recreational angling interests, and commercial fishermen, and is also felt in the Killary:

> *"The problem is that you can't control [netting for salmon]. A lot of countries have banned netting [...]. The more popular scientific view is to make sure that enough salmon go up the river; therefore the salmon has to be exploited near the river mouth. First you have to make sure that a number of salmon go back into the rivers, then you can divide the left over. We started a ranching programme for angling purposes [in 1997]. The drift net fishermen catch 25% of the [returning ranched salmon] outside the coast, then the draft net fishermen take [the rest] so we get 5% back. We would pay them not to do it. There have been studies suggesting that tourism angling is a more sensible way to exploit the resource since it feeds into the*

economy. We'd like to see all fish going into the rivers but traditional fishermen want to net" [Owner of Delphi Fishery].

"We would loose a lot of money. If we can't fish salmon, it will be hard to make a living from fishing. [In the past years] the catches have been really bad and we could just about manage. The salmon fishery has improved due to the ranching at Delphi [...]. The runs to the Errif are still bad. [...] In the first year, [the owner of Delphi] paid us for each of his fish we caught. The thing is that he catches all the fish so that they don't mix with his own stock and then dumps it; that's a waste, why doesn't he do a deal with the salmon fishermen?" [Michael, fisherman].

"The ranching at Delphi is good, but [the owner] wants to get rid off fishermen. He kills the ranched fish to prevent them from spawning. He should leave the fish to the fishermen" [Vincent, fisherman].

Net income from commercial salmon fishing has decreased due to declining catches and low market prices. Research has indicated that the benefits of angling, in terms of income and employment, exceed those from commercial fishing (Fingleton & Whelan, 1994; Wild Salmon Support Group, 1996). In view of stock conservation, which is an important issue, management could more easily be carried out on a catchment basis. For these reasons, there is a strong argument to phase out commercial fishing and in particular drift netting. The position taken by the 1996 Salmon Management Task Force is that "equitable sharing between the commercial and recreational sector is not only possible, but desirable" (SMTF, 1996: 14). Its view is that the commercial section should be given an assured future in salmon fishing and a role in management and promotion of the salmon resource through a

"framework strategy within which all sectors can identify their own role, map out their own future and utilise the structural framework proposed to sort out conflicts and build strong commercial and recreational sectors" (*ibid.*: 15-6).

The Salmon Management Task Force has recommended a rationale for salmon stock management, which is based on achieving spawning escapement targets for each specific stock. Between 1997 and 2000, a proposed new management system should come into place, centred around: (i) spawning escapement targets, (ii) optimum spawning numbers, (iii) a quota system, and (iv) catchment management plans (Marine Institute, 1998). In addition, management structures are proposed to facilitate salmon fishery management. This includes the establishment of a National Salmon Management Commission, responsible for setting quotas, assisted by a Standing Scientific Committee. At local level, it is proposed to establish Fishery Management Committees, operating under the guidance of the Regional Fisheries Boards (*ibid.*). The Task Force's recommendations on carcass tagging and implementation of a quota system will be introduced in May 1999 and they year 2000 respectively. The Salmon Management Commission will be appointed in the summer of 1999 (Whelan, pers.comm.). With this proposed National Salmon Management Strategy, which includes the commercial sector, the debate between

the commercial fishermen and the recreational fisheries has settled somewhat, also in the Killary. A shortened commercial fishing season has already been observed.

A final user group of the Killary are the marine tourism operators, who tend to operate in isolation from the other users. However, there are strong links amongst the two adventure centres and the scuba diving centre:

> *"We target the same market and are in the same business. We try to separate our activities"* [Manager of adventure centre].

> *"We have a very good relationship with the two adventure centres. We work closely together. They put our scuba diving courses in their brochures as part of their multi-activities package. We send a lot of people to their accommodation"* [Manager of scuba diving centre].

From their perspective, conflicts with other user groups are marginal *"as long as we stay away from the fishermen's nets"*. The mussel co-operative does, however, experience a conflict with one of the adventure centres:

> *"One of them is okay, but the other one is badly run. There is general responsibility on their behalf and no supervision. [...] they sail into our rafts and longlines and damage them and put the children's safety at risk. Yachtsmen are usually very perceptive but they are throwing that out of the door. [...] Our attempt to communicate with them failed"* [Des, member of the co-operative].

The problems experienced with the adventure centre is one of several reasons why the mussel co-operative has put forward the idea of single bay management, involving all the user groups in collective resource management. Hitherto, the strained relationship between Delphi Fishery and Killary Salmon has tied up the discussion of the idea. However, according to the local Aquaculture Development Officer, 'CLAMS', a government initiative may be coming on stream shortly. Co-ordinated Local Aquaculture Management Systems (CLAMS) involve, *inter alia*, the integration of aquaculture and inshore fishing activities, commercial development plans, codes of practice, monitoring programmes and regulation. The idea is to start a "living process with local plans being updated and modified as the need arises"; that is, in accordance with the dynamics of the marine ecosystem and the activities taking place in it (BIM, 1998: 1). However, although the integration of different activities is one of the briefs of CLAMS, the programme mainly addresses the development of the aquaculture industry and does not provide a structure for an integrated management strategy, as proposed by the mussel co-operative.

In sum, the history of the Killary as a multiple-use resource dates back to the early 1980s when the traditional users, commercial fishermen and freshwater fisheries, witnessed the development of aquaculture and marine tourism enterprises. Potential conflicts between mussel farmers and fishermen over the latter's access to fishing grounds were anticipated by the mussel farmers and an agreement was made to keep the fishing grounds and fairway free from production structures. In future, however, this informal agreement might be jeopardised by the increasing number of

mussel farmers and, if the government reneges on the agreement of local preference, the potential arrival of (less considerate) outsiders. Unlike Ballynakill Harbour, where major conflicts evolve around the salmon farm, the salmon farm in the Killary is an accepted and respected user group. The only conflict involving the salmon farm concerns the alleged relationship of salmon production with the collapse of the sea trout stocks. The opposing player in this conflict, the private freshwater fishery, is also heavily involved in a heated debate with the commercial fishermen in the area over salmon fisheries management. In addition to these conflicts, the leisure activities in the Killary occasionally cause problems for the mussel co-operative. The mussel co-operative has proposed to take co-operation amongst different users one step further and work towards collective resource management. This initiative has hitherto been frustrated by the strained relationship between the freshwater fishery and the salmon farm. In the near future, the Killary is likely to become a priority area for the CLAMS programme. However, this programme is directed at the integration of aquaculture activities and aquaculture and inshore fisheries and, in its present form, does not provide for an integrated management strategy involving all resource users.

Summary

Only 15km apart and characterised by the presence of the same user groups, multiple-use common-pool resource management in Ballynakill Harbour and Killary Harbour is very different. In Ballynakill Harbour, the activities of the salmon farm, which is perceived as a threat in terms of access to marine space and ecological impacts, has been the trigger for collective action amongst user groups. Collective action was shaped by the formation of a shellfish farming co-operative, thereby creating access rights to the bay, but in practice, was not taken further. In Killary Harbour, conflicts over marine space by the development of shellfish aquaculture was anticipated and formed the basis of co-operative agreements amongst user groups. However, despite the presence of these co-operative links calls for collective resource management of the Killary as a whole have not yet been successful.

In the next chapter, building on the preliminary conclusions of Chapter Two, the findings of the two case studies are used to further inform a grounded perspective on the study of complex, multiple-use CPR management.

Notes

[1] Irish inshore fishermen are increasingly calling for fishery regulations for inshore species such as shellfish and crustaceans. With the successful implementation of the lobster v-notching programme, a conservation and enhancement project voluntarily initiated by fishermen in collaboration with the government, conservation of inshore fisheries has become part of the inshore fishermen's agenda. Fishermen all over the country are submitting requests to the government to implement restrictive measures

for inshore species. However, so far, the Irish government has been slow to respond (Steins, 1998b).

[2] PESCA is one of the initiatives European Commission launched to reduce the adverse effects of the restructuring of the fishing industry under the Common Fisheries Policy. Its aim is to assist communities in fishery dependent regions to diversify from traditional activities and to support suitable alternative activities. PESCA is funded through the European Regional Development Fund, the European Social Fund and the Financial Instrument for Fisheries Guidance. For the period 1994-99, it has been allocated ECU 293 million. The scheme operates on the principle of matching funding; that is, eligible projects have to raise approximately half of the funding required themselves and grant aid is provided at a maximum of 50% from PESCA. The programme will be terminated after December 1999.

[3] Aquaculture activities have been considered as a potential source for eutrophication (increased phytoplankton production), resulting from faecal waste and uneaten fish feed (DG XIV, 1995; Goldberg & Triplett, 1997; Weber, 1997). If phytoplankton production exceeds the ecosystem's assimilative capacity, algal blooms may be the result. Such algal blooms can be disastrous for the aquaculture producers, but also may affect the benthic environment in the vicinity of aquaculture sites, which provide nursery grounds or natural beds for capture fisheries (DG XIV, 1995). External inputs, such as medicinal products, to control disease, weeds and parasites in finfish production, may disperse in the waters surrounding the production sites and can accumulate in the sediment and animals. Copper-based algae-killers, for example, are linked to shellfish mortalities (Goldberg & Triplett, 1997; Weber, 1997).

[4] The sea trout problem in Ireland has the following characteristics: (i) premature/early return of juvenile sea trout (smolts) to freshwater, (ii) severe infestation by juvenile sea lice (*Lepeophtheirus salmonis*), (iii) a collapse in the spawning stock of sea trout, and (iv) when large sea trout remain, the presence of badly emaciated fish (Whelan, n.d.).

[5] The potential of a salmon farm as a tourist attraction does not seem to be recognised, despite the fact that the farm in Ballynakill, before it was taken over by Gaelic Seafoods, organised very popular guided tours for tourists. Such tours still take place on a weekly basis at the farm in the nearby Killary Harbour.

[6] To protect the identity of those concerned, all personal names are fictitious.

[7] To commence an aquaculture venture, operators need a foreshore licence, which grants permission to put production structures on the foreshore, and an aquaculture licence, which gives permission for the actual cultivation process. Both types of licences are usually granted for a period of ten years. Fees for the aquaculture licences for shellfish producers are based on the number of hectares to which the licence applies. For finfish producers, fees are based on output.

[8] The free-riders represent full and part-time fishermen of all age categories. The majority of the committed members are (i) former fishermen, (ii) self-employed, (iii) unemployed.

[9] For completion's sake, it must be mentioned that there is a multiple-use conflict amongst the commercial fishermen in Ireland and recreational angling interests. This

multiple-use conflict will be explored in detail in the case study on Killary Harbour. For the Ballynakill Harbour case study, in-depth data on the conflict of interest between the two groups are not available. However, the conflict appears to be minor as neither the salmon fishermen nor the Fisheries Officer of the Kylemore Fishery mentioned it during interviews. Fishermen who fished in both study areas did, however, refer to the conflict of interest with the private freshwater fishery in Killary Harbour.

[10] Sea lice are tiny crustaceans that feed on the dorsal fins and heads of salmonids.

[11] Drift nets are used in the offshore salmon fishery, while draft nets are confined to estuaries and bays.

[12] Whelan (n.d.: 2) emphasises that "the sea trout problem is not infestation of sea trout by sea lice *per se*. [...] The problem arises when infestation levels and prevalence of juvenile lice increase suddenly and dramatically".

[13] Technically, the term 'single bay management' is incorrect to refer to the integrated management approach the mussel co-operative would like to develop. Single bay management is an approach used in the aquaculture sector. It must be seen in the context of the further envisaged expansion of salmon farms along with a minimisation of adverse environmental impacts and reduction of existing conflict. Single bay management plans involve four main issues: (i) fallowing of salmon production sites, (ii) introduction of single generation sites (generation separation) to facilitate lice control, (iii) agreement on stocking by different salmon farms operating in one bay, and (iv) synchronisation of lice treatments and harvesting programmes amongst different farms.

[14] The other plaintiffs have not dropped their charges. The court case was close to settlement when some of salmon farms involved were granted major increases in their licensed tonnage (Whelan, pers.comm.).

Chapter Six

Theoretical intermezzo

Strategies of (mis)representation

In Chapter Two, based on an empirical study in the harbour of Cowes, I drew a number of preliminary conclusions towards a grounded perspective for the study of complex, multiple-use common-pool resource management. First, I concluded that the appropriateness of constructing design principles for collective action, as developed in CPR theory, has to be reconsidered. Second, I argued that the role of external or contextual factors should become part of the institutional analysis of collective action, as they play a key role in explaining decision-making processes at the collective-choice level. Third, I concluded that focussing the analysis on one user group is not a satisfactory approach to explain either the representation of users in umbrella structures for multiple-use management, or the strategies they employ to influence decision-making processes in umbrella organisations. Fourth, I drew attention to the role of perceived crises as catalysts for collective action. Finally, I questioned the model of purposive action underlying collective action strategies and put forward the thesis that collective action never follows a predetermined path, but is part of a dynamic process of shaping and reshaping.

In Chapter Three, these preliminary conclusions informed the development of a conceptual framework. The objective of this framework is to help me understand the collective action processes that are being shaped and reshaped in the case studies in this book. Borrowing from theoretical notions developed in actor-oriented approaches, critical theory and actor-network theory, I proposed that social actors and collective actions are *collectifs*; that is, emergent effects of interactions between people and things. *Collectifs* are the result of translation processes during which social actors are, as it where, 'agency-ised' by the material and social means that they employ to achieve their objectives. This means that concepts such as 'agency' and 'rationality' can no longer be considered as given properties of individuals, but are emergent properties of *collectifs*. Following ANT, I also proposed that translation processes can only be studied by adopting two principles developed in actor-network theory (ANT): (i) generalised agnosticism, which means that the conventional practice of studying social phenomena (e.g., collective action) in terms of pre-defined categories (e.g., 'success', 'failure') should be abandoned, and (ii) symmetry, which means that everything I seek to explain should be approached in the same way, i.e. the presence of collective action deserves the same explanation as its absence and should not be taken for granted.

The case studies of Ballynakill and Killary Harbour support some of these preliminary conclusions and also generate new insights in the translation processes involved in collective action processes in complex multiple-use CPRs.

Comparing resource management

When comparing the case study areas in NW Connemara, a number of similarities and differences can be identified at the operational level. How can these be explained; and why are they significant for the study of translation processes in multiple-use CPR management?

The most apparent similarity is that Ballynakill and Killary Harbour are characterised by the same types of activities: inshore fishing, recreational fishing, salmon cultivation, shellfish cultivation and marine tourism. The large majority of inshore fishermen work in both the Killary and Ballynakill Harbour area. In both areas, resource use by the newcomers, and in particular aquaculture, is contested by traditional user groups (fishermen, freshwater fisheries). Yet, despite these basic similarities, there are many contrasts in the way user groups interact, mobilise human and material resources and shape translation processes.

A first contrast, at the operational level, concerns the relationships of the two salmon farms with the other user groups. While in Ballynakill Harbour, the salmon farm operates in isolation from the other users, the farm in the Killary has established strong links with fishermen, mussel farmers and marine tourism operators. The changing attitude in the area with respect to salmon farming is one factor explaining this contrast. When the two Dubliners started their farm in Ballynakill Harbour in 1978, salmon farming was in a pioneering stage. Regulations for finfish farming on sea sites were non-existent until the 1980 Fisheries Act and many aquaculture enterprises were established without the required licenses. Community involvement in the licensing process was not an issue. However, the small scale of the farm and the fact that the owners carried out the work themselves contributed to its initial local acceptance. The tide turned in the mid 1980s when (i) the farm expanded, (ii) foreign multinationals took over, (iii) the use of chemicals in the production process and their effects became known, and (iv) research revealed that the bay had the highest concentration of TBT in the country. By the time the salmon farm in the Killary applied for licenses, many locals objected to salmon farming. Despite strong local objections to the license application, which was made possible through the 1980 Fisheries Act, Killary Salmon obtained permission to begin operations.

The Ballynakill farm was the first new user in the bay, whereas Killary Salmon was a newcomer in a fjord that was already characterised by a multiple-use setting. Being a newcomer in turbulent times for the Irish salmon farming industry and being aware of local antagonism against its activities, the establishment of strong links with the other user groups and the wider community was an important strategic action for acceptance and survival. This is also reflected in the fact that the initiators appointed a local as a director and in the current owner's policy of local preference in employment and purchase of inputs. For the farm in Ballynakill, the development of strong relationships with other users did not seem to be necessary at its inception. Once public objection against salmon farming was aroused and durable relations became more important, their development was

prevented by (i) technical problems the farm experienced, and (ii) its instability as a result of a 'coming and going' of new owners. The attempts that were made to establish links with the community, largely through the provision of employment and the tourism programme, came to an abrupt end when the farm was taken over by the Scottish Gaelic Seafoods.

The salmon farm paid for the absence of strong links with other users groups and local communities when it applied for licences for a third site: public support was lacking and the farm's claim over an important inshore fishing ground was strongly disputed. Fishermen felt that some sort of action had to be undertaken. When a local marine biologist and a few fishermen genuinely proposed to revitalise the derelict flat oyster beds in the bay and to start a shellfish farming co-operative, they seized the opportunity. Under the impression that they could kill two birds with one stone - securing access to the bay and making money once the shellfish reached marketable size - they became actively involved in the co-operative's inception. They became spokespersons for (i) fishermen, who would benefit from the development of shellfish farming, (ii) the community development project, whose brief is to encourage socio-economic development initiatives in NW Connemara, and (iii) regional and national government and the European Union, who want to tackle high unemployment rates and migration levels. A Business Plan was written to mobilise these group, link them together and enrol them in the project, using the derelict oyster beds and the government's policy to stimulate and regulate aquaculture development as intermediaries. The translation process was completed when the *collectif* was granted the required licences and financial, technical and managerial assistance from BIM, DoMNR, regional development agencies and the European funded community development project. It is, however, questionable if the *collectif* can maintain its position for much longer. Despite the presence of a large number of design principles for successful collective action (Table 1.1), such as: (i) a common interest, (ii) the presence of agreed upon rules including accountability mechanisms, (iii) clearly defined boundaries of the resource and user group, (iv) high noticeability of cheating, and (v) assistance by external agencies, co-operation was only granted a short life and the co-operative is facing an insecure future.

Killary Salmon's strategy of establishing links with other user groups did not include the two freshwater fisheries, which are located at a considerable distance from the salmon farm. At first, the salmon farm and the freshwater fisheries peacefully co-existed. However, when the sea trout stocks collapsed in 1989 and allegations were made that the stock collapse was associated with salmon farming (sea lice), the private freshwater fishery and the salmon farm became the main players in a ferocious conflict. The conflict extended beyond the boundaries of the Killary, when the freshwater fishery joined forces with other fishery owners in the country and became plaintiff in a law suit against a number of salmon farms and the government. The state-owned freshwater fishery did not become involved in this conflict; neither did the private freshwater fishery in Ballynakill Harbour, which closely co-operates with the Regional Fisheries Board. For the private fishery in the Killary, the stakes in the sea trout fishery were high: the owner

completely depends on the freshwater fishery and has done major investments to maintain its reputation as one of the best fisheries in the country and meet the highest standards of excellence. The state-owned fishery in the Killary cannot become involved in the dispute over the effects of salmon farming on the sea trout stocks. No definite evidence of this link has been put forward and the dispute is politically very sensitive, particularly as the government is involved in a law suit over its alleged failure to rectify the sea lice problem. The fishery's manager thus has to keep a low profile. The Ballynakill fishery is only small and is more of a sideline to the owners. Their main priority is the upgrading of their salmon fishery in conjunction with the Regional Fisheries Board and funded by the European Union. The owners keep a low profile in the dispute as they do not want to jeopardise their links with the state (and thus, the funding). In the meantime, Delphi, the private fishery has decided not to wait for the court decision and has agreed on a settlement with Killary Salmon.

In addition to the above factors, conflicts and co-operation in resource management in the two study areas are also encouraged by factors that are taking place beyond the local level. First, the increasing availability of farmed salmon has lead to lower market prices, which is another incentive for the commercial fishermen and recreational fisheries to condemn the activities of salmon farms. A second factor encouraging conflict is the fact that the government perceives salmon farming to be a major national and regional socio-economic development mechanism. For a long time, it has closed its eyes to the potential externalities related to the activity while, at the same time, stimulating new business.

For equal reasons (as is the case in the dispute over salmon farming), the private freshwater fishery in Ballynakill Harbour and the state-owned fishery in the Killary are not actively involved in the debate between recreational angling interests and the commercial fishermen, which is a third distinction in CPR management between Ballynakill and Killary Harbour. The private fishery in the Killary is a strong defendant of catchment management for salmon fisheries in which particularly the commercial drift net fisheries are hard to accommodate. With the future implementation of the new Salmon Management Strategy, developed by the Salmon Management Task Force and involving extensive consultation of all stakeholders, the debate settled somewhat. Whether or not the salmon fishery remains a contested resource use once the local fishery management committees are established and catchment management is implemented, remains a question.

A final distinction concerning operational level CPR management in Ballynakill and Killary Harbour is the level of co-operation between shellfish farmers and fishermen. In the Killary, co-operation between these groups has occurred from day one. When the prospects of mussel farming became known, it also became apparent that the development of mussel farming might potentially be contested because of the physical characteristics of the resource system and associated socio-economic factors. The Killary is a long, but very narrow fjord, where competition for space is an important issue. Fishermen were concerned that they would loose access to fishing grounds once mussel farming took off. Their potentially

controversial activity formed a strong incentive for the mussel co-operative to make agreements with the fishermen about the cultivation areas in order to keep the fairway and the fishing grounds, which are designated for shellfish aquaculture, accessible to fishing vessels. The fact that the mussel farms are adjacent to the fishing grounds and, consequently, mussel farmers and fishermen are virtually neighbours, facilitates communication. The other policy of the co-operative is to keep mussel farming a local activity by excluding outsiders from access to the mussel resource, one of the reasons being that locals are more sensitive towards the fishermen's needs. To make the informal agreements tangible, they needed to be backed up by the Department of the Marine and Natural Resources (DoMNR), which is responsible for the designation of aquaculture production areas and the granting of licences. The board of the co-operative, assisted by the local community development project, acted as spokespersons for (i) fishermen, who want to maintain access to fishing grounds, (ii) mussel farmers, who want to prevent disputes over resource use with fishermen and to keep the benefits of mussel farming in the area, (iii) local communities, who also feel that the economic benefits of resource use should stay in the area, and (iv) local, regional and national authorities, who want to reduce high unemployment levels and migration. The spokespersons succeeded in enrolling the DoMNR, which agreed to back up the co-operative's policies of access provision and local preference. Nevertheless, although the *collectif* has completed the translation trajectory, it is still contested by the DoMNR, which prefers to maximise the Killary's mussel production capacity and regrets that a number of designated areas lay idle. Each time a licence application by a big (outside) investor is submitted, the co-operative and the community development project have to enrol the DoMNR and re-translate their project.

In contrast to the Killary, Ballynakill Harbour consists of many bays and inlets and competition for space between the oyster co-operative and the fishermen is not an issue. The division of Ballynakill Harbour into several inlets and bays has resulted in a situation where each of the different users has their own territory, where they can work in isolation from the other users. Furthermore, due to its shallowness, this bay is not an important fishing ground for inshore species. A second explanatory factor lies in the technical characteristics of shellfish production. Intensive mussel production requires the use of rafts and longlines, which take up considerable space in the water. The activities of the co-operative in Ballynakill Harbour do not place such high demands on large areas of the bay. Fishing boats can still access the areas where the flat oyster beds are located (provided they do not damage the seabed), and the production of Pacific oysters takes place on sites in the inter-tidal zone, where fishing activities do not take place. Finally, in the Ballynakill area, the majority of the members of the shellfish co-operative are inshore fishermen themselves and co-operative links did not have to be developed; co-operation in this case took place with the establishment of the co-operative, in response to the potential expansion of the salmon farm.

The presence of the community development project has certainly left its mark on resource management in the two areas. In the case of Ballynakill Harbour, the

project has contributed tremendously to the development of the area into a multiple-use resource, primarily through its partnership with the Irish Sea Fisheries Board (BIM) and the consequent appointment of a locally based Aquaculture Development Officer, who provides the shellfish farmers with technical and managerial support and assisted the co-operative, individual producers and the marine tourism operator in obtaining funding under PESCA.

However, the presence of the community development project and the Aquaculture Development Officer has also had a negative influence on collective action. In the case of the shellfish co-operative, the extensive support by the external agents is very convenient for the group of people who want to keep the co-op going in order to maintain property rights to the bay, without complying to the co-op's rules. Equally, in the case of the Killary, the community development project assisted the mussel co-operative in enrolling the DoMNR in their informal policies of securing access to fishing grounds and their policy of local preference. It is questionable whether the co-operative would have succeeded in completing this translation trajectory without the strong bargaining position that the community development project provided for them. Even now, the *collectif* has to be re-translated each time an application by a large investor is submitted. In addition, the efforts of the community development project and the Aquaculture Development Officer have given mussel farming a major boost through financial, technical and managerial assistance and the application for PESCA funds to finance improved production facilities and a marketing structure.

Thus, while co-operation in Ballynakill Harbour is confined to the shellfish farming co-operative and is driven by conflict over resource use by the salmon farm and its perceived threat to the fishing grounds, co-operative links amongst different user groups in Killary Harbour have been established. Most of these co-operative links do not concern resource use *per se*, but are related to the facilitation of activities. The only concerted effort specifically aimed at resource use negotiation is initiated by the mussel co-operative, who got together with the fishermen to agree on the mussel cultivation areas and who have a policy of local preference. The mussel farmers, who realise that their interdependence with other resource users goes further than the fishing grounds, have attempted to get all the users of the Killary together in one platform for resource use negotiation, but the initiative was frustrated by the dispute between the private freshwater fishery and the salmon farm. In future, the co-operative's efforts may get another chance. If the salmon farm can realise to maintain low sea lice levels, as was agreed in the court settlement, and if the sea trout stock recover, most of the controversy between the two parties will have disappeared. In addition, the inception of the CLAMS initiative (aimed at the integration of aquaculture activities, monitoring programmes and codes of practice), and the implementation of the National Salmon Management Strategy (which is based on local catchment management), may form the foundation for the establishment of resource system embracing platforms for resource use negotiation.

Grounding preliminary theory (2)

The findings from the case studies of multiple-use CPR management in Ballynakill and Killary Harbour substantiate the preliminary conclusions from Chapter Two, but also add new insights.

The case of the oyster fishermen in Cowes Harbour (Chapter Two) showed how the presence of design principles for collective action was not a sufficient condition to maintain the common property management regime and how a number of contextual factors were crucial in triggering a joint privatisation effort. Many studies about successful collective CPR management extensively describe the internal characteristics of the management system, but tend to consider the ecological, socio-economic cultural and political-institutional environment and historical context of the CPR as a 'black box'. The case of the shellfish co-operative in Ballynakill Harbour demonstrates how the external environment forms an integral part of the stakeholders' everyday reality and significantly influences decisions to either co-operate or defect. Despite the presence of favourable conditions for collective action, co-operation was only granted a short life. Once the co-operative was initiated, two thirds of its 75 shareholders became free-riders who did not contribute to collective resource management. This expedient behaviour can partly be explained by contextual factors. For instance, the period when shareholders had to contribute to collective resource management runs parallel to the tourist season, which generates a substantial complementary income. The majority of shareholders preferred the direct income from tourism over the future reward from collective management of the oyster beds. The presence of tourism and its part in increasing opportunity costs of spending time on the shellfish grounds is a contextual factor influencing collective action. In addition, other contextual factors that shaped collective action included (i) technical and physical problems (e.g., problems with the restocking programme), (ii) cultural norms and values (e.g., the reluctance to punish fellow-community members), (iii) past experiences (e.g., the current board's involvement in a failing service co-operative), and (iv) the political-institutional framework (e.g., the cargo image of interventions by external agents).

The problem that often surfaces is that these contextual factors are barely visible. I believe that this "invisibility" is complicated by the use of design principles as an analytical starting point. Pre-defined distinctions between categories of 'successful' (e.g., co-operation) and 'unsuccessful' (e.g., free-riding) are of little help, since they *hinder* rather than facilitate an examination of the contingencies involved in the complex processes by which, for example, 'success' is first defined and later achieved (or obstructed) (cf. Verschoor, 1997). For example, the collective action problems that emerged after the initial 'success' of the shellfish co-operative's establishment, cannot be fully understood without a consideration of the relationship between salmon farms and local fishing communities in NW Connemara.

A further problem associated with the use of design principles is that they easily lead to generalisations about how to achieve sustainable collective action, i.e., are

appreciated as a blue print model. However, what may be a design principle in one situation does not necessarily have to be one in another. Again, I emphasise the dynamic relationship between CPR management and contextual factors. The external environment within which the management system is located influences the actors' priorities and, consequently, the extent to which they are prepared to fulfil the demands made by the collective management system. These priorities do not only vary between geographical settings and over time, but also differ between actors who are engaged in the same management system.

In addition, the use of prescriptive design principles raises questions related to normativity. What is 'successful', what is 'a failure'? It is clear that the shareholders of the shellfish co-operative are facing a commons dilemma. The fact that two thirds of the shareholders have become free-riders and that the co-operative only survives because of the efforts of a small group of people and external support, would tempt many of us to say that collective action has failed. However, if we look at the hidden objective of the shareholders, namely securing access to the local fishing grounds, the co-operative can be considered extremely successful in realising this aim. In Chapter Nine, I will return to the problems associated with prescriptive design principles and make an alternative proposal to the study of collective action, using the stakeholders' categories.

The case study of Cowes Harbour (Chapter Two) showed how contextual factors are important in explaining decision-making processes at the collective-choice level. The case of the shellfish co-operative in Ballynakill demonstrates how contextual factors shaped collective action amongst the members of one group. From the comparison of the multiple uses in Ballynakill and Killary Harbour, it is apparent that contextual factors also play a crucial role in explaining collective actions *amongst different user groups* at the operational level, including:

1. the relationship between the technological characteristics of the resource use and the physical characteristics of the resource use;
2. the extent to which user groups perceive each other's activities as a threat;
3. historical experiences;
4. the rate of participation in external policies affecting resource use;
5. the role of external agents in CPR management.

In sum, I conclude that (i) contextual factors are crucial in the shaping of collective action processes at the operational and collective-choice level and should become an explicit part of CPR analysis, and that (ii) the focus on prescriptive design principles in CPR theory hinders the exploration of collective actions since it diverts attention from the dynamic and complex internal and contextual processes that shape them. As Crozier and Friedberg (1980) observe, actors and organisations for collective action are social constructs rather than abstract entities. Therefore, explanatory and prescriptive models of decision-making or collective action are not sufficient.

A focus on the material, structural and human conditions of the context which limits and defines the actors' freedom and rationality is needed to understand the complexities involved in collective action efforts. I will elaborate on this proposal in the final chapter.

The case studies also substantiate and provide further insights in the role of perceived crises as catalysts for collective action, which I identified in Chapter Two. The potential expansion of the salmon farm in Ballynakill Harbour into the fishermen's whitefish grounds triggered collective action amongst fishermen in an attempt to stop the farm from consolidating their bay. Equally, in the Killlary, mussel farmers anticipated a conflict over resource use with local fishermen. This potential contest inspired a concerted effort involving mussel farmers and fishermen, whereby they agreed to keep the fairway and fishing grounds free of production structures. The experiences from the Killary also show how collective actions at the operational level are not necessarily confined to geographical or institutional boundaries. For the concerted action involving the mussel farmers and fishermen to succeed, a community development project and the DoMNR had to become part of the platform through which collective resource use was negotiated. Higher levels of decision-making had to be enrolled to shape collective action at local level. Another example is the crisis associated with the collapse of the sea trout stocks. The private freshwater fishery in the Killary acted in concert with a number of colleagues from across the country in starting a law suit against seven salmon farms and the government over their alleged failure to rectify the sea lice problem. In each of the aforementioned cases, collective action can be linked to ideas developed in the moral economy approach, in which collective actions (peasant revolts) are explained as a result of a perceived threat to subsistence rights (Feeny, 1983; Popkin, 1986).

In this light, attention must be paid to the role of crises as a moment of learning. Social learning occurs when stakeholders gain insight in and evaluate the way their actions affect CPR use and management and seek to find ways to control or adapt such actions (Maarleveld & Dangbegnon, 1999; Röling & Wagemakers, 1998). While such social learning can enhance adaptive resource management aimed at balancing a multitude of stakes, interests and claims, learning patterns that rely on crisis before joint action strategies are developed, are dangerous in that they often do not bring about real change, but result in "accommodation (keeping the situation as it is)" (Maarleveld & Dangbegnon, 1999: 271).

The case of the shellfish co-operative in Ballynakill Bay is illustrative. The fishermen realised that they had to co-operate to secure access to the fishery and, in this sense, caused a change in resource use patterns. However, real change did not occur as action took place one-sidedly and did not result in changes of the cause of the crisis: the aquaculture development policy, and particularly its lack of stakeholder participation. The status quo that resulted in strategic action remained unchanged.

Thus, perceived local crises often act as catalysts for collective action amongst individual resource users or amongst different user groups. In this sense, they can

also be considered learning moments. Collective action efforts to avert perceived local crises often transcend geographical and/or institutional boundaries, to enrol relevant others in the collective action project and complete the translation trajectory. In this light, the rationalities that emerge during the shaping of the collective action process need consideration.

In Chapter One, I put forward the thesis that the concept of purposive rationality, which forms the foundation for collective action theories is too narrow, since collective action is not simply the pursuit of individual interest through voluntary co-operation nor the pursuit of collective interests by individuals. In Chapter Two, I demonstrated how oyster fishermen went beyond purposive rationality in negotiating and agreeing access to the oyster beds with the Harbour Master. The cases of Ballynakill and Killary Harbour show that although the model of purposive rationality may drive the emergence of collective action efforts (e.g., responding to a perceived crisis), its power to explain the shaping of collective action is limited. In the case of the shellfish co-operative in Ballynakill Harbour, the model of purposive rationality dominated both the emergence of collective action and its shaping once access rights had been secured and free-riding became the dominant strategy. In the case of the mussel co-operative in the Killary, however, the model of purposive rationality is too limited to explain collective actions concerning access to the resource system. Although the perceived potential crisis that motivated the mussel farmers to initiate a concerted effort with the aim of securing access for fishermen and their own activity can be considered as a strategic action, purposive rationality can only explain the *emergence* of this effort. The shaping of this concerted action involved a process of negotiation and agreement, not only amongst mussel farmers and fishermen, but also embracing a community development project and the DoMNR, which is responsible for granting access and allocation rights. In reaching agreement about governance rules and thereby creating a situation in which the *collectif*, or platform comprising the co-operative and the enrolled others (fishermen, the community development project, DoMNR), is entitled to expect a certain behaviour from its participants, compliance is guided by normatively regulated social action; in other words, communicative rationality.

I conclude that in the shaping of collective action, strategies of translation are never fixed. Throughout the translation trajectory, *collectifs* use different social means (e.g., persuasion, negotiation, rationality, alliances) and material means (e.g., oysters, mussels, fish, licences, fairways) to achieve their objectives (cf. Bijker & Law, 1992; Latour, 1994; Verschoor, 1997). This also means that rationality is neither fixed, nor the exclusive property of a human being[1]. Rather, rationality is an emergent relational effect of the collective action process and therefore takes different shapes. Theories that are based on the narrow concept of purposive rationality and assume that rationality is a given property of human actors, will never get to fully appreciate how collective action processes are constructed and reshaped.

The translation trajectory involved in collective action leads me to another issue: the role of platforms in shaping collective action. In Chapter One and Three, I pointed out that platforms emerge when stakeholders experience negative impacts of their own and others' use of the resource and realise their interdependency in solving the problems through "adaptive management"[2] (Holling, 1978 in Gunderson *et al.*, 1995: 490). In the Killary, the members of the mussel co-operative realised their interdependency with other resource uses and initiated a platform to address the problem of access to the resource. In vain, the co-operative also called for the formation of a platform for collective resource use involving all users. Although other users also realise their interdependency with other users and, as a consequence, have established co-operative links (e.g., the salmon farm), this has not resulted in collective strategies for resource use. The existing platform initiated by the mussel co-operative is, however, weak. From the case study, it becomes clear that the agreements are easily challenged by the DoMNR. The latter is eager to grant licences for larger sites and to non-locals, and prefers to maximise production. Its interest runs counter to the ideas of the co-operative. Thus, the different discourses concerning the development of the mussel resource form a constraint to platform performance (cf. Aarts & Van Woerkum, 1996). While the mussel co-operative and fishermen realise that their strategic objectives of securing access to the resource system can only be achieved by drawing on communicative rationality, the DoMNR's discourse is purely driven by strategic economic and political motives, for which a focus on communicative action is more of a hindrance than a help. Neither the platform nor its joint agreements have been formalised, so that strategic rationality easily overrules communicative action. Discontinuities in interests, stakes, and social action influence the performance of the platform and might, on the long term, result in conflicts.

In this context, the case draws attention to the role of third parties in shaping collective action efforts amongst different user groups. While the community development project plays a role in facilitating negotiating processes involving local resource users and the government, the performance of the platform as a whole is undermined by the institutional framework at the constitutional (legislative) level. This problem has also been observed in studies on the management of local single-use common property resources (e.g., Barrett 1991; Olomola 1992; Ostrom 1990; Wade 1988). In addition, the case of the shellfish co-operative in Ballynakill Harbour showed how third party involvement in the co-operative formed a contextual factor that frustrated collective action.

The comparison of the case studies of Ballynakill and Killary Harbour in NW Connemara resulted in a number of observations that substantiated and/or provided new insights in earlier preliminary conclusions. In sum, I concluded that contextual factors should become part of CPR analysis as they set the scene for and shape collective action processes at the operational and collective-choice levels. I argued that a focus on prescriptive design principles for successful collective action diverts attention from the dynamic trajectory that shapes collective action; the same argument applies to the assumption that purposive rationality is a given property of humans and the driving explanatory factor behind co-operation or lack

thereof. I also pointed out that, in cases where collective action processes are shaped through platforms, discontinuities in interests, stakes and social action influence, and sometimes threaten, the translation trajectory.

In the next chapters, I will further elaborate on these findings. The scene of the following chapter is the Dutch Wadden Sea; an important nature conservation area that accommodates much contested shellfish fisheries. To achieve a balance between fisheries and nature, a co-management framework has been implemented, involving all relevant parties at different institutional levels. In the case studies of Cowes Harbour (Chapter Two) and Ballynakill and Killary Harbour (Chapter Five), the emphasis was on how collective action efforts emerge, and how these are shaped by contextual factors at the operational and collective-choice levels. Furthermore, these cases dealt with resource uses that were contested at local level only. In the case of the shellfish fisheries in the Wadden Sea, resource use is not only contested at local level, but has also become a public or national concern. This social stake has been of prime importance in shaping and *reshaping* a collective action process that started at the collective-choice level and, through political intervention, was extended to include the constitutional level and wider social interest groups.

Notes

[1] I do not deny that *collectifs* are capable of making a rational decision based on the interplay of cognitive factors including perceptions and emotions, communication, and preferences (Capra, 1997; Röling, pers.comm.). What I do dispute is that exercising rationality is the enterprise of human beings; rather *collectifs* make decisions that, to them, are rational. In this context, rationality, like the *collectif* itself is a relational effect that can take a number of forms. Thus, in a collective action process, rational action is not necessarily guided by strategic rationality, which is the model underlying rational choice theories.

[2] The term 'adaptive management' was introduced by the ecologist C.S. Holling and his colleagues in the late 1960s. Adaptive management is an approach that deals with "the unpredictable interactions between people and ecosystems as they evolve together" (Gunderson *et al.*, 1995: 490). It aims to "share and communicate understanding of resource issues, to expose key uncertainties, embrace alternatives, develop robust policies, and use their consequences to modify and adapt policies and actions further" (*ibid.*).

Chapter Seven

The politics of resource (co-) management

Balancing fisheries and nature in the Dutch Wadden Sea

The case studies of Cowes Harbour (Chapter Two) and NW Connemara (Chapter Five and Six) showed how local resource use increasingly became contested because of the growth of existing activities and the development of new activities respectively. In Cowes, lack of representation in the umbrella organisation for common-pool resource management was an important factor that triggered a collective action effort amongst oyster fishermen to gain access to the decision-making arena and secure access to their fishery. In NW Connemara, the lack of participation of traditional user groups in the development of the coastal waters resulted in various collective actions with the objectives of either preventing further undesired externalities from competing uses or balancing different uses. At the heart of both the 'activist' and the 'accommodative' collective action was the desire to secure access to the resource.

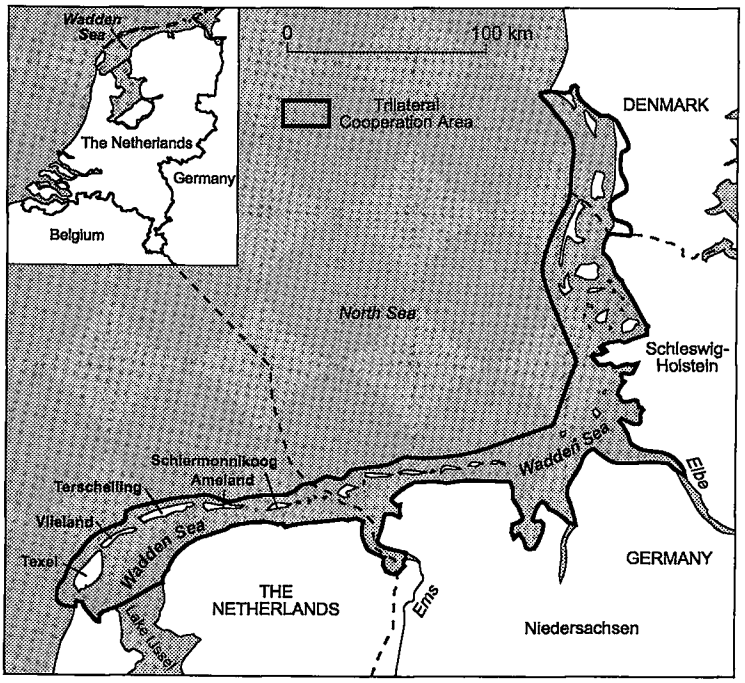
In the Dutch Wadden Sea, the scene of the present chapter, CPR use is contested not only at local level, but also at social level. Its waters have traditionally fulfilled an important role for shipping, fishing, mineral and gas extraction, military defence and recreation. From the 1980s onwards, nature conservation has gained a profound role, particularly through the designation of the area as a State Nature Monument and the implementation of a number of international nature conservation designations. Although all economic activities have become subject to some restrictions, the shellfish fishermen in the Wadden Sea have probably experienced most impact from the articulation of nature conservation. Their activities are not only contested by the local bird population, wild mussel beds and the sediment (through their spokespersons, that is), but have also become a public issue.

The theme of this chapter is 'the politics of resource (co-) management'. It focuses on the shaping and reshaping of the co-management framework for the Wadden Sea, which is aimed at the integration of shellfish fisheries and nature values through a multi-party process, including the shellfish industry, nature conservation groups, scientists and the government. Despite the implementation of the co-management approach, CPR use by the shellfish industry is still heavily contested. The images the resource users have of each others' activities and interests, and the role the different stakeholders adopt towards resource management cloud the negotiations and decision-making process concerning CPR management.

The Wadden Sea

The Wadden Sea is a tidal area extending from the north-west corner of The Netherlands along the coast and islands of the German Bight to Esbjerg in Denmark (Figure 7.1). It is a network of tidal channels, sandbars, mudflats, salt marshes, 23 islands with sand dunes and 14 high sands, covering about 9,000km² (including the islands, which account for 985km²). Approximately 30% of the Wadden Sea falls under the jurisdiction of The Netherlands, 10% falls under the jurisdiction of Denmark and the remaining 60% is the responsibility of the German Federal States of Schleswig-Holstein, Bremen, Hamburg and Niedersachsen (NFNA *et al.*, 1991).

Figure 7.1
The Wadden Sea



The Wadden Sea is Europe's largest wetland ecosystem and one of the largest in the world. It is characterised by a very high biomass production and an ecological importance extending far beyond its borders. The area forms one of the most important habitats for coastal waterfowl and shorebirds in the world and is the most important staging area and point of distribution for migrating birds in Europe. A number of sea mammals are indigenous to the area. Furthermore, the Wadden Sea is the residence of numerous fish species and an important nursery area for fish species from the North Sea and surrounding coastal waters. Consequently, a large number of nature conservation designations apply to the area. The Dutch part of the Wadden Sea is designated as: (i) a Wetland of International Importance

under the Ramsar Convention 1971, (ii) a Special Protection Area under the European Directive on the Conservation of Wild Birds (79/409/EEC), and (iii) a Man and Biosphere (MAB) Reserve under the UNESCO MAB Programme (NFNA *et al.*, 1991). Every three years, the governments of The Netherlands, Germany and Denmark meet at the Trilateral Governmental Conference, to discuss and agree on policy actions regarding the protection of the Wadden Sea as a whole.

The protection and conservation of the Dutch Wadden Sea at national level is based on a combination of two planning instruments: (i) the Nature Conservation Act 1981, designating the area as a State Nature Monument, and (ii) the Wadden Sea Memorandum (1981, amended in 1994), which is the basis for all further planning, conservation and management for the area for all state, regional and local authorities. The primary objective of the Wadden Sea Memorandum is:

> "the sustainable protection and development of the Wadden Sea as a nature conservation area" (VROM, 1994: 7).

Within the preconditions of this objective, "human uses for economic or recreational purposes are possible" (*ibid.*).

By the time the nature conservation values of the Wadden Sea were first articulated, the area had already developed into an important economic resource, including fishing, commercial shipping, military defence, recreation, and the extraction of minerals (sand) and gas. In this context, the need to harmonise nature conservation values and human uses has become of increasing importance.

Before 1996, the management of the various human uses was based on a sectoral approach with each user group having its own management plan. When the Wadden Sea Memorandum was amended in 1994, it was decided that all 12 sectoral plans should be incorporated in one overall plan, the Integrated Management Plan Wadden Sea. Its prime objectives are (i) the undisturbed development of natural processes, and (ii) the conservation and, were possible, regeneration and development of existing nature values. Human uses are allowed, provided they do not conflict with these ecosystem objectives (Rijkswaterstaat, 1996). The different user groups were asked to reconsider their existing plans, taking into account the primary management objectives for the Wadden Sea. After a process of extensive user participation, the Integrated Management Plan Wadden Sea for the period 1996-2001 was approved.

The role and position of fisheries in the management plan is somewhat different from other uses. In 1993, the government adopted a co-management approach to fisheries management. This meant that a management strategy for the Wadden Sea fisheries, which is based on ecosystem objectives, was already in existence. Since conflicts amongst the fishing industry and other economic user groups were absent, gearing the fisheries to other economic uses was not considered necessary. Therefore, it was decided to incorporate the existing strategy in the plan and, consequently, the fishing industry's involvement in the Integrated Management Plan

was only minimal. The fisheries also differ in terms of the management responsibilities given to them. Whereas other users are mainly regulated by local, provincial and national authorities with different levels of user group participation and management responsibility, the shellfish fishing industry in particular has obtained considerate co-management responsibilities.

Towards fisheries co-management

"The great cockle robbery..."

The Dutch Wadden Sea has been an important fishing ground for centuries. Nowadays shrimp (*Crangon crangon*), cockles (*Cerastoderma edule*) and mussels (*Mytilus edulis*) are the dominant species. There are 91 licence holders for the shrimp fishery in the Wadden Sea. Total Dutch shrimp landings in 1998 accounted for 8.849 tonnes, of which approximately 30% originate from the Wadden Sea (Pvis, 1999). In the cockle fishery, two types of fishery are distinguished: (i) the mechanical sector, which uses hydraulic suction dredges to fish cockles, and (ii) the non-mechanical sector, which uses the traditional hand dredge. There are 37 licences for the mechanical fishery. The licences are concentrated on 23 vessels and are held by ten companies. Seventy-five fishermen have licences for the non-mechanical fishery; approximately 20 of them make a living from the cockle fishery. As the cockle stocks can show significant fluctuations, annual landings may vary strongly (see Table 7.1). In 1998, the total value of landings accounted for DFL 60 million (PO Cockles, pers.comm.). The mussel fishery is a semi-culture, concentrating on the bottom cultivation of wild mussel seed on parcels, which are rented from the state. There are 89 licences for the mussel seed fishery and 82 lessees of mussel parcels. In 1998, the total mussel seed catch in the Wadden Sea was 60 million kilos; the total landings of mussels for consumption were 92.2 million kilos (fresh meat) with a value of DFL 101.3 million (Pvis, 1999).

Due to continuous fishing pressure in the 1980s, followed by a series of mild winters which caused low spatfall, mussel seed stocks were very low in the early 1990s. The lack of sufficient mussel seed led to intensive fishing of the remaining wild beds. The combination of human and natural factors almost resulted in the total disappearance of inter-tidal mussel beds (Smit, 1995). In the same period, cockles also showed reduced spatfall. A considerable share of the low stock was fished (Dankers, 1993) (Table 7.1). All these factors contributed to a food shortage for birds whose main diet comprises cockles and mussels, most notably, the oyster catcher (*Haematopus ostralegus*) and the eider (*Somateria mollissima*). As a consequence, high mortality rates occurred.

The death of thousands of birds attracted strong media attention. Nature conservation groups and some scientists stated that the Wadden Sea had been robbed of almost its complete stock of cockles and its last wild mussel beds, and spoke of an *"ecological disaster"*. Quality newspapers published articles with headings like "The great cockle robbery of 1990" (NRC, 26.09.92), influencing

public opinion. The effects of natural factors on the available stocks were hardly mentioned, although research indicated that despite the closure of the cockle fishery in 1991, food availability for birds was not sufficient (Smit, 1995). The cockle fishermen who use hydraulic suction dredges to fish cockles were also accused of destroying the rare eelgrass *(Zostera marina)* beds and of damaging the sea bed.

Table 7.1
Cockle stocks and landings 1985-1998 (x 1.000 tonnes fresh meat)

Year	*Total stock*	*Total catch*	*Percentage catch from total*	*Stock in densities >50/m²*	*Percentage catch from densities >50/m²*
1985	15.0	5.8	38.7	6.0	96.7
1986	10.0	2.6	26.0	4.0	65.0
1987	12.0	1.2	10.0	5.0	24.0
1988	175.0	8.2	4.7	147.0	5.6
1989	115.0	6.4	5.6	85.0	7.5
1990	26.0	5.6	21.5	8.9	62.9
1991	4.5	0.0	0.0	1.9	0.0
1992	40.0	2.5	6.1	23.9	10.5
1993	53.9	4.7	8.7	36.3	12.9
1994	24.7	2.6	10.5	12.0	21.7
1995	34.1	3.3	9.7	15.0	22.0
1996	3.8	0.0	0.0	0.2	0.0
1997	13.6	1.4	10.3	12.6	11.1
1998	145.0	9.3	8.1	-	-

Source: Pvis *et al.* (1998); PO Cockles (pers.comm.)

In 1991, the Ministry for Agriculture, Nature Conservation and Fisheries (LNV) closed approximately 50% of the Wadden Sea for cockle fishing. The cockle sector took legal action and the fishery was reopened again; the president of the State Council judged the government action to be unlawful as fisheries legislation at the time did not grant powers to take nature conservation measures (Keus, 1994). However, like in the previous period, fishing was not regulated by any means other than the required fishing licence. Again, the fishermen's activities resulted in strong protests.

It was within this context of conflict over the resource that the mussel and cockle sector decided to impose a number of restrictions.

In 1991, the mussel sector and the government agreed on a division of available mussel seed between fishermen and birds. In addition, a 'fishing plan' was made which stipulated a Total Allowable Catch (TAC) for mussel seed and individual mussel seed quota. In 1992, the mussel industry voluntarily agreed on the closure of tidal mudflats for seed fishing in the eastern Wadden Sea. By restricting the adverse influences on the environment, the mussel sector hoped to prevent strict government measures (Keus, 1994).

In 1992, the mechanical cockle sector (hereafter referred to as cockle sector), followed their colleagues from the mussel sector and implemented a fishing plan. Measures included *inter alia*: (i) reduction of the fleet from 36 to 22 vessels by concentrating two licences on one vessel, (ii) quota for the Eastern Scheldt estuary, (iii) an agreement not to fish near eelgrass beds, and (iv) the requirement to have a 'black box', registering all fishing positions, on board. In 1993, a similar fishing plan came into effect for the Wadden Sea (PVV, 1994). The non-mechanical sector made its own fishing plan. A year later, the voluntary measures were incorporated in a national co-management policy framework for sea and coastal fisheries.

The Sea and Coastal Fisheries Policy

In 1993, after a period of consultation and heated discussions involving the industry, nature conservation groups, government authorities and the government's advisory boards, the Sea and Coastal Fisheries Policy (SCFP) was implemented. The policy is built around two central themes: (i) the division of responsibilities between the fishing industry (coastal and offshore), and the government, and (ii) the integration of fisheries and nature (LNV, 1993). The SCFP covers a period of ten years. For the coastal fisheries, which includes fisheries in the Wadden Sea, two phases are distinguished. The first phase ran from 1993 to 1998. An evaluation of the measures taken in the first phase was carried out in 1997/98. The conclusions of the evaluation were translated into additional measures for the second phase (1999-2003). The implications of the SCFP for shellfish fisheries in the Wadden Sea are far-reaching.

The interpretation of the SCFP for the Wadden Sea is based on nature conservation and protection of natural processes, as stipulated in the Wadden Sea Memorandum. As a result of the policy, a total area of 26% of the Wadden Sea has been closed for cockle fishing and mussel seed fishing to protect the development of mussel and cockle beds and eelgrass. This closure is based on an agreement at the 6th Trilateral Governmental Conference in 1991. For shellfish fisheries, the first phase of the SCFP (1993-1998) was based on a differentiated approach in which a distinction is made between so-called normal years and years with a food shortage for birds. In years with a food shortage, which is determined on the basis of a stock inventory by the National Fisheries Research Institute (RIVO), 60% of the calculated mean food demand is reserved for the birds and fishermen are allocated quota. If less than 60% of the mean food requirement for birds is available, the fishery is closed (LNV, 1993). Within this framework the shellfish industry, in collaboration with nature conservation groups, was responsible for the design and implementation of a Shellfish Fisheries Management Plan (1993-1998) in which the principle of integration of fisheries and the natural environment in the coastal waters is shaped through tangible agreements. The development of the plan took place under the aegis of a steering committee with an independent chairwoman. Within the structure of the Shellfish Fisheries Management Plan, the industry is obliged to design yearly fishing plans. Table 7.2 gives an overview of the measures taken under the first Shellfish Fisheries Management Plan. The responsibility of the design,

implementation and monitoring of the fishery management plan and the yearly fishing plans lies with the producers' organisations[1] for the mussel and the cockle sector, and with Cardium, the association for the non-mechanical cockle fishermen.

The other commercial fishing activities in the Wadden Sea, shrimp and flatfish fishing, are also subjected to the SCFP. For the shrimp fishery no restrictive measures have been taken, since (i) the negative nature conservation impacts of shrimping are considered to be minimal and (ii) the sector has already taken measures to reduce by-catches of undersized fish and market regulatory measures to control overfishing. Flatfishing activities in the Wadden Sea are very marginal. In line with the closure of areas for mussel seed and cockle fishing, 26% of the area has been closed for beam trawling with tickler chains.

Table 7.2
Shellfish Fisheries Management Plan (1993-1998)

Cockle fisheries	*Mussel seed fishery*
▪ 60% reservation of mean food requirement in the form of cockles in years with a food shortage* (SCFP)	▪ 60% reservation of mean food requirement in the form of mussels in years with a food shortage (SCFP)
▪ in years with a food shortage, 1/17 of TAC is reserved for the non-mechanical sector* (SCFP)	▪ implementation of yearly fishing plans (SCFP)
▪ implementation of yearly fishing plans* (SCFP)	▪ introduction of TAC on mussel seed in years without a food shortage
▪ reduction of fishing capacity (number of vessels, maximum diameter of suction tube, limitations on engine capacity)	▪ control system (black box) and heavy sanctions
▪ spread of the fleet	▪ protection of eelgrass beds
▪ control system (black box) and heavy sanctions	▪ voluntary closure of additional areas where wild mussel banks may develop
▪ minimisation of disturbance to birds and seals*	▪ minimisation of disturbance to seals
▪ protection of mussel beds and eelgrass*	▪ research into more efficient use of mussel seed and improved fishing gear
▪ closure of beds with predominantly first year class cockles	
▪ restrictions on fishing periods	
▪ research into reductions of ecological externalities and quality improvements	
* measures also taken by the non-mechanical sector	

The Shellfish Fisheries Management Plan (1993-1998)

When the first voluntary fisheries management measures were taken by the mussel and cockle sector in respectively 1991 and 1992, the measures were implemented by Zevibel, a regional fishermen's association in collaboration with the National Fishermen's Association. As associations have no legal powers to oblige fishermen who have not signed the fishing plan, to comply with its rules and as LNV refused to

get involved in its enforcement, the mussel sector decided to transfer responsibilities for the fishing plan to the producers' organisation (PO) for the mussel sector in 1993. PO regulations are binding for all members and the PO has statutory powers to impose sanctions, including fines. Since POs offer a number of facilities that are profitable to its members, members will think twice before they leave the PO. Furthermore, the European regulation EEC 3759/92 stipulates that the PO is the competent organisation to take measures to ensure good quota management; this means that their authority cannot be questioned (Keus, 1994). These factors made enforcement of the fishing plans easier to achieve. In 1995, the cockle sector established a PO for the same reasons.

The problem when first establishing regulations was the question of how to convince fishermen of the need for restrictive measures, i.e., how to make fishermen who are used to fish in a 'free fishery' comply with self-management regulations? For the cockle sector, the compliance question was complicated by the fact that the large majority of the fishermen are employed by a number of companies and work on commission. Therefore, their interest in restricting fishing activities was virtually absent as *"only the kilos count"* and as they feared the loss of their jobs.

There were a number of tools available to convince the fishermen of the need for regulations. The industry's weekly newspaper, Fishing News, was used to explain the need for measures. Meetings were held in which each measure that was taken in the first fishing plan and was incorporated in the fishing licence, was explained assisted by scientists. In this way, it was tried to create an understanding of the need for measures.

In addition to these persuasive communication strategies, the two POs sanction anyone who does not comply with the rules. For example, in the first year the fishing plan for the cockle sector was carried out, total fines added up to an amount of DFL 62,500; the fines were all collected. One of the cockle fishermen, who repeatedly did not comply with the rules, was fired by his company under pressure of the PO. The companies agreed that should a skipper be fired, he will not be employed by any other company. The impact of peer pressure is also an important factor in encouraging compliance and seems to be working very well. The PO Cockle Fishery has put a lot of effort in convincing the fishermen that what they perceive to be *"shopping their mates"* should be looked at from a constructive angle:

> *"[We told them:] if one of your colleagues do not comply with the rules, warn him; it is always better to warn someone beforehand than to wait till the inspectorate gets him".*

The introduction of the 'black box', which is a small computer registering all fishing positions, has been crucial in monitoring compliance by the shellfish fishermen. If there is reason to believe that fishermen have not abided with the rules, the data on the black box are used to prove whether or not the fisherman in question has violated the agreements.

The implementation of the voluntary measures and, after 1993, the Shellfish Fisheries Management Plan 1993-1998 (Table 7.2) has had significant impacts on the operational level. The most important consequence was that the 'free fishery', i.e., the absence of restrictions on fishing except for the licence requirement regulated by the government, was abandoned in favour of a regulated common property fishery:

> *"[Before the fishing plan came into place] it was like the wild west [...] we tried to fish as many cockles as possible since you had to recover your expenses and earn money on top of that. [...] I admit that a lot of things happened that were wrong in that period"* [Thijs[2], cockle fisherman].

> *"It was tramp shipping [...]. It used to be a race against time to get the largest part of the available [mussel] seed. When the vessel was full, we had to race to the parcel, sow the seed and rush back, because, you know, while you were on your parcel, somebody else was fishing away the seed"* [Adrie, mussel cultivator].

The shift towards a common property fishery has resulted in a number of benefits for the cockle fishermen and the mussel cultivators. A first benefit is the installation of the black box on board of the cockle vessels and its use in the mussel seed fishery. At start, fishermen did not know what to think of this technological artefact, but now they are raving about it:

> *"The black box is fantastic. A little while ago we were called that a trail from a cockle dredge was found on [the tidal flats in a closed area]. We all handed in our memory cards and it appeared that none of us had been there. They don't know what happened but presumably it was a flatboat that had run aground and used its screw propeller to get going "* [Thijs, cockle fisherman].

> *"Each cultivator hands in their memory cards and then you can read that we do not fish in the closed areas. It has put us in a stronger position. For example, the Balgzand area is closed and you can find a lot of mussels there. Well, we don't go to that area and if you can prove that with something, then you're in a much stronger position. So the relationship with the nature conservation groups has improved somewhat"* [Douwe, mussel cultivator].

For the PO Cockle Fishery, the black box has yet another advantage:

> *"[The black box data] indicate that over the past 5 years we have constantly fished in the same areas and that the fishery took place in 3.3% of the Wadden Sea".*

These data are used in the discussion with the nature conservation groups and the government about the impacts of mechanical cockle fishing on nature conservation.

Second, the implementation of the co-management measures has had economic consequences. For the mussel sector economic disadvantages have been minor, although, in comparison with a 'free fishery', the net added value was reduced with 7-12% (Pvis *et al.*, 1998). The quota system has resulted in the more efficient use of

seed. Whereas previously, fishermen would fish as much seed as possible and *"wouldn't stop fishing until their neighbour stopped"*, they now have to sow the same number of parcels with less seed. The system has resulted in an efficiency increase with a factor 3:

> "Before the 1990s, the total average catch of [seed] mussels was about 150,000t/year by 100 or more large dredgers in six or more weeks. This gave a saleable crop of 100,000t (66% conversion). In the years between 1992 and 1995, when reduced fishing was agreed with the bird conservationists, a lower catch of 40,000t was taken by 86 vessels in 10-18 fishing days per season. This gave a final production of 80,000t - representing a conversion of 200%" (FFI, 1997).

For the cockle sector, the implementation of the measures under the SCFP has resulted in a heavy economic loss of DFL 72,4 million over the period 1993-1997[3] (Pvis *et al.*, 1998). The years 1993, 1994 and 1995, were years with a food shortage and a TAC was set for the cockle fishery (see Table 7.1). In 1996, the Wadden Sea was completely closed for cockle fishing. This situation can be attributed to natural factors. The 1997 stock inventory by RIVO showed that, once again, the cockle fishery had to be closed. As a second consecutive closure on top of a number of poor years would have disastrous economic consequences for the industry, the cockle sector obtained permission to fish 1.200 tonnes in the sublitoral parts of the Wadden Sea[4] [permanently submerged areas]. In accordance with the SCFP, the non-mechanical sector was allocated 1/17 of this TAC. Economic benefits are related to the reduction of the fleet from 36 to 22 vessels which results in a better spread of the fleet over the fishing grounds and lower running costs.

The introductory period of the measures under the SCFP has not been without its problems. Three mussel cultivators did not sign the fishing plan of the PO Mussel Culture. The fishermen who did sign the fishing plans were divided into groups that participated in the seed fishery on the basis of a rotation system. It was also agreed not to fish the mussel beds in the Eastern Scheldt in the south-west of the country. The non-signers went to LNV and obtained permission to fish one week. The result was that they fished during the entire first week of the season including in the Eastern Scheldt and had a higher catch than the agreed quota, thereby infuriating the others, who perceive that the co-management system is undermined if non-members can rely on alternative management regulations offered by the government:

> *"It cannot be possible that the government treats someone who is not a PO member equally, and sometimes even better, than the members who have restricted themselves. And such is the case now. The self-management system stands or falls with it. If the government does not grant the mussel and cockle sector an 'extension de régime' [which means that measures taken by the PO become binding to non-members], you can shake it on the long term. If it is not no longer interesting for the fishermen to be a PO member, then we, the administrators, cannot guarantee the implementation of the fishing plan".* [Secretary PO Cockle Fishery].

With the adoption of co-management, the government has opted for an extensive delegation of management responsibilities to the industry on the basis of a multi-party participatory process involving the shellfish industry and nature conservation groups with scientific assistance from different research institutes. The strength of this approach is undoubtedly the high compliance rates with fisheries regulations. However, although the multi-party negotiating process has resulted in a 'cease fire', i.e., the former opponents are on speaking terms, resource use in the Wadden Sea is still heavily contested. The next sections will show how the role the different parties adopt in relation to resource management and the images they have of each other's interest are of crucial importance in the dynamic process of shaping and reshaping the co-management framework.

The politics of resource co-management

Eco-warriors and "political biologists"

In the late 1960s and early 1970s, fishermen's organisations and nature conservation groups united in their fight against the damming of the Eastern Scheldt in the south-west of the country. The proposed closure was part of the Delta Works that were being built in response of the 1953 flood disaster in which over 1800 people lost their lives. The joint lobby by nature conservation groups and the fishing industry and increasing public pressure in the 1970s, led to a government decision to construct a surge barrier, which could be closed at storm tides, rather than damming off the Eastern Scheldt. The tidal regime was maintained and an important nature conservation area, nursery for North Sea fish and shellfish ground was saved. By the early 1990s, the tide had turned and the two former allies had become opponents.

There are a number of factors that led to the development of these strained relations. First, the nature conservation groups accused the cockle fishermen and mussel cultivators of being responsible for high bird mortalities in the early 1990s. Second, for the cockle sector, a series of other events further added to the disturbed relationship. The mussel cultivators, who were desperate for mussel seed for their cultivation parcels, hired a number of cockle fishermen to fish the last remaining mussel seed on the tidal flats in the areas that were too shallow for the mussel dredgers.

Another factor that is not to the benefit of the cockle sector are the suction dredges, which leave clear trails on the tidal flats. The cockle fishermen were being accused of *"ploughing up the entire Wadden Sea"*. Just after the implementation of the SCFP, another incident occurred whereby cockle vessels damaged the research plots from the Directorate General of the Ministry for Public Works, causing an outburst of anger amongst nature conservation groups and the research community. The PO Cockle Fishery claims that the fishermen did not know about the presence of these so-called ecoplots, which was confirmed by the Institute of Forestry and Nature Research. The map in the SCFP showing the closed

areas is not correct, so that the ecoplots do not fall within the boundaries of closed areas. The fishermen used this map to outline the closed areas on their Global Positioning System (GPS) and consequently fished in the ecoplots.

The media quickly followed up on the press releases by the nature conservation groups. However, not only the nature conservation groups, but also some scientists actively started to seek media attention. Notorious for having appeared in several newspaper articles from 1988 onwards, is the following extract by one particular biologist:

> "Watching out of the observation cabin [for bird watching at the island of Griend in 1988], I suddenly saw six flat monsters approaching. They were factory ships used in the cockle fishery. With pounding speed and at spring tide, they shovelled over the mudflats and scraped the upper layer of the sediment off. [...] That was the last time I saw Griend in its original state" (Volkskrant, 20.09.97).

The actions of these 'political biologists', who, according to an industry representative, *"cannot make a distinction between objective scientific facts and their personal opinion about nature conservation"* are a thorn in the flesh of the fishing industry and other scientists. The majority of the scientists, many of whom carry out scientific research commissioned by LNV in the context of the SCFP, feels that such remarks by their colleagues damage the relationship with the sector: *"fishermen tend to pigeon-hole us as nature conservationists"*. The actions of a minority group affect the trust the shellfish sector puts in the research community, the dissemination and use of scientific results, and co-operation between the groups. The same applies to the position the nature conservation groups take.

When the SCFP was discussed the House of Commons and it became clear that the politicians did not want to take any further measures than the ones that were presented in the consultation draft, the influential National Society for the Protection of the Wadden Sea (*Waddenvereniging*) decided to agree on the House of Commons' proposal to get engaged in formal negotiations with the shellfish industry rather than to turn its back to them. This strategy led to much upheaval within the nature conservation movement:

> *"The die-hards felt that we had sold our soul to the devil. But [the strategy] is Realpolitik; through collaboration with the sector we have tried to make a stand with respect to the management plan and have ensured that we stay in the centre of the policy-making process rather than being sidelined"* [Director *Waddenvereniging*].

The *Waddenvereniging* feels that their approach of entering a dialogue with the shellfish industry pays rewards:

> *"In the 1980s, there was a mussel seed race; this has all been regulated now. [...] That is an advantage. If we look at the impacts on nature conservation it is not enough, but at least there is a realisation now that you can't just do anything to get that mussel aboard. It is more difficult for the cockle sector, since that sector is more*

> *capital-intensive and has to fish cockles in a relatively short period of time"* [Director *Waddenvereniging*].

The general view within the *Waddenvereniging* is that mechanical cockle fishing is not a sustainable fishery and will be subject to many discussions to come. Although they are consulted about the contents of the fishing plans by the PO Cockle Fishery, *"the plans never go as far as we want in terms of nature conservation"*. Communication with the sector is generally considered to be good, but the society has its doubts about the results of the communication process. According to their Fisheries Division, the interests of the sector and the interests of the nature conservation groups are too far apart despite the fact that both groups acknowledge that nature conservation is in their mutual interest. Whereas the sector feels that they have restricted themselves severely for nature conservation purposes, the *Waddenvereniging* perceives that the sector has shrugged it off too lightly. In November 1997, the *Waddenvereniging* declared itself openly against mechanical cockle fishing in the Wadden Sea. The activities of the non-mechanical sector are considered to be *"an environmentally friendly way of fishing"* and, as a consequence, are tolerated without discussion.

The relationship with the mussel sector, especially with the cultivators at the operational level, is more intense. The *Waddenvereniging* attributes this to the different organisational structure of the sector: the mussel cultivators own their own company in contrast to the cockle fishermen, who are nearly all employed by a small number of large companies. These companies, in their turn, rely on their PO to represent their interests. In addition, the mussel festivals that are being held throughout the summer offer an opportunity to mix with the cultivators and discuss matters informally.

The Netherlands Society for the Protection of Birds (*Vogelbescherming*) takes a more explicit position with respect to co-management than their colleagues of the *Waddenvereniging*. Although they *"are not negative about the results of the [SCFP]"*, they are of the opinion that the responsibility for nature conservation should rest with the government and can never be given to the fishing industry that only aims for economic goals. During the consultation period for the proposed SCFP, communications between the *Vogelbescherming* and the shellfish industry were very frequent. After the policy came into force, communications became less:

> *"We do not think we should be engaged in bilateral negotiations with the sector; we are not aiming for covenants. If we negotiate with the sector than it must result in policy changes"* [Representative of the *Vogelbescherming*].

Despite the differences in approaches towards the sector, the two nature conservation groups have the same vision about the protection of the Wadden Sea. Therefore, they try to harmonise their ideas and often act collectively in the political lobby[5].

The opinions about the relationship with nature conservation groups within the shellfish industry vary. The comparatively frequent exchanges between the mussel sector and the nature conservation groups seem to have contributed significantly to the way the cultivators perceive the nature conservation groups:

> *"[in the beginning] I felt that they were overreacting, they always blamed the fishermen. Of course bad things have happened in that period [the early 1990s]. But now the relationship has improved significantly, and it still is. We can now sit around the table. We know that we need each other"* [Adrie, mussel cultivator].

> *"We also agreed upon those biotopes [wild mussel beds]. From our practical experience we know that biotopes are most likely to develop around the islands. So we indicated a voluntarily closed area south of the island of Ameland, since the mussel seed won't wash away easily over there. But it will take at least 20 years for a biotope to develop. If you close an area voluntarily, you will get the nature conservation and environment people more easily on your side"* [Johan, former mussel cultivator].

In contrast to the mussel cultivators, the cockle fishermen have bitter feelings about the nature conservation groups. They believe that the latter are ill-informed about cockle fishing which makes them draw the wrong conclusions:

> *"I took one of them on a fishing trip and the first thing he mentioned was the size of the blade attached to the dredge that would allegedly cut 10cm into the seabed. I showed him the size of a cockle and said: how big is this cockle and how deep is it buried? Do you need a 10cm long blade to dig it up? No, 3cm is long enough. If a farmer lifts his potatoes, he is not going to plough up his field half a meter either"* [Thijs, cockle fisherman].

Cockle fishermen also perceive that the nature conservation groups are not always truthful when they bring fishing activities under the attention of the public. One particular incident in 1997, whereby a representative of the *Vogelbescherming* claimed on national television that the mechanical cockle sector was to be blamed for the death of a large number of oyster catchers has become a popular example to illustrate their point. The cockle sector was furious since the fishery was closed in the previous season; later they were backed up by LNV and the *Waddenvereniging*. However, fishermen at the operational level feel that such false coverages are damaging their reputation for which they fought so hard.

The PO Cockle Fishery confirms the concerns of the fishermen, but from their position of being representatives for the mechanical sector they feel that the relationship with the nature conservation groups has improved significantly:

> *"Once the SCFP came into force there was peace and we do communicate from time to time about the evaluation of the SCFP. Informal negotiations also take place, for example about the fishing plans"* [Secretary PO Cockle Fishery].

However, the fishermen's concern about the misleading information given by the nature conservation groups in the media is also felt by the PO as a major problem affecting their trust in the nature conservation groups.

Of crucial importance for the relationship between nature conservation groups and the shellfish industry, and therefore for resource use negotiation, are the images both groups have of nature and each other's interest, which cloud the discussions over resource use in the negotiating and decision-making process at the collective-choice and constitutional level.

Vacuum cleaners, robberies and other images

During discussions with cockle fishermen, mussel cultivators, fishermen's representatives and nature conservationists, it soon became clear that the images of 'the other' and the language they used when referring to the same subjects played a central role in the process of resource use negotiation. Cockle fishermen, for example, frequently made remarks like:

> *"When you go to the [Frisian] islands and you have a chat and you tell them that you are a cockle fisherman, they immediately react like 'oh, how does that work'. Then you have to explain them that you fish with a hand dredge and then it's okay"* [Jippe, (non-mechanical) cockle fisherman].

> *"[...] and then you've got the whole media hype around it. It happened a couple of times that the newspapers published articles with headings like "cockle fishermen empty the entire Wadden Sea" while we [mechanical sector] didn't even fish that year. And then they publish a rectification which is so small that no one will even read it. Then the damage has been done and we are again considered to be criminals"* [Thijs, cockle fisherman].

> *"I admit that, in the past, we [mechanical sector] have done things that won't do. But not anymore and that's because of the black box. It is not fair that there are still people who won't believe it"* [Jos, cockle fisherman].

> *"We [non-mechanical sector] have asked the nature conservation groups to make a distinction between us and the mechanical sector when they bring things under media attention'"* [Secretary of the association for non-mechanical cockle fishermen].

The cockle sector as a whole perceives that the images the nature conservation groups have about cockle fishing severely affect the discussion about proposed policies and management strategies. The cockle sector agrees that their fishing activities under virtual open access conditions have immensely contributed to the creation of the image of 'factory vessels that plough up the whole area and take away food for birds'; however, they perceive that they do not get a chance to adjust this image. In particular, their perception that the nature conservation groups, who are well-informed, twist the information in order to gain media attention and attract new members has caused bitter feelings.

In discussions and press releases discourses such as "ploughing up the tidal flats", "food robbery", "the only place where cockles can still be found is in *paella* [Spanish dish]", and "they are fishing like madmen", were frequently mentioned by nature conservation groups and some scientists. The hydraulic suction dredges are referred to as "vacuum cleaners" and the cockle vessels are called "factory vessels". In most press releases after 1993, a distinction is made between mechanical and non-mechanical cockle fishing.

If we put these discourses into perspective a different image arises. First, it is true that the cockle vessels are very large. The vessels are very shallow (50cm) in order to be able to fish on the tidal flats; thus the length and width of the vessel compensates its depth, which enables the fishermen to equip it with gear and technologies to minimise by-catches and the catch of undersized cockles. Second, the hydraulic suction dredge may look like a vacuum cleaner, but unlike a vacuum cleaner it does not 'hoover' everything it encounters; rather it ensures a very selective way of fishing whereby only cockles over a certain size are caught. Third, it is a fact that the 3cm long blade attached to the dredge scrapes the top-layer of the sediment away and leaves a very visible trail behind. However, unlike the non-mechanical fishermen who systematically walk over the flats, it is physically impossible for the mechanical sector to fish in neat parallel lines, so that the tidal flats look rather messy once they have been fished.

The discourse used when referring to the non-mechanical sector is completely different. In general, this sector is neglected in the discussion or is not considered to be particularly damaging to the ecosystem. In contrast to the image of the mechanical sector, the image of the non-mechanical cockle sector can be compared to the traditional, romantic image of 'the hardworking fisherman'. 'Traditional', in the discourse of the nature conservationists, is a synonym for *"good"*, *"environmentally friendly"* and *"the way it was always done"*. By being 'traditional' the non-mechanical cockle fishermen have obtained a powerful weapon: they are considered to have historic rights to fish in the nature conservation area called the Wadden Sea *and* they are conceived to be harmless[6].

The image of the mussel fishery is far less explicit than is the case for the cockle sector. From 1991 onwards, there has been no competition for mussel seed with birds as the seed fishery, except for 1994, only took place in the sublitoral areas. In addition to the areas closed under the SCFP, additional have been closed voluntarily. These factors have contributed to decreasing media attention for the effects of the mussel fishery compared to the mechanical sector. Nevertheless, an image of the mussel fishery has been constructed over the past ten years.

In the period before 1993, press releases about the mussel fishery were characterised by headings such as "mussel fishery goes down by its own ignorance" and "a real farmer would be ashamed of himself" - both referring to the low returns from the mussel seed that were sown on the parcels before the seed quota were introduced - and "mismanagement causes death of thousands of birds".

After this period, the number of press releases about the mussel fishery decreased and were mainly directed at the competition for mussels with birds.

The mussel sector's representatives have reacted to these press releases in a more reticent fashion than the PO Cockle Fishery. In the period prior to the SCFP, the sector decided to re-create the public image of the sector, rather than entering a public discussion. For these purposes a platform, consisting of amongst others, the mussel and cockle sectors, local councils, provinces and the Chamber of Commerce was established. Its objective was to influence the political decision-makers through an active public affairs policy aimed at improving the image that was created by nature conservation interests through the media.

Just as the nature conservation groups have an image of fisheries and nature, the shellfish industry, equally has a certain image of nature. In relation to the food reservation for birds cockle fishermen mentioned the availability of alternative food sources, including small cockles, to cope with lack of shellfish. Furthermore, two fishermen wondered why the closed areas are not rotated on a yearly basis so that they could fish the big cockles in these areas - *"they will die anyway after five years, so they are of no use to anyone then"*- and the birds could eat the small, and commercially unattractive, cockles in formerly open areas.

The mussel cultivators have a very clear opinion about the disappearance of the mussel beds, which is closely related to their image of nature:

> *"We were accused of dredging those beds entirely. It's not true, we thinned them out, but we made sure enough was left. But now there isn't enough spatfall on the tidal flats and the cold winters have resulted in high mortality rates of small mussels and cockles. [...] I mean, look at the cockle fishery, they haven't fished there for years but cockle beds haven't emerged at all. The fisherman is being blamed for natural [processes] [...] Now they [the environmental groups] want to have the eelgrass beds back and the wild beds back, but ever since they have started talking about it and have closed areas nothing has happened. What do they think anyway, after such cold winters and floating ice nothing could have survived"* [Douwe, mussel cultivator].

The cultivators, who are used to demarcated, structured parcels, also have their own image of wild mussel beds:

> *"I can't see why they think these mussel beds are beautiful. Have you ever seen one? It looks like a right mess"* [Adrie, mussel cultivator].

> *"You have to work the sea. It's like a farm; if a farmer doesn't work his land, it will look awful [...] you've got to help nature a bit"* [Douwe, mussel cultivator].

Whereas nature conservation interests blame the cockle and mussel sector for taking the food for birds, the cultivators, on their turn, blame the eiders for eating their product. And like farmers, some cultivators have got their own scarecrow: speedboats.

> *"... then you get to your parcel and you can see it is swarming with eiders diving for your mussels. [...] The last couple of years we have been guarding the parcels in winter. We anchor the vessel and just scare them off with a speedboat. [...] In [other] areas, where there are a lot of parcels, [the cultivators] undertake a joint effort [...] they make a rotation scheme and go turn by turn, because if you have to stay at your parcel all the time, you know, that's a dread"* [Douwe, mussel cultivator].

The mussel sector has, from 1993 onwards, not suffered heavily from negative publicity. However, in the period when the official evaluation of the measures taken in the first phase of the SCFP (1998) and various research reports about the ecological effects of mussel fishing were made public, the media, encouraged by the environmental groups, picked up the issue again. And yet another image occurs:

> *"I'm only a fisherman, but the environmental groups, they can write; they are always in the newspapers, on the telly, everywhere. But before they do that they must first talk to the practitioners. If you can write well and are well-spoken, it doesn't necessarily mean that you're always right"* [Douwe, mussel cultivator].

It is apparent that the image of nature of the shellfish industry is different than that of nature conservation groups. Although all fishermen and the PO Cockle Fishery agree that they need a sustainable ecosystem to secure their livelihood, the sector also looks at the Wadden Sea in terms of a production area. Nature conservationists feel that the area is first and foremost a nature monument in which the development of natural processes must proceed with no interference by human uses. Therefore, discussion about rotating closed areas is not possible since this would affect these undisturbed developments. And because the nature conservation groups' prime objective is to protect the natural environment and to lobby at the legislative level, the activities of the mechanical sector are often used as a mechanism to influence public opinion via the media in a subjective fashion.

The same difference in perceptions about nature can be identified for the mussel industry. Whereas both seem to think that nature needs a little help, the nature conservationists want to stimulate the development of a 'chaotic' and 'natural' Wadden Sea, while the cultivators believe in a different type of order: neat and structured mussel parcels. The nature conservationists' preferred image of nature is negatively influenced by the activities of the cultivators. The cultivators consider natural factors to be the main cause of the disruption of the ecosystem.

The common interest of the shellfish industry and nature conservation interests is overshadowed by the different language the groups use when discussing issues related to the integration of fisheries and nature (cf. Aarts & Van Woerkum, 1996). Their new relationship as partners in a negotiation process is not yet consolidated and use of subjective language by the nature conservation groups in the media is perceived by the sector to be a blow to the relationship of trust that is slowly being developed. The discussion about integrating fisheries is a sensitive topic for both groups and its success stands or falls with the objective attitude of the various actors towards each others' activities and their willingness to listen to one another

in all candour. In the next sections, it will become clear just how the different images and positions the groups take, affects the reshaping of the Shellfish Fisheries Management Plan for the period 1999-2003.

Evaluation of the first phase of the SCFP

The co-management measures taken in the first phase of the SCFP were evaluated in 1997/98. Several research institutes investigated the effects of the policy on nature and fisheries over the period 1993-1997. The first objective of the evaluation was to determine whether the co-management measures aimed at the integration of fisheries and nature had indeed increased possibilities for the development of natural biology, such as old mussel beds and eelgrass, and whether the differentiated approach of normal years and years with a food shortage was a satisfactory means to secure food supply for birds. The second objective was to evaluate how the system of co-management itself had worked in practice, i.e., the extent to which the shellfish industry had succeeded in successfully implementing their Shellfish Fisheries Management Plan. The evaluation took place under the guidance of LNV. A group of representatives from the fishing industry, nature conservation groups, various ministries, local councils and advisory boards acted as a sounding board for the assessment of the interpretation of the research results.

As natural factors completely influenced shellfish spatfall and survival, the period of four years was deemed too short to make any *definite* statements about the effects of the co-management measures on the ecosystem (LNV, 1998). However, four main conclusions could be drawn. First, although a small number of wild mussel beds had been observed in some areas that were either closed under the SCFP or voluntarily through the fishing plans, the recovery of wild mussel beds fell short of expectations. Second, the introduction of the 60% reservation in years with a food shortage for birds has significantly reduced the effects of the shellfish fishery on the bird population. Third, the implementation of the co-management framework and the Shellfish Fisheries Management Plan has been successful, although the cockle sector experienced considerable economic setbacks as a result. Finally, the introduction of the black box on the cockle and mussel dredgers has been of crucial importance for the implementation of and compliance with the co-management measures (LNV, 1998; 1999).

On the basis of the evaluation, it was concluded that, for the period 1999-2003, the system of co-management should be continued. Equally, the differentiated approach of normal years and years with a food shortage, i.e., the 60% food reservation, should be maintained. As the development of wild mussel beds fell short of expectations, extra measures to encourage their development were deemed necessary. While the State Secretary was preparing her policy document on shellfish fisheries management for the House of Commons, research institutes were joining forces to prepare a so-called habitat map (see next section) that would form the basis for the implementation of additional conservation measures under the shellfish industry's new Shellfish Fisheries Management Plan. In the process of negotiating the

policy framework for the period until 2003, it once again became clear that resource use of the Wadden Sea is heavily contested amongst the different parties in the co-management platform.

Reshaping co-management for the period 1999-2003

The core of the proposed new Shellfish Fisheries Management Plan is the implementation of additional measures to encourage the development of wild mussel beds, which, on the one hand, are considered part of the natural habitat of the Wadden Sea and, on the other hand, form an important food source for birds. Three research institutes were asked to jointly develop a map showing the statistical probability of the development of a wild, stable mussel bed on the tidal mudflats (hereafter referred to as 'habitat map'). Representatives of the shellfish industry, the Fisheries Board, the *Waddenvereniging* and the Directorate of Nature Management chaired by LNV, acted as a sounding board for the assessment of the procedure of mapping. The habitat map functioned as a facilitating tool for the negotiation of additional conservation measures by the shellfish sector.

On the basis of the map, the mussel and cockle sector have decided to close additional areas for the mussel seed and cockle fishery. As some of the areas with a very low probability for the development of mussel beds are located in areas that have been permanently closed under the SCFP, while areas with a very high probability are located in existing fishing grounds, they have proposed to swap these areas. An exchange is of particular importance to the cockle fishermen, for whom closure of additional areas will result in further economic losses and, if stocks remain at the low levels of the years between 1993 and 1997, will jeopardise the continuity of the sector. The proposed exchanges are included in the proposed consultation draft of the Shellfish Fisheries Management Plan 1999-2003. In her policy document for the House of Commons, the State Secretary for Fisheries goes along with the idea of exchanging areas, the objective being to achieve a "win-win" situation for the ecosystem and the shellfish industry (LNV, 1999). It is this proposed exchange that is heavily contested by nature conservationists and marine biologists.

The State Secretary's policy document, which forms the foundation for the second phase of the SCFP for shellfish fisheries (and thus for the industry's management plan), was discussed in the House of Commons in March 1999. The government's advisory board for policy proposals concerning the Wadden Sea had to advise the House of Commons about the policy document. The advisory board comprises a group of independent experts and is established by law. The document was also sent to the fishing industry and nature conservation groups so that they could notify the Members of Parliament (MPs) of their reactions.

In contrast to the development of the Shellfish Fisheries Management Plan for the first phase of the SCFP, the proposed plan for the period 1999-2003 was not supervised by a steering committee. As the space of time between the presentation

of the habitat map and the debate in the House of Commons was only short, the proposed additional conservation measures were made on the spot, in a meeting with industry representatives called by LNV. The nature conservation groups and the majority of the scientists who were responsible for the map did not participate in this meeting. Therefore, consensus amongst the relevant stakeholders about the proposed measures, which included a swap between some permanently closed areas and open areas, was lacking. The independent experts in the fields of marine biology and ecology in the advisory board for the Wadden Sea area - who ironically also were part of the research team responsible for the habitat map – opposed the proposed exchanges. They are of the opinion that opening up of areas within areas that have been closed for fishing from 1993, is not sensible considering the natural processes that have been taking place in these areas, and leads to fragmentation of protected areas and natural development. Attention was also drawn to the fact that the government had passed over the principles of co-management by not allocating time for a discussion of the proposed additional measures involving all relevant stakeholders. The advisory board was not able to reach a unanimous conclusion and therefore could not advise the House of Commons[7].

The *Waddenvereniging* fiercely opposed the proposed exchange of areas. On the morning of the debate in the House of Commons, a joint press release with the *Vogelbescherming* appeared in a quality newspaper. In the article, they claimed that, on the basis of an examination of the black box readings for 1998, which had become publicly available after a court ruling, the mechanical cockle fishery fished an inter-tidal area triple the size than the State Secretary mentioned in her policy document[8] (Trouw, 17.03.99). In the same article, one of the 'political biologists' claimed that the data on the available cockle stocks by the National Fisheries Research Institute (RIVO) are incorrect, i.e., too optimistic, which means that fishermen need an area ten times bigger than is claimed by RIVO to fish their maximum quota of 10 million kilos of cockle meat in normal years (*ibid.*). Both the nature conservation groups and the biologists also informed the State Secretary and the MPs of these claims.

The phones of the industry representatives and RIVO did not stop ringing that morning. In great haste, reactions to the press release were send to the MPs and the media[9]. RIVO responded by showing how the 'political biologists' had interpolated their research data, which originate from an area with low cockle densities, to the entire Wadden Sea without taking these low densities into consideration. Besides influencing the debate in the House of Commons, the press release further worsened relationships within the research community and between the fishing industry and the institute where the biologists concerned are employed.

The debate in the House of Commons was the moment of truth for the shellfish industry, i.e., would the various parliamentary parties support the policy document? During the debate, it soon became apparent that the MPs had a variety of critical questions for the State Secretary and that their opinions on the political

line in the policy document differed. Questions were raised about the process through which the policy document was formulated and, in this context, LNV's interpretation of co-management. Questions were asked concerning the exchange of areas. Attention was drawn to the question whether it is morally right that the mechanical cockle fishery might be slowly squeezed out by the ever-increasing number of nature conservation measures without getting compensation or whether it would be more fair to buy the licence holders out. Questions were also raised about the press release and letters by the nature conservation groups and the group of biologists. The differences in opinion mainly concerned the mechanical cockle sector. The mussel sector was hardly mentioned. In the end, the House decided to agree on one exchange of areas. While this exchange is beneficial to the mussel sector, who gain an important area for mussel seed fishing, it only has disadvantages for the cockle sector, that looses fishing grounds in return for an area where cockle stocks are absent. Therefore, the House asked the State Secretary to confer on additional measures for the cockle sector for the years 2000-2003 with all the relevant stakeholders and bring the case again before the House in a so-called second term (in June 1999). The shaping of the second phase of the co-management strategy for shellfish fisheries has yet to be completed.

In the next chapter, building on the insights from Chapter Two and Six, the theoretical implications of the Wadden Sea case study are explored.

Notes

[1] Producers' Organisations (POs) are usually co-operative based organisations initiated by the fishing industry, i.e. fishermen and companies who own fishing vessels and offer fishery products for sale. They have played a key role in regulating the supply side of the market since the establishment of the common market organisation for fish products in 1971 (Phillipson, 1999). All POs depend on voluntary membership. POs have legal powers to enforce binding agreements to their members. Once the PO has obtained the required legal documents it will be recognised by the European Union.

[2] To protect the identity of those concerned, all personal names are fictitious.

[3] There are two main reasons why the economic consequences of the co-management are so different for the mussel and cockle sector. First, the SCFP's 'normal years' model could be followed for the mussel fishery; that is, there has been no mussel shortage for birds from 1991 onwards. Second, the difference between the two sectors is that the cockle fishery does not involve a cultivation process. This means that, for the cockle sector, closure of areas results in a direct loss.

[4] The SCFP only deals with fishing activities on the tidal flats. Fishing in the sublitoral parts is not mentioned. The mechanical sector seized this 'bottleneck' in the SCFP to make a request to fish in the sublitoral despite the closure of the Wadden Sea for cockle fishing.

[5] For example, in 1993 the *Waddenvereniging* and *Vogelbescherming* submitted a joint complaint to the European Commission stating that The Netherlands fail to protect the

Wadden Sea in accordance with the European Bird Directive, i.e., the SCFP is inadequate. In response the Commission applied to the European Court of Justice. In 1998, the Court ruled against the allegation.

[6] In this context, it is interesting to point out to the parallel with the shrimp fishery in the Wadden Sea. For the shrimp fishery, no restrictive measures were taken under the SCFP since this activity is considered to have only minor impacts on the benthic fauna and does not compete with food sources for birds. The nature conservation groups have never undertaken any actions in relation to the shrimp fishery; they view the shrimp fishery as a traditional fishery. The fact that is has been there for centuries is considered enough proof of its marginal impacts on the ecosystem (Steins, 1997b).

[7] Their advice was eventually send to the MPs in April 1999 and will be considered in the second term of the House of Commons' discussion on the second phase of the SCFP for shellfish fisheries, which is scheduled in June 1999.

[8] The PO Cockle Fishery refused to make the black box data publicly available for fear that the black box data would be used against them, i.e., to demonstrate relationships between cockle fishing and any kind of undesired natural process in their fishing grounds. The *Waddenvereniging* successfully went to court. In 1998, the surface area of tidal flats fished by cockle vessels was indeed higher than in the previous years. In this year, cockle stocks were very high and no quota was set. The years from 1993 to 1995 were years with a food shortage and low quota for the fishery. In 1996, the fishery was closed and in 1997, the fishery did not take place on the tidal flats. In their press release, the *Waddenvereniging* did not take these poor years into account and gave the impression that 1998 was representative for all previous years.

[9] The press release and letter by the group of biologists in which they (falsely) claimed that the prognoses of the available cockle stocks by RIVO where far too optimistic, has an interesting aftermath. Although the group of biologists claimed that their action was the action of a group of independent biologists, they made it crystal clear where they are employed. The Fish Board wrote a letter to the Minister of Education, Culture and the Sciences, who is responsible for the particular institute, asking for clarification about the action of his employees. In the media, the Fish Board argued that the strategic timing of the press release and letter to the MPs on the day before the political debate showed that the biologists' action was driven by political rather than scientific motives (Volkskrant, 23.03.99). In response, MPs have announced that they want clarification on the issue from the relevant Ministers and will ask questions in the House of Commons. Time will tell the consequences for the 'political biologists' and its indirect impacts on the co-management strategy.

Chapter Eight

Theoretical intermezzo

The politics of resource (co-) management

Building on the insights from the case of Cowes Harbour in Chapter Two, the empirical study set in NW Connemara (Chapter Five) further generated a number of preliminary conclusions towards a grounded perspective for the study of complex, multiple-use common-pool resource management. In Chapter Six, I further substantiated my theses that (i) the design principles used in CPR theory should be reconsidered and (ii) contextual factors should become part of the institutional analysis in CPR theory. I argued that contextual factors embedded in the stakeholders' external world, form an integral part of their everyday reality and significantly influence their decisions to co-operate in or frustrate a collective action effort. The 'invisibility' of these contextual factors is hindered by the use of pre-defined conditions for successful collective action as an analytical starting point. A further danger inherent in the use of design principles is that they are used as a blue print model, thereby failing to recognise the unique arenas in which collective action is achieved (or obstructed) and the way stakeholders construct their perception of 'success' (and 'failure'). Thus, I concluded that the focus on *a priori* categories in CPR theory are of little help as they divert attention from the dynamic internal and contextual processes that shape collective action at the operational and collective-choice level.

I also drew further attention to the role of perceived crises as catalysts for collective action. In the case studies in Chapters Two and Five, the risk of loosing access to the CPR inspired collective action efforts within user groups (e.g., fishermen) and amongst user groups (e.g., mussel farmers and fishermen).

I further concluded that in the shaping of collective action processes, strategies of translation are never fixed. Social actors, or *collectifs*, use different social and material means to achieve their objectives. Thus, rationality is neither fixed, nor a given property of a human being. This implies that CPR theory, which builds on the concept of purposive rationality, will never get to fully appreciate how collective action processes are constructed and reconstructed. In this context, my final preliminary conclusion concerned the role of platforms for resource use negotiation in shaping collective action. Discontinuities in interests, stakes and social action within platforms, influence, and sometimes threaten, the translation trajectory in which the platform is involved.

The findings from the case study of the Wadden Sea, where a statutory multi-party platform for resource use negotiation has been in place from 1993 onwards, support these preliminary conclusions and their further development. The case also provides new insights in the translation trajectory of collective action at the operational, collective-choice and constitutional level in complex CPRs.

Negotiating resource use through a co-management platform

The implementation of the statutory co-management framework for the integration of shellfish fisheries and nature values in the Dutch Wadden Sea did not come out of the blue. A combination of natural and human factors led to a mussel and cockle shortage for birds in the 1990s, causing high mortality rates among oyster catchers and eiders. The spokespersons for these birds, the nature conservation groups (assisted by some scientists), successfully sought media attention, thereby triggering public concern about the situation. The 'bird crisis' formed a crucial contextual factor that inspired the mussel sector to negotiate a number of voluntary measures, as they feared that the government would put severe restrictions on the mussel seed fishery if they themselves failed to respond to the situation. Following their colleagues, the cockle sector implemented a number of voluntary measures a year later, in 1992.

Enrolling the fishermen, who were used to fish under open access conditions, to support the voluntary measures was a cumbersome task. Education about the role of mussels and cockles in the wider ecosystem played an important role in convincing them of the need for adopting fisheries regulations. In addition, sanctions were enforced upon those who did not comply with the voluntarily restrictions in the fishing plan. As it proved difficult to make those who did not sign the fishing plan comply with the voluntary measures, the mussel sector transferred responsibilities for implementation and enforcement of the fishing plan to its producers' organisation; POs have statutory powers to impose sanctions and its regulations are binding to all its members. The cockle sector established a PO for the same reasons.

In 1993, the voluntary measures were incorporated in the co-management framework of the Sea and Coastal Fisheries Policy. The political line taken in the SCFP was heavily contested by the nature conservation groups, who felt that shellfish fisheries, and particularly the mechanical cockle fishery, do not belong in Europe's most important wetland area. The shellfish sector, however, had already shown that it was willing to restrict its activities. The government, whose interest in the Wadden Sea is two-fold - nature conservation and economic exploitation – opted for a compromise. Within the framework of closed areas and a differentiated approach of normal years and years with a food shortage, the shellfish industry, in collaboration with the nature conservation groups and assisted by scientists, was given responsibility for the implementation of a Shellfish Fisheries Management Plan through which the integration of nature and fisheries had to be shaped by tangible agreements.

Thus, collective action by the shellfish industry was triggered by a potential crisis, i.e., loosing access to the fishery, and was mediated through mussels and cockles. By linking fishermen (who did not want to loose access to the fishery), birds and other nature values (represented by nature conservation groups) and the government (who needed to find a political solution for the 'bird crisis' and had to protect both nature conservation and economic benefits), the representatives of the

shellfish industry acted as spokespersons for the co-management strategy. They enrolled fishermen to manage the fishery under a common property regime; they enrolled the Ministry of Agriculture, Nature Management and Fisheries (LNV) and the government, who agreed on sharing responsibilities; and they enrolled the nature conservation groups, who, in the political arena had no alternative but to go along with the policy proposal. As became clear in the previous chapter, the platform for resource use negotiation that was established in this way, is still contested by its various stakeholders and is subject of a complex process through which each stakeholder tries to translate the platform into his own particular project.

The trajectory of translation was not completed with the establishment of the co-management platform. First of all, LNV built in space for evaluation by distinguishing two phases of the SCFP for shellfish fisheries. On the basis of the evaluation, the measures taken under the first phase would be adapted, if necessary. The translation trajectory was, however, not confined to these two time spans. From the moment the SCFP has been in place, all stakeholders have adopted the role of translator: the shellfish sector by showing that they could take their newly acquired statutory responsibilities; the nature conservation groups in their public and political lobby aimed at further restricting the shellfish fishery in the Wadden Sea; and LNV in their role as guardian of the government's political line.

The translation trajectory of the co-management strategy does not just involve negotiations and agreements amongst the multiple stakeholders. It also evolves around technological artefacts, social learning, science and the creation of images. First, technological artefacts play an important role in resource co-management. For the fishermen, the presence of the 'black box' on board of their vessels is the key to their identity of complying fishermen. With the black box, the mechanical cockle fishermen particularly, have obtained a powerful tool that protects them from allegations by their opponents; it also ensures them of an equal treatment of all individual fishermen. For LNV, the black box is their guarantee that the fishing plan is complied with so that their policy cannot be questioned. The nature conservation groups have only recently gained access to the black box readings for the cockle fishery. Although the data prove that none of the fishermen violated the agreements, allegations were made by the nature conservationists that the mechanical cockle fishery took place in a much larger area than the cockle sector claimed; these allegations influenced the political debate concerning the reshaping of the second phase of the SCFP for shellfish fisheries.

Second, translation in the co-management platform evolves around social learning. I already discussed how social learning was important in creating awareness among the shellfish fishermen of the need for restrictive measures. It must, however, be noted that the different understandings of users and scientists of the resource base may form a constraint in furthering social learning processes. For example, as part of the measures under the first phase of the SCFP, parts of the Wadden Sea have been closed for fisheries to encourage the potential development

of stable wild mussel beds and their surrounding habitat. Fishermen repeatedly pointed out that, from their experience as everyday users, such beds, in some of the designated areas, are unlikely to develop. They states that they would like to 'swap' areas that are now open (and that, according to them, have potential for the development of old beds) for closed areas. The closed areas are, however, based on scientific understanding of the ecosystem. This has resulted in some tensions. However, these tensions have also been beneficial in that they inspired an evolving social learning process. In some of the areas that were closed voluntary by the mussel sector in addition to the existing areas, wild beds have indeed developed. In the preparations for the second phase of the SCFP, the habitat map showing the statistical probability of the development of wild beds, was made on the basis of a joint effort between scientists and fishermen. The social learning process is thus not limited to the fishermen (and their representatives), but also includes scientists and LNV.

Third, science plays an important role in the translation process. For LNV, scientific research is of importance to demonstrate the ecological and socio-economic effects of the policy measures for shellfish fisheries and to justify new policies. For the nature conservation groups, science is a way of proving the alleged negative impacts of, in particular, cockle fishing on the natural environment. They hope that proof of such negative effects will result in stricter measures for the shellfish fishery and, ultimately, the ban of the cockle fishery from the Wadden Sea. Although the nature conservation groups commission research themselves, they also regularly join in with a group of biologists who oppose the cockle fishery and as 'independent' researchers draw public attention to various alleged relationships between cockle fishing and the environment. For the shellfish fishermen, science has a triple role. First, their fishing activity depends on the yearly scientific inventory of the available mussel seed and cockle stocks in the Wadden Sea. Second, they rely on science for the development of technological artefacts that make their activity less contested, such as the black box and a new eco-friendly mussel dredge. Third, by commissioning scientific research they can reverse the burden of proof that is placed upon them by nature conservation groups and the 'political biologists' and show that there are no adverse effects of shellfish fishing on the natural environment; in case such effects are demonstrated they can undertake measures.

Finally, the creation of images forms part of the translation processes taking place in the co-management platform. In the previous chapter I showed how both the fishermen and the nature conservation groups have different images of each other's interests (cf. Aarts & Van Woerkum, 1996). Over the past years, major discrepancies between the fishermen's and the nature conservationists' images of nature values have partly been addressed by a process of social learning through which the fishermen have been made aware of the importance of, for instance, wild mussel banks, for the Wadden Sea ecosystem. This is not to say that the nature conservation groups' image is now the fishermen's image; however, the awareness about the need to manage the fishery and, consequently, the acceptance of the fishing plans, is now widespread. In their turn, the nature

conservation groups and some biologists have created an image of the shellfish fisheries that has changed little from the period prior to the implementation of the fisheries management measures. Although the nature conservation groups cannot deny that the fishermen abide with the rules, their image of the way the tidal flats in the Wadden Sea are fished have largely remained the same and are still used to influence public opinion. The same goes for the group of 'independent' biologists. 'Stereotyping the other', which, according to Van Woerkum & Aarts (1998), is a way of reinforcing identity and gains more importance when those who 'stereotype' others feel vulnerable or threatened, is not only a defence mechanism, but can also be a means that can be mobilised in enrolling others in one's project, i.e., the Dutch public and politicians. The only group that is not troubled by a bad image, are the non-mechanical cockle fishermen. By being granted the stereotype of the 'traditional fisherman', which is associated with 'environmentally friendly', they have obtained a powerful weapon in their battle to secure access to their fishery.

From the start, the process of co-management was aimed at reaching consensus about management measures amongst the various stakeholders on the basis of open discussion. In this respect, the co-management strategy fits in very well in Dutch political culture, also referred to as the 'polder model', which embraces participation, negotiation and consensus-building as principles. In practice, however, reaching this objective is a cumbersome task for a variety of reasons. First, negotiations and discussions between the industry and environmental groups tend to be limited to periods when policies are evaluated and reshaped. In the interim period between policy design/implementation and policy evaluation discussions hardly take place; this implies that the groups only commence formal negotiations when their interests are explicitly at stake. In the interim period, each group is defending its own turf.

Second, co-management heavily relies on communicative action, not only in reaching agreement about governance rules and thereby creating a situation in which the different stakeholders are entitled to expect a certain behaviour, but also in the preceding stage where they have to negotiate a common definition of the situation and harmonise their plan of action. In practice, this is difficult to realise as not all the stakeholders in the co-management platform are willing to do so. The fact that each stakeholder essentially wants to pursue his individual goals is in itself not a constraint to communicative action; however, the fact that some stakeholders are not willing to harmonise their plan of action on the basis of a common definition of the situation, is. The nature conservation groups, for instance, are only involved in the co-management process because it was either the most viable way of staying in the centre of the policy-making process or because they were explicitly asked by the government to become part of the platform. Their attitude in the co-management process is guided by purposive rationality. This has implications for the behaviour of the other stakeholders who recognise strategic action and, on their turn, start acting on the basis of the same principle. Thus, communicative action, although it forms the premises for co-management, cannot be commanded.

The shaping of the additional measures for the second phase of the SCFP for shellfish fisheries is another example of how communicative action was frustrated. In contrast to the shaping of the Shellfish Fisheries Management Plan for the period 1993-1998, LNV did not establish a steering committee with an independent chairwoman to supervise the process. While the evaluation of the first phase was completed in March 1998, the actions towards the reshaping of the co-management measures did not start until October 1998, when a first meeting was held to discuss the development of the habitat map that was to form a facilitating tool in negotiating additional measures. With the date for the House of Commons discussion approaching (March 1999), and the habitat map only being completed in a preliminary form in February, time for a negotiation process involving all parties was limited. The representatives of the shellfish industry were asked at a meeting with LNV to propose additional conservation measures; the representatives had not yet discussed any proposals with the POs and the nature conservation groups were not present at this meeting. Furthermore, the scientists involved in the preparation of the habitat map were not given time to discuss with the shellfish sector what areas on the map they thought should (or should not) be exchanged. Thus, LNV passed over the principles of co-management in the preparation of the Shellfish Fisheries Management Plan (1999-2003), for which the whole co-management platform paid in the House of Commons discussion. LNV's dual role in acting as the facilitator of the platform while being the guardian of the government's political line, is thus an important contextual factor that affects the co-management process.

Third, co-management goes beyond negotiation and building consensus about tangible agreements. Once the stakeholders have left the negotiation table, trust that that the parties will comply with the agreements and support one another becomes an important factor. Each of the parties involved has, at some stage or another consciously or unconsciously breached the others' trust: the cockle fishermen when they fished the ecoplots; the nature conservation groups in their media strategies to influence public opinion; LNV when they granted non-signers of the fishing plan a licence for the mussel seed fishery. One incident of a breach of confidence may be talked over; however, if this happens repeatedly, the parties involved may have no further desire to open up each other. An example is the PO Cockle Fishery, which, although they had nothing to hide, refused to make the black box data publicly accessible out of fear that the data would be used against them. When they lost a court case over their decision, their fears became realised.

Finally, co-management measures must also be backed up by tangible tools. The example of the mussel seed licence for non-signers of the fishing plan is illustrative. In the early years of the SCFP, some mussel fishermen who did not sign the fishing plan, and were not members of the PO, were granted a seed fishing licence by LNV and therefore fished more seed than those fishermen who voluntarily restricted themselves to the mussel seed quota. If 'alternatives' provided by the government are more interesting on the short term than the membership of the Producers' Organisation, compliance with self-management agreements is undermined. The POs have repeatedly asked for an *extension de régime*, which means that their

regulations become binding to non-members, but without success. Although they have been given far-reaching responsibilities for shellfish fisheries management and are responsible for the implementation and control over the fishing plans, the tools they have been given to make it work for the sector as a whole do not match these responsibilities.

While the co-management strategy that forms the basis for the integration of shellfish fisheries and nature in the Dutch Wadden Sea has been praised at the operational, collective-choice and constitutional level, and has been used to as a model in the debate about sustainable marine resource management in other countries, the question can be raised whether or not it is a 'make-believe' success. The strategy comprises most of the ingredients that CPR theory prescribes for successful collective action. In addition, collective action amongst the multiple stakeholders has been given shape through the co-management platform. Nevertheless, collective resource use is still heavily contested and, recently, has been challenged by its own facilitator and guardian.

Grounding preliminary theory (3)

The findings from the case study of co-management in the Dutch Wadden Sea substantiate the preliminary conclusions drawn in Chapters Two and Six, but also add new insights. The latter particularly apply to the role of platforms for collective resource use negotiation.

In Chapters Two, Five and Six, I showed how contextual factors are important in shaping collective action processes at the operational and collective-choice level and, in each specific context, identified the most important factors that played a role in the collective action process. I concluded that contextual factors should become part of the institutional analysis in CPR theory. This preliminary conclusion is further substantiated in the Wadden Sea case study. Again, the role of a perceived crisis as a trigger for collective action emerges as an important contextual factor. However, while in the other studies, it inspired collective action at the operational level (with feedback at the collective-choice level), in the case of the Wadden Sea, a crisis was perceived at the operational *and* constitutional level and resulted in an interlocking of projects: the mussel cultivators feared that the government would put severe restrictions on them if they did not undertake action towards the bird crisis; the government was facing a political crisis if they refrained from implementing restrictive measures. The perceived crisis formed a trigger for a social learning process aimed at adaptive resource management through a multi-stakeholder approach. Unlike in NW Connemara, where the learning effect from the perceived resource use crisis was conceived one-sidedly and thus did not bring about real change (accommodation) (Maarleveld & Dangbegnon, 1999), in this case a process of change at all three institutional levels was set in motion.

On the basis of my analysis of the co-management platform that was established as a result of this interlocking of projects, a number of further conclusions can be drawn.

First, had I looked at the platform in terms of the design principles for collective action used in CPR theory, the apparent success of the platform would have been confirmed. However, while for 'outsiders' the platform might be an example of successful co-management, the participants do not necessarily share this opinion. This applies in particular to the nature conservation groups, who feel that the responsibility for nature conservation should rest with the government alone and that some forms of shellfish fishery cannot be reconciled with the primary objective in the Wadden Sea Memorandum. Judgements about 'success' (and 'failure) are thus socially constructed, not only by the stakeholders involved, but also by researchers (like myself) and bystanders. By focussing on pre-defined categories of 'success' and 'failure' researchers never get to fully appreciate how the distinction is constructed and used (cf. Law, 1994). My earlier conclusion that the use of design principles hinders rather than facilitates the study of collective action is thus further substantiated. I will return to this issue and its implications in Chapter Nine.

Second, the role of non-human actors as part of the *collectif* is articulated. Co-management in the case of the Wadden Sea evolves around shellfish and birds, not around humans. The latter are caught up in the process: the nature conservation groups because they act as spokespersons for these nature values; the shellfish fishermen since they are part of the actor-network that we refer to as 'cockle fisherman' or 'mussel cultivator', and in this role form a non-natural factor that affects the shellfish stocks (and thus the birds' diet); and the government because it has to protect the interests of the birds, the shellfish, the fishermen, the nature conservation groups and the public. If the birds would not have preyed on shellfish or if the shellfish stocks would have been in abundance, there might have been no need for the various actor-networks involved to mobilise resources and start a translation trajectory to secure access to the CPR for birds and shellfish fishermen.

In addition, compliance with the co-management measures is mediated by a non-human entity that forms part of the *collectif* we call (mechanical) cockle fishermen and mussel cultivator: the black box. Although the co-management measures have been negotiated and agreed upon by all stakeholders in the platform, and as a result, each of them is entitled to expect a certain behaviour, the black box provides solid evidence that the rules have been followed. Take away his black box and the cockle fisherman's reputation as a complying fisherman becomes jeopardised, although he may perfectly adhere to the rules. Compliance with restrictive measures is one of the last trumps these fishermen hold in the debate over access to the Wadden Sea; the only way of proving this compliance is through the black box. I conclude that non-human entities should become part of the analysis of collective action in complex CPR management as they form an integral part of the network that constitutes both the stakeholder-*collectif* and the platform-*collectif*.

Third, I argue that the material and social means that *collectifs* mobilise in their translation strategies are as dynamic as the translation process itself. Furthermore, the translation of collective action is not completed with the establishment of a platform, but evolves in time and space as old stakes are articulated again or new stakes arise. In the co-management platform, we saw how stakeholders mobilised

science and discourses (images) as resources they perceived of as being beneficial to the translation of their claim. Social learning was another resource that was mobilised as a tool to enrol relevant others, and over time also became an effect of the translation attempts in the platform. The platform has been subject to translation attempts by its different representatives from the moment it was established; such efforts extended beyond its boundaries in an attempt to reshape the context in which the platform is embedded and, in this way, translate or re-translate particular claims.

In this light, my fourth preliminary conclusion concerns the concept of rationality as an emergent property of a *collectif*. Earlier in this chapter, I argued that co-management, or the sharing of management responsibilities based on a mutually agreed upon harmonised action plan, must necessarily evolve around the principle of communicative rationality; thus, communicative action should be the emergent effect from a co-management platform. At first sight it looks as if the stakeholders in the platform have achieved this objective through the implementation of the SCFP for shellfish fisheries, including the Shellfish Fisheries Management Plan. However, when focussing on the platform, it appears that the pursuit of individual objectives is not based on a common definition of the situation. As new insights, people and artefacts enter the arena in which the platform is embedded, the stakeholders reconsider their projects and decide on certain courses of action. The latter are not fixed, but change constantly. Sometimes it means that collective agency amongst different parties is an emergent outcome of the translation trajectory; sometimes stakeholder representatives judge that the best course of action is to act individually. The interlocking of projects, or communicative action, is the outcome of a translation process whereby stakeholders perceive that co-operation is the best strategy to achieve their individual projects. However, in their interactions with the other stakeholders, when the interlocked *collectif* tries to enrol those others, the emergent outcome of a successful translation attempt does not necessarily have to be communicative action; the enrolled others may have let themselves be enrolled because, in their perception, the only way of achieving their individual objective was to do so. In the latter case, purposive rationality was the emergent effect. The Wadden Sea case study thus substantiates my earlier conclusion that rationality is a relational effect of the translation trajectory of which the stakeholders are a part. Translation efforts are aimed at success; the means that are employed to achieve this are not predetermined. At the very most, stakeholders will have decided on some course of action when they embark on the trajectory, but as the context changes, translation strategies are reshaped along with the rationality principle they draw on.

Fifth, the establishment of the co-management platform was part of an action-oriented approach towards the integration of fisheries and nature to deal with conflicts over CPR use and its management. In this light, I have to go on thin ice and pay attention to some insights concerning the facilitation of platforms. Although I cannot grant platforms a pre-defined outcome such as 'sustainability' or 'intervention' as is the practice in the knowledge systems perspective discussed in Chapter Three, the principle of co-management evolves around communicative action. Co-management processes often rely on third parties to help the stakeholders negotiate a common definition of the situation and harmonise their plan of action. In

the case of the co-management strategy for the Wadden Sea, LNV was the formal facilitator of the platform. At the early stages of co-management strategy, it established a steering committee to supervise the development of the Shellfish Fisheries Management Plan. When the second management plan had to be shaped, there was no such steering committee, and LNV was the formal facilitator co-ordinating the different actions that formed part of the preparation of this plan. Elsewhere I argued that the value of a facilitator lies in its role as a 'neutral' actor, impartial in co-ordinating activities in the platform (Steins & Edwards, 1999a). In addition, facilitators can act as 'gatekeepers' between the platform and its environment, i.e., representing the platform, spotting potential problems and opportunities and commanding respect for the action strategies proposed by the platform (Crozier & Friedberg, 1980). However, with LNV having a contradictory dual role as a translator for the government's political line and for the performance of the platform, the outcome of the platform process was not a mutually agreed upon plan of action, but a situation in which they became the translators of the government's political line.

Thus, I conclude that, like the other stakeholders in the platform, facilitators are also translators; their project is to make the platform work. Their neutrality cannot be commanded, it can only be maximised. Maximisation of neutrality is, however, a difficult task. As Maarleveld & Dangbegnon (1999) argue, impartiality of a third party can be influenced by those who hire or pay for the facilitation, foreknowledge of the problem situation and learning biases. In addition, I argue that as the insights of the facilitator in the platform develop, biases will develop and impartiality becomes more difficult to maintain. In his attempts to 'get his job done', the facilitator will become a translator himself and becomes part of the process in which the stakeholders try to constitute themselves as *collectifs*. In this context, the important issue for the researcher/facilitator is to give those who are directly involved and those who are outsiders (e.g., the readers) an evaluative basis for his actions in and interpretations of the process. I will return to this point in Chapter Nine.

My final preliminary conclusion is concerned with the position of platforms in the institutional frameworks governing resource use. The co-management platform for the integration of shellfish fisheries and nature does not stand on its own, but is embedded within a larger decision-making framework. In Chapter One, I argued that institutions at the operational, collective-choice and constitutional level are nested. Platforms always operate within, or may even require, institutions at higher levels of decision-making (e.g., the SCFP). As platforms tend to consist of stakeholder representatives, the practical implementation of the action strategies that have evolved from the platform process, usually rests with lower level groups (e.g., POs and fishermen). Therefore, I conclude that the concept of 'platform' is too narrow to include this whole complex of stakeholders and stakeholder represented; instead I propose the term 'nested platform'[1].

The analysis of the co-management strategy for the Dutch Wadden Sea has resulted in a number of findings that further substantiate earlier preliminary

conclusion or generate new ones. In summary, I concluded that contextual factors, such as crises, are as important for the analysis of collective action processes at the constitutional level as they are at the operational and collective-choice level. By focussing on pre-determined categories of successful collective action, the contingencies involved in the complex internal and external processes that underlie the shaping of collective action and its assessment by the stakeholders involved will be excluded from the analysis, and collective action cannot be fully appreciated. I also concluded that non-human entities should become an explicit part of CPR analysis, since they form an integral part of the network that constitutes the stakeholder-*collectif* and the platform-*collectif*. Furthermore, I argued that translation efforts are aimed at success; the means employed to achieve this are not pre-determined. The material and social means that *collectifs* mobilise in their strategies are not confined to the boundaries of the platform and are as dynamic as the translation process itself. In this context, I also further substantiated the idea that rationality in a collective action situation is neither fixed (in other words, strategic) nor the exclusive property of human beings, but is a relational effect of the translation trajectory of which the stakeholders are a part. In case where platforms rely on third party facilitators, it is crucial to realise that, like the stakeholders, facilitators are translators as well. Maximisation of neutrality should be aimed at, but in the process of guiding the stakeholders in defining a common situation definition and harmonise their plan of action, impartiality of the facilitator might soon be lost as the role of facilitator conflicts with his role of translator. Finally, I concluded that platforms are embedded within a larger institutional framework and, therefore, should be referred to as 'nested platforms'.

The preliminary conclusions from this chapter, together with those from Chapters Two and Six have hitherto not been carried beyond the status of reflections or stimuli for further thought. In the next and final chapter, I draw these ideas together and develop a perspective that addresses the research problem underlying this study.

Notes

[1] I am indebted to one of the anonymous reviewers of an article published in Agriculture and Human Values (Steins & Edwards, 1999a), who brought the idea of 'nested platforms' under my attention.

Chapter Nine

Conclusion

A new ontology and praxeology for CPR theory

Our global natural resource base is in crisis. Inherent in this problem is its status as a common-pool resource; that is, its joint use involves subtractability and exclusion of demands is associated with high transaction costs. Our science-based industrial system, combined with growing demands on natural common-pool resources and permanent gross imbalances and inequalities among people and countries, have brought us to a point where we can no longer rely upon prevailing positivist and reductionist scientific approaches and existing institutions for monitoring and protection to provide solutions to environmental and social problems.

Sustainable natural resource management has been on the international political agenda since the first global environmental conference in 1971. The predominant strategies of privatisation of common-pool resources (CPRs) and enforcement of state regulations have not prevented further degradation and depletion of local, national and global CPRs. There is increasing awareness that global problems, such as environmental degradation, scarcity of natural resources and poverty, are interconnected. Equally, problems at local and national level are not isolated problems either. In this light, alternative perspectives on natural resource management are urgently needed.

The coastal zone takes an important position in the debate about sustainable natural resource management. For many countries, the intensive exploitation of the coastal resource base forms an important basis for economic growth and socio-economic development; 50% of the world population now lives and works within a close distance from the coastal zone, which comprises only 10% of the earth's surface (Buisman, 1996). Growing demands for entry to the coastal zone have, however, resulted in ecological and environmental externalities and have brought about competition and conflicts amongst various traditional and new stakeholders over access to, allocation of and control over coastal space and resources. The presence of a multitude of management regimes to co-ordinate different claims has not prevented these externalities from occurring.

All over the world, stakeholders at operational, collective-choice and constitutional levels of decision-making have been breaking new ground in attempting to find solutions to the degradation of the coastal resource base. Integrated coastal zone management (CZM) is gaining increasing popularity as a participatory, multi-stakeholder approach to achieve sustainable resource use. Furthermore, estuary management plans, coastal forums and co-management strategies, in which coastal management issues are considered from a broader

perspective and stakeholders work collectively towards solutions for perceived problems, are rapidly emerging. In addition, the 1992 Earth Summit resulted in global acceptance of Agenda 21, which devotes one chapter entirely to coastal and ocean management. The thread of all these projects is that they build on collective action as the mechanism to deal with complex and interconnected natural resource management problems; no longer is the 'strategic narrative' (Röling & Maarleveld, 1999) dominant in fuelling policies and strategies towards problem resolution and sustainable management.

In Chapter One, I argued that an understanding of the processes that shape co-operation amongst the multiple stakeholders of natural resources is crucial if we want to pursue the idea that a collective action approach is an alternative means to deal with complex, interdependent CPR management problems. Many words have already been written on collective action, the crux of all theories being the individual's willingness to contribute voluntarily towards maintaining a collective good (co-operation) versus his rational incentive to defect or free-ride. In this light, The Tragedy of the Commons has dominated the debate on collective action in natural resource management scenarios, the prevailing belief being that only through privatisation and external control, CPRs can be protected from overexploitation. One group of collective action scholars has, however, taken up the position that individuals with an interest in a CPR are not by definition locked in a position that leads to Tragedy. The core argument of CPR theory is that decision-making arrangements provide the mechanism whereby stakeholders can transcend the commons dilemma, i.e., they can work together in crafting rules regulating the benefits produced by a CPR.

The concepts and frameworks developed in CPR theory are increasingly being applied to problems associated with the management of *complex* CPRs at local and global level; that is, CPRs that are characterised by the presence of different types of use and different types of management regimes. Furthermore, existing concepts and frameworks are increasingly being adopted by international organisations, such as the World Bank, as mechanisms to promote sustainable local CPR use world-wide. At the heart of this study is the argument that CPR theory, in its present form, is not sufficiently developed to justify these practices.

In Chapter One, I elaborated on this general problem and put forward a number of theses. First, I argued that present theoretical notions in CPR theory are based on the unrealistic assumption of 'single-use'. My second thesis was that CPR theory relies on an oversimplified representation of the internal characteristics of resource use and management; the explicit absence of contextual factors in conceptual tools for CPR analysis limits our understanding of collective action processes. Third, I put forward the thesis that the definition of collective action, which is regarded as primarily strategic behaviour, is too narrow and that by using a pre-defined model of collective action, the contingencies involved in collective action processes will not become readily apparent. In this context, I developed a fourth argument, namely that the development and use of prescriptive design principles for collective action (see Table 1.1) inevitably results in the establishment of

normative criteria for measuring outcomes, diverting attention from the stakeholders' constructions and perceptions of resource management and the process through which collective action evolves. Finally, I put CPR theory in the context of the continuous development of CPRs into complex resource systems. I argued that existing theoretical notions need to be further developed before they can be applied to complex resources.

Table 9.1
Emerging issues from the case studies and 'intermezzos'

- contextual factors cannot be ignored in CPR theory as they are of crucial importance for the study of collective action processes at the operational, collective-choice and constitutional level of decision-making;
- the power of perceived multiple-use crises is that they act as catalysts for collective action efforts;
- contextual factors become visible by comparing the different actors and their action strategies;
- the presence (or absence) of design principles is no guarantee for 'success' (or 'failure');
- the focus on design principles diverts attention from the stakeholders' constructions of collective action and 'success' and 'failure';
- the emphasis placed on design principles hinders the analysis of the internal and contextual processes involved in the shaping of collective action;
- non-human entities are part of the network that constitutes the individual and the interlocked stakeholder and cannot be ignored in the analysis of collective action;
- the model of purposive rationality is too narrow to explain either the emergence or absence of collective action efforts;
- in the shaping of collective action, stakeholders draw on divergent material and social means to achieve their objectives, and in the process they do not follow a predetermined path;
- rationality is neither fixed, nor the exclusive property of human actors;
- purposive and communicative rationality emerge from the collective action
- platforms for resource use negotiation are a way of interlocking multiple interests in a CPR;
- the performance of platforms is influenced by discontinuities in interests, stakes and social action and the tactics each participant uses to enrol others;
- the concept of 'nested platform' does more justice to the embeddedness of platforms in a larger institutional framework.

The task I set myself in this study is to address the aforementioned issues by shedding light on the emergence, management and facilitation of collective action processes amongst multiple, often competing stakeholders in complex CPR management scenarios. My mission is not to falsify existing theory, but to develop a grounded perspective for the study of complex CPR management that will assist the development of further theory. The empirical basis is laid by three case studies in which fishermen were confronted, and affected, by the arrival of other activities and/or the articulation of other interests in or near their fishing grounds. By following the interactions amongst these multiple stakeholders, I gained many insights in the way the management of resources, spaces and people is constructed in different local, regional and national contexts. An overview of the preliminary conclusions that have emerged so far, is presented in Table 9.1.

In this final chapter, I fit all the heterogeneous bits and pieces that emerged from the empirical cases together. My first conclusions have a theoretical nature. I outline how the ontology and epistemology of CPR theory has to be reshaped to go beyond descriptive studies and to appreciate the contingencies involved in collective action. My proposal is to adopt a social constructivist approach to the study of CPR management. Second, I discuss the implications of my theoretical conclusions for a 'praxeology', i.e., a theory informing practice, identifying methodological insights for the study and facilitation of complex CPR management. Finally, I give some directions for future social constructivist research and policy for the study and facilitation of collective action in CPRs.

Towards a new ontology for CPR theory

Reconstructing CPR theory

From the analysis of the case studies (Table 9.1), it becomes clear that my theses concerning the problems inherent in current CPR theory are not unfounded. While the theoretical notions and frameworks developed in CPR theory might be useful in analysing a management regime for a single resource unit, they are too limited to account for the interdependencies amongst multiple stakeholders in multiple-use scenarios and their effects on individual resource uses as well as the CPR as a whole.

Even if we assume a (theoretical) 'single use situation', it is apparent that the concepts in CPR theory need further development: the assumption of atomised, rational individuals and the narrow focus on internal variables affecting CPR management have been very beneficial for the foundation of theoretical notions and frameworks, but the practice of acknowledging that there are exogenous factors impinging upon collective action yet regarding them as a 'black box', can no longer be justified. Rather than providing an innovative framework for CPR analysis, CPR scholars have made it their enterprise to bring forward as much empirical evidence as possible to show that resource users are not by definition locked in The Tragedy of the Commons[1], but are able to organise CPR use by crafting institutions. As Knudsen (1995: 3) argues, CPR theory embraces

> "a revisionist critique [in which] the wish to revise Hardin's thesis is more evident [...] than the intent to put forward alternative theory or research programme".

As a consequence, the development of CPR theory is in stasis, yet its concepts are increasingly being applied to analyse situations that are far more complex than they were originally developed for. In this context, I want to emphasise my belief that no CPR management regime can be regarded as 'simple'; even if a regime evolves around one resource unit only, for example, irrigation water, then the different claims over irrigation water by different social groups and the different uses of irrigation water, turn this 'single use' in a very complex 'multiple use' (see Meinzen-Dick & Bakker, 1999).

In addition to the aforementioned problem, CPR theory has repeatedly been criticised for its incapacity to explain why CPR management regimes change over time (Buck, 1998, Edwards & Steins, 1998a; Knudsen, 1995). Much of the empirical work by CPR scholars focuses on 'snap shots' of management regimes at one specific point in time, while attention for its historical and future evolution is remarkably absent. Only a few CPR scholars have carried out longitudinal research into the evolution of management regimes and with a specific focus on the question of why stakeholders develop adaptive strategies for CPR use and management (e.g., Edwards, 1996; Jentoft & Kristoffersen, 1989; McKean, 1986; Van Ginkel, 1995a; 1998). An explicit focus on changing management regimes is of particular importance in the context of globalisation, which places new demands on CPRs and its management and which creates both opportunities and externalities for traditional and new stakeholders in CPRs. In view of changing socio-economic, sociotechnical and ecological conditions, the analysis of the complex processes that guide "adaptive management" (Holling, 1978, in Gunderson *et al.*, 1995: 490) *or* the demise of management regimes, is a necessary step.

Thus, a reconstruction of CPR theory and its concepts is key if we want to use it as (i) a foundation for the analysis of complex CPR management, and (ii) as a conceptual framework in pursuing the idea that collective action is a powerful alternative to deal with complex, interdependent problems in a meaningful way. From the case studies of complex coastal CPR management, it can be concluded that this reshaping of CPR theory is centred around a number of concepts: (i) rationality, (ii) contextual factors, and (iii) categories of collective action, and the development of a new ontology and praxeology.

Collective action and nested collectifs

In classical collective action theories, the model of economic, calculated rationality is used to explain human behaviour in collective action situations. CPR theory has discarded this neo-classical assumption and, instead, embraces the notion of bounded rationality as the driving force. Individual choice of action strategies is considered to be affected by four internal variables: (i) expected benefits, (ii) expected costs; (iii) internal norms and (iv) discount rates (Ostrom, 1990). In Chapter Three, I argued that in using this model and by focussing on institutionalised sets of procedures for collective action, CPR theory creates a divide between the individual and the social. In doing so, CPR theory moves collective action away from the arena of everyday sociotechnical interaction in which stakeholders in the CPR find themselves.

The assumption that rationality is a property of individuals and is essentially driven by purposive or strategic action, severely hinders our understanding of the complex processes inherent in collective action efforts. Therefore, a radical change in perspective is required. Stakeholders in CPR management scenarios should not be regarded as rational, atomised individuals, but, following actor-network theory (ANT), must be considered as *collectifs* from whose attempts in shaping the social

acting upon a certain form of rationality is one of the emergent effects. Let me elaborate on this proposal.

From the empirical cases in this study, it became clear that collective actions within and amongst stakeholder groups evolve around and are mediated by non-human entities. In Cowes Harbour (Chapter Two), collective action evolved around the fairway and was mediated by oysters; in Ballynakill Harbour (Chapter Five), it evolved around salmon cages and was also mediated by oysters; in Killary Harbour (Chapter Five), collective action evolved around, *inter alia*, (a) mussel production structures and (b) sea trout and sea lice, and was mediated by respectively (a) cultured mussels and capture species and (b) antibiotics; in the Wadden Sea (Chapter Seven), it evolved around oyster catchers, eiders and 'vacuum cleaners' and was mediated by cockles, mussels and black boxes. Furthermore, the stakeholders themselves are defined by their relationship with non-human entities. Take away his vessel, fishing gear, black box and his entitlement to cockles and a cockle fisherman will no longer be a cockle fisherman. Hence, I conclude that non-human entities should become part of CPR analysis.

Thus, stakeholders are relational networks of interactions amongst people and things, in other words: they are *collectifs*. Crucial to this notion is that we have to abandon the conventional sociological assumption that agency is a given property of human beings; rather, agency is an emergent property from the process through which *collectifs* constitute themselves (cf. Callon & Law, 1995; Latour, 1994). In accordance with ANT, I refer to this process as 'translation'. If agency cannot be regarded as a given property of humans or things, then rationality must be treated in an equal fashion. Indeed, the case studies illustrated that rationality emerges in different forms throughout the process of shaping collective action (or free-riding).

Following Habermas (1997), I distinguish two main forms of rationality. The first, purposive rationality, accommodates two types of action of which 'strategic action' is the most relevant for the analysis of the translation of collective action. According to Habermas, the actor involved in strategic action calculates the most successful decision for the realisation of an end on the basis of goal maximisation and the anticipation of the decisions made by at least one additional goal-directed actor. The second form is communicative rationality, where actors pursue their individual goals under the condition that they harmonise their plan of action on the basis of a common definition of the situation.

The combination of adopting the notion of translation, which is essentially a strategic enterprise, and Habermas' principle of communicative rationality, seems paradoxical. However, like strategic action, communicative action is also goal-oriented, yet based on a different premise. In trying to enrol others, *collectifs* involved in a translation trajectory are at the same time involved in "trials of strength" (Bijker & Law, 1992; Verschoor, pers.comm.); the strategies they employ in this process, are never mapped out. Thus, while Habermas tends to regard strategic and communicative action as 'thought out in advance'; that is, rationality

is shaped prior to embarking on the action, I consider purposive and strategic rationality to be an emergent effect from the translation process in which the *collectif* is involved. This means that in the course of a translation process, different forms of rationality emerge as "necessary points of passage" (Callon, 1986: 27). The Cowes Harbour study, for instance, showed how the fisherman who assumed the leadership in the translation process that was aimed at securing access to the fishery, emphasised that in order to pursue their individual goals (fishing the oyster beds), the fishermen would have to agree upon a joint plan of action on the basis of a collective assessment of the problem. This resulted in the idea of applying for private property rights; thus, communicative rationality emerged as the best strategy. To increase the chances of success, the fishermen decided that they would have to get the other relevant stakeholders on their side before they submitted the application; here strategic rationality proved to be the best strategy. In their discussion with the Harbour Master, communicative rationality emerged again, when they agreed on a compromise on the basis of a joint assessment of the problem that would benefit all parties.

By granting purposive and communicative rationality the status of emergent effects in a translation trajectory, at least some of the criticism on Habermas' theory of communicative rationality (e.g., Leeuwis, 1993; Rojek, 1985) is addressed. An ideal speech situation is imperative to communicative action. According to critics, this concept is so rarefied that its application to social life is very limited. However, like strategic and communicative action, the ideal speech situation is not a scenario that can be set in advance, like the stage in a play, but is one of the possible effects of the translation trajectory. While not all the 'components' of the ideal speech situation may be present in their 'ideal' form and *collectifs* may draw on different validity claims, scenarios that constitute 'limit cases' of communicative action (Habermas, 1997) may be the outcome of the interactions amongst them, as was illustrated in the empirical studies. In addition, as well as marginalising the role of agency in relation to human relations, Habermas has been criticised for paying insufficient attention to the role of structure in relation to communicative action[2]. By considering the social, and for that matter purposive and communicative rationality, to be the outcome of interactions amongst *collectifs*, this criticism is easily overcome. It is the tactics of translation in which these *collectifs* are involved that matter for the emergence of purposive or communicative rationality. By explaining these tactics, the sociotechnical means that are mobilised, and which may include structures like class and ethnicity, will come to the surface. Having outlined my perspective on rationality, I will now turn to the notion of the nested *collectif*.

In a discussion between two of ANT's architects, the following observation was made:

> "[...] *collectifs* come in various shapes and sizes. Some are strategic, and some aren't. Some are intermediaries that just pass on messages, and some aren't. Some seek to boldly split infinitives where no man – excuse me, no entity – has done so before. Some are unpredictable and capricious, like the Greek Furies or

> Shakespeare's Ariel. And some are decentered. All over the shop" (Callon & Law, 1995: 495).

This variety in shapes and sizes of *collectifs* is illustrated in the empirical cases in this study. There are *collectifs* comprising one human-material entity, for example, a fisherman; there are *collectifs* that consist of multiple human-material entities, for instance, the co-operatives in Ireland; some are ordered, like the Dutch co-management platform, while some, for instance the Dutch public, are decentered and act as intermediaries. In Chapter Three, I called the *collectifs* through which collective action in CPR management scenarios is shaped, 'platforms for resource use negotiation'.

The notion of platforms stems from the knowledge systems perspective, which is aimed at developing a diagnostic framework for analysis, design and management of policy decisions and helps land users in becoming experts at managing complex ecosystems in a sustainable manner (Engel, 1995; Röling, 1994b; Röling & Wagemakers, 1998). Platforms emerge when stakeholders experience the negative impacts of their own and others' use of a resource and become aware that (i) collective action is needed to deal with such problems, and (ii) a decision-making capacity has to be developed at the ecosystem level to which the perceived problem applies. In such platforms, resource management issues are considered from a multiple-use perspective and social actors exercise collective agency in working in concert towards adaptive resource management through (i) fostering understanding about the resource base, (ii) minimisation of social dilemmas associated with collective resource use, and (iii) implementation and fine-tuning of action strategies with respect to perceived problems. In Chapter Three, I criticised the knowledge systems perspective and its notion of platforms for being humanist and in conflict with the essence of its social constructivist claim; the latter referring to its normative practice of prescribing outcomes for the platform processes rather than letting the stakeholders construct its outcome. Despite these criticisms, I adopted the notion of platforms with a number of adaptations, so that it would fit within the ontological and epistemological principles underlying this study. I consider the platform to be a *collectif* that does not have a desired, pre-defined outcome and must be considered as the result of interactions of different *collectifs* at different stages; in other words, its outcome is the product of its own interactions. Later in this chapter, I will elaborate on the action-oriented brief of platforms.

In the empirical cases I showed how stakeholders and platforms as *collectifs* are interlocked in a larger institutional framework *collectif*. Thus, in addition to their emergence in different shapes and sizes, *collectifs* are all nested. A mussel cultivator in the Wadden Sea is a fisherman-*collectif* as well as a stakeholder-*collectif* in the resource system of the Wadden Sea. He is part of the platform-*collectif* that forms the PO Mussel Culture, which, on its turn is part of the platform-*collectif* established by the co-management strategy for shellfish fisheries at the constitutional level. I conclude that rather than regarding the various types of *collectifs* as isolated entities, they must be considered as *nested* entities, as each

collectif defines the relationship between the different human and non-human entities and thereby constructs larger *collectifs*. The introduction of the notion of the *nested collectif* partly addresses the problem of ANT's managerial bias in following the 'master translators' and excluding (i) those who are marginalised by these attempts and (ii) the invisible work contributed by countless others (Summerton, 1997). By explicitly recognising the 'nestedness' of *collectifs*, the various other actor-networks it constitutes (or is part of) are at the very minimum acknowledged, even though they may not become an explicit part of the analysis.

The nestedness of *collectifs* is of importance to the shaping of collective action efforts through platforms. In the case of the mussel co-operative in Killary Harbour, I showed how the voluntary platform that was formed to secure (local) access to the resource system, was undermined by a *collectif* at the constitutional level: the government, whose economic and political discourse is aimed at a more large scale development of the fjord. This problem has also been observed in studies on the management of local single-use common property resources (Barrett, 1991; Olomola, 1992; Ostrom, 1990; Wade, 1988). In contrast, in the case of the Wadden Sea, I showed how collective action amongst multiple stakeholders was strengthened through the establishment of a statutory co-management approach. The comparison of these case suggests that formalised ties interlocking the various layers of *collectifs* are crucial in facing the trials of strength that take place amongst them. In addition, the organising capacity of the *collectif* and its spokespersons and its ability to respond to changing translation attempts, in other words, to adapt over time, are important assets in confronting such trials of strength.

This brings me to the question of the 'effectiveness' of platforms in organising collective action amongst multiple stakeholder-*collectifs*. The emergence of platforms is part of a translation process. The case study of the Wadden Sea demonstrated how translation does not end with the establishment of a co-management platform or the constitution of a *collectif*, but evolves in time and space as old stakes are re-articulated, new stakes arise and *collectifs* that form part of the nested platform take on new roles. In the trials of strength that continuously take place, former 'master translators' can become enrolled in another's project themselves. For instance, an earlier attempt by the Cowes fishermen to privatise their fishery failed because the Harbour Master proved to be the stronger force; fifteen years later, the roles were reversed and the fishermen succeeded in enrolling the Harbour Master in their project. I conclude that translation trajectories, unless abandoned, are infinite; the shaping of a *collectif* is a necessary point of passage in the process of translation. In this light, 'effectiveness' or 'success' is achieved when a translation takes place at any point in time. The longer a *collectif* maintains it relational patterns, the more 'durable' it is; if it enrols other actor-networks or materials to maintain its durability, the *collectif* also becomes mobile (Law, 1992). Again, I must emphasise that 'translation' and 'durability' are neutral or hybrid terms, which may refer to something we would, from a normative or moral perspective, call either 'good' or 'bad'.

Having elaborated on my proposal that stakeholders in collective action processes should not be regarded as rational individuals, but as nested *collectifs* from whose attempts in shaping the social, different forms of rationality emerge, I will now discuss the preliminary conclusions concerning 'contextual factors' and 'design principles' in more detail. In doing so, I will also draw on the above discussion. The ontological and epistemological implications for CPR theory from the previous and proceeding sections are addressed hereafter

Contextual factors

In Chapter One, I discussed how the external world is remarkably absent from the theoretical notions and frameworks developed in CPR theory. The bulk of CPR literature regards the wider environment in which the CPR is embedded as 'given' or as a 'black box'. In writings that do address external changes, such contextual factors tend to be used as an *excuse* for resource degradation. While contextual factors are often recognised as determining factors in the downfall of a common property regime, researchers do not venture beyond the internal world of the resource regime to provide a fuller explanation of the significance of context (Edwards & Steins, 1998b).

The apparent lack of contextual analysis in CPR theory is interesting in view of its heavy reliance on the concept of bounded rationality in explaining collective action. In analysing individual choice of action strategies, CPR theory only considers *internal* variables to be part of this bounded rationality. This practice overlooks the fact that, in the translation trajectory, co-operation or free-riding are not only the outcomes of outweighing expected social and economic costs generated by the CPR itself (internal variables), but also of the consideration of alternative options embedded in the external world. In Chapter Five, for example, I showed how the voluntary work that shareholders of the shellfish co-operative in Ballynakill Harbour had to carry out to restock and manage the common property wild oyster beds, ran parallel to the tourist season. The majority preferred the direct income from tourism over the future reward from collective management of the beds, and started to free-ride (cf. Galjart, 1992). The presence of tourism and its part in contributing to an opportunity cost of spending time on the shellfish grounds is an example of how contextual factors influence collective action. The lack of contextual analysis is also interesting in view of criticism directed at CPR theory's incapacity to explain why property regimes change over time. I conclude that in the evolution of management regimes, contextual factors are of particular importance as they create dynamic forces that influence the strategies that emerge throughout the translation trajectory by affecting the way in which nested *collectifs* justify certain courses of action and shape collective action in time and space.

From the empirical cases in this study, it became apparent that contextual factors influence collective action processes within and amongst nested *collectifs* at all three institutional levels. In the case of the umbrella platform for complex CPR management in Cowes Harbour, for instance, contextual factors explaining

(mis)representation of user groups in the collective-choice platform included *inter alia*, the historical background of the specific uses within the resource system and the socio-economic importance of the specific stake within the CPR. In NW Connemara, the rate of local participation in external policies affecting the CPR and the role external agents adopted towards socio-economic development, were among the contextual factors that influenced operational level co-operation and conflicts. In the Wadden Sea, changing nature conservation demands were one contextual factor resulting in constitutional co-management. The cases show that there is a large variety of contextual factors affecting the translation trajectory of collective action (or free-riding). What is more, contextual factors will differ from case to case and, in each case, will evolve in time and space. However, as Van Ginkel (1998: 10) rightly stresses, "this is no reason to exclude them from the research agenda".

Lack of knowledge of contextual factors can lead CPR analysts to make simplified judgements about collective action or free-riding. Indeed, the external environment and the CPR are interdependent. The former supplies the nested *collectifs* involved in CPR use and management with resources and must also absorb the products or benefits from the CPR (cf. Crozier & Friedberg, 1980). However, identifying these factors is not necessarily an easy task as contextual factors are often quite hidden. This is particularly the case for contextual factors that are embedded in everyday local practices or local culture. My experience is that contextual factors tend to be more readily apparent in situations of controversy surrounding 'failure', such as, for instance, in the case of the shellfish co-operative in Ballynakill Bay. In this respect, problems to manage the CPR can be, as Law and Callon (1992: 22) call it, a "methodological convenience", helping the researcher to display the contextual factors that are more easily hidden in cases where collective action is the emergent effect of the translation trajectory. Here lies, in my perception, at least part of the explanation for the apparent lack of contextual analysis in CPR theory.

In their eagerness to rebut The Tragedy thesis, CPR scholars have identified a range of structural internal characteristics of such long enduring common property regimes, the so-called design principles (see next section). In doing so, they fell into a similar epistemological trap as the sociologists of science who were criticised by David Bloor for assuming that true scientific knowledge does not need sociological explanation (Chapter Three), i.e., CPR theory describes 'success' rather than the examination of the contingencies involved in the process whereby this is achieved. In the next section, I will elaborate on how the use of pre-defined categories of 'success' hinders the analysis of contextual factors.

Thus, the question of how to analyse contextual factors is critical. Clearly, there is a limited extent to which researchers can study the entire external world of the CPR and its single or multiple management regime(s). Starting with one outcome, or point of passage, in a translation trajectory, for instance, the establishment of a co-management platform, and then 'backsolving' (Feeny, 1994) or tracing back the 'tactics of translation' (Law, 1994) by focusing on critical incidents, is one way of

making visible contextual factors[3] (cf. Oakerson, 1992; Edwards & Steins, 1998b). From an analytical point of view, it is useful to distinguish between local and remote contextual factors in this process of backsolving. Local contextual factors affect both the demand and supply of products, benefits and services from the CPR and, therefore, have a direct effect on CPR use and its management. Generally, stakeholders will be able to influence local contextual factors. For example, the status of the Wadden Sea as an important breeding and staging ground for birds is one of the local contextual factors that eventually resulted in the establishment of the co-management platform for shellfish fisheries and nature in an attempt to deal with changing nature conservation demands and attitudes towards shellfish fishing in the area. Remote contextual factors usually have an indirect effect on the CPR and tend to be outside the control of the stakeholders. For example, a number of consecutive cold winters in combination with storms affected the shellfish stocks in the Wadden Sea and, even if the shellfish fisheries would not have taken place, resulted in a food shortage for birds; this was one of the factors that resulted in the division of shellfish between birds and fishermen under the co-management regime.

Furthermore, the comparison of the action strategies that emerge throughout the translation process is important in making visible the internal and contextual sociotechnical variables shaping it. Only by comparing, for example, the different uses in Cowes Harbour, could representation and misrepresentation in the umbrella-*collectif* be appreciated. Equally, the explanation of why in Ballynakill Harbour co-operation amongst different *collectifs* is virtually absent while in the nearby Killary Harbour, many co-operative arrangements exist, relies on a comparison of the two estuaries and the sociotechnical construction of CPR management by the different *collectifs* involved. When comparing the different cases presented in this study, the role of perceived crises emerges as an important local contextual factor triggering a translation process aimed at collective action. However, in comparing the translation trajectories, it becomes clear that different constitutional contexts are important in shaping the outcome of translation. In the United Kingdom, for instance, sectoral management based on the collaboration of different agencies and with the assistance of local informal collaboration, is the predominant approach; this has implications for representation, as stronger sectoral interests (e.g., the yachting and cargo industry in Cowes) easily dominate weaker ones (e.g., the oyster fishermen). In Ireland, the prevailing top-down approach to marine development with few possibilities for local participation, has resulted in a situation where local interests feel that development is imposed upon them and have to rely on informal networks to negotiate access to the CPR. In contrast, the Dutch 'polder model' has been extremely influential in the shellfish industry's voluntary attempts to negotiate resource use and, later, in the statutory establishment of a co-management strategy in which all interests should be considered. Thus, by comparing the three case studies, the importance of national contexts in translating CPR use and management, becomes evident.

From a methodological point of view, distinguishing between local and remote contextual factors and making them visible through backsolving and comparative

analysis are the only two grounded guidelines for the analysis of contextual factors in CPR management. While contextual factors are broadly embedded in a number of spheres, such as the ecological, economic, demographic, social, cultural, political, legal, technological and infrastructural environment, their presence and their direct and indirect impact on CPR management will vary from situation to situation. From an analytical perspective, it may be tempting to define categories of contextual factors on the basis of a comparison of case studies, as has been the case for the design principles, for instance. This practice may indeed lead to a number of emergent similarities in contextual factors. An example from this study is the 'perceived crisis', which played an important role in triggering collective action efforts in all three empirical cases, and to which I will return at the end of this section. However, from an ontological perspective, the use of pre-defined categories cannot be advocated. Categories that I, as a researcher, propose, may be interpreted and constructed differently by other researchers as well as the stakeholders in the CPR (who may not even know 'our' categories). Furthermore, the inherent risk in categorising the dynamic, external forces impacting on CPR use and management is that they are used as blueprints. As I pointed out earlier, the presence and impact of contextual factors will vary from case to case. By using *a priori* categories, researchers may easily lapse into generalisations by attributing the same weight to each contextual factor in the translation process and may run the risk of overlooking contextual factors that are not 'on the list', but may have been crucial in the translation process.

I conclude that 'successful CPR management', i.e., collective action as the dominant strategy, cannot taken for granted; that is, cannot be used as an excuse not to analyse the contextual factors that formed part in achieving this situation. The management regimes for CPRs are subject to dynamic internal and external changes; some have been present for centuries and may evolve around one or multiple resource units, others have more recently witnessed the arrival of new stakes and have been slightly adapted or completely transformed in response to meet the new demands placed upon the resource system. While some stakeholders have been able to adapt their CPR management regime to external changes and, in this respect may be considered 'successful' (e.g., Edwards, 1996; Netting, 1981), others have proven incapable of adaptation (e.g., McKean, 1986). In both cases, the interactions amongst internal and contextual factors as well as the stakeholders' perceptions of these dynamic forces and the CPR itself, have contributed to the realisation (or decay) of adaptive management, and therefore cannot be taken for granted but deserve explanation. A key question in the analysis is therefore: through what *mediating mechanisms* do these contextual factors affect and modify (and in what sense) the tactics of translation amongst nested *collectifs* (cf. Crozier & Friedberg, 1980).

A final note concerns the role of perceived crises. In the empirical cases in this study, the role of crises emerged as an important local contextual factor influencing collective resource management. In the case of Cowes Harbour, a potential closure of the oyster fishery in the interests of safety and navigation and nature conservation, triggered a collective privatisation effort. In Ballynakill

Harbour, the perceived consolidation of fishing grounds by a foreign salmon farm acted as a catalyst for collective action amongst local fishermen in an attempt to secure access by creating common property rights. In Killary Harbour, the anticipated conflict over resource use with local fishermen, formed an incentive for mussel farmers to enrol the former in a concerted action in which they agreed to keep the fairway and fishing grounds free of production structures, even though some of these areas are officially designated for shellfish aquaculture. The crisis associated with the collapse of the sea trout stocks triggered a collective action effort by the local freshwater fishery and a number of other freshwater fisheries in the country aimed at seeking justice and rectifying the problem. In the Wadden Sea, conflicts over high bird mortality and consequent fear of severe restrictive regulations imposed by the government, resulted in the implementation of voluntary fisheries management measures by the shellfish industry. In each of these case, the perceived crises were learning moments in creating awareness that some form of collectively organised adaptive management was needed.

The significance of a perceived crisis as a factor influencing collective action is interesting in view of the theoretical argument put forward by economists that, for collective action to occur, *marginal* gains must be higher that *marginal* costs; thus, collective action should take place if a net gain is the result. Nevertheless, in reality, it seems that often there has to be a threat of a *total* loss before collective action becomes a viable strategy. Here we meet again with the interactive nature of the CPR and its contextual characteristics. In their tactics of translation, stakeholders do not only outweigh the direct (or visible) costs and benefits of opting for a certain strategy, but also take numerous other external factors that they perceive of as being important, into account. This means that marginal costs and gains cannot solely be considered in terms of a narrow relation to the issue that is at stake (or from an economist's point of view, should lead to collective action), but that the role of hidden contextual factors and responses to translation attempts by other nested *collectifs* should equally be considered. In this context, collective action may not become the dominant strategy (even though it may seem the most 'rational' thing to do), until a crisis emerges that may lead to a total loss of a stake. What is more, the argument put forward by economists is based on the assumption that rationality is a property of individuals, which explains its theoretical logic, but not its practical outcome. In the preceding discussion, I argued that purposive and communicative rationality are emerging effects of the translation trajectory in which a nested *collectif* is involved. Theories that consider rationality to be a given effect of individuals will never get to properly analyse how collective action is constructed, reconstructed or deconstructed. Thus, when a crisis appears on the horizon, it *may become* (not: 'is') rational for nested *collectifs* to join forces and become part of a translation process aimed at collective action. However, I agree with Maarleveld & Dangbegnon (1999: 271) that although

> "crisis is a strong force to convince people of the need for change [...], once in a crisis, options and time for change become scarce".

Design principles

One of the critical themes of CPR theory is the formulation of design principles[4] (Chapter One; Table 1.1), which is strongly associated with the tendency to look at outcomes of collective resource management in terms of 'measurable' criteria. For example, Oakerson (1992) suggests economic efficiency (i.e., achieving Pareto optimality[5]) and social equity (i.e., distribution of benefits is equal in comparison to distribution of input costs), as performance criteria for collectively managed CPRs. The assessment of outcomes directly 'feeds' into the formulation of conditions for successful collective action; that is, under what circumstances are users capable of maximising economic efficiency and social equity? As Edwards & Steins (1998a) argue, the use of such criteria poses a number of practical problems, in particular in multiple-use settings. First, it is difficult to implement Pareto optimal efficiency measures in practice. Particularly, in multiple-use scenarios a precise measurement of the efficient level of each type of use is generally not feasible, especially since achieving Pareto optimality for one type of use may subtract Pareto optimality from other uses. Second, when using equity as a performance criterion, it is imperative to examine distributional and redistributional gains and losses both *within* each user group and *amongst* all user groups. In Chapter One, I put forward the thesis that the development and use of prescriptive design principles inevitably results in the establishment of normative criteria for measuring outcomes, taking attention away from the users' construction and perception of CPR management and the process through which collective action evolves.

The empirical cases in this study provide ample evidence that the status of design principles in CPR theory should be reconsidered. In Chapter Two, for example, I showed how the informal common property regime for the oyster fishery included the basic design principles and how, for its users, the informal regime was a satisfactory agreement. However, despite the presence of design principles, the fishermen deemed privatisation necessary as their livelihood was threatened by external forces. Equally, the case of the shellfish co-operative in Ballynakill Harbour showed how despite an abundance of favourable conditions for collective action, common property resource management was characterised by free-riding behaviour. Thus, what may be a 'condition' for successful collective action in one scenario does not necessarily have to be one in another. Furthermore, the presence of design principles does not automatically guarantee 'successful' collective CPR management. The setting within which the management system is located, influences priorities and, consequently, to what extent nested *collectifs* are prepared to fulfil the demands made by the CPR. These priorities do not only vary between geographical settings and over time, but also differ amongst nested *collectifs* who are engaged in the same management system. For example, while two thirds of the shareholders of the aforementioned co-operative chose not to contribute to collective resource management, one third decided that the voluntary work at the co-operative was worthwhile. Moreover, the stakeholders' priorities will be reshaped in time and space through interactions with other *collectifs*. For example, a previous privatisation attempt by the oyster fishermen in Cowes Harbour was abandoned;

however, the threat of closure by the Harbour Master and, potentially, nature conservation interests, combined with the preparation of the estuary management plan, acted as catalysts for fishermen to join forces and breathe new life into the privatisation project.

The above examples again illustrate the importance of contextual factors. Without the threat of closure and the preparation of the estuary management plan, it is unlikely that the fishermen in Cowes would have started the translation of the informal common property regime into a private property regime. In the previous section, I discussed how the narrow focus on design principles has impeded the analysis of contextual factors: by describing cases of 'success' and pinning it down to the internal characteristics of the management regime, CPR scholars have largely neglected the role of contextual factors. What is more, 'success' itself remains unexplained; but is reduced to an abstract status that can be achieved by getting the mix of institutional ingredients right. In this 'recipe for success', the external world is a 'black box'. I conclude that by focussing on pre-defined design principles for success, attention is diverted from the internal and external complexities involved in the emergence and evolution of collective action processes and hinders the understanding of the dynamic and interactive nature of the translation trajectory it involves.

In addition to the above methodological difficulties, I argue that there is a more philosophical problem inherent in CPR theory. In assuming that outcomes of collective action processes are determined design principles, a substantial part of CPR theory is based on a post-positivist or critical realist ontology. Collective action in common-pool resource management is studied in terms of 'successes' and 'failures'. This raises questions related to normativity: what is 'success', what is a 'failure'? And, more importantly, are the researcher's or policy-maker's definition of 'success' the same as those of the stakeholders in the CPR?

The problem can again be illustrated by aforementioned shellfish farming co-operative. The co-operative was established under the guise of improving income opportunities for local fishermen. Its hidden objective was, however, to create property rights to parts of the local bay to prevent the local salmon farm from expanding. Once the co-operative was initiated, two thirds of its shareholders became free-riders. Many would be tempted to say that collective action in this case has failed and that the logic of rationality had driven the free-riders to opt for a collectively irrational outcome. However, if we look at the shareholders' hidden objective, namely securing access to the local fishing grounds, the co-operative can be considered extremely successful in realising its aim. Similarly, if we study the co-management platform for the integration of fisheries and nature in the Wadden Sea in terms of the design principles identified in CPR theory, the apparent success of co-management would be confirmed. However, while 'outsiders' have praised its success, the stakeholders in the platform have a different opinion. This particularly applies to the nature conservation groups who feel that responsibilities for nature conservation should rest with the government alone and that some forms of shellfish fishery cannot be reconciled with nature conservation. Recently, the success of co-

management has also been questioned by the representatives of the shellfish industry, who perceive that the Ministry of Agriculture, Nature Management and Fisheries has failed to fulfil its role as a gatekeeper of the principles of co-management in the translation process for the policy's second phase.

Judgements about 'success', 'failure' and 'rational behaviour'[6] are thus socially constructed, not only by the stakeholders involved, but also by researchers, policy-makers and bystanders. By focusing on pre-defined categories, CPR analysts will never be able to fully appreciate how the distinction between success and failure, and indeed the notions of 'success' and 'failure' themselves, are constructed and used (cf. Law, 1994). Furthermore, 'categorisation' does not do justice to both the uniqueness of the management setting and imposes categories upon local and cultural contexts that may be completely alien to the resource managers concerned and, consequently, may lead to erroneous judgements. The recognition that *a priori* categorisation hinders CPR analysis has far-reaching implications for the research methodology used by CPR scholars[7] as it implies that they should use the categories constructed by the stakeholders under study rather than their own categories. I will elaborate on this proposal in the next section.

A final related note concerns the different perceptions of and discourses on CPR management. In the case of shellfish fisheries management in the Wadden Sea, I showed how different images of nature and stereotypes of traditional versus modern (bad) fishermen influenced multi-party negotiation and action strategies in the co-management platform. Equally, different discourses concerning marine resource development in Killary Harbour by the government and local stakeholders posed a threat to the durability of the local voluntary platform. Perceptions and discourses form integral parts of the processes that shape CPR management (cf. Aarts & Van Woerkum, 1996; Van Woerkum & Aarts, 1998). By focussing the analysis on narrow categorisations, discourses and perception are likely to remain hidden.

I conclude that by following the conventional scientific belief that reality can be divided into categories and that its shaping mainly operates through cause-effect relations, the process of collective action cannot be fully appreciated and is limited to the development of even more categories. Stakeholders in and platforms for collective action, i.e., nested *collectifs*, are social constructs rather than abstract entities. Therefore, explanatory and prescriptive models of decision-making or collective action are not sufficient (Crozier & Friedberg, 1980). Rather, a focus on the sociotechnical and structural characteristics of the context that shapes the translation trajectory is needed to understand the complexities involved in collective action efforts.

Ontological and epistemological implications for CPR analysis

From the above discussion, it is apparent that CPR theory needs to be reshaped. Its post-positivist conception of reality, its narrow assumption of fixed, purposive rationality, the focus on internal variables and the prescriptive categorisation of

collective action provide a too limited scope to deal with the analysis of complex CPRs. The traps associated with its current ontology, i.e., its beliefs about the nature of reality, and epistemology can, however, be avoided. In the previous sections, I made a first move in reconstructing key concepts in CPR theory. My proposal is to adopt a social constructivist perspective to the study of CPR (and facilitation, see next section) of complex CPR management, the implication being that reality can no longer be taken for granted, but is the result of complex interactions between people and things, i.e., nested *collectifs*. Two principles, derived from actor-network theory, are key to this new perspective for CPR theory and should be adopted.

First, ANT's principle of generalised agnosticism is crucial for the appreciation of collective action processes. The principle of generalised agnosticism tells us to abandon *a priori* categories and design principles for collective action as they thwart the analysis of the stakeholders' constructions of CPR management and the way these constructions are used. The focus of analysis should be on the tactics of translation, i.e., following the nested *collectifs* in the way they mobilise social and material means to enrol others in their projects.

Does this imply that the design principles in CPR theory are useless? The answer has to be 'yes' if they are tacitly used as prescriptions for establishing co-operation in CPR management situations. The answer is 'no' if analysts use them as a starting point for the formulation of research questions that help to identify how stakeholders define, *inter alia*, 'success', 'free-riding', 'cheating', 'sanctioning', in other words, construct CPR management. This strategy will assist the examination of the translation of collective action or free-riding. In this process, the analyst should acknowledge the interdependent relationship between these questions and the dynamic forces from the external world that impinge upon CPR management. I will return to this methodological issue later.

In view of the principle of generalised agnosticism, the abolition of the 'human' category in favour of the 'actor-network' or *collectif* is another ontological benefit of ANT for CPR theory. Collective action strategies can only be appreciated by taking into account the very non-human entities that (i) constitute the various stakeholder-*collectifs* and, in multiple-use scenarios where different resource uses are characterised by a certain level of interdependency, (ii) are the pivot of the trials of strength that take place amongst the different *collectifs* throughout the process of translating resource management, of which co-operation and free-riding are equally likely effects.

Second, ANT's symmetry principle benefits the understanding of collective action processes. The principle of symmetry tells us that everything in a collective action situation needs explaining in the same terms. This means that the fact that collective action is 'successful' does not make it exempt from in-depth analysis; that is, 'success' cannot itself be offered as an explanation (for example, by 'defining' design principles on the basis of successful cases), but is that what needs to be explained. Thus, the presence of collective action should be analysed in the same way as its absence.

The adoption of the principles of generalised agnosticism and symmetry is the first basic requirement for the further development of CPR theory from a descriptive (and consequently prescriptive) approach to an explanatory, multi-dimensional perspective. From an epistemological point of view, this new ontological foundation means that the position of the CPR scholar in relation to the CPR and the nested *collectifs* that have a stake in it, drastically changes. Guba & Lincoln (1989: 84) describe this new relationship as follows:

> "an inquirer and the inquired-into are interlocked in such a way that the findings of an investigation are the *literal creation* of the inquiry process".

For the study of CPR management, this means that, at the outset of the investigation, only broad phenomena can qualify for analysis (Verschoor, pers.comm.). The 'inquired-into' should determine how the analysis of this broad phenomena is filled in, i.e., they are the ones that set the research agenda. 'Co-operation' or 'collective organisation' are examples of such phenomena. If a CPR scholar wants to carry out research into 'co-operation as a mechanism to achieve sustainable fisheries management' and the inquired-into have never heard of the concept of sustainability, it does not make much sense to carry this research through. The idea for this research may have arisen because the particular researcher misinterpreted or romanticised the existing collective organisation of fisheries exploitation as an institution aimed at sustainable management, whereas for those involved, it is nothing more but a distributional arrangement. In this example 'co-operation' itself is that what needs an examination.

While the recognition of the ontological principles of symmetry and generalised agnosticism and the related concept of the nested *collectif* are of crucial importance to CPR theory as a whole, these principles are of particular interest for the study of complex, multiple-use CPRs. In such scenarios, there are divergent claims on, stakes in and constructions of the resource system. What is more, the different nested *collectifs* are interdependent in that each particular type of use will, in nearly all cases, have some effect other uses. In addition, the range of local and remote contextual factors that affect the evolution of adaptive management (or lack thereof) increases; while some *collectifs* may experience a significant influence from certain contextual factors, others may feel little or no effect of the same factors (Buck, 1998). Finally, collective action processes are not limited to one particular type of use, but also take place (or don't) amongst different uses. These characteristics make the study of collective action processes in complex, multiple-use scenarios a complex undertaking.

The adoption of the principles of generalised agnosticism and symmetry will facilitate our understanding of the contingencies involved in the shaping and reshaping of collective action processes by focusing on the sociotechnical construction of CPR management and the internal and contextual factors that influence the emerging action strategies by nested *collectifs*. In this analytical process, co-operation and free-riding are both outcomes or effects of the interplay

and consequent trials of strength amongst the different *collectifs* with a stake the CPR and their mobilisation of social and material resources external to the CPR.

By accepting the offer of translation, instead of regarding collective action and free-riding as predominantly static phenomena, the practice of taking 'snap shots' and describing CPR management (or lack thereof) can no longer be defended. Changes in CPR management regimes (or nested *collectifs*, to be consistent) through, for instance, adaptation, transformation, disappearance and materialisation, and the processes involved in those changes, as well as the examination of durability and mobility of CPR management regimes, will become the enterprise of CPR scholars. In this way, it becomes possible to truly develop theory instead of (i) accumulating evidence rebutting Hardin's Tragedy, (ii) categorising CPR management and, ultimately, (iii) (consciously or unconsciously) dogmatising these categories.

Essential for this proposed paradigm shift in CPR theory is that the adoption of the principles of generalised agnosticism and symmetry is complete; that is, does not discriminate between some aspects of CPR theory. The most radical ontological shift will not be the notion that stakeholders have their own constructions of the CPR and their role in its management nor the idea that non-human entities should became part of the analysis, it will be the new status of the concept of rationality. As was outlined at various points in this study, the rational choice approach and particularly the concept of bounded rationality have formed the foundation for the analysis of 'appropriator behaviour'; boundedness in this case referring to internal variables of common property regimes. Purposive rationality is the force that drives the appropriator and, as a consequence, divides him from the social. The concept of agency is not made explicit and, unlike actor-oriented approaches that extended the agency concept to include the social world[8], only seems to refer to interactions of atomised individuals (cf. Wilson & Jentoft, 1999). By adopting ANT's basic principles, CPR scholars may find themselves in a conceptual crisis: from having a limited "undersocialised conception" of the appropriator (Granovetter, 1992, in *ibid.*: 63), they have to go right to the other side of the continuum in conceptualising 'appropriators' as nested *collectifs*, whose agency and rationality are not given properties, but are the emergent outcomes of interactions of human and non-human entities. Nevertheless, this radical change in the assumptions underlying collective action processes is a basic requirement: by clinging to the concept of purposive rationality and considering it to be a fixed property, CPR scholars will never be able to analyse how collective action is constructed, how the emergence of strategic or communicative action are effects of trials of strength at a certain stage in the translation trajectory and how they are points of passage in the ongoing shaping of translation.

Now that I have argued the case for the adoption of a social constructivist perspective to the study of complex, multiple-use CPR management, I will discuss its implications for a praxeology for the facilitation of collective action in complex CPRs.

Towards a praxeology

An action-oriented perspective

In Chapter One, I set out four strategies to guide the construction of a grounded perspective on complex CPR management, one of them being the adoption of an *action*-oriented perspective. My reasons for doing so are two-fold. First, instead of telling stories only, which is the enterprise of actor-network theory and actor-oriented sociology, I believe that the development of methodologies to study CPR management outcomes is crucial if we want to facilitate concerted actions amongst different stakeholders. Increasingly, the categories developed in CPR theory are being adopted by global organisations, such as the World Bank, the Food and Agricultural Organisation, and non-governmental organisations as 'recipes' for sustainable collective resource management. In the previous sections, I discussed the inherent dangers in the use of such categories. In this context, passing heuristic tools to external agents that help them (i) to make visible the contingencies involved in CPR use and management, and (ii) to develop action strategies to solve perceived problem in collaboration with the stakeholders involved, are vital. Unfortunately, the development of methodologies and heuristic tools for the facilitation of collective resource management has not been on the agenda of CPR scholars (cf. Röling & Maarleveld, 1999), and has only recently begun to be explored (see Agriculture & Human Values, Special Issue, 1999). Second, in view of the present debate on natural resource management, the complex interdependent nature of resource management problems and the incapacity of existing institutions to deal with them, I believe that a collective action approach is a viable alternative. However, discussing and studying collective action is of little help if we do not act upon it.

I am aware that by embracing this action-oriented approach, I can be criticised for contradicting my own proposal to adopt a social constructivist perspective, and particularly, the ontological principle of generalised agnosticism. I have argued that the focus on design principles raises, amongst others, questions concerning normativity. By advocating the facilitation of collective action, I too take a normative stance. I believe, however, that the adoption of a social constructivist approach in combination with an action-oriented perspective does not necessarily have to be a contradiction in terms, provided the latter is based on the ontological and epistemological characteristics of the former. In the practice of facilitating collective action, or translating translation, social constructivist methodologies can be of major benefit. Below, I will elaborate on this proposal. My objective is not to develop methodological tools for collective action or adaptive management, but rather to give some guidelines on methodological starting-points for the analysis and facilitation of translation attempts towards adaptive management of multiple-use CPRs.

One of the conclusions from the empirical cases in this study is that balancing a mix of uses and management regimes is key to the management of complex CPRs. Multiple-use may, in the short or long term, result in physical or ecological

externalities and cultural and socio-economic changes for different user groups. This is inherent in the interdependent nature of multiple types of use in one single resource system. Given these dynamics, and assuming that access to, allocation of and control over the benefits generated by the CPR is the outcome of negotiation and contest amongst different *collectifs* over endowments (i.e., the existing rights and resources allocated to *collectifs*) and environmental entitlements (i.e., alternative benefits from environmental resources that people can command) (Mearns *et al.*, 1998), adaptive management is conditional in achieving a balanced mix of uses. Adaptive management requires social learning about the CPR in terms of, at the very minimum, the physical, ecological, socio-economic and cultural characteristics of its use and management. In this context, some form of organised concerted action involving the nested *collectifs* in the CPR is necessary. In this light, with a few adaptations, I introduced the notion of 'platform for resource use negotiation' to refer to the nested *collectifs* through which collective actions in CPR management scenarios are shaped.

Increasingly, the participatory and community-based natural resource management ethos that has been propagated by practitioners and non-governmental organisations involved in rural development in non-western societies during the past fifteen years (e.g., Biggs, 1995; Chambers, 1983), is gaining ground as a policy approach, examples being integrated coastal zone management strategies (e.g., OECD, 1993; Robinson, 1997) and fisheries co-management (e.g., Pinkerton, 1994; Chapter Seven). In this context, a large number of participatory approaches and tools have been developed, including agroecosystems analysis (Conway, 1985), RAAKS (Rapid Appraisal of Agricultural Knowledge Systems) (Engel, 1995), the environmental entitlements framework (Mearns *et al.*, 1998), forums for collaborative learning (Daniels & Walker, 1996) and learning approaches to ecological management (Michael, 1995). Each of these alternative methodologies is based on the idea that (i) problems are always open to different interpretations, (ii) the resolution of one problem inevitably leads to another, (iii) stakeholders have the capacity to continually learn about these changing conditions, and (iv) changes cannot be effected with full stakeholder involvement and the adequate representation of their views and perspectives (Pretty, 1993). In addition, they all rely heavily on some form of platform process.

From an ANT perspective, it is easy to criticise these heuristic tools for being based on the humanist position that agency and learning capacity are given properties of human beings (rather than relational effects) and for assuming an *Idealtype* model of harmonious change through complete consensus amongst all (rather than considering change to be the outcome of trials of strength amongst the translators and the translated). However, the more fundamental problem is associated with the facilitation of platform processes. The methodologies passed to the external facilitator tend to be founded on narrow categorisations of the social and biased notions of 'the stakeholders' (i.e., the extractive users) and tend to detach the external agent from the nested *collectifs* in the platform[9]. In doing so, the examination of the constructions of resource use and management and potential problems remains largely superficial and is dependent on the facilitator's

sensitivity to hidden human/material stakeholders, hidden sociotechnical factors and hidden constructions of the social.

Thus, the question is how to make the invisible visible; that is, how to make sense of the *collectifs* involved, their constructions of resource management, the social and material means they mobilise and the action strategies that emerge from their interactions. This question equally applies to external agents who do not an play active part in the translation processes, but merely want to study such processes, for example, the past and present generation of CPR scholars. The answer to the question seems simple: 'following the actors' (Latour, 1987), but is it?

Following the actors

The method of 'following the actors' is controversial as it breaks with the conventional social scientific beliefs that researchers (and facilitators) should be detached, objective and, preferably, use quantitative methods of inquiry (although the latter criterion has successfully been challenged and has almost disappeared in its pure form). In Chapter Four, I explained how a social constructivist inquiry is based on the principles of methodological intersubjectivity (engagement), methodological relativism and methodological interactionism, and heavily relies on anthropological research methods (Knorr-Cetina, 1981). This raises three basic questions: (i) what actors should we follow, (ii) what if time is a constraining factor in following the actors, and (iii) how do we deal with inevitable fact of the researcher or external facilitator becoming part of the translation process he is studying or facilitating?

Finding an answer to the first question necessarily starts with the question: 'what phenomenon are we trying to understand?'. Earlier in this chapter, I argued that, at the outset of an inquiry, only broad phenomena can qualify for the analysis and that filling in the details, i.e., setting the research agenda, is the task of those inquired-into. Once the phenomenon has been qualified, it can be linked with the identification of the stakeholder-*collectifs*. Let me use the example of the shellfish farming co-operative in Ballynakill Harbour to illustrate this issue. To freshen up your memory, this is the picture that emerges at first sight: the co-operative was established with the objective of creating supplementary income opportunities. As part of their share in the co-operative (the fishing permit once the oysters had reached marketable size), its members had to pay an amount in cash and contribute in kind by carrying out 18 days of voluntary work at the oyster production sites. Within a year of its establishment, two thirds of the 75 shareholders had become free-riders. On the basis of this information, the phenomenon that deserves further study is 'controversy surrounding co-operation'.

A number of social constructivist methods to identify (human) stakeholders has been developed in different fields of inquiry[10]. Key to the identification of nested *collectifs* is that they come in various shapes and sizes and have different needs, wants, perceptions and conceptualisations. The methods for stakeholder analysis

proposed by Grimble & Wellard (1997) and Guba & Lincoln (1989) evolve around the principle of sequential sampling. The inquirer selects one actor to be followed and asks him to tell the inquirer his perspective on the phenomenon under study. After this initial conversation, the inquirer asks the informant to name a person, who he believes has a completely different idea of the issue[11]. In practice, the 'other' will often be someone who is part of the first informant's relational network and is likely to be one of the 'opponents' in the trials of strength taking place between different *collectifs*. Through this process, the inquirer is able to identify stakeholders and constructions until nothing new turns up. I must emphasise that constructions are shaped and reshaped throughout the inquiry process and that from initial conversations, constructions may be incomplete, since a relationship of trust still has to be established between inquirer and inquired-into. Furthermore, in the selection of the first actor to be followed, a bias for a *visible* nested *collectif* is often the case. By asking this visible actor to nominate someone with a different view, this bias may be carried through. By consciously considering the nested *collectif* in terms of an actor-network, the inquirer's task is also to unravel this actor-network itself, focussing on the linkages with material resources and less visible nested *collectifs* that constitute the 'master' actor-network (Latour, 1987). For example, the shellfish co-operative depends not only on its members and the external agents that support them, but on a range of other nested *collectifs*. The local aquaculture development officer who supports the co-operative, depends on the BIM headquarters for her job description and new scientific insights in shellfish cultivation. BIM depends on the government and the European Union for funding for its staff, commissioning of research and on local counterparts for co-projects. In this process, an enormous number of invisible secretaries, researchers, managers, counterparts, opponents and associated material resources take part in shaping the small shellfish farming project that is taking place in a remote village in NW Connemara. In following the actors and their translation attempts, Latour (1987: 175) makes the following proposal:

> "[...] the name of the game will be to leave the boundaries open and to close them only when the people we follow close them. Thus, we have to be as undecided as possible on which elements will be tied together, or when they will start to have a common fate, on which interest will eventually win over which. In other words, we have to be as *undecided* as the actors we follow".

In my example of the inquiry into the controversy surrounding co-operation at the shellfish co-operative, the two actors I started to follow were: (i) the director of the community development project that financially supported the co-operative, and (ii) the aquaculture development officer. They gave me their views (which in later conversations on the basis of interviews with others turned into a more complete picture) and nominated two other potential interviewees. The director nominated one of the co-operative's members who really did not believe in co-operatives as a mechanism for socio-economic development at all. The aquaculture development officer nominated a very committed member. Through this process, I was able to identify a large number of stakeholders and constructions of the controversies surrounding co-operation, including constructions of what constituted a free-rider, why some members became free-riders while others did not and why it was so

difficult to do something about free-riding. After a few interviews and informal conversations, it seemed as if the data collection reached a point of saturation. For example, the importance of opportunity costs and the difficulty to sanction fellow community members, were continuously revealed as explanations for the durable controversy of free-riding behaviour. However, being engaged in the village's social life, it became apparent that there was something else which people were not willing to tell. In this remote community, many people are part of a 'black market' of alternative enterprises, devised to supplement their social security allowance. These people, and in particular the fishermen, are very suspicious about researchers, always suspecting that 'the taxman is behind them'. By becoming part of these people's lives, partaking in activities such as attending church, drinking Guinness, going fishing and working at the co-operative (in other words using anthropological research methods), some fishermen decided that 'the girl was to be trusted' and revealed the real reason behind the establishment of the co-operative: the creation of property rights to the bay to stop the local salmon farm from expanding. Suddenly, a whole new range of questions and stakeholders emerged. Having a week left, I could only begin to understand the controversies surrounding co-operation and I had to completely redefine my categorised beliefs about 'success' and 'failure' (i.e., despite the failure of the voluntary work scheme, the co-operative had been very successful in achieving its hidden objective, mobilising the government's aquaculture development policy in stopping the very thing the policy aims to achieve: aquaculture development). I had to wait two years before I had the opportunity to complete my appreciation of the problem of the salmon farms.

This leads me to the second question: what if time is a constraining factor in carrying out the process of following the actors? In practice, inquirers often have to draw the line somewhere. I experienced this problem myself. My solution was to try and combine anthropological methods, such as participant observation, with sociological and rapid appraisal[12] methods, like formal open interviews, group discussions, mapping techniques, analysis of the 'things' that constituted the *collectifs* and a focus on critical incidents in interactions of nested *collectifs*. When time (or budget) is a constraining factor and the inquirer/facilitator has to rely on a combination of methods derived from different fields, it is crucial to remain sensitive to the fact that he may not have a full appreciation of the stakeholders and their constructions, and that it is likely that less visible nested *collectifs* are not represented. One strategy to bridge this problem is by confronting the people who are believed to be stakeholders (and who do not necessarily have to be interviewed before), with the construction of the situation as perceived by the inquirer. Faced with the same problem, Ravnborg & Del Pilar Guerrero (1999) invited all the users of a watershed to a meeting where they presented *their* construction of the resource management problems, which was based on eight interviews, thereby assuming the unpopular role of making existing conflicts explicit. This strategy seems useful in that it prompted the reformulation and refinement of the facilitators' constructions, which formed the basis for the development of action plans. In this context, Guba & Lincoln (1989) draw attention to the fact that the inquirer/facilitator is likely to be the only person who

moved extensively between participants and stakeholders and, therefore, has the most complete set of constructions, i.e., is more informed than anyone else.

The final question is how to deal with the fact that the inquirer/facilitator becomes part of the translation process he is studying or facilitating. Like the other nested *collectifs* in the platform, the external facilitator is also a translator involved in trials of strength and, consequently may either succeed in enrolling the participant-*collectifs* in his project of facilitation or may himself be enrolled in the translation attempts by participant-*collectifs*. The idea that researchers and facilitators should be objective or neutral is essentially driven by positivist epistemological beliefs. While I agree that there should be some form of impartiality on behalf of the researcher/facilitator in order not to let alliances that he consciously or unconsciously makes, determine the translation process, they do not have to be completely neutral in the process. Facilitators have an important role to play in eliciting personal constructions of issues related to CPR management and discussing them with the stakeholders in the CPR without compromising these stakeholders (Ravnborg & Del Pilar Guerrero, 1999). Rather than making frenetic efforts to be neutral, the important issue for the researcher/facilitator is to give those who are directly involved and those who are outsiders (e.g., the readers) an evaluative basis for his actions in and interpretations of the process. Here we meet with the field of critical hermeneutics (Drinkwater, 1992), I outlined in Chapter Four. When a researcher/facilitator feels that his engagement has significantly influenced the constructions of the stakeholder, or when he experiences a certain bias towards some stakeholders that affects the research or translation process (e.g., empathising with weaker groups), it is crucial that he brings these issues under the attention of the readers, the partners in his team and the stakeholders in the platform.

Nested platforms for CPR use negotiation

If we succeed in following the actors and, in view of ANT's ontological and epistemological principles, abandon the categorisation of the social and the prescription of directions that the analysis and translation of the social should take, then the notion of platforms with its particular action-oriented commitment, can become an important heuristic tool for the facilitation of CPR management in complex, multiple-use scenarios. The potential of nested platforms lies in their action-oriented commitment, i.e., they call attention to the need for creating capacity for decision-making and action at the ecosystem level at which 'solution' to resource use problems can be developed by, *inter alia*: (i) making visible existing or potential issues of contest, (ii) encouraging understanding of the physical, ecological, socio-economic and cultural characteristics of the CPR, (iii) letting the nested *collectifs* with a stake in the resource system set management objectives for the CPR (instead of prescribing them), (iv) working collectively to balance the different demands on the resource system, and (v) providing a participatory basis for the development of evaluative criteria to assess whether or not the objectives have been achieved. The latter is of importance in light of the

current practice of measuring outcomes of CPR management on the basis of evaluative criteria such as economic and social efficiency, equity and sustainability. The use of such criteria is problematic. First, the use of multiple criteria means that trade-offs have to be made as no management system can simultaneously maximise each criterion used (Oakerson & Walker, 1997). Second, developing and using evaluative criteria becomes increasingly difficult in complex CPRs as different uses are interdependent and, consequently, achieving an optimum for one type of use may result in a suboptimal outcome for another. Third, evaluative criteria are necessarily value-laden: (i) what is a desirable outcome, (ii) for whom is it desirable, and (iii) whose criteria should be used in the first place? Platforms can help assessors in constructing evaluative criteria by using the constructions of those concerned and in assisting the actual assessment process. I refer to Edwards & Steins (forthcoming) for a detailed discussion on the use and development of evaluative criteria for CPR management.

The effective use of platforms as a heuristic tool for the negotiation, co-ordination and facilitation of complex, multiple-use CPR management, is, however, associated with a number of critical factors. First of all, when stakeholder analysis has to be translated into stakeholder representation, social structures and prevailing beliefs about and prejudices against some groups may form barriers for participation. The sheer size a nested platform can take when all stakeholder groups are represented is another constraint. In addition, there is the question whether or not representatives are really representatives. This question must also be seen in light of the dynamic nature of priorities, stakes and the resource system itself (Steins & Edwards, 1999b). Second, although platform processes heavily rely on the emergence of communicative rationality, true communicative action will be the exception rather than the rule. This is not because the ideal speech situation is so difficult to achieve, but because some *collectifs* will let themselves *become* enrolled in the platform as it is strategically the best course of action (see, for example, the participation of the nature conservation groups in the Dutch co-management platform for shellfish fisheries). In this light, the collective actions that are agreed upon will always be the result of comprise and, from the stakeholders' perspective, are likely to be suboptimal. Thus, platforms are not a panacea to solve all the perceived problems, they are merely a way of mediating these problems. Third, different perceptions of and discourses about the issue at stake as well as 'stereotyping' other participants can frustrate collective decision-making and concerted action (cf. Aarts & Van Woerkum, 1996; Van Woerkum & Aarts, 1998). Fourth, I have already touched upon the role of third parties in facilitating platforms. However, I want to add that third party involvement, notwithstanding the associated problems, is crucial for facilitation; not only can a third party (i) make the constructions of different stakeholders visible and (ii) help to make sense of them, but also it can (iii) ensure continuity, (iv) function as a 'gatekeeper' at the interface of the nested platform and its environment (Crozier & Friedberg, 1980), and (v) reduce or absorb the transaction costs of forming a platform. Although these latter task could be the responsibility of a stakeholder at a higher institutional level (e.g., a government agency), the case study of the Wadden Sea showed how the dual role of the Fisheries Directorate in following the government's political

line and facilitating the platform was irreconcilable. In view of the comparison of the empirical cases, it seems that the facilitating role of stakeholders at higher institutional levels should be geared towards backing up agreements by the platform, rather than helping platforms to make such agreements.

As the facilitation of complex CPR management has not been on the agenda of CPR theory and as the concept of platforms as a heuristic tool for negotiating common-pool resource management has only recently been introduced, many questions remain. From a discussion in the panel on platforms for collective action in complex CPR management at the 7th Common Property Conference in 1998, which was organised by myself and Victoria Edwards, a number of issues that should be taken into consideration emerged. First, it is important that nested platforms correspond with the resource system level that is at stake - in ecological, economic and social terms - and that they are stakeholder-based, rather than user-based. Second, 'back up' by small-scale local platforms can facilitate decision-making and effective representation in larger-scale nested platforms for collective CPR management. Third, the empowerment of platform participants to express their views is important to challenge inequalities (in terms of gender, ethnic, education and skills) and dominant power relations, and to create a situation in which communication is as open (and voluntary) as possible. Fourth, stakeholders' priorities, as well as the resource system, are dynamic and are constantly being reshaped. Consequently, nested platforms are subject to the same dynamics. Fifth, in collective CPR management, social learning about the resource system, the different stakes, views and actions, is vital to agree on action strategies and to redefine existing power structures that may hinder collective actions. Sixth, platforms for resource use negotiation are always nested within other decision-making structures. The latter influence the role of the nested platform and create the context within which new platforms for solving certain resource management problem are necessary or redundant. Seventh, a too strong reliance on the formation of nested platforms as the solution to complex CPR management problem may overshoot the mark; sometimes it can be more effective to let platforms evolve from smaller-scale initiatives to tackle the perceived problem. Finally, the presence of a third party is beneficial to the performance of nested platforms (see a Special Issue of Agriculture & Human Values, 1999, for a detailed discussion).

I want to emphasise that these factors are not meant to be prescriptive design principles for 'successful' nested platforms for complex CPR management. If nested platforms are formed to facilitate collective resource negotiation and concerted actions, the recognition that each specific CPR management scenario represents a unique and dynamic setting with its own demands is vital. Prescriptions about platform constitution and facilitation are risky, since this involves the risk that locality-specific social and cultural factors are overlooked or generalised. The above factors have emerged from a first exchange of experiences and must be seen as heuristic tools that help researchers and facilitators to prompt questions about platform management. In this context, only the principles of

generalised agnosticism, symmetry and following the actors may be granted the status of design principles for CPR management research and facilitation.

Recommendations for further development of CPR theory

By proposing a new perspective for CPR theory based on social constructivism and an action-oriented commitment, I have become a 'translator in the making'. At the outset, I pointed out that my objective would not be to develop a theory on complex, multiple-use common-pool resource management, but to develop a grounded perspective that could become a basis for the further development of CPR theory. If this study, and this final chapter in particular, has made its readers interested in a social constructivist perspective to study and facilitate complex CPR management scenarios and the potential of collective action, part of my translation project (the stage of *interessement*) has succeeded. However, for this study to become a point of passage in the development of a theory for complex, multiple-use CPR management, its readers, and CPR scholars in particular, have to be encouraged to take up this challenge. Therefore, I want to conclude this study by giving some directions for future social constructivist research and policy into complex CPR management.

The first, and evident, implication of my proposal is that the potential of a social constructivist approach needs to be further explored. Hitherto, various streams of social constructivism have been developed and applied the fields of the sociology of knowledge, the sociology of science, philosophy, agricultural science, medical anthropology and evaluation studies. My proposal relies heavily on the ontology and epistemology of actor-network theory, which was developed in the context of the sociology of science. This means that not all of its principles and methodological rules are applicable to following common-pool resource stakeholders. Using the principles of generalised agnosticism and symmetry and the method of following the actors as starting points, new methods and techniques will have to be developed that can deal with the analysis of the contingencies involved in the tactics of translating CPR management.

Second, in the development of new heuristic tools for the study of CPR management from a social constructivist perspective, particular attention will have to be paid to methodologies that help to reveal the contextual factors that influence CPR management; the focus should not only be on explaining why some contextual factors form an incentive for change, but also why some factors do not. Furthermore, the development of heuristic tools should focus on the question of how to make the constructions of the various stakeholders involved, visible. In this chapter, I presented a rough outline only of the basic methodological steps of following the actors. In this context, the design principles of present theory might be useful in helping the inquirer to prompt questions on the stakeholders' construction of the management regime for CPR management (if one is present).

Third, I argued that by focussing on translation processes, CPR scholars will be able to explain change (or adaptation) of management regimes (or lack thereof). In its present form, outcomes of CPR management are described by a process of backsolving interactions of a number of categories. In an adapted form (that is, without using pre-defined categories), the process of backsolving may also benefit the analysis of translation, as I outlined in this chapter. In addition, a comparative analysis of the action strategies and the 'structural characteristics' of the nested *collectifs* is a method to make the tactics of translation and consequent changes visible. However, other methods of following the actors are also conceivable; for example, not following past translation attempts of the nested *collectifs*, but following present and future tactics of translation. This concept and other methodologies should be explored and developed further.

Fourth, the facilitation of collective action has only recently emerged on the agenda of CPR scholars. In this light, heuristic tools that facilitate concerted actions amongst multiple nested *collectifs* are lacking. In this study, I drew attention to the concept of platforms for resource use negotiation, which, with some adaptations, may be one such potential tool. From a number of practical experiences of platforms for CPR management in various corners of the world, I identified several emerging issues that can assist CPR scholars in prompting questions about platform management. In this light, some issues need further exploration: (i) the role of social learning in CPR management, (ii) the role of leadership in nested platforms, (iii) methodologies for stakeholder analysis, empowerment and the facilitation of collective action, (iv) adaptive management by adapting nested platforms, and (v) the role of third parties in the facilitating platforms. I want to emphasise that, besides their potential role in facilitating collective action, platforms also have an important part to play in the analysis of the outcomes of CPR management. Presently, there is a tendency to measure such outcomes on the basis of evaluative criteria defined by the analyst. Platforms can assist the development of such criteria based on stakeholders' constructions, as well as the actual assessment of outcomes. Further research into the development of heuristic tools for the facilitation of concerted actions amongst multiple nested *collectifs* should be carried out.

Fifth, the idea that collective action is an alternative to deal with complex, interdependent natural resource management problems has only recently emerged on the political agenda. Initiatives that rely on collective action amongst multiple stakeholders, such as integrated coastal zone management programmes and coastal forums, are still in their infancy and still have the associated teething problems. Yet, many of these initiatives have shown their potential in balancing different claims and interests over CPRs. However, by advocating that collective action is an alternative strategy for policy development and action towards problem resolution and sustainable management only, it is easy to fall in the same 'revisionist trap' as current CPR theory. Instead, research programmes into the study and facilitation of collective action to co-ordinate multiple stakes in complex CPR management are urgently needed.

Finally, an analysis of the social constructions of the natural and sociotechnical environment and the various unique management regimes for complex CPRs and the way these constructions affect collective resource management, should be a core aspect of any research project or policy programme concerning natural resource management.

With this study I have proposed an agenda for the reshaping of CPR theory that goes beyond analysing social dilemma situations on the basis of a narrow conception of the actors involved and a divide between the actor and the social, and, instead, focuses on (i) the tactics that nested *collectifs* employ in shaping CPR management and (ii) the facilitation of collective action amongst multiple stakeholders.

My proposal may seem radical to CPR scholars and modest (and perhaps inappropriate) to actor-network theorists; yet I hope that that I do not remain a 'translator in the making', since the adoption of a social constructivist ontology to CPR theory is crucial if we want to go beyond descriptive frameworks that lead to prescriptive models and, instead, make visible the contingencies involved in complex CPR management. As John Law (1992: 390) emphasises:

> "organisation is an achievement, a process, a consequence, a set of resistances overcome, a precarious effect. Its components – the hierarchies, organisational arrangements, power relations, and flows of information – are the uncertain consequences of the ordering of heterogeneous materials. [...] Our task is to study [this process], to understand how [*collectifs*] realise themselves, and to note that it could and often should be otherwise".

Notes

[1] In Chapter One, I discussed how The Tragedy of the Commons has become a strong symbol in the debate about CPR management. It is the unfortunate use of the word 'common', that has created so much confusion; if Hardin would have called his thesis The Tragedy of Open Access instead, no one would have contested his argument.

[2] In view of the famous agency/structure debate in sociology (e.g., Giddens, 1993), it is interesting to note that this criticism does not refer to the agency/structure dichotomy, but to Habermas' neglect to address both.

[3] Backsolving is the essence of Oakerson's well-known analytical framework for common-pool resources: working backwards through the relationships by studying interaction patterns amongst resource users will provide initial answers regarding the reasons for specific outcomes; the analyst must then ascertain how the variables in the framework: (i) physical and technological properties of the resource, together with (ii) institutional arrangements, affect the interaction patterns (Oakerson, 1992).

[4] The tendency to determine the conditions under which actors are willing to co-operate also prevails in collective action theories that draw on evidence from 'collective action games' in controlled, experimental situations.

[5] The Pareto optimal principle suggests that allocative efficiency of a resource system as been reached when it is no longer possible to re-allocate the use of the resource system (in terms of resource units or use of the resource system), so that one user will gain without loss to another. Pareto optimality is based on individualism of benefits; that is, "its realisation is achieved by separate, individual-by-individual examinations of benefits, or preferred outcomes" (Coleman, 1994: 338).

[6] Note Latour's argument (1987) that the claim of some action being irrational is always the result of an accusation made by someone who tries to build a network over someone who stands in the way; the accusation of irrationality can always be tried by trying to reverse their outcome showing that the 'irrational' actions by the defendant are not so much illogical as simply distant from our own beliefs.

[7] Note that there is no such thing as a CPR research methodology. CPR scholars comprise a wide variety of academic backgrounds including political science, economics, anthropology, law and geography. Besides academics, a large number of practitioners contribute to and use CPR literature. As a consequence, many research methods underlie the empirical work. The only heuristic tools that may be an explicit part of CPR methodology are: (i) the analytical framework that was originally developed by Oakerson (1992) and has since been subject to various adaptations (Feeny, 1994; Edwards & Steins, 1998a) and (ii) Ostrom's analytical framework for institutional choice (1990). Yet, in exploring the different variables comprising these frameworks, researchers depend on their own construction of research methods.

[8] Although actor-oriented approaches themselves can be criticised for their humanist position, their strategic conceptualisation of rationality and their insufficient explanatory power beyond the level of the individual, their introduction of the notion of the social actor has been of importance in 'socialising' agency in an attempt to address the famous agency/structure dichotomy in sociology.

[9] In this respect, RAAKS, which is a soft systems methodology, probably is the most social constructivist framework out of these examples. I refer to Engel (1995) for a detailed discussion. However, like the other methodologies I listed, it is questionable to what extent RAAKS can provide an in-depth analysis of the constructions of the stakeholder-*collectifs* involved, as the team of facilitators remain detached from the process. Furthermore, the 'Rapid' aspect of the framework makes such in-depth analysis difficult to achieve: a RAAKS exercise usually covers only a few weeks. Although the 'R' can also stand for 'Relaxed', i.e., referring to exercises that cover longer periods in time (Engel, 1995), interactions between the team and the platform are usually limited to specific snapshots in time, constraining in-depth analysis.

[10] Note that social constructivism embraces a number of streams with ANT probably being one of the most radical approaches. Social constructivism has been adopted in various fields and, consequently, different methodologies have been developed.

[11] I refer to Grimble & Wellard (1997) and Guba & Lincoln (1989) for a detailed outline of methods for stakeholder analysis. Note the analogy with theoretical sampling and constant comparison in grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1990).

[12] In this context, I found the RAAKS methodology (Engel, 1995) useful in prompting questions about data collection, although due caution has to be taken that its categories are not used as blueprints for research questions, but as a heuristic tool to guide decisions as what the inquiry might potentially focus on.

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Glossary and acronyms

Glossary

Actor-network theory: a relational and non-reductionist sociological theory that considers the ordering of society as an effect generated by patterned networks of heterogeneous human and non-human materials.

***Collectif*:** a relational network of human and material resources.

Collective action: action taken by a group, either directly or on its behalf by an organisation, in pursuit of the group members' perceived shared interests.

Collective-choice level: the organisational level.

Co-management: the division of management responsibilities for a common-pool resource between the state or Crown and the user group(s) of that resource.

Common-pool resource: a resource for which (i) joint use involves subtractability; that is, use by one user will subtract benefits from another user's enjoyment of the resource system, and (ii) exclusion of individuals or groups involves high transaction costs.

Common property: use rights to a common-pool resource are attached to a specified user group.

Commons dilemma: a situation in which it is more rational for individuals not to co-operate, even though everyone would be better off if they did.

Communicative rationality: the realisation of an individual goal under the condition that the action plan to achieve that goal is harmonised with other goal-oriented actors on the basis of a common definition of the situation.

Complex common-pool resource: a common-pool resource system that is used by multiple users for different types of use that are managed under different types of management (or property) regimes.

Constitutional level: the legislative level.

Contextual factors: external factors that influence the use and management of a common-pool resource. Local contextual factors affect both the demand and supply of products, benefits and services from the common-pool resource and, therefore, have a direct effect on its use and management. Remote contextual factors tend to be outside the control of stakeholders in the common-pool resource, and affect its use or management either directly or indirectly.

CPR theory: a general banner to refer to the work of a collection of scholars from various disciplines that deals with the analysis of collective action in 'real life' common-pool resource management scenarios.

Critical hermeneutics: the understanding of social action through a process of engagement between the researcher and the actors under study.

Decision-making arrangements: see 'institutions'.

Design principles: a set of characteristics of robust collective management regimes for (single-use) common-pool resources.

Epistemology: the relationship of the knower to the known, i.e., the relationship of the researcher to the phenomenon under study.

Generalised agnosticism: the principle that forbids the use of pre-defined categories in the study of the social in favour of the analysis of the translation tactics that *collectifs* employ in constituting themselves.

Grounded theory: a theory that is developed on the basis of a recursive, process-oriented procedure.

Institutions: the working rules that are used to determine who is eligible to make decisions, what actions are allowed under what conditions, what procedures must be followed, and what rewards will be given.

Knowledge systems thinking: an action-oriented perspective that is aimed at developing a diagnostic framework for the analysis, design and management of policy processes and that helps land users in becoming experts at managing complex ecosystems.

Multiple-use common-pool resource: see 'complex common-pool resource'.

Nested(ness): embedded(ness)

New institutionalism: a general banner to refer to the work by a collection of economists and political scientists who consider institutions or decision-making arrangements to be the mechanism whereby individuals can transcend social dilemmas.

Ontology: beliefs about the nature of reality.

Open access: the common-pool resource has no use rights attached to a specific group, resulting in a general 'free for all'.

Platforms for (common-pool) resource use negotiation: a voluntary or statutory body or *collectif* in which resource management issues are considered from a

multiple-use perspective and in which stakeholders work in concert towards adaptive resource management through (i) fostering understanding about the resource base, (ii) minimisation of social dilemmas associated with collective use, and (iii) implementation and fine-tuning of action strategies with respect to perceived problems.

Praxeology: a theory that informs practice.

Private property: tradable rights to a resource are owned by an individual, household or company.

Property regime: the decision-making arrangements that define the condition of access to, allocation of, and control over a range of benefits arising from a resource.

Property rights: social institutions that have evolved as a means of enforcing claims to a flow of benefits.

Public property: access to a common-pool resource for the public are held in trust by the Crown or state.

Purposive rationality: see 'strategic rationality'.

Rational choice theory: a paradigm which views actors as rational individuals who attribute different utility to different actions and goods and, who from a set of alternative action, choose the action that maximises their utility.

Resource system: the common-pool resource as a whole.

Resource units: the stream of products or benefits that users withdraw or enjoy from the resource system.

Social constructivism: a general banner to refer to theories that are based on the ontology that reality (or society) is socially constructed by human actors, i.e., consider society as a social product.

Strategic rationality: a decision is made between alternative courses of action to achieve the realisation of an end; the actor's calculation of the most successful decision is guided by goal maximisation and the anticipation of the decisions made by at least one other goal-directed actor. Also referred to as purposive rationality.

Symmetry: the principle that everything needs explanation and that each phenomenon that one seeks to explain should be approached in the same way.

Tragedy of the Commons: a thesis that predicts the overexploitation, degradation and eventual ruin of any (unregulated) collectively used natural resource as a result of each user's rational incentive to maximise his individual utility.

Translation: the generation of ordering effects, i.e., the process by which *collectifs* try to constitute themselves.

Acronyms

ANT	Actor-Network Theory
BIM	Sea Fisheries Board (Ireland)
CEC	Crown Estate Commissioners (UK)
CHC	Cowes Harbour Commissioners (Isle of Wight, UK)
CLAMS	Co-ordinated Local Aquaculture Management Systems (Ireland)
CPR	Common-pool resource
CZM	Coastal Zone Management
DoETR	Department of Environment, Transport and the Regions (UK)
DoMNR	Department of the Marine and Natural Resources (Ireland)
FAS	Training and Employment Authority (Ireland)
GPS	Global Positioning System
ICES	International Council for the Exploration of the Seas
LNV	Ministry of Agriculture, Nature Management and Fisheries (Netherlands)
MAB	Man and Biosphere (UNESCO)
MEMP	Medina Estuary Management Plan (Isle of Wight, UK)
MP	Member of Parliament
PO	Producers' Organisation
RAAKS	Rapid (or 'Relaxed') Appraisal of Agricultural Knowledge Systems
RIVO	National Fisheries Research Institute (Netherlands)
RYA	Royal Yachting Association (UK)
SCFP	Sea and Coastal Fisheries Policy (Netherlands)
SCRA	Solent Cruising and Racing Association (Solent, UK)
SOS	Save Our Sea Trout (Ireland)
SFC	Sea Fisheries Committee (England and Wales)
TAC	Total Allowable Catch
TBT	Tributyltin
UK	United Kingdom

Appendix

Overview of formal interviews

Cowes Harbour, Isle of Wight, UK (May-June 1996; total 3 weeks)

Description of interviewee	*Interviews*	
▪ Fishing industry:	5	
▪ Oyster fishermen		(4)
▪ Isle of Wight Commercial Fishermen Association (telephone)		(1)
▪ Cargo wharves:	4	
▪ Recreational sector:	11	
▪ Yacht clubs and associations		(8)
▪ Yacht havens/marinas		(2)
▪ UK Sailing Academy		(1)
▪ Local authorities:	11	
▪ Isle of Wight Council		(4)
▪ Cowes Harbour Commissioners		(2)
▪ Newport Harbour Master		(1)
▪ Cowes Pilot Authority (telephone)		(1)
▪ Chief Fisheries Officer Southern Sea Fisheries District		(1)
▪ Local Fisheries Officer Southern Sea Fisheries District (telephone)		(1)
▪ Environment Agency Southern Region (telephone)		(1)
Total	**31**	

NW Connemara, Ireland (July-August 1996; 5 weeks)

Description of interviewee	*Interviews*	
▪ Inshore fishermen:	7	
▪ Aquaculture operators:	20	
▪ Salmon farms		(3)
▪ Mussel farmers co-operative		(5)
▪ Private mussel farming company		(2)
▪ Oyster farming co-operative		(5)
▪ Private oyster producers		(5)
▪ Marine tourism operators:	5	
▪ Adventure centres		(2)
▪ Sea angling operator		(1)
▪ Scubadive West (telephone)		(1)
▪ Marine heritage centre (telephone)		(1)
▪ Freshwater fisheries:	3	
▪ Delphi Fishery (telephone)		(1)
▪ Errif Fishery		(1)
▪ Kylemore Fishery (telephone)		(1)
▪ Development agents:	5	
▪ Forum community development project		(2)
▪ Local Shellfish Development Officer, Irish Sea Fisheries Board		(2)
▪ State authorities	2	
▪ Department of the Marine and Natural Resources (DoMNR) (telephone)		(1)
▪ Local Fisheries Officer DoMNR (telephone)		(1)
▪ Research:	1	
▪ Fisheries Research Centre, Abbotstown (telephone)		(1)
Total	**43**	

Follow up research NW Connemara, Ireland (15-18 January 1998)

Description of interviewee	*Interviews*	
▪ Inshore fishermen:	3	
▪ Aquaculture operators:	2	
▪ Salmon farm		(1)
▪ Mussel farmers co-operative		(1)
▪ Freshwater fisheries:	1	
▪ Delphi Fishery		(1)
▪ Development agents:	2	
▪ Forum community development project		(1)
▪ Local Shellfish Development Officer, Irish Sea Fisheries Board		(1)
▪ State authorities	3	
▪ Department of the Marine and Natural Resources		(1)
▪ Local Fisheries Officer Department of the Marine and Natural Resources		(1)
▪ Western Regional Fisheries Board		(1)
Total	**11**	

Wadden Sea, The Netherlands (June – August 1997; 10 weeks)

Description of interviewee	*Interviews*	
▪ Fishing industry	17	
▪ cockle fishermen (mechanical sector)		(4)
▪ mussel cultivators		(3)
▪ shrimp fishermen		(3)
▪ Producers Organisation (PO) Cockle Fishery		(1)
▪ PO Mussel Culture		(1)
▪ PO Texel		(1)
▪ Association for shrimp fishermen		(1)
▪ CARDIUM (Association for non-mechanical cockle fishermen)		(2)
▪ Fish Board		(1)
▪ Nature conservation groups:	5	
▪ Waddenvereniging (National Society for the Protection of the Wadden Sea)		(3)
▪ Vogelbescherming (Netherlands Society for the Protection of Birds)		(1)
▪ Natuurmonumenten (Society for the Protection of Nature Monuments)		(1)
▪ Fisheries Directorate, LNV	2	
▪ Government advisory boards:	5	
▪ Wadden Adviesraad (Wadden Area Advisory Board)		(3)
▪ Raad voor het Landelijk Gebied (Advisory Board for the Countryside)		(1)
▪ Co-ordinating bodies for Wadden Sea area:	2	
▪ CCW (Co-ordination Commission Wadden Sea Area)		(1)
▪ Stuurgroep Waddenprovincies (Steering Group Wadden Sea Provinces)		(1)
▪ Research:	7	
▪ Institute for Forestry and Nature Research (IBN-DLO)		(2)
▪ Institute for Agricultural Economics (LEI-DLO)		(2)
▪ National Fisheries Research Institute (RIVO-DLO)		(1)
▪ Institute for Coast and Marine Research (RWS-RIKZ)		(2)
Total	**38**	

Summary

In 1996, the new fish cages of an Irish salmon farm were sabotaged and juvenile salmon with a value of IR£ 250,000 were released, nearly putting the farm out of business. This deed was an act of protest against the growth of the salmon farming industry. The loss of fishing grounds, ecological and environmental concerns, and the perceived impact on the unspoilt scenery of the area are amongst the factors that explain local opposition against salmon farming.

In 1991, Dutch mussel cultivators in the Wadden Sea and the government agreed on a division of available mussel seed between fishermen and birds. A year later, the mussel cultivators voluntarily closed part of the tidal mudflats for the seed fishery. These actions were a response to the heavy criticisms by environmental groups, who blamed the shellfish fishermen for causing the death of thousands of birds by 'robbing' them of their main diet.

The above examples are illustrative of the problems associated with the management of complex, multiple-use common-pool resources. *Common-pool resources* (CPRs) are resources for which: (i) joint use involves subtractability (use by one user will subtract benefits from another user's enjoyment of the resource system), and (ii) exclusion of users involves high transaction costs. For a long time, policies aimed at sustainable CPR management were fuelled by the belief that rational individuals, who are driven by utility maximisation, cannot maintain a common resource (the Tragedy of the Commons). The implementation of a multitude of management regimes to regulate CPR use has, however, not prevented externalities, such as resource degradation and conflicts, from occurring. This is particularly the case in complex, multiple-use CPRs, where different activities take place in the same resource system and where uses may be competing or incompatible (Chapter One). The coastal waters, which are the setting of this study, are an example of a complex CPR.

The complexity and interconnectedness of coastal management problems, combined with the incapacity of existing institutions for monitoring and protection to deal with the continuous decline of the coastal zone, has resulted in local, national and global collective action initiatives, which consider management issues from a broader perspective and where stakeholders work collectively towards problem solution. Increasingly, a collective action approach is seen as an alternative in dealing with complex problems (Chapter One). This book aims to contribute towards an understanding of the processes that shape collective actions amongst multiple stakeholders in complex CPRs.

The theoretical argument of this study is that CPR theory – a body of knowledge that deals with the analysis of collective action and the associated social dilemmas, in 'real life' scenarios – is not sufficiently developed for the study and facilitation of collective action in complex CPR management. This argument is

elaborated in Chapter One. On the basis of an examination of CPR theory and its roots, rational choice theory and the new institutionalism, it is argued that the application of the conceptual frameworks of CPR theory to the study of complex resources is problematic, since they are based on: (i) the simplistic assumption that CPRs are used for one single type of use, (ii) the exclusive analysis of the internal dynamics of the collective management system, thereby 'black boxing' the influence of external factors, (iii) a static model of strategic rationality, and (iv) the assumption that the outcomes of collective resource management are determined by a number of pre-defined design principles. Building on a grounded theory approach, this book proposes a new perspective for the study and facilitation of collective action processes in complex CPR management scenarios.

The empirical basis is laid by three case studies in the English, Irish and Dutch coastal waters. In each study area, fishermen were confronted with the arrival of new activities and/or the articulation of other interests in or near their fishing grounds. The cases focus on the interactions amongst fishermen (or their representatives), other marine users and non-governmental and state agencies, and the way (collective) management of resources, spaces and people take shape.

Chapter Three develops a conceptual framework that assists the analysis of the collective action processes in the empirical studies. This conceptual framework is based on a critical examination of CPR theory and its problems in Chapter One, and supported by a case study of complex CPR management in Cowes Harbour (UK) in Chapter Two. It builds on theoretical notions from Habermas' theory of communicative action, actor-network theory (ANT) and the knowledge systems perspective. It has several methodological consequences for this study. First, the notion of the rational actor is replaced by that of the *collectif* (Callon & Law, 1995): an actor is considered to be the effect of interactions of human and material resources. The objectives, strategies and rationalities of *collectifs* are continuously reshaped as new *collectifs* enter the arena and new relationships are brought into being. Second, following ANT, any pre-defined models and conditions for collective action are left out, and co-operation in a collective action situation is explained in the same way as free-riding. Finally, an *action*-oriented perspective, aimed at the facilitation of collective action, is adopted. For the organisation of this book, the grounded theory approach to data analysis (Chapter Four) means that the conclusions of each chapter feed into the next one, with the exception of Chapter Four, which describes the research methodology.

The case study of Cowes Harbour (UK) in Chapter Two follows the oyster fishermen in their collective action aimed at securing access to the fishery, which was threatened by a closure in the interest of navigation and nature conservation considerations. It illustrates the complexities associated with the management of multiple-use CPRs, by showing how the different activities and interests in the harbour are interdependent and why, in a complex scenario, the presence of individual management regimes for the different uses is not a sufficient strategy. The preliminary conclusions support the development of the conceptual framework in Chapter Three.

Chapter Five presents a comparative case study of two bays in NW Connemara (Ireland). In this area, local marine resource use has become increasingly become contested, particularly because of the development of salmon farming. The case follows fishermen and freshwater fisheries in the two bays in their interactions with the new user groups. While in one bay, collective action by the fishermen is exclusively aimed at preventing the local salmon farm from expanding, in the other bay, 15km to the north, collective actions amongst the same fishermen, the salmon farm and shellfish producers are aimed at balancing resource use. In this later bay, however, the local freshwater fishery is involved in a heavy dispute with the salmon farm over the collapse of its sea trout stocks, while in the former bay, this dispute is not articulated, despite a similar stock collapse. The case study illustrates how different social, historical, institutional and physical contexts, are important in shaping the interaction processes amongst multiple stakeholders. The case study in Chapter Seven is set in the Dutch Wadden Sea, where the shellfish fisheries are contested by nature conservation groups. It follows the shellfish fishermen in their efforts to achieve a balance between their fishing activities and nature conservation. The implementation of voluntary nature conservation measures by the shellfish sector formed the basis for the implementation of a statutory co-management strategy, involving the shellfish industry, the government, nature conservation groups and scientists. The case illustrates how the images that stakeholders have of each other's activities and interests, and the role they adopt towards resource management, influence the decision-making process in the co-management platform.

In the theoretical intermezzos in Chapters Six and Eight, the cases of NW Connemara and the Wadden Sea are analysed. The conclusions resulting from the analyses are merged and developed further in Chapter Nine. The general conclusion is that, in its present form, CPR theory hampers the analysis of the complex processes through which collective action is achieved (or frustrated), and needs to be redeveloped. First, the definition of the rational, atomised actor is too limited to explain collective action processes. Instead, actors should be regarded as nested *collectifs*, whose strategies in the collective action arena are constantly reshaped. Second, the use of a static strategic model of rationality is insufficient to appreciate the shaping of collective action (or free-riding). The case studies show how *collectifs* use different social and material means to achieve their objectives. In trying to enrol other *collectifs* in collective actions aimed at realising their projects, different forms of strategic and communicative rationality emerge. Third, the use of pre-defined categories and design principles diverts attention from (i) the stakeholders' constructions of collective resource management, and (ii) the influence of contextual factors, and therefore limits the explanatory power of CPR theory. Furthermore, a danger inherent in the design principles is that they are picked up as blueprints for the development of policies and intervention programmes for 'successful' CPR management. For these reasons, CPR theory should become explicitly concerned with contextual analysis, rather than merely describing 'successes on the commons' and developing prescriptive principles. In this context, a number of methodologies for contextual analysis are introduced.

The second general conclusion concerns the facilitation of collective action, which has only recently emerged on the agenda of CPR scholars. This book demonstrates that balancing a mix of uses is crucial for the management of complex CPRs, since the interdependency of multiple uses is likely to result in externalities. Experiences from the case studies show that nested platforms for CPR use negotiation are a promising heuristic tool for the facilitation of collective problem appreciation and solution. The performance of platforms is, however, associated with, a large number of critical factors, including, amongst others: (i) the influence of different perceptions and 'stereotyping' of participants on collective decision-making, and (ii) the position of third parties, who may act as a facilitator or gatekeeper, but may also frustrate collective action by imposing their own agenda.

Based on an extensive discussion of the above issues, the book concludes that radical reconstruction of the ontological foundation of CPR theory is needed if it is to be used as (i) a foundation for the analysis of complex CPRs, or as (ii) a conceptual framework in pursuing the idea that collective action is a powerful alternative to deal with complex resource management problems. A social constructivist approach to the study and facilitation of complex CPR management is proposed. Two principles, derived from actor-network theory, form the foundation for this new perspective. The first principle is *generalised agnosticism*, which means that pre-defined categories (e.g., success, rational behaviour) and design principles have to be abandoned; instead, the focus of analysis should be on the tactics that the nested *collectifs* employ in mobilising social and material means to enrol others in their projects. The second principle is *symmetry*, which means that everything in a CPR management scenario needs explaining in the same way; in other words, co-operation in a collective action situation should be explained in the same way as defective behaviour.

The adoption of these principles will facilitate the understanding of the contingencies involved in the evolution of collective action, by focussing on the sociotechnical construction of CPR management and the internal and contextual factors that influence the action strategies adopted by nested *collectifs*. In this analytical process, co-operation, free-riding and rationality are outcomes of the interplay and trials of strength amongst the different *collectifs* with a stake in the CPR, and their mobilisation of social and material resources.

The book concludes with two main recommendations for future research and policy into complex CPR management. First, the potential of a social constructivist perspective needs further exploration. In particular, the development of new methodologies that make the contingencies involved in collective action processes visible, is required. Second, in view of the increasing reliance on collective action to solve complex resource management problems, the development of a praxeology (a theory that informs practice) for CPR theory needs urgent attention.

Samenvatting

In 1996 werden, uit protest tegen de groei van de kweekzalmindustrie, de netten van de nieuwe kooien van een Ierse zalmkwekerij kapot gesneden. Jonge zalm met een waarde van IR£ 250.000 verdween in zee, hetgeen de kwekerij bijna de kop kostte. De lokale oppositie tegen de zalmkweek hangt samen met een aantal factoren, zoals: het verlies van visgronden, de angst voor ecologische gevolgen, en de vrees dat het ongerepte karakter van het landschap wordt bedorven door de aanwezigheid van de kwekerijen.

In 1991 besloten Nederlandse mosselkwekers samen met de overheid om het beschikbare mosselzaad in de Waddenzee te verdelen tussen vissers en vogels. Een jaar later besloten dezelfde kwekers om een gedeelte van de droogvallende platen te sluiten voor de mosselzaadvisserij. Deze maatregelen waren een reactie op de zware kritiek van de natuurbeweging, die de vissers ervan beschuldigde de vogels van hun voedsel te beroven.

De bovengenoemde voorbeelden zijn tekenend voor de problemen omtrent het beheer van complexe gemeenschappelijke hulpbronnen. Gemeenschappelijke hulpbronnen (hierna afgekort als CPRs, *common-pool resources*) hebben twee kenmerken: (i) wanneer iemand de gemeenschappelijke voorraad aanspreekt, dan wordt deze voorraad kleiner voor anderen, en (ii) het is moeilijk om individuen of groepen uit te sluiten van het gebruik van de gemeenschappelijke voorraad. Het beleid ten aanzien van het gebruik van CPRs werd lange tijd gedragen door de gedachte dat rationele individuen, die uit eigenbelang handelen, niet in staat zijn een gemeenschappelijke hulpbron duurzaam te beheren (de zogenaamde *Tragedy of the Commons*). Het invoeren van een scala aan beheersystemen voor CPRs heeft echter het optreden van ongewenste effecten, zoals degradatie en conflicten, niet kunnen verhinderen. Dit is vooral het geval in complexe CPRs, die gekenmerkt worden door de aanwezigheid van meerdere vormen van menselijk gebruik. Deze activiteiten kunnen elkaar beconcurreren, of zijn soms zelfs onverenigbaar (hoofdstuk een). De kustwateren, die het toneel van dit boek vormen, zijn een voorbeeld van een complexe gemeenschappelijke hulpbron.

De complexiteit van beheerproblemen in de kustwateren, in combinatie met onvrede over de resultaten van bestaande maatregelen gericht op duurzaam gebruik, hebben op lokaal, regionaal en mondiaal niveau geleid tot initiatieven waarin collectieve actie tussen belanghebbenden centraal staat. Hierin worden beheerproblemen vanuit een breed perspectief benaderd en werken de betrokkenen gezamenlijk aan een oplossing. Een dergelijke 'collectieve actie benadering' wordt steeds vaker gezien als een alternatieve strategie voor het oplossen van complexe problemen (hoofdstuk een). Dit boek probeert bij te dragen aan het begrijpen van de processen die vorm geven aan collectieve acties tussen verschillende gebruikers van complexe gemeenschappelijke hulpbronnen.

De zogenaamde CPR theorie houdt zich bezig met de analyse van collectieve actie, en de daarmee gepaard gaande sociale dilemma's, in het beheer van gemeenschappelijke hulpbronnen in praktijksituaties. Het theoretische argument van dit boek is dat deze CPR theorie niet voldoende is ontwikkeld om collectieve actie-processen in *complexe* CPRs te bestuderen en te ondersteunen. CPR theorie is namelijk gebaseerd op: (i) de simplistische veronderstelling dat een gemeenschappelijke hulpbron slechts voor één vorm van menselijk gebruik wordt gebruikt, (ii) een analyse waarin de externe factoren die een collectief beheersysteem beïnvloeden, als een gegeven worden beschouwd, (iii) een statisch rationaliteitmodel, en (iv) de aanname dat de uitkomsten van het collectief beheer van een CPR bepaald worden door een aantal ontwerpprincipes (*design principles*). Deze argumenten worden uitgewerkt in hoofdstuk een. Dit boek stelt een nieuw perspectief voor de studie en ondersteuning van het gemeenschappelijk beheer van complexe hulpbronnen voor.

Het praktijkonderzoek voor dit boek werd uitgevoerd in de Engelse, Ierse en Nederlandse kustwateren. In elk studiegebied werden vissers geconfronteerd met nieuwe activiteiten en/of belangen in of nabij hun visgronden. De interacties tussen vissers (en hun vertegenwoordigers), de overige gebruikers van de kustwateren, niet gouvernementele organisaties en de overheid, staan centraal; evenals de manier waarop aan het collectief beheer van de kustwateren vorm wordt gegeven.

In hoofdstuk drie wordt een conceptueel kader ontwikkeld. Het doel van dit kader is om de analyse van de collectieve actie-processen in de onderzoeksgebieden te ondersteunen. Het conceptueel kader is gebaseerd op een kritische beschouwing van CPR theorie in het eerste hoofdstuk, en een praktijkstudie van complex beheer in de haven van Cowes (Engeland) in hoofdstuk twee. Het kader bouwt op theoretische begrippen uit de handelingstheorie van Habermas, actor-netwerk theorie en het kennissysteem perspectief. Het heeft een aantal methodologische consequenties voor deze studie. Ten eerste wordt het concept van 'de rationele actor' vervangen door dat van 'het *collectif*' uit actor-netwerk theorie (Callon & Law, 1995). Dit betekent dat een actor wordt beschouwd als een effect van de interacties tussen mensen en dingen. De doelen, strategieën en rationaliteiten van *collectifs* worden aangepast zodra nieuwe actoren de arena betreden en nieuwe relaties worden gevormd. Ten tweede worden alle vooraf gedefinieerde modellen en ontwerpprincipes voor collectieve actie vermeden. Daarnaast worden situaties waarin actoren samenwerken op dezelfde manier bestudeerd als situaties waarin actoren zich aan samenwerking onttrekken (defectief gedrag of *free-riding*). Tenslotte wordt een *actiegericht* perspectief gehanteerd. Het boek is gebaseerd op een 'gegronde theorie benadering' (*grounded theory*, zie hoofdstuk vier). Voor de opbouw van dit boek betekent dit dat de conclusies van ieder hoofdstuk de basis vormen voor het volgende hoofdstuk. Uitzondering hierop is hoofdstuk vier, waarin de onderzoeksmethodologie wordt besproken.

Hoofdstuk twee volgt de oestervissers in de haven van Cowes (Engeland) in het opzetten van een collectief beheersysteem dat de toegang tot hun oesterbedden

moet waarborgen. De visgronden werden uit verkeersveiligheids- en natuurbeschermingsoverwegingen bedreigd met sluiting. Het hoofdstuk illustreert de complexiteit die samengaat met het beheer van gemeenschappelijke hulpbronnen waarin verschillende activiteiten plaatsvinden. Tevens laat het zien waarom in een dergelijke situatie een overkoepelend beheersysteem noodzakelijk is. De conclusies uit het hoofdstuk ondersteunen de ontwikkeling van het conceptueel kader in hoofdstuk drie.

In hoofdstuk vijf staan twee baaien in NW Connemara (Ierland) centraal. De kustwateren in dit gebied vormen een strijdtoneel voor traditionele gebruikers, zoals kustvissers en sportvissers, en nieuwe gebruikers, en met name de zalmkweek. In de ene baai is collectieve actie door de kustvissers er vooral op gericht om een halt toe te roepen aan de uitbreiding van de zalmkwekerij in hun visgronden. In de andere baai, die 15 km noordelijker ligt, werken diezelfde vissers echter samen met de lokale zalmkwekerij en de overige gebruikers, waaronder mosselkwekers. In deze baai zijn de sportvisserij en de lokale zalmkwekerij echter in een hevige strijd verwikkeld; centraal in dit conflict staat de enorme afname van de (wilde) zeeforelbestanden. Dit conflict is in de eerste baai niet aan de orde, terwijl ook daar sprake is van een dergelijke bestandsafname. Het hoofdstuk onderstreept de rol van verschillende sociale, historische, institutionele en fysieke contexten in de ontwikkeling van collectieve actie-processen.

In hoofdstuk zeven staat de discussie tussen natuurbescherming en schelpdiervissers in de Waddenzee centraal. De vrijwillige maatregelen die door de schelpdiervisserij werden genomen om natuurwaarden te beschermen, zijn door de overheid vertaald in een systeem van medebeheer (*co-management*). In dit systeem wordt de verantwoordelijkheid voor de integratie van visserij en natuur gedeeld door de overheid en de schelpdiersector, en worden de natuurbeweging en wetenschappers bij het opstellen en evalueren van afspraken betrokken. Het hoofdstuk laat, onder andere, zien hoe de besluitvorming in en over het *co-management* platform wordt beïnvloed door beeldvorming over de verschillende activiteiten/belangen.

De praktijkstudies van NW Connemara en de Waddenzee worden in respectievelijk de hoofdstukken zes en acht geanalyseerd. De conclusies uit deze theoretische intermezzo's worden verder uitgewerkt in hoofdstuk negen. De algemene conclusie van dit boek is dat CPR theorie, in haar huidige vorm, de studie van de complexe processen die leiden tot de totstandkoming van collectieve acties (of de afbreuk daarvan), belemmert. Deze theorie behoeft daarom verdere ontwikkeling. Ten eerste is de definitie van de sociaal-geïsoleerde, rationele actor te beperkt om collectieve actie te verklaren. Actoren moeten worden beschouwd als *collectifs*, wier strategieën in het ondersteunen of dwarsbomen van collectieve actie constant opnieuw gevormd worden. Ten tweede is het gebruik van een statisch, strategisch rationaliteitmodel te beperkt. De praktijkstudies laten zien hoe de verschillende *collectifs* diverse sociale en materiële middelen inzetten om hun doelen te bereiken. In dit proces komen

verschillende vormen van strategische en communicatieve rationaliteit naar voren. Ten derde leiden de vooraf gedefinieerde modellen van collectieve actie en de ontwerpprincipes in CPR theorie de aandacht af van (i) de manier waarop actoren het collectieve beheer ervaren, beoordelen en vorm geven, en (ii) de invloed van contextuele (externe) factoren op collectieve actie. Daarnaast bestaat het gevaar dat de ontwerpprincipes ten onrechte worden gebruikt als blauwdrukken voor beleid en interventieprogramma's. Dit leidt tot de conclusie dat CPR theorie zich expliciet moet richten op contextuele analyse, in plaats van enkel 'succesverhalen' te beschrijven en ontwerpprincipes te ontwikkelen. In dit kader worden een aantal methodologieën voor contextuele analyse besproken.

De tweede algemene conclusie heeft betrekking op de ondersteuning van collectieve actie-processen. Dit onderwerp maakt pas sinds kort onderdeel uit van de agenda van CPR theorie. Dit boek laat zien dat het in balans brengen van een scala aan gebruikers van zeer groot belang is voor het beheer van complexe gemeenschappelijke hulpbronnen; immers, iedere activiteit resulteert (in meer of mindere mate) in neveneffecten voor andere activiteiten. De praktijkstudies laten zien dat gebruikersplatformen, die gericht zijn op het werken naar een gezamenlijke probleemdefinitie en -oplossing, een mogelijkheid bieden om collectief beheer te ondersteunen. Het functioneren van dergelijke platformen is echter afhankelijk van een groot aantal factoren, zoals, onder anderen: (i) de invloed van beeldvorming en stereotypering op collectieve besluitvorming, en (ii) de rol van derde partijen, die een belangrijke ondersteunende of intermediaire rol kunnen vervullen, maar ook collectieve actie kunnen dwarsbomen door hun eigen agenda voorop te stellen.

In hoofdstuk negen worden de bovengenoemde punten uitgebreid besproken. Op basis van deze discussie concludeert dit boek dat een radicale reconstructie van CPR theorie noodzakelijk is, wil zij als basis dienen voor de analyse van collectieve actie-processen in het beheer van complexe CPRs, en/of een conceptueel kader vormen om invulling te geven aan het idee dat collectieve actie een alternatieve strategie is voor het oplossen van complexe beheerproblemen. Dit boek stelt voor om een sociaal constructivistisch perspectief voor de studie en ondersteuning van het beheer van complexe CPRs te hanteren. Twee principes uit actor-netwerk theorie liggen hieraan ten grondslag. Ten eerste mag men in de analyse van collectieve actieprocessen niet uitgaan van vooraf gedefinieerde categorieën (bv., succes, rationeel gedrag) en ontwerpprincipes (het principe van *generalised agnosticism*); in plaats daarvan moet de aandacht van de analyse uitgaan naar de tactieken die de *collectifs* hanteren om hun doelen te bereiken. Ten tweede moet samenwerking in het beheer van een gemeenschappelijke hulpbron niet als vanzelfsprekend worden beschouwd, maar moet dit fenomeen op dezelfde manier worden verklaard als het optreden van zogenaamd defectief gedrag of *free-riding* (het principe van *symmetry*).

Door deze principes te hanteren zullen de complexe processen die ten grondslag liggen aan het ontstaan en de ontwikkeling van collectieve acties beter begrepen kunnen worden. De aandacht wordt verlegd naar de wijze waarop de betrokkenen

het gemeenschappelijke beheer van natuurlijke hulpbronnen beoordelen, ervaren en vorm geven, en naar een analyse van de interne *en* contextuele factoren die actiestrategieën beïnvloeden. In dit proces worden samenwerking, opportunistisch gedrag en rationaliteit gezien als de uitkomsten van het 'krachtenspel' tussen de verschillende actoren met een belang in de gemeenschappelijke hulpbron.

Het boek eindigt met een aantal aanbevelingen. Deze vallen in twee algemene categorieën uiteen. Ten eerste moet het potentieel van een sociaal constructivistisch perspectief voor CPR theorie verder worden onderzocht. De aandacht moet hierbij uitgaan naar ontwikkeling van nieuwe methodologieën die de verborgen processen in de ontwikkeling van collectieve actie zichtbaar maken. Ten tweede is het van belang dat een praxeologie (een theorie die de praktijk informeert) wordt ontwikkeld. Hiermee kan invulling worden gegeven aan de toenemende aandacht voor collectieve actie als een alternatieve strategie voor het oplossen van complexe problemen.

Curriculum vitae

Nathalie Anna Steins was born in Oirsbeek, The Netherlands, on October 5th, 1971. From 1983 to 1989 she was enrolled in pre-university education (VWO) at the St. Janscollege in Hoensbroek. In 1995, she obtained her MSc in Rural Development Sociology at Wageningen Agricultural University[1]. During her university studies, she stayed six months in Nepal and three months in Ireland for a practical period. In addition, she spent a year as a full-time board member of the local youth centre Unitas.

From August to December 1995, she worked as a research assistant at the Rural Development Sociology Group, Department of Social Sciences, at Wageningen Agricultural University. From February 1996 to August 1998, she was a research assistant at the Department of Land and Construction Management at the University of Portsmouth in the United Kingdom. Together with dr. Victoria Edwards she worked on the development of analytical frameworks for multiple-use common-pool resources, which included fieldwork in the United Kingdom, Ireland, The Netherlands and the United States. The results of this research were published in several refereed journals and edited books (see publication list); she was one of the guest editors of a special issue of *Agriculture & Human Values* (Vol. 16, 1999) on platforms for collective action in common-pool resource management.

In addition to her research activities at the University, Nathalie was also involved in lecturing at undergraduate and postgraduate level. As a member of the academic staff of the University's Centre for Coastal Zone Management, she participated in several consultancy projects. From February 1997 onwards, she worked on this doctoral dissertation as an external postgraduate student of the Communication and Innovation Studies Group at Wageningen University.

In 1998, she was a member of the Inshore Fisheries Management Task Group of the European Social Science Fisheries Network. The Task Group worked on a comparative study of fisheries management in the 12 mile zones of the European Member States. In the same year she was one of the organisers of the introductory workshop on common-pool resource management at the 7th Conference of the International Association for the Study of Common Property in Vancouver (Canada). She also participated in an interdisciplinary research school for doctoral students on fisheries management, which was funded by the Nordic Academy for Advanced Studies.

She is currently employed as a policy maker at the Dutch Fish Board in Rijswijk. Her main field of activity is the integration of inshore fisheries and nature conservation.

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