Fisheries co-management, the role of local institutions and decentralisation in Southeast Asia : with specific reference to marine sasi in Central Maluku, Indonesia

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1 Theoretical Framework

As both terrestrial and marine ecosystems are under severe pressure from human use, climate change and other external impacts, the need for the practical application of science becomes more eminent. Scientists from various disciplines have organised themselves to look into management of common resources. Common property research is an outcome of this movement. Multi-disciplinary and international research projects have been devised in a search for solutions and better management approaches. The theory of environmental anthropology helps us to understand the role of humans in their environment and the impact they have on the ecosystem. This chapter gives a chronologic overview of the theoretical schools in anthropology and in environmental sciences to show the developments of both disciplines over time and how they came together in environmental anthropology. It further presents new schools of thought like Common Property Research that are important in studying and analysing issues in resource management and fisheries in particular. It is these (more applied) research lines that form the context of the *sasi* study central in this thesis. In line with this pragmatic approach, the chapter ends with the potential role of the anthropologist in modern fisheries management approaches.

1.1 The road towards environmental anthropology

1.1.1 Environmental determinism versus cultural determinism

In his evolution theory, Darwin (1859) explained how in each generation more individuals are produced than can survive in a context of limited resources which leads to competition and adaptation. His ideas were influenced by Malthus (1798) who argued that human populations naturally tend to outstrip their food supply and that shortages would put a limit to population growth. This idea of the environment shaping culture (human social and cultural behaviour) is typical for environmental determinism and was the dominant approach in ecological anthropology until the 1960s. Debates in ecological anthropology centred upon the question whether cultures adapt to their environment in the same way that organisms do. Researchers hoped that the study of adaptations would provide explanations of customs and institutions (Salzman and Attwood 1996). One of the findings in ecological anthropology was that populations are not engaged with the environment as a whole, but with a part of it, their local environment or *habitat*, consisting of selected aspects and elements. As a consequence, it was concluded that each

population developed its own cultural adaptations, especially technologal, within a specific environment (Salzman and Attwood 1996).

The assumption was that understanding the environment of a region would lead to an understanding of the cultures occupying that region. However, this assumption proved incorrect as it could not explain the various cultural characteristics and differences within similar geographical areas. In Europe, anthropologists responded by turning their attention to the social, rather than the ecological functions of cultural institutions (Durkheim, Radcliffe-Brown and Malinowski). In the United States the emphasis on environmental factors remained (Boas, Wissler, and Kroeber) and formed into an approach called *possibilism* (Milton 1996). Possibilism acknowledged that one the one hand the environment limited human behaviour, while it also allowed for certain activities to be carried out. The inadequacy in explaining cultural diversity, however, remained an issue and in a search for a more precise understanding of the effect of the environment on cultures Steward (1955) developed a methodology called *cultural ecology*.

Steward searched for the adaptive responses of various cultures to similar environments (Orlove 1980). He examined the available resources and distribution in relation to the technology, economic arrangements, social organisation and demography of a certain place. As a result, he identified a 'culture core' consisting of the elements of a culture influenced by the environment, i.e. the features most closely related to subsistence activities and economic arrangements. Yet, cultural ecology could neither provide a model for explaining the origin and persistence of cultural features, nor for determining the extent of environmental influence in the evolution of specific cultures (Netting 1977; Orlove 1980; Barfield 1997).

As a reaction, in the 1960s and 1970s new schools of thought were formed based on cultural determinism, i.e. the idea that culture influences the environment. One of those schools, *ethno-ecology*, describes the conceptual models that people have of their environment.[1] It distinguished, for example, 'folk nature' or the perceptions that people have on nature, from 'real nature' on which these perceptions are based. The approach used classifications and shared its methods and underlying premises with cognitive anthropology.[2]. In the end, however, neither environmental nor cultural determinism

1 The prefix 'ethno' was used to denote the field of knowledge defined from the viewpoint of the people being studied (Fowler 1977). 'Ethno' was already used in the 19 th century in ethno-botany which focused on how and why people used and conceptualised herbs, plants and trees. It is still an important approach in medicinal research.
2 The focus on classification and the extraction of knowledge in cognitive anthropology lead to the development of structured methods of research still in use today such as interviews, direct observation and participation.

formed a satisfactory basis to describe human-environment relationships. [3] Alternatively, instead of shaping or being shaped by environmental factors, human beings were understood to interact with their environments in mutually constructive ways (Milton 1996).

1.1.2 The ecosystem approach, human ecology and processual human ecology

The *ecosystem approach*, brought into play by anthropologists like Rappaport (1968) and Vayda (1969), conceptualized human populations as participants in ecosystems. It was a first attempt to reconcile ecological sciences with functionalism[4] in anthropology. Research focused, amongst others, on the material outcomes of economic activities and the efficiency of subsistence systems. Yet, the approach was limited with its focus on 'units' and 'populations' rather than cultures and its preference for small-scale (island) societies (Rappaport 1969). A broader focus was presented by *human ecology* which was concerned with the ways human populations interact with their environment. Yet, even though it acknowledged the importance of knowledge, information, and people's understanding of the world (Ellen 1982), the ecosystem approach excluded the unobservable components of culture. It is therefore – and this is where I agree with Milton (1996) – inadequate to study people-environment relations.

In the mid 1970s, in contrast to cultural ecology, neo-evolutionism and neo-functionalism,[5] another approach emerged: *processual ecological anthropology*. It focused on the processual relationship between the local population and their immediate environment conditioned by the intervention of external political, legal, and economic factors. Important research trends were, amongst others, the relation between demographic variables and production systems, the response of populations to environmental stress, and the formation and consolidation of adaptive strategies[6] (Orlove 1980). Processual ecological an-

3 Human-environment relationships can be defined as the interplay between people and their environment, including the elements and arrangements by which humans use the environment and the limitations that the environment puts on human behaviour. Culture plays a prominent role in human-environment relations (Milton 1996, 6).

4 Functionalism originally attempted to explain social institutions as collective means to fill individual biological needs; later it came to focus on the ways social institutions fill social needs, especially solidarity. Functionalists argue that social institutions are functionally integrated to form a stable system, and a change in one institution will precipitate a change in other institutions (http://encyclopedia.thefreedictionary.com/).

5 Within neo-functionalism the social organisation and culture of specific populations are seen as functional adaptations which permit the population to exploit their natural environment successfully without exceeding the carrying capacity through negative feedback (Orlove 1980; Bettinger 1996 in McGrath 2003).

6 If adaptive strategies are seen as the outcome of decision-making or repeated allocation of scarce resources to a hierarchy of goals under conditions of constraint, then it is necessary to examine the pattern of resource distribution and the source of goals and constraints. This is the contribution of recent work in Marxism (Orlove 1980).

thropology examined shifts and changes in individual and group activities and focused on the mechanisms by which behaviour and external constraints influenced each other. It stimulated the importance of decision-making models in ecological anthropology.

1.1.3 Ecological anthropology and environmental sciences in the Netherlands

In the Netherlands, anthropology had always been strongly linked to the colonial past (Indonesia) and focused on culture, judicial systems, religion and language. After the independence of Indonesia in 1945 and the subsequent rigid relationship between the two countries, this focus was expected to change towards a more environmentally oriented anthropology (Persoon and Hobbes 1993; Schefold 1994). Research, however, continued largely along existing research lines and aside from a number of interesting studies on environmental use, innovation and adaptation (Van den Breemer 1984; Visser 1989; De Bruijn and Van Dijk 1995, Bavinck 2001), ecological anthropology in the Netherlands never strongly developed.

A major influence in the 1970s were the actor-based models which shifted the focus from cultures towards the study of social processes and individual incentive structures for certain (environmental) behaviour (Orlove 1980). The actor-based models were elaborated by Vayda who developed the methodology of *progressive contextualisation* (Vayda 1983, 1996). [7] In the 1980s Dutch environmental science searched for an approach to study environmental problems without having to describe entire people-environment systems. Vayda's approach formed the inspiration and therewith the basis of the *Action-in-Context* approach which describes the role the different actors involved in a problematic environmental action and their influence in the decision-making process at different levels. This model was developed further by De Groot (1992, 1998) into the *Problem-in-Context* approach – a normative, solution oriented approach to environmental problems. [8] This approach has been applied to study the social dynamics and driving forces of deforestation in the Philippines (Van den Top 1998) and in Brazil, Ecuador and Cameroon (Cleuren 2001).

The emergence of new generations of anthropologists together with a restructuring of the Dutch academic landscape has resulted in inter-university research schools that cross the disciplinary boundaries. Environmental

7 Progressive contextualisation works its way from a defined (problematic) action outward to the actors and factors that explain that specific action.
8 The Problem-in-Context approach contains a so called 'actors field' which presents the interactions between actors at different levels (horizontal and vertical linkages). Options and motivations of actors are influenced by contextual factors but also by other actors, usually at a higher level i.e. in a more powerful position. The social chain in the model describes the institutional setting, the social arrangements and the dependencies.

themes as 'dynamics of natural resources' and 'management of coastal zones and food security' as well the study of complex resource systems such as reefs (Buginesia Project) involve researchers from various disciplines among which is anthropology (cf. Pet-Soede 2000). Nowadays, anthropologists are often involved to represent the social science aspects of a multi-disciplinary project in order to deal with a particular type of questions or to act as an intermediary between local people and project. New types of research projects are being developed genuinely aiming for an integrated approach on the basis of problem oriented research questions. The search for solutions where different disciplines need to feed in leads to interesting discussions, for example about values, which form an important aspect of the process. The program Environment and Development of the Centre of Environmental Sciences in Leiden is such a collaboration of various disciplines.

1.1.4 Environmental anthropology today

Environmental issues were a strong impulse to develop a more applied anthropology, which came up next to mainstream academic anthropology. *Environmental anthropology* has the potential to understand, inform and present information on how to construct sustainable ways of living (Brosius 1999; Osseweijer 2001). It looks at 'the ways in which a particular population purposely or unintentionally shapes its environment, and the ways in which its relations with the environment shape its culture and social, economic and political life' (Salzman and Attwood 1996). The impact that humans have on their environment is a combination of technology with economic values, ethical standards, political ideologies, religious conventions, practical knowledge, the assumptions on which all these things are based as well as the activities that are generated by them (Milton 1996). Hence, it is important to understand all aspects of human thought and action.

The distinction between people's actions and what they hold in their minds, made 'choice' available for investigation. It allows us to look at the incentives that people have for certain behaviour and the choices they make about their environment and the use of it (Milton 1996). Attention on the rationale behind these choices, i.e. the options and motivations of people, is growing as they appear essential in adaptation of behaviour, for example, in the setting up of a management system and the institutions that support this over a longer period of time. In the Fisheries Co-management Research Project the study of the 'patterns of interaction' was essential to understand local initiatives towards resource management, i.e. the creation of organisations, rules and regulation. Also studied were the outcomes in terms of sustainability, equity and efficiency. Insight into these components and the incentives that people have can provide a key in resource management as it identifies the level on which adaptations can be made to stimulate people to change their behaviour towards a more sustainable approach in resource use.

1.2 Other environmental approaches

The general growth in environmental scholarship and the recent theoretical discourses have led to the development of a number of cross-disciplinary approaches that deal with environmental issues and human-environment relationships. A combination of those, and *Common Property Theory* in particular, form the overall framework for the Fisheries Co-management Research Project and hence the *sasi* study described in this thesis. The members of the research team were from various disciplinary backgrounds and my views from environmental anthropology were complemented with insights from political science, resource economics and (marine) biology. Together we assembled the information necessary to complete the various boxes of the institutional analysis framework. My specific area of interest is institutional resilience, which is a spin-off from resilience thinking. These fields, as well as other current environmental approaches, are described in the section below.

1.2.1 The systems view

Systems view or *systems ecology* is a relatively new field, but one with impressive evidence on co-evolution in human-nature relations, including traditional ecological knowledge and the self-organising ability of people for sustainable resource use (Holling 1978; Berkes and Folke 1992). In the systems view, the structure and function of the ecosystem is sustained by synergetic feedbacks between human societies and their environment. The underlying assumption is that the physical and biological environment places constraints on the growth and development of the human sub-system and vice versa. Leading scientists in this field are Fikret Berkes and Carl Folke who look at how the social system has developed management practices based on ecological knowledge for dealing with the dynamics of ecosystems and on the social mechanisms behind management practices (Berkes and Folke 1993, 1994, 1998, 2003). The self-organising abilities and adaptations of both the ecological and human sub-system shape the way in which society defines and uses natural capital.

The vital role of the life-support functions for economic development and sustainability has caused a shift from ecology to economics and is theoretically as well as empirically analysed through *ecological economics* (Odum 1975). The shift has, in part, given rise to the terminology of *natural capital* and *human-made capital*. In contrast to the assumptions of standard economic theory, ecological economists regard human-made capital and natural capital as fundamentally complementary. Natural capital consists of non-renewable resources such as oil and minerals, renewable resources such as fish and wood, and the quality of the atmosphere and climate. Human-made capital on the other hand is capital generated via economic activity through human ingenuity and technological change – the produced means of production. Natural capital and its derived goods and services are the basis for economic

development while it is not possible for human ingenuity to create human-made capital without natural capital (Daly 1990). Only through maintenance of an integrated, functional ecosystem can each environmental good and service be assured (Berkes and Folke 1992) Sustainability, however, cannot be studied by focusing only on natural capital and human-made capital. A third dimension, *cultural capital*, is needed to explain the interrelations between the two.

Cultural capital refers to factors that provide human societies with the means and adaptations to deal with the natural environment and to actively modify it. It pays attention to how people view the world and the universe and includes cosmology, environmental philosophy and ethics (including religion), traditional ecological knowledge, and social-political institutions. Cultural capital, as used here, thus includes the wide variety of ways in which societies interact with their environment (Berkes and Folke 1998). From a systems perspective, it is emphasized that the three types of capital are strongly interrelated and form the basis for guiding society towards sustainability (Gunderson *et al.* 1995).[9]

1.2.2 Adaptive management

Adaptive management (Holling 1978; Walters 1986; Charles 2001; Folke *et al.* 2002; Gunderson and Holling 2002) is based on the assumption that the environment is inherently unpredictable and that scientific information will always be incomplete. The advantage of adaptive management is that it allows for changes in the locus, scale, and the scope of decision-making, depending on the issue being addressed. Active adaptive management views policy as a set of experiments designed to reveal processes that build or sustain resilience (Berkes 2003). It requires and facilitates a social context with flexible and open institutions and multi-level governance systems that allow for learning (Folke *et al.* 2002). Learning and adaptive management are probably the most important processes to make cross-scale approaches work (Degnbol and Raakjær Nielsen 2002; Berkes 2003).

There are attempts to combine adaptive management and co-management in what Folke *et al*. (2002) have called *adaptive co-management*: a process by which institutional arrangements and ecological knowledge are tested and revised in a dynamic, ongoing, self-organised process of trial and error.

9 There are a number of other approaches, such as ecosystem management (Schramm and Hubert 1996 in Jentoft *et al.* 1998, 423) and participatory environmental research (Berkes 2001), but these are not further discussed here.

1.2.3 Resilience thinking

Another current approach that studies people's responses to a changing environment is *resilience thinking*. It focuses on the adaptive capacity of social groups and their institutions to deal with stresses as a result of social, political and environmental change (Berkes and Folke 1998; Charles 2001). One way to approach this is to look for informative case studies of change in social-ecological systems and to investigate how societies deal with change. This knowledge is envisaged to provide a basis for improved governance and management of natural systems so that their capacity to sustain human and natural capital is enhanced. The study of *sasi laut* can be regarded as such a case study. Looking at the changes in processes and the adaptation and survival of the institution over time helps in explaining and understanding what is called *institutional resilience* (see Chapter 7). Recently, a platform has been established to work on issues around resilience: the Resilience Alliance.[10]

1.3 Common property theory

Currently, one of the most prominent approaches in dealing with natural resources management is *common property theory* or *commons research.* Because this approach is important as it forms the context of this thesis, it is dealt with in more detail.

1.3.1 The tragedy of the commons

In the 1960s and 1970s policy innovations, based on early work of resource economists and the idea that without private ownership commons would be depleted, transferred forests, pasture land, inshore fisheries and other natural resources from their previous property rights regimes to government ownership (Dietz *et al*. 2002). The rationale for centralised government control was Hardin's (1968) 'tragedy of the commons' which presented a pessimistic view on human behaviour. The rationale for the tragedy of the commons was in a common-pool resource, each user faces the dilemma about how much to harvest. If all users restrain themselves, everybody benefits and the resource will be sustained. However, if one person limits his use while his neighbours do not, the person has lost the short-term benefits of taking his share and the resource collapses. People therefore were assumed to always maximise their efforts (Hardin 1968).

Sometimes, however, the transfers of property rights to the national government were disastrous for the resources they were intended to protect. Instead of creating a single owner with a long-term interest in the resource, nation-

10 The Resilience Alliance is a multidisciplinary research group that explores the dynamics of complex social-ecological systems in order to discover foundations for sustainability (www.resalliance.org/).

alising common-pool resources typically led to a rejection of existing indigenous institutions, poor monitoring of resource boundaries due to a lack of capacity of the national government, and subsequently de facto open access conditions and a race to use the resources (Dietz *et al.* 2002). As a result, the presumption that government ownership was a universally applicable solution to the 'tragedy of the commons' was seriously challenged.

The rational-choice theory that underpins Hardin's theory regards humans as acting merely out of self-interest (Smith 1977). Opposing views, however, argue that people are not simply a *homo economicus*, but members of a community and as such under influence of social and cultural values which are important when economic decisions are made (Jentoft *et al.* 1998).[11] Economic action thus is not an individual decision, but it is socially situated and embedded in networks of social relations (Swedberg and Granovetter in Jentoft 2004). This implied that the 'tragedy of the commons' could be averted by mechanisms that cause individuals to act in the interests of the collective good, such as communication, trust, the anticipation of future interactions, and the ability to build agreements and rules (Rappaport 1968; Vayda 1969; Rappaport 1984; Dietz *et al*. 2002). Their arguments are backed up by rich case study literature which present a wide diversity of settings in which users organised themselves and achieved better outcomes than Hardin's model could ever predict (Johannes 1978; Kalland 1981; Akimichi and Ruddle 1984; Cordell 1984, 1989; McGoodwin 1984; Ruddle and Johannes 1985; Ruddle 1987; Sengupta 1991; Johannes 1998; Feeny *et al.* 1990, Pomeroy 1994; Pomeroy *et al.* 1996), and also the study central in this thesis (Novaczek *et al.* 2001). In the end, the 'tragedy of the commons' was shown to be the consequence of open-access conditions and *not* of common property (Berkes 2003) thereby providing an argument for good governance and local management.

1.3.2 The study of common property resource management

Largely in reaction to Hardin's article and the frightening stories about rapid population declines of many (marine) species, in the late 1970s and early 1980s scientific interest in the commons grew (Dietz *et al.* 2002). Commons research documented in considerable detail the self-organisation and self-regulation of communities of resource users to deal with *subtractability* and *exclusion* – two central problems of commons management. [12] The dilemma of 'free riding' can be an important incentive for individuals to maximise their own resource benefits at the cost of the benefits available to others. However, the studies mentioned in the above section showed that people appeared to sometimes have different motivations and do move beyond individual self-interest.

11 Jentoft therefore prefers to talk about homo socious (2004, 14).
12 The problem of subtractability means that overuse or destruction by one person subtracts from the benefits available to others. The problem of exclusion means that the benefits go to all, while the costs are shared between those who have paid their fair share (Dietz *et al.* 2002).

By the mid-1980s, more and more questions were being raised about Hardin's model and the number of scientists from various fields and countries examining common-pool resources increased. Yet, the issues were not discussed widely across scientific disciplines because each tended to use its own language and theory and there was little exchange between scholars from various regions of the world. In 1983, the Panel on the Study of Common Property Resource Management recognised the need for a common research framework, which was designed by Oakerson (1986) and developed over the following years. [13] The Institutional Analysis Framework (IAF) used in the Fisheries Co-management Research Project was derived from this model (see Chapter 3).

The empirical foundations for the analysis of common-pool resources were laid by a number of studies (Berkes 1986, 1989; Berkes *et al.* 1989; Blomquist 1992; McCay and Acheson 1978; Pinkerton 1989; Ostrom 1990; Bromley 1992; Tang 1992). They demonstrated that, under some conditions, local groups using a common property regime (or resource management system) could manage their resources quite well. This research changed the focus of the field from a search for the 'right' overall conception and the 'right' policy, to a search for the conditions under which particular institutional arrangements serve user groups well in sustaining their resource base over long periods of time (Dietz *et al*. 2002). One of the most renown publications that still guides many researchers is 'Governing the Commons' by Elinor Ostrom (1990) who studied (and still does) complex institutional arrangements which guide the use of common-pool resources such as large marine ecosystems, groundwater basins, fresh water and grasslands. The conditional propositions she presented have been formulated as 'design principles'. The evolving theory of the commons fairly establishes the conditions under which community-based management may or may not work.

The members of the panel also identified needs in research and lessons learned that still provide guidance in studying common property regimes (Dietz *et al.* 2002):

13 In 1990, the International Association for the Study of Common Property was established (IASCP). At their bi-annual meetings, scientists from over 50 countries exchange their findings (Dietz et al. 2002, 8).

1 The need to define the performance of an institutional arrangement in terms of both environmental and human dimensions.
2 The importance of the initial situation as it affects emergence, performance, survival and relative costs and benefits of institutional arrangements.
3 The importance of the distinction between the characteristics of the resource and the regime that manages the resource.
4 The need to compare and synthesize analyses of common-pool resources and common property regimes using a multidisciplinary framework.
5 The need, especially for international donors, to understand how various changes in property rights affect institutional arrangements, such as the distribution of wealth.
6 The need to understand how spatial and temporal heterogeneity in the resource endowment creates opportunities for some at the expense of others.
7 The need to compare the costs and benefits of various institutional arrangements for a given resource.
8 Resource users' ability and willingness to cooperate depends on their bargaining power, the initial value of the resource, shared values and other factors.

FIGURE 1.1 – Research needs

Also developed were several comparative data bases designed to facilitate quantitative work related to the evolving theories. The cross-national study on fisheries co-management conducted by ICLARM and IFM in collaboration with national partners in Africa and Southeast Asia formed such a network. The purpose of this network of collaborating research institutions was to apply the same core measurements to a series of cases within a country and to revisit locations regularly in order to study the dynamic processes over time. The common IAF framework allowed for comparison within, but also between countries and regions (ICLARM/IFM 1996). From the case-studies a number of new design principles or conditions for success were distilled that are described in Chapter 11.

Currently, common property theory and 'the commons' are at the centre of the international research agenda on the human dimensions of global change. It is an important theme in studies on international cooperation, environmental decision-making, and the design of resource management institutions in order to achieve global sustainable development (Ostrom 1999; NRC 2002). Commons research is at a point of rapid growth in work intending to understand the dynamics of common-pool resources and the institutions that manage (and mismanage) them (Dietz *et al.* 2002). This is even of more relevance in the light of ongoing decentralisation processes where decision-making power is being transferred to the local level (see Chapter 10). New kinds of commons are being analysed and new methodological tools and theoretical perspectives developed. This thesis aims to contribute to this field through the study of *sasi* and insights that have been derived from my experience in fisheries research.