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Ocean and Coastal Management

journal homepage: www.elsevier.com/locate/ocecoaman

Reinventing *papadak/hoholok* as a traditional management system of marine resources in Rote Ndao, Indonesia

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ARTICLE INFO

Keywords:

Marine resource management
 Customary management
 Indigenous institution
 Ocean governance
 Rote Ndao

ABSTRACT

Indigenous people have their own knowledge and perspectives on the use of natural resources, including marine resources. *Papadak/hoholok*, implemented by the Rote Ndao community, is one of many marine resource management systems in Indonesia. Our study aims to understand the process that contributes to the success of the establishment and implementation of *papadak/hoholok* in managing marine resource in Rote Ndao. The data were collected from observations and in-depth interviews on indigenous (*adat*) leaders, governments and experts from several NGOs regarding the application of *papadak/hoholok*. The study results explain that, although not yet fully implemented, there are potential social mechanisms in these traditional management practices, including the use of local institutions to provide leaders/stewardship and rules for social regulation, and the internalization of local culture in marine resource management practices. The application of *papadak/hoholok* emphasizes the learning process that combines traditional and scientific knowledge to respond to feedback from the environment as guidance on marine resource management. Exchange of knowledge between people involved in *papadak/hoholok* provides an opportunity for all stakeholders involved to develop new knowledge and understanding of the resources and foster shared responsibilities. Although there is still a need for an in-depth study of the successful application of *papadak/hoholok*, the results of the study can be useful in the process of revitalization of traditional institutions or the establishment of new co-management institutions of marine resources in Indonesia and elsewhere.

1. Introduction

The increasing activity in the sea causes increased pressure on marine resources. Increased exploitation of marine resources is partly due to increased market demand for sea products, even those not previously used, and ultimately leading to the depletion of these resources (Berkes, 2004; Berkes et al., 2006). In the midst of existing system failures that are generally top-down, significant attention has been paid to the development of new solutions to control the deterioration of the marine environment: the improved involvement of local communities in marine management and conservation (Christie et al., 2003; Ferse et al., 2010; Johannes, 2002; Mascia, 2003). Some authors suggest that conservation strategies that consider indigenous ecological knowledge, management practices, and customary sea tenure institutions have a higher rate of local acceptance and, consequently, greater conservation value (Aswani et al., 2007; Cinner and Aswani, 2007; Johannes, 2002; McClanahan et al., 2006; Ruddle, 1998).

The ever growing interest in traditional knowledge since the 1980s is indicative of the need to gain further insights into indigenous and/or local practices of resource use from an ecological perspective (Berkes et al., 2000). According to Berkes et al. (2000, p. 1252), the analysis of many Traditional Ecological Knowledge systems show that there is a component of local observational knowledge of species and other environmental phenomena, a component of practice in the way people carry out their resource use activities, and further, a component of belief regarding how people fit into or relate to ecosystems. Traditional Ecological Knowledge is further defined as "...cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment." (ibid.). Traditional knowledge may be holistic in outlook and adaptive by nature, gathered over generations by observers whose lives depended on this information and its use (Berkes et al., 2000). It often accumulates incrementally, tested by trial-and-

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<https://doi.org/10.1016/j.ocecoaman.2018.04.018>

Received 8 January 2018; Received in revised form 10 April 2018; Accepted 22 April 2018

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error and transmitted to future generations orally or by shared practical experiences (Ohmagari and Berkes, 1997).

Traditional knowledge is an important part of coastal management and has long been practiced in the form of customary management. Cinner and Aswani (2007, p. 202) define customary management as local practices that are designed to regulate the use of, access to and transfer of resources which are informed by indigenous ecological knowledge and are culturally embedded in customary land and sea tenure institutions. This covers a large variety of measures and techniques similar to those of modern fisheries managers such as temporal or permanent area closures, gear prohibitions, species-specific bans and closed seasons (Cinner and Aswani, 2007). There are many forms of customary management that has been documented, some successfully meeting conservation and community goals (Bennett and Dearden, 2014a; Cinner and Aswani, 2007; Johannes, 2002; Población et al., 2014; Satria and Adhuri, 2010), as well as failures (Bennett and Dearden, 2014b; Glaser et al., 2010; Satria et al., 2006; Oracion et al., 2005; Elliott et al., 2001; Ruddle, 1993). Customary management regimes frequently possess design principles of effective governance institutions that induce compliance, including the demarcation of boundaries of resources and user groups, mechanisms for conflict resolution, sanctions for violators, adaptability to social and ecological conditions, and mechanisms to induce compliance (through perceived legitimacy of authorities and regular reminders of rules) (Cinner, 2007, p. 1036). It can be dynamic and adaptive to changes in both social and ecological conditions (Berkes et al., 2000). As Ruddle (1993) explains, there are many external factors that influence the development of customary coastal management, among others from the pressures of demographic change, modernization and economic development, and government policy. These external factors then change the customary coastal management to something that is often different from the same practice in the past (Ruddle, 1993), although by maintaining their original character as legal context, values, principles and rules within a modern context (Bavinck et al., 2015).

As a nation, Indonesia is rich with customary local wisdom (*adat*), including *adat* management system of marine resources¹ which has lasted for centuries despite the rapid socioeconomic change (Thornburn, 2000; Ruddle, 1993). *Papadak/hoholok* of Rote Ndao is one of those *adats* that still exist. It is interesting because until recently this local wisdom is only applied on land (such as on agricultural land, plantations or springs), but communities are beginning to apply it to the marine areas as well due to its potential as a natural resource management system. Our study aims to understand the process that contributes to the success of the establishment and implementation of *papadak/hoholok* in managing marine resource in Rote Ndao. We are particularly interested in the adaptation process of *papadak/hoholok* on land to sea; the governance structure of *papadak/hoholok*; the role of leadership in customary practice; how knowledge, meaning, and visions of environmental protection are generated and communicated; and how *adat* leaders and local community have managed to gain support.

2. Methodology

This study uses qualitative research that focuses on the process of examination and interpretation of data in order to acquire meaning, understanding and build empirical knowledge (Dey, 2003; Corbin and Strauss, 2014) of the social phenomenon that consists of actors, events, places, and involves many research methods in identifying problems (Marshall and Rossman, 2014). The qualitative approach was selected

¹ There are many forms of traditional (*adat*) management system of marine resources in Indonesia. Local communities, particularly in the eastern parts of the country, have practiced these systems for centuries. Some of the most commonly discussed in the literature are *sasi* of Maluku and Papua, and *awig-awig* of Bali and Lombok. For further discussion on this topic, see for example Satria et al. (2006); Satria and Adhuri (2010); Thornburn (2000).

because it allows the researcher to comprehensively review the dynamics of the *papadak/hoholok* process and implementation, mainly related to the role and interests of every stakeholder involved.

Information was obtained by observation and fieldwork. Observations were conducted on community activities and in coastal areas in Rote Ndao that implement *papadak/hoholok*. Semi-structured interviews with indigenous leaders, governments and experts from Non-Government Organizations (NGOs) were carried out to understand the process of the application of *papadak/hoholok* in Rote Ndao. Each interview were conducted independently. The selection of respondents are determined by using the snowball method. With this method, the number of respondents interviewed were initially small then enlarges with provided referrals from the initial respondents (Neuman, 2013). Each new referral was explored until primary data from sufficient number of samples are collected.

The fieldwork was completed in two stages. The first stage was to identify the key actors involved in the initiation and implementation of *papadak/hoholok*. This was conducted on 7–12 April 2017. The second stage was completed on 13–26 August 2017, covering in-depth interviews of key actors identified in the first stage. In total, the interview was conducted on 17 people: 3 from the government, 4 from NGOs, and 10 *adat* leaders and community members.

In addition, content analysis was also performed in this study. It is a systematic analysis of a text (who says, to whom, why, and to what effect) quantitatively and qualitatively (Bhattacharjee, 2012), to reduce the unnecessary elements of textual material through summarizing, explicating and structuring (Flick, 2009). This analysis was required to process the symbolic forms used in the communications submitted by respondents by using classification criteria to explore problems, issues, conditions occurring in the field and data collection results, so to gain understanding to what extent the implementation of *papadak/hoholok* has on environmental protection in Rote Ndao.

3. Background of the study site

3.1. Ecological importance of Rote Ndao territorial waters

Rote Islands is an archipelago in East Nusa Tenggara Province, situated on the most southern part of Indonesia. Most of the territorial waters of Rote Ndao District are included in the territorial waters of Savu Sea National Marine Park (NMP) (see Fig. 3). Overall, Savu Sea has the highest coverage of coral reef with the highest biodiversity of species in the world and is a critical habitat for 18 species of whales, including two rare species of whales, the blue whale and the sperm whale (DKPP, 2016; Kahn, 2013; Perdanahardja and Lionata, 2017). Savu Sea also strategically significant for development in East Nusa Tenggara Province, since most districts/municipalities is dependent upon it. Fisheries are viewed as a mainstay of subsistence lifestyles and a foundation of food security, but also as a potential engine to drive local and national development. More than 65% of the sustainable potential of fish resources in this province is contributed by Savu Sea (DKPP, 2016; Kombaitan et al., 2015; Perdanahardja and Lionata, 2017). However, most locals in Rote Ndao District have land-based livelihoods such as agriculture and plantation work, while marine-related activities only become complementary. People look to the sea only as a supplementary source of food. Therefore, the culture of the Rote Ndao community is essentially agrarian. It is the migrant communities from outside Rote Ndao who work as fishermen and develop a maritime culture for decades.

The waters of Rote Ndao District are important for marine conservation and for marine-related economic activities (Perdanahardja and Lionata, 2017). The largest coral reefs, seagrass and mangrove cover in the Savu Sea are located on the coast and waters of Rote Ndao (Attachment of Decree of MoMAF No. 6/Kepmen-KP/2014; Hidayat et al., 2017). In addition to these three important ecosystems, there are also some protected animals, such as whales, dolphins, turtles, dugongs

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