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## Seaweed farming, property rights, and inclusive development in coastal areas

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### 1. Introduction

In the light of environmental deterioration of coastal and marine regions, the international community has been recommending the expansion of marine protected areas (MPA) (Gurney et al., 2014; Hugenholz and McKenzie, 2015). The government of Indonesia has supported this effort by establishing many new MPAs, also in populated coastal regions (Clifton, 2003; Gurney et al., 2014; Kusumawati and Hsiang-Wen, 2015; Chui-Ling, 2015). This paper compares two MPA sites, focusing on the extent to which the local people have been involved in planning and implementation (Glaser et al., 2010; Chui-Ling, 2015; Raymond-Yakoubian et al., 2017; Ban et al., 2017). We compare two MPAs with different regimes, i.e. Karimunjawa National Park under Ministry of Forestry (MoF) regime and the Savu Sea Marine National Park under Ministry of Marine Affairs and Fisheries (MMAF) regime. In both cases, the local people have also been encouraged to engage in seaweed farming. The practice of seaweed farming is, however, sometimes

antithetical to the rules employed for conservation, potentially resulting in conflict. The question guiding this paper therefore is the following: how can top-down coastal management systems be synchronized with local realities in the coastal zone? In particular we ask: How does the formal property rights framework regarding seaweed production in two MPA's in Indonesia interact with local customary practices and rules and how can the former support the latter to enhance local farmer well-being and protect local ecosystems?

Our entry point is inclusive development, defined as development that includes marginalized people, sectors and countries in social, political and economic processes for increased human well-being, social and environmental sustainability, and empowerment (Gupta et al., 2015). Inclusive development is considered to be an adaptive learning process, which responds to change and new risks of exclusion and marginalization. The imposition of conservation areas, such as MPAs, which are expected to result in environmental sustainability, may also result in local processes of social exclusion (Fiske, 1991; Coklin et al., 1998; Visser, 2004; Mascia and Claus, 2008). The realization of conservation areas that take account of the necessities of social inclusion is from this perspective a major challenge (Voyer et al., 2014; Martin et al., 2017; Yunzhou and Fluharty, 2017).

We also make use of a property rights perspective (Ostrom and Schlager, 1996). Ostrom and Schlager (1996) distinguish five types of property rights, i.e. access rights, withdrawal rights, management rights, exclusion rights, and alienation rights, and also identify five types of users: authorized entrant, authorized user, claimant, proprietor, and owner. They argue that property rights occur in 'bundles', and may take different shapes, depending on the local context.

The paper is set up as follows. Section 2 provides an overview of the Indonesian policy context, examining the characteristics of marine conservation policy as well as the national endeavour to encourage seaweed farming in coastal regions. Section 3 describes the research methodology and research settings, while Section 4 provides a window to the interaction between seaweed farming and conservation policy in two case study regions, namely Karimunjawa National Park, in western Indonesia, and Savu Sea Marine

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National Park in the Coral Triangle. Section 5 provides the discussion, while Section 6 provides conclusions.

## 2. The policy context

An understanding of the formal legal framework is necessary to make sense of coastal governance in Indonesia. There are two ministries in charge of the management of conservation throughout Indonesia, i.e. the Ministry of Forestry (MoF) and the Ministry of Marine Affairs and Fisheries (MMAF) (Satria et al., 2006a; Kusumawati and Hsiang-Wen, 2015). We will refer to their management practices as the forest regime and the coastal regime respectively. The MoF looks after the management of conservation areas, both land and water. These come in the form of protected areas (including national parks, forest parks, and natural tourism parks) under the forestry regime. The MMAF focuses on water conservation areas. The two ministries (and regimes), therefore, control similar resources but they do so in different areas and produce different rules (Satria et al., 2006a).

Act No. 5/1990 on Conservation of Natural Resources is the main legislation for governing conservation areas under the forestry regime. Article 34 (1) of the Act states that the management of national parks, forest parks, and natural parks, is to be under the control of the government. The Act is implemented through Governmental Regulation No. 28/2011 on The Management of Nature Reserve Areas and Nature Conservation Areas. The regulation states that the management of Conservation Areas should be based on zoning arrangements. Karimunjawa National Park, which comprises of both land and marine waters, is governed by a MoF regime shaped by the Act and Regulation.

Meanwhile, the MMAF is in charge of another regime based on Act No. 1/2014, an amendment of Act. No. 27/2007 on Management of Coastal Areas and Small Islands. Act No. 1/2014 empowers local communities to access and utilize water resources throughout the Licensed Area. For example, Article 1 (18) states that: 'A licensed area is granted permission to utilize the space of the Coastal Waters covering most of the sea surface and the water column up to the seabed in a certain breadth limit and/or to exploit some parts of small islands'. At the same time, Article 16 (1) qualifies that: 'Anyone who utilizes a space of coastal waters and uses some parts of the small islands is bound to have a Licensed Area' and that a 'Licensed Area as defined in Article 16 paragraph (1) shall be issued by the zoning plan of coastal areas and small islands' (Article 17 (1)). The 'Licensed Area as referred to Article 16 paragraph (1) is issued for a certain width and time' (Article 17 (3)) and the 'Licensed Area cannot be issued for the core zone in the conservation area, the sea channel, the port area, and the public beach' (Article 17 (4)). Based on Article 17(3) the seaweed farming is also required to get licensed area, and it is prohibited to practice in the core zone in the conservation area, the sea channel, the port area, and the public beach.

Article 20 states that the government and the local government shall facilitate the acquisition of Licensed Area for local and traditional communities who utilize the space and marine resources to fulfil their daily livelihood needs. Furthermore, Act No. 1/2014 recognizes customary practice in managing coastal areas, through Article 61 (1) which says that 'The Government recognizes, respects and protects the rights of indigenous peoples, traditional communities, and local wisdom on Coastal Areas and Small Islands which has been utilized from one generation to the next'. The MMAF's regime governs the Savu Sea Marine National Park includes marine waters.

In addition to its conservation tasks, MMAF is also in charge of the promotion of seaweed farming, arguing that seaweed farming can provide alternative livelihoods for coastal communities in

Indonesia and boost their income (MMAF, 2016). This is because seaweed production is (a) cheap, (b) requires relatively simple technology, (c) can be undertaken all year round, (d) requires no land as it is undertaken in coastal areas; and (d) builds on existing cultural practices in terms of preparation, location, planting, caring, and harvesting.

Seaweed production in Indonesia has grown to 7,427,527 tons and now is the dominant aquaculture produced commodity. It comprises 66.87% of the total production of aquaculture commodities (MMAF, 2015). The increase of seaweed was enabled by the MMAF program that provided qualified seaweed seed by building a nursery center and providing farming equipment, credit, and extension services. In 2015, MMAF developed 440 nursery centers in 22 sites, covering 0.55 km<sup>2</sup> (MMAF, 2016). MMAF also promote seaweed farming in the two cases study by providing nursery center and farming equipment.

## 3. Materials and methods

### 3.1. Study sites

The research detailed here was conducted in two study sites: 1) Karimunjawa National Park; and 2) Savu Sea Marine National Park. Karimunjawa is an archipelago, located in the Java Sea, that consist of 27 islands. There are only four islands that are inhabited by people: Karimun Island, Kemujan Island, Parang Island and Nyamuk Island. This research focused on Kemujan Island and specifically Kemujan Village which has practiced seaweed farming as a form of community livelihood. Administratively, Kemujan Village is included in Karimunjawa District, Jepara Regency, Central Java Province. The area of Kemujan Village is 15 km<sup>2</sup>, and is composed of three sub villages: Batulawang, Telaga, and Mrican. Kemujan Village is 90 km from Jepara Regency (Statistic of Jepara Regency, 2016).

Savu Sea Marine National Park, which is located in eastern Indonesia, consists of two water areas, namely: 1) the territorial waters of the Sumba Strait and the surrounding area of 567,170 ha, covering Sumba Regency, West Sumba Regency, Central Sumba Regency, Manggarai Regency, and West Manggarai Regency; and 2) the territorial waters of Timor-Rote-Sabu-Batek that comprises an area of 29,500 km<sup>2</sup>, covering East Sumba Regency, Rote Ndao Regency, Kupang Regency, and South Central Timor Regency (kkji.kp3k.kkp.go.id). This research focused on Rote Ndao Regency, where seaweed farming is an important part of people's livelihoods.

There are 10 districts in Rote Ndao Regency: East Rote, Landuleko, Pantai Baru, Central Rote, Lobalain, South Rote, Rote North-western, Southwestern Rote, West Rote, and Ndao Nuse. There are a total of 89 villages in the Rote Ndao Regency, of which 54 are located in coastal areas. People cultivate seaweed as their livelihood especially in the following areas: 1) West Rote District (Sedeon, Nembang, and Oenggaot villages); 2) Southwestern Rote District (Landu village); and 3) Landuleko District (Daiama village and Pantai Baru village).

### 3.2. Method

Qualitative method is used in this research. Primary data was collected directly from the informants through in-depth interviews, focus group discussions (FGDs), and participatory observation. The informants included national park officials, officials from the Office of Marine Affairs and Fisheries in Jepara and Rote Ndao Regencies, village officials, community leaders, seaweed farmers, and NGO officials (Wildlife Conservation Society in Karimunjawa and The Nature Conservancy in Rote Ndao). Purposive and snowball

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