

Shifting Waters - Indonesia's Dynamic Marine Protected Area Policy Seascape

by

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Declaration

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution.

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Abstract

The coastal waters of Indonesia are among the planet's most biologically diverse. They also provide food and income for thousands of vulnerable coastal communities. These ecosystems are increasingly being degraded from overexploitation and other threats. Marine Protected Areas (MPAs) are essential for supporting the sustainable management of the country's marine resources and contributing to the food security of coastal communities. However, these conservation initiatives suffer from chronically low levels of effectiveness.

A robust policy framework is vital for creating effective natural resource management regimes. This study rigorously reviewed Indonesia's MPA policy arrangements and examined whether they reflect contemporary theory and practice. It also examined how Indonesia's MPA policies are being implemented in the field using the Eastern Indonesian case-study sites of Raja Ampat Islands MPA and Sawu Sea Marine National Park. With this information, the research identified policy needs and opportunities for improving MPA performance. A variety of methods were employed to collect data, including in-depth literature and policy reviews, semi-structured interviews and field visits.

The research found that although Indonesia's MPA policy arrangements capture many aspects of contemporary theory and practice, some significant issues exist. The move to 'decentralisation' and then 'recentralisation', overlapping legislative instruments and the multiplicity of management institutions have created a complex and sometimes confusing jurisdictional framework. To improve the country's MPA performance and overcome the main policy weaknesses, the study recommended that attention be given to the five key policy areas of (i) clarification on jurisdictional and institutional overlap, (ii) institutionalisation of community-based and co-management arrangements, (iii) building legitimacy and support with local communities, (iv) tighter prescriptions for biophysical design, and (v) mainstreaming contemporary theory and practice into core policies. Many aspects of planning and management from the Raja Ampat Islands MPA can help guide the development of tighter national policy settings. The findings presented in the thesis may be used to provide a better understanding of how Indonesia's MPA performance can be enhanced.

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List of Acronyms

CTI-CFF	The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security
GIS	Geographic Information System (software)
KKM	Maritime Conservation Area
KKP3K	Coastal and Small Island Conservation Areas
MCZSI Law	Management of the Coastal Zone and Small Islands Law
MPA	Marine Protected Area
MMAF	Ministry of Marine Affairs and Fisheries
NPoA	National Plan of Action
NTT	Nusa Timor Tenggara (province)
NTZ	No Take Zone
PAME	Protected Area Management Effectiveness
PES	Payment of Ecosystem Services
Sawu Sea MNP	Sawu Sea Marine National Park
RPoA	Regional Plan of Action
USAID	United States of America International Development Agency

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Chapter 1- Introduction and Methodology

‘Situating upon the equator, and bathed in the tepid water of the great tropical oceans, this region enjoys a climate more uniformly hot and moist than almost any other part of the globe, and teems with natural productions which are elsewhere unknown.’ Alfred Russel Wallace describing the waters of the Malay Archipelago (Wallace 1869, 1)

Marine ecosystems are a complicated and diverse mosaic of living habitats and organisms maintained through cycles of reproduction, dispersal and predation. Complex social systems and anthropogenic impacts influence these cycles. The combination of fishing, pollutant runoff, physical habitat damage and the growing impacts of climate change are dramatically altering the ocean’s chemistry, physical structure and ecology (Lubchenco et al. 2003). Moreover, increasing demand on marine resources over the last three decades, especially in the tropics, has led to widespread overexploitation of fishing stocks (FAO 2012). As prominent marine biologist Callum Roberts pertinently puts it: ‘we are transforming life in the sea, and with it undermining our own existence’ (Roberts 2012, 8).

Indonesia is the world’s largest archipelagic nation with some 13,466 islands (KKP 2015a). Its coastal waters are among the most biologically diverse on the planet (Veron et al. 2009), having 16% of the world’s coral reefs and nearly a quarter of its remaining mangrove forests (Burke et al. 2011; Giri et al. 2011). These marine resources are vital for sustaining over 12,000 coastal villages and providing daily food and income for millions of poor people (KKP 2015a; Dutton 2005)¹. However, the country’s marine ecosystems suffer the same pressures that have beset much of the planet. Over the last decade, the number of coastal fishers in the country has increased by 40% (Huffard, Erdmann, and Gunawan 2012, 1). This change has been driven in part by population growth, dwindling land availability for agriculture and a lack of alternative employment (Campbell et al. 2012). Today, there is widespread overexploitation and depletion of fish stocks (Fox et al. 2009; Dutton 2005; Pet-Soede et al. 2001; Bailey and Zerner 1992). The Ministry of Marine Affairs and Fisheries² (MMAF) own assessment of fish stocks concluded that there are signs of overexploitation in

¹ Coastal waters have varying levels of productivity and capacity to support local livelihoods (Clifton and Foale 2017). For example, ecosystems driven by upwellings or terrestrial nutrient input can sustain greater levels of biomass yield (Birkeland 1997).

² *Kementerian Kelautan dan Perikanan*

all management areas, particularly for small pelagic fish (MKP 2011). Dutton (2005, 163) goes further and describes the situation in Indonesia's coastal waters as an 'eco-catastrophe'. This notion is supported by other studies, which, for example, show that over 90% of the country's coral reefs suffer a medium to high level of local threat (Burke et al. 2011). Lastly, fish catches in Indonesia are projected to decline by over 20% within the next forty years (Cheung et al. 2010, 32). As these trends continue, rural coastal villages will be the most vulnerable to the impacts of further marine resource degradation.

Marine Protected Areas (MPAs) are the globally preferred management strategy to conserve marine biodiversity. This includes Indonesia, which has nearly doubled its MPA estate in the last decade to cover more than 17 million hectares or 2.9% of the country's marine waters (KKP 2016; UNEP-WCMC 2016). The introduction of MPAs has been shown to provide a range of conservation and social benefits such as supporting fisheries management and contributing to local livelihoods (e.g., Miteva, Murray, and Pattanayak 2015; Leisher, van Beukering, and Scherl 2007; Russ et al. 2004; Roberts et al. 2001). However, they also bring social costs that may adversely impact local communities (Mascia, Claus, and Naidoo 2010). Importantly, the ecological and social benefits of MPAs can only be realised if they are effectively managed. However, research shows that this is rarely the case (e.g., Edgar et al. 2014; Leverington et al. 2010; McClanahan 1999). In Indonesia, the majority of MPAs are performing very poorly, with the overall level of effectiveness perhaps being as low as five to ten percent³ (KSDAE 2015; KKP 2015c; Campbell et al. 2012; Burke et al. 2011; Green et al. 2011; Mangubhai et al. 2011; Wiadnya et al. 2011; Clifton 2003).

As can be seen, there is a substantial and urgent need to improve the effectiveness of Indonesia's MPAs. This is both to ensure the conservation of the country's globally important biodiversity, as well as to provide resilient livelihoods for coastal communities. The foundation of an effective natural resource management intervention or initiative is a solid policy framework. However, there is a paucity of up-to-date and rigorous critical analysis of Indonesia's MPA policy arrangements in the public domain. Numerous authors have written about this topic, but these papers tend not to cover the most recent policy changes, are somewhat superficial or focus on specific policy elements such as decentralisation

³ The estimated level of effectiveness for Indonesia's MPAs is based on current research (listed in text) and the author's experience in the field. 'Overall level of effectiveness' is defined as biodiversity being adequately conserved and management objectives achieved.

(Dirhamsyah 2016; Susanto 2016; Siry 2011; Wiadnya et al. 2011; Patlis 2008; Dirhamsyah 2006; Satria and Matsuda 2004). There is also a considerable body of case-study literature, which typically glosses over the complexities of the country's policy arrangements (e.g., Gurney et al. 2016; Jaiteh et al. 2016; Kusumawati and Visser 2014; Campbell et al. 2013; Sidangoli, Lloyd, and Boyd 2013; Steenbergen 2013; Syakur et al. 2012; Glaser et al. 2010; Clifton 2003).

This thesis attempts to fill this gap by answering two principal questions. First, do Indonesia's MPA policies reflect contemporary design and management theory? With this information, the thesis explores and identifies policy needs and opportunities for improving MPA performance. Second, how are Indonesia's MPA policies being implemented in the field and to what extent are they effective? By focusing on two case-study sites in Eastern Indonesia, the thesis examines how field research can inform and enhance national policy settings. This thesis makes a significant contribution by presenting the most up-to-date and in-depth analysis of these policy arrangements. It also provides insight into how MPA effectiveness can be improved. Another significant aspect of this study is that it offers a contextually adapted model of policy elements that are essential for designing and managing successful MPAs in the Asia-Pacific region.

1.1 Methodology

To give a complete and well-rounded analysis of Indonesia's MPA policy arrangements, a variety of methods were employed to collect data. This included an in-depth literature and policy review, semi-structured informal interviews, field visits and drawing on extensive professional experience in protected area management, including within Indonesia⁴. The research and analysis described in the thesis was conducted over a period of four years, when the author lived in Indonesia to conduct the research under the Prime Minister's Australia Asia Endeavour Award and then as a technical consultant for Conservation International.

⁴ The researcher has extensive personal experience in protected area management. This includes working on both policy development and management activities for Parks Australia and the Queensland Parks and Wildlife Service. In Indonesia, the researcher has been a technical consultant with Conservation International for the last two years, working on projects in North Sumatra and West Papua. Previously, the researcher completed an AusAid volunteer assignment in Wakatobi Marine Park (South East Sulawesi), which involved living within a remote fishing community for 12 months. These experiences, have given the researcher a very good 'hands on' understanding of MPA management and the challenges of implementing conservation initiatives in Indonesia.

The research project began by conducting a comprehensive review and synthesis of contemporary literature to define the main policy elements required to effectively design and manage MPAs in the Asia-Pacific region⁵. This information was sourced from peer-reviewed literature and a range of agency reports and other publications, which span the interdisciplinary realm of natural and social sciences. These policy elements formed the conceptual framework used to critically analyse policy arrangements and on-ground implementation. A detailed literature review of Indonesia's national policies was also conducted, which focused on national laws, institutional instruments and other published policies. The terms 'effective' and 'successful' management are used interchangeably in the thesis to describe the extent to which an MPA is adequately protecting its values and achieving management objectives⁶ (Hockings, Leverington, and Cook 2015).

Informal interviews and discussions were used to augment the literature research. Published documents alone cannot provide a complete picture of natural resource management policies. To gain a better understanding of the intent, perceived issues and future plans, 12 targeted interviews were carried out with a range of experts who work in the government, academic and NGO sectors⁷. These participants were approached based on their expertise in MPA policy or involvement with the case-study sites. The interviews were conducted using a semi-structured technique, in which adapted open-ended questions were asked to initiate discussion (Arksey and Knight 1999; Maykut and Morehouse 1994). Responses then formed the basis for follow-up enquiries to provide clarification and explore aspects of interest (Arksey and Knight 1999; Maykut and Morehouse 1994). This technique invites conversation (Maykut and Morehouse 1994), where participants are able to freely express thoughts in a spontaneous way (Arksey and Knight 1999; Hall and Hall 1996). Indeed, interviews were more like 'informative discussions', where notes were taken later that day. These interviews were conducted in Jakarta, Bali and the field sites (see next paragraph), and lasted anywhere between half an hour to several hours. Over the duration of the research project, the author regularly consulted with the expert informants to clarify matters of confusion or fill in information gaps. The research project was approved by the Murdoch University Human Research Ethics Sub-Committee (ethics clearance project number 2013/114). Permission was

⁵ Although recognising the importance of political economy theory, the thesis does not cover this extensively within the literature review (particularly concerning competing or vested interests), since the primary objective of this research is focused on the relationship between policy and on-ground practice.

⁶ Protected area effectiveness typically covers three main themes: design; adequacy and appropriateness of management systems and processes; and the delivery of protected area objectives (Hockings, Leverington, and Cook 2015).

⁷ Refer to Appendix 1.1 for a list of the expert informants interviewed.

sought from the Informants before any data collection activities, which included providing consent to be quoted in the thesis.

The case-study sites of Raja Ampat Islands MPA and Sawu Sea Marine National Park (Sawu Sea MNP) were used to investigate the second research question. These ‘high-profile’ sites offer contemporary but contrasting examples of how Indonesia’s national MPA policy arrangements are being implemented. Raja Ampat Islands MPA was established by regional authorities. In contrast, the creation of Sawu Sea MNP was driven by the national government⁸. Data on these sites was collected through a literature review and interviews. The researcher also conducted a week long field visit to both sites to gain an understanding of the context and carry out interviews⁹. A number of communities were visited and informal discussions held to gain an insight on local perceptions toward the MPAs.

1.2 Thesis structure

The thesis is organised into five chapters. The main policy elements required to improve MPA performance in the Asia-Pacific region are outlined in the second chapter. The next part of the thesis critically analyses Indonesia's key MPA policies and identifies needs and opportunities for enhancing these arrangements. The fourth chapter then uses Raja Ampat Islands MPA and Sawu Sea MNP as case-study sites to critically examine how policies are being implemented in the field, and whether these experiences can enhance the effectiveness of the country's overall MPA policy framework. Finally, the last chapter draws this analysis together to provide recommendations for improving MPA performance.

⁸ Sawu Sea MNP is the only national park that has been created by the Ministry of Marine Affairs and Fisheries. This site provides an example of how MPA planning and management is being implemented by the country’s lead agency for marine conservation (see Section 3.1 for further details on Indonesia’s MPA institutional arrangements).

⁹ The field visits were facilitated with support from Conservation International and The Nature Conservancy.

Chapter 2 - Designing and Managing Successful Marine Protected Areas in the Asia-Pacific Region

Marine Protected Areas (MPAs) are the dominant global strategy for conserving marine biodiversity. They come in a variety of forms, but all have the common purpose of altering anthropogenic resource use within a specific geographical area (Silva, Gately, and Desilvestre 1986). The IUCN General Assembly defines an MPA as ‘any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment’ (Christie and White 2007, 1047). Marine Protected Areas were initially considered as a tool predominately for conservation, but, as time passed, advocates recognised that they could also provide a range of social benefits such as supporting fisheries management, providing economic opportunities and reducing carbon emissions (Miteva, Murray, and Pattanayak 2015; Ferraro, Hanauer, and Sims 2011; Gaines, Lester, et al. 2010; Botsford et al. 2009; Laffoley et al. 2008; Leisher, van Beukering, and Scherl 2007; Russ et al. 2004; Roberts et al. 2001). Today, MPAs are often designed with multi-use zoning arrangements, which allow greater flexibility to accommodate human uses and values (Laffoley et al. 2008).

Recognition that the marine environment is increasingly degraded has led to an extraordinary expansion of MPAs. Over the last 45 years, the global number of MPAs rose from a mere 118 to nearly 15,000, covering 4.5% of the world’s oceans and 10.2% of national jurisdictional waters (UNEP-WCMC 2016; Kelleher and Kenchington 1992). Despite this expansion, MPA success is surprisingly low. Studies estimate that only 10 to 30% of MPAs are effective (Mora et al. 2006; Christie et al. 2003; Willis et al. 2003; McClanahan 1999). For example, the global study by Edgar et al. (2014) on 87 MPAs found that only 10% meet the author’s criteria for adequately conserving biodiversity. Interestingly, this study targeted well-regarded reserves, and the true figure may be much lower. In the Asia-Pacific region, the level of MPA effectiveness may be as little as 10% (Burke et al. 2012; Green et al. 2011; Nañola, Aliño, and Carpenter 2011; McClanahan et al. 2006; Gjertsen 2005; Christie 2004).

This chapter of the thesis explores contemporary theory to identify how MPA performance in the Asia-Pacific region can be improved. The author also draws on personal experience

working on protected area management in the region. It is argued that to enhance this performance six main interconnected design and management elements must be incorporated into MPA policy arrangements; namely, appropriate biophysical design, socio-economic assessment and participation in planning, good governance and management, community empowerment, community support and sustainable financing (see Figure 2.1). These elements build on and integrate existing models, which tend to focus on particular aspects of design and management (e.g., Edgar et al. 2014; Green et al. 2014; Weeks et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008; Hockings et al. 2006; Pomeroy et al. 2005; Roberts et al. 2003; Roberts and Hawkins 2000; Hockings and Phillips 1999). For example, Edgar et al. (2014) argue that five biophysical design and enforcement characteristics make an MPA successful. General guides for designing MPAs (e.g., Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008; Roberts and Hawkins 2000) are typically skewed toward biological design considerations. A research bias also exists toward MPAs in North America, Australia, Europe and the Mediterranean (Ban, Adams, Almany, et al. 2011). Consequently, some prescriptions in the literature on how to design and manage MPAs may be less relevant to other regions of the world, including the Asia-Pacific.

In proposing the six elements in this chapter, the author endeavours to place greater emphasis on social-economic factors, while still recognising biophysical design as the foundation of conservation success. As is well documented, the majority of coastal waters in the Asia-Pacific region are inhabited by communities who rely heavily on marine resources. Many scholars have convincingly argued that rigid ‘enforcement’ and ‘biophysical design’ approaches cannot by themselves create successful MPAs and social-economic barriers such as poverty need to be better integrated into management (Spalding et al. 2016; Brewer et al. 2012; Mascia, Claus, and Naidoo 2010; Pollnac et al. 2010; Charles and Wilson 2009; Cinner and Aswani 2007; Christie 2004; Christie et al. 2003; McClanahan 1999). Lastly, the author recognises that the proposed elements in this chapter are interconnected and interdependent. These elements could arguably be ordered in a number of ways; for example, placing sustainable financing under good governance and management. Nonetheless, the author asserts that the chapter presents a classification that will allow a robust analysis of Indonesia’s MPA policy arrangements.

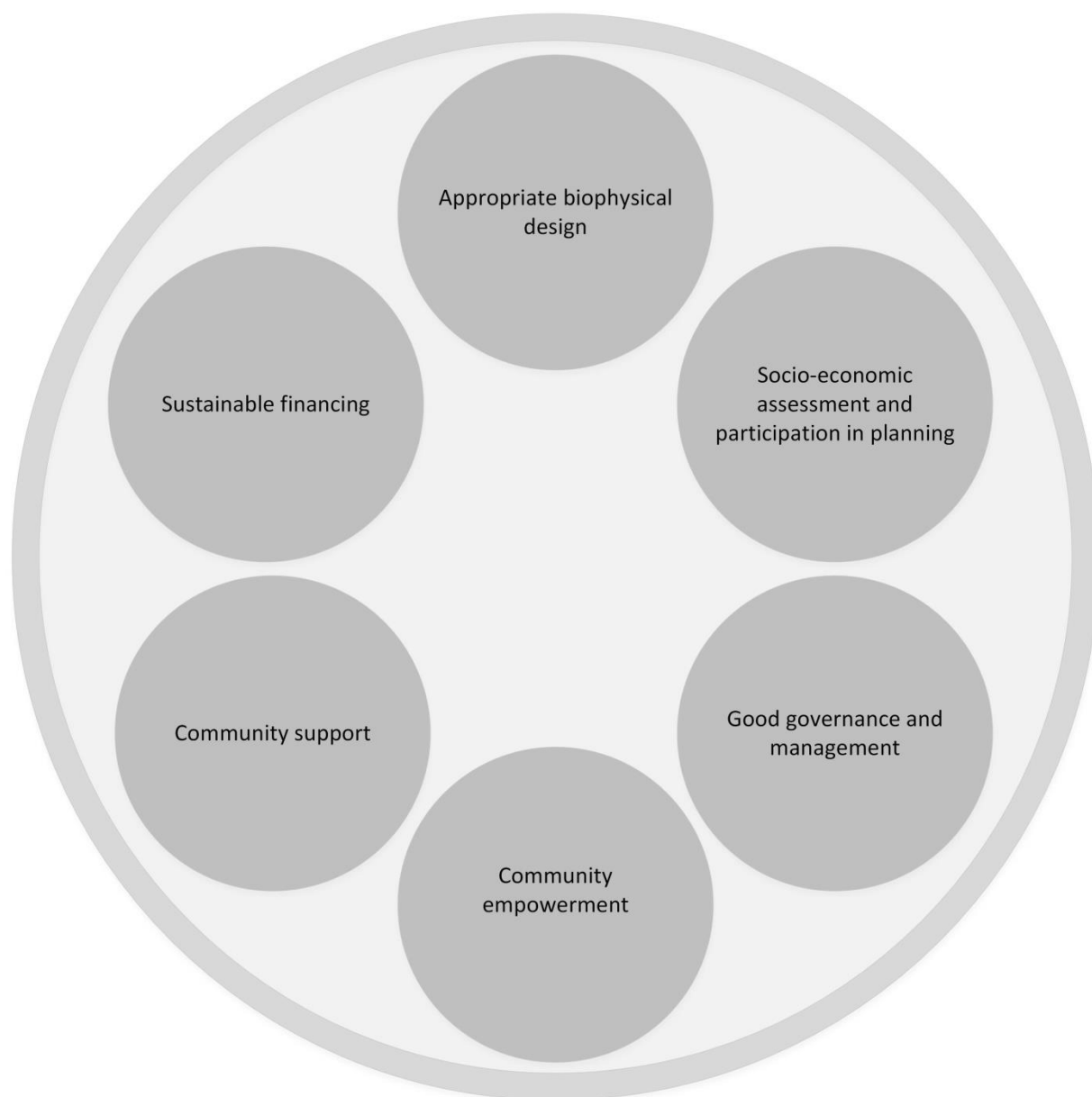


Figure 2.1 Design and management elements that should be incorporated into policy arrangements to improve Marine Protected Area performance in the Asia-Pacific region

2.1 Appropriate biophysical design

The preeminent biodiversity conservation goal of an MPA is to protect habitat, reduce species mortality and allow ecosystem processes to function. Typically, this goal is achieved by eliminating or at least reducing anthropogenic stressors from fishing and other activities. Research strongly supports this approach, showing that where extractive activities are prohibited (within no take zones or NTZs), a range of in-situ ecological benefits occur at the species (for example, increased densities, mean size, age and production of propagates) and ecosystem (diversity and biomass) levels (e.g., Wilson et al. 2011; Gaines, White, et al. 2010; Russ and Alcala 2010; Laffoley et al. 2008; Lubchenco et al. 2003; Boersma and Parrish 1999). These benefits have been observed in most regions of the world and for a broad range of habitats, including coral reefs (e.g., Babcock et al. 2010; Edgar, Barrett, and Stuart-Smith 2009; McClanahan and Graham 2005; Castilla 1999). Still, where MPAs are introduced in areas that are degraded, full ecosystem recovery, particularly for higher order species such as sharks, may take several decades (Russ and Alcala 2004).

In recent years, recognition of the interconnectedness of marine ecosystems has led to MPA theory shifting to a network approach (Green et al. 2011; Wood 2011; Laffoley et al. 2008). The IUCN defines an MPA network as ‘a collection of individual MPAs or reserves operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels that are designed to meet objectives that a single reserve cannot achieve’ (Laffoley et al. 2008, 12). These networks typically aim to protect all of the different habitats, as well as ecologically significant areas such as aggregation sites, within a defined ecological area (for example, an ecoregion) using a series of MPAs (with NTZs) (Wilson et al. 2011; Laffoley et al. 2008). If appropriately placed, these reserves can protect meta-populations connected through larvae dispersal and to a lesser extent adult movements. Scholars contend that this approach better protects the heterogeneity of marine ecosystems in a more politically feasible way (Botsford et al. 2009). Marine Protected Area networks can also build greater ecological resilience. If one of the reserves in the network is disturbed or a population significantly reduced (for example, from excessive fishing pressure) then larval dispersal from other MPA nodes can allow rapid recovery (Planes, Jones, and Thorrold 2009).

Academic debate on biophysical design predominately focuses on the most appropriate configuration for creating ecologically functioning MPA networks. Indeed, deficiencies in this aspect of design are commonly recognised as one of the leading factors for poor MPA performance (Spalding et al. 2016; Devillers et al. 2015; Edgar et al. 2014; Rife et al. 2013; Agardy, Notarbartolo di Sciara, and Christie 2011; Weeks, Russ, Alcala, et al. 2010). Table 2.1 summarises the design principles and configuration argued for by leading scholars. From this body of literature, there are some important considerations to note. First, MPA networks should be designed so that individual NTZs are larger than the home range of adult target species, making them both self-sustaining and net larvae exporters (Green et al. 2014). Second, the spacing between these reserves should be no-greater than the mean larvae dispersal distance of target species (Green et al. 2014; Laffoley et al. 2008). Third, NTZs should be replicated in each habitat type with the total area of these zones being dependent on the effectiveness of fisheries management regimes and the presence of ecologically significant features (such as threatened species) (Green et al. 2014). Lastly, spillover of adult fish stocks should be minimised through reducing edge effect (Green et al. 2014; Laffoley 2013; Gaines, White, et al. 2010).

Table 2.1 Recommended biophysical design considerations for Marine Protected Area networks

DESIGN CONSIDERATION	CONCEPT	DESIGN PRESCRIPTION
Protection of significant sites and species		<ul style="list-style-type: none"> • Protect unique and vulnerable habitat types • Protect foraging and breeding grounds • Protect source areas (e.g., nursery grounds) (Fernandes et al. 2012; Laffoley et al. 2008;)
Size of individual reserves	The size of an individual NTZ within an MPA network should be large enough to be self-sustaining and a net larvae exporter (that is, larger than the home range of target species) (Green et al. 2014).	<ul style="list-style-type: none"> • Tens of kilometres in longshore length, extending offshore to encompass depth-related movement of adults (Gaines, White, et al. 2010) • 10 to 20 km across at its minimum width (Laffoley et al. 2008) • 5 km longshore and 5 km offshore (Fernandes et al. 2012) • 5-20 km across (Green et al. 2014) • Sizes should vary (Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008)
Connectivity	The spacing of MPA NTZs should be less than the mean larval dispersal distance of target species (Laffoley 2013; Green et al. 2014). However, larval dispersal can vary significantly between and within species, which may allow flexibility in design (Jones et al. 2009).	<ul style="list-style-type: none"> • 10 to 20 km (Shanks, Grantham, and Carr 2003) • 1 to 20 km (Fernandes et al. 2012; Laffoley et al. 2008) • 1 to 15 km, with smaller reserves placed closer together (Green et al. 2014)
Spatial coverage	Much has been written about the level of MPA spatial coverage required to conserve marine biodiversity (Wood 2011). Broadly, these targets specify a certain level of percentage coverage of each habitat type.	<ul style="list-style-type: none"> • 20-30% NTZ (Bohnsack et al. 2002) • Up to 50% NTZ (Roberts et al. 2003) • 20-40% protection of each major habitat and physical environment type based on fishing pressure and the presence of a fisheries management regime (Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008) • Where MPAs are the only form of protection, the proportion of each major habitat type in NTZs should be over 30% (Green et al. 2014) • Where target species are threatened the spatial coverage should be greater (Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008) • Have sufficient replication to safeguard against catastrophic events and disturbances (Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008) • Choose sites that are more resilient to global environmental change (Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008) • Maintain the latitudinal and longitudinal gradient in habitats (Fernandes et al. 2012; Laffoley et al. 2008) • Place MPAs upstream of larval dispersal pathways (Fernandes et al. 2012; Laffoley et al. 2008)
Edge effect and spillover	MPA boundaries are often heavily fished and a source of vulnerability (Roberts et al. 2001). Spillover should be minimised through reducing edge effect (proportion of edge versus interior) (Green et al. 2014; Laffoley 2013; Gaines, White, et al. 2010).	<ul style="list-style-type: none"> • Reserves should be round or square in shape • Align the edge of each habitat with the MPA boundary (Laffoley et al. 2008)

2.2 Socio-economic assessment and participation in planning

The introduction of MPAs nearly always affects resource users. Some scholars have been quite critical of marine reserves for causing adverse cultural, economic, food security and political consequences (Agardy, Notarbartolo di Sciara, and Christie 2011; Mascia and Claus 2009; Gjertsen 2005; Christie 2004; Elliott et al. 2001). In contrast, other authors argue that local communities can actually benefit from MPAs through the provision of such things as increased fisheries production, employment, business opportunities, securing marine tenure and improved infrastructure (Ferraro, Hanauer, and Sims 2011; Gaines, Lester, et al. 2010; Botsford et al. 2009; Laffoley et al. 2008; Leisher, van Beukering, and Scherl 2007; Russ et al. 2004; Roberts et al. 2001). This is a complex debate, where impacts (positive or negative) depend on many contextual and institutional factors. Mascia, Claus, and Naidoo's (2010) paper synthesising all of the research on this topic provides a very reasonable conclusion to the debate, noting that MPAs are neither uniformly good nor bad for human wellbeing but rather their effects vary within and among social groups. Most importantly, research shows that negative social impacts can undermine MPA success (Agardy, Notarbartolo di Sciara, and Christie 2011; Kelleher and Recchia 1998).

To reduce potential negative social impacts, it is generally accepted that MPA planners need to thoroughly understand the social landscape and local resource use patterns (Laffoley et al. 2008; Cinner 2007). The IUCN guide on creating resilient MPA networks states that a 'full understanding of the costs and benefits of functioning coastal and marine ecosystems and resources is an important starting point for planning effective MPA networks' (Laffoley et al. 2008, 22). This view is supported by many scholars, who note that mitigating negative impacts and costs during planning can enhance conservation success (Voyer, Gladstone, and Goodall 2012; Adams, Pressey, and Naidoo 2010; Mascia, Claus, and Naidoo 2010; Schrekenberg et al. 2010; Mascia and Claus 2009; Polasky 2008).

With this in mind, an important question for practitioners is how to assess and mitigate social impacts. Over recent years, significant advances have been made in incorporating social, cultural and economic considerations into MPA planning (Kittinger et al. 2014; Halpern et al. 2013; Esteves, Franks, and Vanclay 2012; Ban, Adams, Almany, et al. 2011). Some scholars argue that formal integrated Social Impact Assessment (SIA) processes with participation

provide the best opportunity to predict, monitor and minimise social impacts (Mascia, Claus, and Naidoo 2010; Schreckenberget al. 2010). Certainly, SIAs have on occasions been used for this purpose in advanced economies (Voyer, Gladstone, and Goodall 2012). These assessments typically involve collecting information on economic conditions, as well as less tangible factors such as culture, history, tradition and ‘sense of place’ to identify possible impacts across stakeholder groups (Vanclay et al. 2015; Voyer, Gladstone, and Goodall 2012).

There are also numerous other approaches identified in the literature for integrating social-economic factors into systematic conservation planning (see Cabral, Mamauag, and Aliño 2015; Gurney et al. 2015; Kittinger et al. 2014; Halpern et al. 2013; Adams, Pressey, and Naidoo 2010). One of these approaches is using spatial prioritising tools such as Marxan and C-PLAN, which have emerged as a popular way of supporting MPA planning processes such as selecting reserve locations and defining zoning arrangements (McIntosh et al. 2016; Weeks and Jupiter 2013; Agardy et al. 2011). These software tools identify different MPA scenario configurations that meet predefined biological and social objectives (for example, no village will lose more than 20% of their fishing grounds) (Gurney et al. 2015; Agostini et al. 2012; Wilson et al. 2011; Weeks, Russ, Bucol, et al. 2010). Spatial prioritising tools are sometimes used in conjunction with SIAs (Fernandes et al. 2005), or as stand-alone planning processes (Gurney et al. 2015; Weeks and Jupiter 2013; Wilson et al. 2011; Weeks, Russ, Bucol, et al. 2010). However, the effectiveness of these tools to mitigate social impacts is poorly documented in the literature, with some scholars raising concerns about resource access equity issues among user groups (McIntosh et al. 2016; Gurney et al. 2015). Agardy et al. (2011) note that the effectiveness of spatial prioritising tools depends on the quality of data inputs.

Involving local communities and stakeholders in decision-making offers an alternative approach to formal expert-driven social assessment processes, where social impacts are mitigated through a process of negotiation rather than prediction (Voyer, Gladstone, and Goodall 2012). These approaches have been successful in building community support and achieving conservation outcomes, particularly in less developed regions (e.g., Walton, Gomei, and Di Carlo 2013; Voyer, Gladstone, and Goodall 2012; Kessler 2004; Christie and White 1997; Pomeroy 1995). They also allow the integration of local knowledge and ensure peoples’ rights over natural resources are respected (Kessler 2004). Walton, Gomei, and Di

Carlo (2013) note that ‘participatory engagement of stakeholders is perhaps the most important component of the planning and development of an MPA’. These processes can take many forms. In more developed countries, participation tends to occur through advisory committees, public hearings, meetings and panels (Kessler 2004). Using Participatory Rural Appraisal and Participatory Learning and Action approaches to support protected area design is common in the Asia-Pacific region (Schrekenberg et al. 2010; Govan et al. 2008; Christie and White 1997). More broadly, other participatory approaches such as Outcome Mapping, Participatory Community Mapping, Participatory Impact Pathways Analysis and Participatory Impact Assessment have been used to support natural resource management and development planning (Catley, Burns, and Suji 2013; Schrekenberg et al. 2010).

There are also potential issues associated with involving communities and other stakeholders in MPA planning processes. These include questions of equitable representation, tension among stakeholder groups, lack of consensus, delays in decision-making and increased expense (Kessler 2004; Pomeroy 1995). Indeed, Berkes (2004) reminds us that the notion of ‘community’ is a gloss for a complex multi-level social system with competing individuals and groups. The author goes on to conclude that ‘it is difficult to find a cohesive social group to work with in the field’ (Berkes 2004, 623). Resource-dependent community aspirations also typically centre on food security, economic development and cultural goals, which may not be consistent with biodiversity conservation outcomes (Benson 2012; Cinner 2007; Pomeroy et al. 2007). Nevertheless, there are some factors that can play a role in improving success. These include the community’s capacity and awareness of conservation; the transparency and equity of the planning process (among and within stakeholder groups); and the facilitator’s ability to build consensus (Steenbergen 2013; Walton, Gomei, and Di Carlo 2013; Kessler 2004). Finally, like many aspects of MPA practice, participatory processes should be tailored to fit the needs and opportunities of each site (Kessler 2004).

2.3 Good governance and management

The provision of good governance and management is intuitively important for achieving MPA success (Lockwood 2010). The IUCN defines governance as ‘the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken and how citizens or other stakeholders have their say’ (Borrini-Feyerabend et al. 2013, 11). Put another way, the concept of governance encompasses the social and institutional arrangements that oversee policies and decision-making for an MPA, determining who holds power and under what conditions (Borrini-Feyerabend et al. 2013). Management, in contrast, refers to the systems and actions that implement the policies and objectives as defined by the governance regime (Borrini-Feyerabend et al. 2013). A number of authors have tried to identify the principles of good protected area governance, which are summarised in Table 2.2 (Borrini-Feyerabend et al. 2013; Lockwood et al. 2012; Lockwood 2010; Lockwood et al. 2010; Graham, Amos, and Plumptre 2003). The IUCN guide on protected area governance notes that management capacity includes (i) the ability to achieve management objectives as planned and monitored; (ii) making efficient use of financial resources; and (iii) having skilled and competent staff (Borrini-Feyerabend et al. 2013).

For the Asia-Pacific region, there are several governance and management issues that are particularly important for MPA policy. The first of these issues is how to ensure that resource users comply with reserve regulations. A considerable body of research demonstrates that punitive sanctions (or enforcement) are an effective way, and indeed a necessary part, of achieving this outcome (e.g., Arias 2015; Bergseth, Russ, and Cinner 2015; Edgar et al. 2014; Mangubhai et al. 2011; Christie et al. 2009; Hilborn et al. 2006; Walmsley and White 2003; Bruner et al. 2001). However, the on-ground reality for many MPAs in the Asia-Pacific region is that conducting widespread surveillance and enforcement is too difficult and expensive. For this reason, management authorities need to explore ways of encouraging voluntary compliance. Conventional social economic theory explains that deterrence is in part due to the probability of detection and certainty of penalty compared with potential benefits gained from non-compliance (that is, illegal activity) (Sutinen and Kuperan 1999). Norms (for example, religious beliefs), moral obligations and social influences can also affect compliance behaviour (Arias 2015; Sutinen and Kuperan 1999). Research on this topic for MPAs has shown that voluntary compliance is influenced by a range of institutional and local

social-economic factors (Arias 2015; Arias et al. 2015; Pomeroy et al. 2015; Cinner, McClanahan, et al. 2012; Peterson and Stead 2011; McClanahan et al. 2006; Crawford et al. 2004; Pollnac, Crawford, and Gorospe 2001; Russ and Alcala 1999; Ostrom 1990). In particular, resource users are more likely to comply with regulations where they perceive these rules to be legitimate, fair (proportional), transparent and accountable (Pomeroy et al. 2015; Stern 2008; Sutinen and Kuperan 1999; Ostrom 1990). Moreover, there is evidence to suggest that simple management measures such as graduated sanctions, boundary markers (for example, buoys and signs) and community awareness may result in greater levels of compliance (Cinner, McClanahan, et al. 2012; Leisher, Mangubhai, et al. 2012; Walmsley and White 2003). The role of community empowerment and support is also critical (which are discussed below as separate elements).

For community-based MPAs, the seminal work of Ostrom (1990) provides general guidance on design principles that may lead to better compliance. These include clearly defined boundaries; rules that match local needs; resource users have the right to make, enforce, and change the rules; community rights over resources are respected by outside authorities; rules that are easily enforceable; graduated sanctions; the presence of low-cost conflict resolution mechanisms; and being nested within other institutions (Ostrom 1990). These design principles have been supported by a large number of empirical studies (Cox, Arnold and Villamayor-Tomás 2010). Other researchers have shown that compliance in community-based MPAs can also be influenced by population size, participation, settlement vicinity and food security (Pomeroy et al. 2015; Crawford et al. 2004; Pollnac, Crawford, and Gorospe 2001).

The next important issue for MPA governance in the Asia-Pacific region is implementing 'adaptive management', which is widely recognised as being a critical element of protected area success (Lockwood et al. 2012; Jentoft, Son, and Bjørkan 2007; Hockings et al. 2006). Protected areas exist in dynamic settings, where biophysical and socio-economic variables constantly evolve; managers must be flexible and able to respond (Lockwood et al. 2012; Hockings et al. 2006). Adaptive management can broadly be described as an iterative process of adaptive learning and decision-making, where goals and methods are altered as new information becomes available or social-ecological circumstances change (Ban, Adams, Almany, et al. 2011). To be effective, adaptive management requires clearly defined objectives, monitoring of progress toward these objectives, and management structures that

allow change (Ban, Adams, Almany, et al. 2011; Christie and White 2007; Gunderson 1999). Protected Area Management Effectiveness (PAME) tools should be used as part of the evaluation process (Hockings, Leverington, and Cook 2015; Leverington et al. 2010; Hockings and Phillips 1999). These tools are established protocols or methodologies that use a series of indicators¹⁰ to evaluate protected area effectiveness against predefined objectives or standards that usually focus on design, management systems (adequacy and appropriateness) and the delivery of management objectives (Hockings, Leverington, and Cook 2015). Implementing adaptive management also has some challenges. These include the potential for increased planning costs and the creation of uncertainty for some stakeholders, such as artisanal fishers concerned with losing access to fishing grounds or commercial resource users looking to invest in new equipment (Ban, Adams, Almany, et al. 2011).

The role of international non-government organisations (NGOs) is another governance issue of importance. In many instances, these organisations have played a vital role in catalysing, facilitating and even managing MPAs in the Asia-Pacific region (Gurney et al. 2016; Weeks et al. 2014; Weeks and Jupiter 2013; Fidelman et al. 2012; Djohani 2009). These efforts have largely been driven by international donor support worth tens of millions of dollars (Foale et al. 2013). The involvement of NGOs as implementers in development practice has steadily increased over the last thirty years (Lewis and Opoku-Mensah 2006; Fisher 1997; Edwards and Hulme 1996). However, there can be challenges associated with NGO involvement in MPAs, particularly around differing values and expectations, short-term funding cycles and dependency issues post-project withdrawal (Foale, Dyer, and Kinch 2016; McClanahan et al. 2015; Gurney et al. 2014; Kusumawati and Visser 2014; Weeks et al. 2014; Benson 2012; Keppel et al. 2012; Gray 2010; Foale 2001; McClanahan 1999). For example, Benson (2012) noted that NGOs working on marine conservation in Madang Lagoon (PNG) were focusing on short-term project outcomes such as MPA expansion, while local communities wanted better management of existing areas so that livelihood benefits could be realised. International NGOs have also been criticised by some scholars for the commoditisation of nature and overlooking broader structural drivers of inequity, particularly those policies predicated on neoliberal approaches to conservation (Büscher et al. 2012; Igoe and Brockington 2007). It is vital that NGOs providing technical and operational assistance to

¹⁰ PAME protocols can use both qualitative indicators such as subjective questions or quantitative variables (for example, wildlife population surveys). There are over 40 PAME tools in existence (Juffe-Bignoli et al. 2014).

MPAs carefully plan exit strategies and build local capacity (Gurney et al. 2014; Weeks et al. 2014). Baral, Stern, and Heinen (2007) suggest that at least a decade is required to build capacity and influence behavioural change among local people for conservation focused projects. International NGOs also need to operate with the same good governance principles as government agencies, ensuring accountability, participation, transparency and fairness.

Table 2.2 Summary of good governance principles for protected areas

KEY PRINCIPLES			SUMMARY OF POLICY IMPLICATIONS
Source	(Lockwood 2010)	(Borrini-Feyerabend et al. 2013)	
Principle	Legitimacy	Legitimacy and voice	<ul style="list-style-type: none"> • Governance institutions accepted by society as being legitimate, based on formal/informal statutes and broad community acceptance • All rights holders and stakeholders represented, provided with adequate information and have a role in decision-making • Power devolved to the lowest level at which it can be effectively exercised
	Inclusiveness		<ul style="list-style-type: none"> • Opportunities available for stakeholders to participate in and influence decision-making processes and actions
	Transparency		<ul style="list-style-type: none"> • Visibility in decision-making, including clearly communicating the reasons behind decisions • Relevant information about governance and performance is available
		Direction	<ul style="list-style-type: none"> • Consistent strategic vision with an adaptive management approach
	Accountability	Accountability	<ul style="list-style-type: none"> • Clear allocation and acceptance of responsibility for decisions and actions • Demonstration of whether and how these responsibilities have been met
	Capability	Performance	<ul style="list-style-type: none"> • Achieve management objectives as planned and monitored • Make efficient use of financial resources and promote sustainable financing • Skilled and competent staff (that is, technical, financial, managerial)
	Fairness	Fairness and rights	<ul style="list-style-type: none"> • Consistency and absence of personal bias in decision-making • Equitable sharing of the costs and benefits of establishing and managing protected areas • Respect for and active engagement with rights and stakeholders
	Integration		<ul style="list-style-type: none"> • Connection between and coordination across different levels and organisational components of governance • Alignment of priorities, plans and activities across governance organisations and scales
	Adaptability		<ul style="list-style-type: none"> • Incorporation of new knowledge and learning into decision-making and implementation • Anticipation and management of threats, opportunities and associated risks • Systematic reflection on individual, organisational and system performance

2.4 Community empowerment

Over the past 30 years, the self-organising capacity of communities to manage common pool resources is well-documented; with debate shifting from the question of efficacy to understanding how participation can be facilitated, adapted and supported to achieve fair and sustainable resource use (e.g., Gurney et al. 2016; Warren 2016; Steenbergen 2013; Brooks, Waylen and Borgerhoff Mulder 2012; Ostrom 2009; Berkes 2006; Ostrom et al. 1999). This trend has occurred for MPAs as well, where top-down approaches have increasingly given way to community involvement and empowerment strategies (Jones, Qiu, and De Santo 2013; Cinner, Daw, et al. 2012; Christie and White 1997; Pomeroy 1995). The paradigm shift has largely been driven by the poor performance of conventional MPAs and an acknowledgement that community participation results in more successful conservation outcomes (Campbell et al. 2013; Jones, Qiu, and De Santo 2013; MacNeil and Cinner 2013; Andrade and Rhodes 2012; McClanahan et al. 2006; Gjertsen 2005; Pollnac, Crawford and Gorospe 2001). Today, MPAs can be broadly classified into five overlapping governance models based on participation level:

- *Centrally managed.* These are government managed MPAs that have well-established legal frameworks and management agencies that have clearly defined objectives and obligations. This legal framework usually has specific provisions for stakeholder participation through formal mechanisms such as advisory committees. Centralised management was historically the most common model of MPA governance in colonial and post-colonial societies in the Asia-Pacific region (Christie and White 2007).
- *Private.* These MPAs are operated by non-government entities usually for the purpose of philanthropic conservation or supporting business operations (for example, dive resorts). Under such arrangements, the incumbent is often granted property rights over a particular area for a specified period. Typically, such reserves are independently managed but sometimes collaborate with public institutions and local communities.
- *Co-management.* This type of MPA is managed within a formal legislative framework similar to centralistic approaches, but incorporates formal (or informal) mechanisms devolving power to lower levels of government, NGOs, community organisations or

private entities (Kusumawati and Visser 2014; Cinner, Daw, et al. 2012; Berkes 2009; Carlsson and Berkes 2005; White, Courtney, and Salamanca 2002; Pomeroy and Berkes 1997). These mechanisms have included cooperative management agreements, management boards or advisory groups. The use of co-management governance arrangements has become popular in some countries, where they have been implemented on a national scale (for example, Philippines) (Gelcich et al. 2010; Béné et al. 2009; Cinner et al. 2009). However, co-management MPAs can be more expensive to manage than centralistic approaches, and the involvement of many players with sectoral and individual interests can convolute and complicate decision-making and implementation.

- *Traditional marine managed areas.* Historically, many coastal communities in the Asia-Pacific region were highly reliant on near-shore resources and had customary institutions to control use (Foale et al. 2011; Christie and White 2007; Johannes 1978). The majority of these systems have, however, been eroded over time due to the influence of centralistic governance arrangements, modern technology and the market economy (Pomeroy et al. 2007). Customary practices can still be found in some parts of Indonesia, Timor-Leste and the Philippines, as well as in much of the Pacific Islands (Adhuri 2013; McLeod, Szuster, and Salm 2009; Cinner 2005; Harkes and Novaczek 2002; McWilliam 2002; Ruttan 1998; Pannell 1997; Pomeroy 1995; Bailey and Zerner 1992). Advocates argue that customary management arrangements inherently possess design principles suited to effective MPAs, including demarcated boundaries, definitive use rights, mechanisms for conflict resolution and sanctions to induce compliance (Cinner 2007). For this reason, customary marine institutions have tended to be a target of community-based and co-management initiatives (Cinner et al. 2009). However, the effectiveness of these customary institutions in meeting conservation goals has been variable (Aswani et al. 2009; Cinner et al. 2006; McClanahan et al. 1997). Foale et al. (2011, 363) argue that traditional institutions can be the foundation of successful community-based arrangements, but ‘a critical understanding of their cognitive underpinnings is vital to facilitate their evolution into successful management tools in the modern context’.
- *Community-based management.* In recent years, a significant effort has been made to create, adapt and empower local institutions to manage marine resources; proponents argue that this approach can be a cost effective and successful conservation strategy

(Christie and White 2007; Pomeroy et al. 2007). Typically, this type of MPA is based on existing customary management institutions or newly created organisations such as local fishing cooperatives. Christie and White (2007, 1050) note that bottom-up approaches such as community-based management ‘represent an important means by which communities are able to reassert authority over resources upon which they depend’. External organisations such as government agencies or NGOs often play a catalytic role, ensuring consistency with wider legal and government policy objectives (Steenbergen 2013; Weeks and Jupiter 2013). However, establishing community-based initiatives can be a long and difficult process, particularly where customary institutions have eroded or are non-existent (Pomeroy 1995). Poorly designed and negotiated community-based arrangements can also be subject to elite capture issues (Steenbergen 2016; Warren and Visser 2016; Béné et al. 2009). Importantly, local socio-political relations and embedded cultural practices (decision-making and cooperative relations) should be considered in the design of community-based MPA arrangements (Steenbergen 2013; Foale et al. 2011; Blaikie 2006; Cleaver 2002). Cleaver (2002) advocates an adaptive approach of ‘institutional bricolage’, where institutions are constructed through a process of merging new arrangements with established practices and norms.

A flexible approach is needed for establishing MPA governance arrangements, where the level of participation should be adapted to the local context. MPAs located in areas with low populations and existent customary institutions, bottom-up approaches such as community-based MPAs will probably be most effective in achieving conservation outcomes (Brewer et al. 2012; Cinner, McClanahan, et al. 2012; Ostrom 2009; Muehlig-Hofmann 2007; McClanahan et al. 2006; Cinner 2005; Crawford et al. 2004; Johannes 2002; Agrawal 2001). Community-based MPAs, however, tend to be small, localised and fragmented (Weeks, Russ, Alcala, et al. 2010). The need to ‘scale up’ community-based MPAs to achieve ecological outcomes is widely recognised (e.g., Ban, Adams, Almany, et al. 2011; Weeks, Russ, Alcala, et al. 2010; Berkes 2006). Berkes (2006, 57) notes that community level management is important as a starting point, but cross-scale institutions are needed to bridge the hierarchic gap and provide nested institutional support for monitoring, assessment, and enforcement. In contrast, centralistic arrangements with consultation are generally better suited to places that have high population densities, numerous migrants, commercial threats, strong government institutions and no customary management arrangements (for example, adjacent to large cities). In between this social spectrum, co-management offers the best chance of MPA

success (Brewer et al. 2012; Ban, Adams, Almany, et al. 2011; Cinner and Aswani 2007; Aswani 2002).

2.5 Community support

Community support provides MPAs with a constituency that results in resource users being more likely to comply with reserve regulations (Bennett and Dearden 2014; Crawford et al. 2004). To build this community support, MPAs must provide a perceived benefit; effectively going beyond the 'do no harm' principle. This 'benefit' is typically achieved through recognition of intrinsic value or the provision of recreational opportunities in developed nations. In the Asia-Pacific region, where people are more reliant on coastal waters for food security and livelihoods, more tangible outputs are required. Indeed, Adams, Pressey, and Naidoo (2010) assert that conservation in developing countries requires more than a pre-occupation with minimising costs, but also a consideration of options for increasing incomes. Although the nexus between conservation and community benefits is poorly understood (Leisher, Mangubhai, et al. 2012; Leisher, Sanjayan, et al. 2012; Mascia and Claus 2009), recent research highlights three main ways that MPAs in the Asia-Pacific region can improve the social and economic conditions of local communities. These are enhanced fisheries outputs, employment opportunities and alternative livelihood programs. The local context will largely determine which of these strategies or series of strategies is appropriate for any given MPA.

Many scholars argue that well-designed and managed MPAs can benefit local communities by enhancing fisheries outputs through the export of larvae and spillover of adult fish to surrounding waters (Gaines, Lester, et al. 2010; Goni et al. 2010; Russ and Alcala 2010; Botsford et al. 2009; Haplern, Lester, and Kellner 2009; Laffoley et al. 2008; Leisher, van Beukering, and Scherl 2007; Abesamis, Russ, and Alcala 2006; Abesamis and Russ 2005; Russ et al. 2004; Roberts et al. 2001; McClanahan and Mangi 2000). The IUCN report on establishing resilient networks of marine reserves states that 'MPAs contribute to reducing poverty and increasing the quality of life of surrounding communities' (Laffoley et al. 2008, 3). The extent of spillover can range from tens of metres to hundreds of kilometres depending on the species and ecosystem (Gell and Roberts 2003). For coral reefs this distance may only be a few hundred metres (Abesamis, Russ, and Alcala 2006). Importantly, recent studies provide empirical evidence that fishers' catch per unit of effort can increase after the

introduction of an MPA (Goni et al. 2010; Mascia, Claus, and Naidoo 2010; McClanahan, Hicks, and Darling 2008; Russ et al. 2004; Roberts et al. 2001). To maximise this spillover benefit, the literature offers a number of design considerations. First, the reserve must be large enough to cover the home range of target species, which will result in spillover occurring through displacement rather than by draining the reserve's abundance (Varkey, Ainsworth, and Pitcher 2012). Second, spillover is more likely to occur when the immediate surrounding waters are relatively homogenous (Abesamis, Russ, and Alcala 2006). This means spillover can be maximised by partially covering habitats (Fernandes et al. 2012). Lastly, NTZs should be designed in a shape that maximises edge per volume ratio (Fernandes et al. 2012).

The second way that MPAs can benefit local communities is through employment. Often Asian-Pacific MPAs are designated in places that are remote and have limited salaried employment opportunities. An MPA can create jobs directly with the management authority or indirectly from industries that rely on conservation (for example, tourism and recreation). The contribution of protected areas to local economies from tourism is well documented (Leisher, Sanjayan, et al. 2012; Leisher, van Beukering, and Scherl 2007; Eagles, McCool, and Haynes 2002; Driml and Common 1995). For example, it is estimated that the Great Barrier Reef provides \$AU 7 billion to the Australian economy annually and sustains 69,000 jobs (Deloitte Access Economics 2013). Still, research that specifically focuses on resource-dependent communities and the extent to which they integrate into 'new' conservation focused economies is limited. Some authors have documented that opportunities from tourism in remote and poorly developed areas are often captured by elites who have greater access to financial capital, political power and human capacity (Bennett and Dearden 2014; Tumusiime and Vedeld 2012; Shah and Gupta 2000; Goodwin et al. 1998). If the full benefit of MPA tourism is to be spread equitably across the social spectrum, management agencies may need to consider implementing interventions such as targeted capacity-building training, micro-financing schemes and mandated employment quotas (Walpole and Goodwin 2001; Shah and Gupta 2000; Goodwin et al. 1998).

The final strategy for MPAs to benefit local communities is through livelihood or alternative income programs. These programs typically try to create an incentive for people to move away from fishing to more environmentally sustainable sources of income (Campbell 2008). Although such programs are widely supported (Foale et al. 2013; Muallil, Cleland, and Aliño

2013; Gjertsen 2005; Allison and Ellis 2001), they have had varied success (Ferrol-Schulte et al. 2013; Muallil, Cleland, and Aliño 2013; Hill et al. 2012; Gjertsen 2005; Sievanen et al. 2005; Pollnac, Crawford, and Gorospe 2001). Failure is commonly associated with local socio-economic factors such as debt, gender, food preferences or cultural constraints not adequately being considered (MacNeil and Cinner 2013; Johnson et al. 2012; Muallil et al. 2011; Pollnac, Crawford, and Gorospe 2001). Muallil et al. (2011) found in their Philippines study that even when offered relatively high monetary incentives, some fishers didn't want to exit the industry because it represented an important way of life. Moreover, poor households may not have the capacity, skills or experimental space (ability to endure risk) to attempt new livelihood strategies (Barrett et al. 2006). The existence of corruption, stakeholder conflict and weak institutional structures can also hinder success (Stanford et al. 2013; Barrett et al. 2006). Despite these challenges, recent research suggests that fishers who have an income from a diversity of sources are more willing to dampen their fishing effort (Daw et al. 2012; Cinner, Daw, and McClanahan 2009; Stern 2008). Where alternative income programmes are designed carefully and consider local socio-economic factors they are more likely to be successful (Campbell et al. 2013; Silva 2006; Pollnac, Crawford, and Gorospe 2001). This strategy for benefitting local communities is better suited to co-managed or centrally managed MPAs that experience market integration.

2.6 Sustainable financing

All marine reserves, be they predicated on top-down or bottom-up approaches, require funding for design and management. Unfortunately, studies show that there is a considerable funding deficit for MPAs across the planet (McCarthy et al. 2012; Mora and Sale 2011; Gravestock, Roberts, and Bailey 2008; Emerton, Bishop, and Thomas 2006; Balmford et al. 2004; Balmford and Whitten 2003). This gap is most severe in developing countries and on the high seas (Emerton, Bishop, and Thomas 2006). Moreover, Balmford et al. (2004) predict that the cost of placing 20-30% of the world's oceans under strict protection would be between \$US 5 and 19 billion annually, which is an increase on current spending of around two orders of magnitude.

The issue of how to meet this funding shortfall, or as it is broadly referred to 'sustainable financing', is discussed extensively in the literature. The IUCN defines sustainable financing

as ‘the ability to secure sufficient, stable and long-term financial resources, and to allocate them in a timely manner and in an appropriate form, to cover the full costs of protected areas and to ensure that protected areas are managed effectively and efficiently with respect to conservation and other objectives’ (Emerton, Bishop, and Thomas 2006, 15). The same report quite rightly notes that sustainable financing is not just about sourcing funds but also expenditure and offers a list of elements for achieving these outcomes (Emerton, Bishop, and Thomas 2006, 16):

- taking a comprehensive view of costs and benefits to deal with externalities¹¹;
- building a diverse, stable and secure funding portfolio;
- improving financial administration and effectiveness;
- creating an enabling financial and economic framework (including overcoming market, price and policy distortions that undermine protected areas); and
- mainstreaming and building capacity to use financial tools and mechanisms.

Across these elements, there are a number of sustainable financing approaches and strategies (outside government budget allocations) that are especially relevant for MPA policy in the Asia-Pacific region.

First of all, significant efficiency gains can be achieved by considering MPA management costs at the start of the design process (Adams, Pressey, and Naidoo 2010; Naidoo et al. 2006; Ferraro 2003). McClanahan (1999) argues that MPAs should be developed primarily around a system to finance them, focusing less on biophysical considerations and more on economic sustainability. Indeed, it is possible for planners (and communities) to locate, adapt and configure MPAs to minimise long-term management costs (Ban, Adams, Pressey, et al. 2011). Interestingly, a number of studies have examined MPA cost correlations. These show that the cost of establishing an MPA is associated with its size and the duration of the planning process (McCrea-Strub et al. 2011). In contrast, the cost of management depends on reserve size (per unit management cost decreases as a reserve becomes larger), accessibility and management objectives (Bruner, Gullison, and Balmford 2004; Balmford et al. 2004). MPAs that are closer to the coast with higher population densities are also typically more expensive to manage (Balmford et al. 2004). Published research on the relationship between governance models (as outlined in the community empowerment section of this chapter) and management costs is limited.

¹¹ A comprehensive view of costs and benefits ensures that those who bear the costs are recognised and adequately compensated, and those who benefit make a fair contribution to management.

The second sustainable financing strategy relevant to the Asia-Pacific region is the use of market-based charges (Emerton, Bishop, and Thomas 2006). Up to now, tourism and recreational activities are the most commonly used market-based financing mechanism in the region, where funds are typically collected through entry fees, indirect taxes (for example, a proportion of tax from local or national authorities), licencing of tour operators and the leasing of commercial facilities (Bos, Pressey, and Stoeckl 2015; Emerton, Bishop, and Thomas 2006; Spergel and Moye 2004). Other relevant market-based approaches include the direct sale of products (for example, commercial or recreational licences) and payment for environmental services (PES) (Bos, Pressey, and Stoeckl 2015; Emerton, Bishop, and Thomas 2006). The aim of PES schemes is to recognise the true value of the goods and services provided by protected areas and make the beneficiaries pay. So far, the vast majority of PES schemes have focused on terrestrial landscapes (Emerton, Kyin, and Tizard 2015), but there is a growing level of interest in the marine realm. 'Blue Carbon' initiatives are a notable example of this, which involve carbon polluting entities paying for the restoration and protection of mangrove forests and marine habitats through credit schemes or other mechanisms (Bos, Pressey, and Stoeckl 2015; Mohammed 2012; McLeod et al. 2011). The commoditisation of nature through market-based mechanisms has not been without its critics (for example, Fletcher et al. 2016; Brockington and Duffy 2010). Evidence suggests however that if adapted to the local context and integrated with other conservation measures, successful outcomes can be achieved (Scullion et al. 2011; Ulber et al. 2011).

The next sustainable financing mechanism is 'trust funds', which has been advocated for in the literature as a way of meeting recurrent long-term conservation funding needs (e.g., Bladon, Mohammed, and Milner-Gulland 2014; CFA 2013; Spergel and Moye 2004; Balmford and Whitten 2003). Although taking many forms, trust funds are commonly independent institutions (trustees) that are designed to hold and invest funds (including from user fees, donations and income for PES schemes) before allocating them for targeted activities (Bladon, Mohammed, and Milner-Gulland 2014). Three types of trust funds are common: 'endowment funds' spend only income while attempting to maintain or enhance the underlining capital; 'sinking funds' liquidate all of their assets over a specified period; and 'revolving funds' are designed to receive regular replenishments (Emerton, Bishop, and Thomas 2006, 34). Of these, only the endowment fund is truly a long-term sustainable revenue-generating mechanism. Globally, there are over 70 conservation focused trust funds

that exist (Bladon, Mohammed, and Milner-Gulland 2014). Although complex, the literature offers a number of conditions that can enhance trust fund success. These include having a long-term and clear commitment to addressing the issue, active government support, stakeholder participation, basic system of legal and financial practices and a diverse financing base (that is, reduced reliance on donor support) (Bladon, Mohammed, and Milner-Gulland 2014; Spergel and Mikitin 2008; GEF 1998).

Other sustainable financing approaches that can be applied in the Asia Pacific region include biodiversity offsets, privately owned MPAs, donor funding and the removal of perverse subsidies. Biodiversity offsets are a widely used instrument, where developers or other entities provide compensation for unavoidable damage usually through rehabilitating or conserving an equivalent area of habitat (Bos, Pressey, and Stoeckl 2015; Emerton, Kyin, and Tizard 2015). Privately owned protected areas involve for-profit businesses or non-government organisations setting aside an area of land or water for conservation (Stolton, Redford, and Dudley 2014). In the marine realm, this is usually associated with dive tourism (Brunnschweiler 2010; Teh, Teh, and Chung 2008). Philanthropic or charitable donations have supported many marine conservation programs in the Asia-Pacific region. Lastly, the removal of perverse subsidies involves redirecting government assistance to fisheries, agricultural and other extractive sectors towards more sustainable enterprises (Bos, Pressey, and Stoeckl 2015). Bos, Pressey, and Stoeckl (2015, 119) note that even if a portion of the \$US 25 billion per year of fisheries subsidies were redirected, there would be sufficient capital to address marine ecosystem degradation. Interestingly, MPAs provide an annual beneficial fisheries subsidy of US\$ 870 million globally (Cullis-Suzuki and Pauly 2010).

As can be seen, there are a range of sustainable financing mechanisms available to enhance the effectiveness of MPAs in the Asia-Pacific region. It is important that these mechanisms be considered early in the planning process and their application adapted to the context (Bos, Pressey, and Stoeckl 2015; Esteves, Franks, and Vanclay 2012). For example, user fees may provide a considerable stream of revenue in higher population areas, while the licencing of sustainable use permits or participating in PES schemes may prove to be a better option for more remote community-based MPAs. Above all, it is vital that the implementation of these strategies be accountable, minimise environmental impacts (for example from the construction of infrastructure) and ensure funds are used to augment government budgets (not replace) and support conservation activities.

2.7 Conclusions

There is no easy pathway for designing and managing successful MPAs in the Asia-Pacific region. However, it is hoped that the six policy elements proposed in this chapter will provide a tangible framework based on contemporary theory and practice for improving MPA performance. Importantly, these policy elements should be applied flexibly and adapted to local circumstances.

The biophysical design of an MPA underpins conservation success and provides the foundation to apply socio-economic and institutional considerations. The design process should begin with a comprehensive biological and socio-economic assessment, which includes identifying and mitigating social impacts. The process should also have extensive community engagement and, where appropriate, the genuine devolution of decision-making power. From an institutional perspective, factors such as sustainable financing, governance framework, community empowerment and mechanisms to provide tangible benefits to local communities must be considered. Finding the right formula based on these design factors will give an MPA the best chance of success. For example, in remote locations with low population pressure, community-based approaches that focus on providing socio-economic benefits through improved fisheries management or PES schemes will probably be the most appropriate option. In contrast, places that have higher population densities and stronger market integration will be better suited to co-management or centrally managed MPAs. In some cases, biological design considerations may need to be compromised to ensure MPAs are able to build community support. For example, access to ecosystems that have a high biomass yield such as upwellings or areas of terrestrial nutrient input could remain open for sustainable exploitation to support local livelihoods (despite reducing overall ecosystem representativeness protected within an MPA) (Birkeland 1997). There will also be some places where the magnitude of social or political constraints means that other resource management initiatives will be more appropriate to achieve sustainable management of marine resources (Spalding et al. 2016).

The management of an MPA should follow the principles of good governance. Encouraging voluntary compliance is a major challenge in the region. To overcome this issue, managers should implement strategies that seek to address socio-economic barriers from the outset and

ensure that MPAs are perceived to be legitimate, fair and transparent by local communities. Empowering stakeholders and local communities to participate in decision-making, as well as building support through the provision of tangible benefits, will contribute to achieving these outcomes. Social benefits can be provided through strategies such as enhancing fisheries outputs, provision of employment opportunities and the implementation of alternative livelihood programs. It is also important that planning is done with an adaptive management framework and sustainable financing strategies implemented.

Chapter 3 – Indonesia’s Marine Protected Area Policy Seascape

The Indonesian Archipelago has a long history of marine resource management and use. Customary practices associated with coastal resource management have been present for many centuries in the region, especially where local communities relied heavily on near-shore resources (Christie and White 2007). The Dutch colonial administration introduced the first formal marine reserves in the country (for example, Palau Pombo reserve in Maluku) (Djohani 2009). From the 1970s, Indonesia followed the global trend of creating ‘centralist’ protected areas with a primary purpose of conserving biodiversity. However, with the fall of President Suharto’s authoritarian administration in the late 1990s, significant legislative and institutional change ensued, in particular focused on decentralisation policies under which regional governments were granted greater control over natural resources (Wiadnya et al. 2011). In recent years, there has been a concerted effort to revive or reinvigorate customary institutions with numerous community-based MPAs being created around the country (Yulianto et al. 2013; Glaser et al. 2010). This evolution has led to a proliferation of legislative, institutional and policy arrangements that today govern Indonesia’s MPAs.

In this chapter of the thesis, Indonesia's key MPA policy arrangements are examined. The chapter starts out by providing a brief overview of these arrangements and then analyses how they reflect contemporary MPA theory as outlined in Chapter 2. It also identifies policy needs and opportunities for improving MPA performance.

3.1 Indonesia’s Marine Protected Area policy – at a glance

The legal basis for Indonesia’s MPAs comes from national laws and government regulations, which are supported by a range of institutional policies and reports. These instruments can be conceptualised and categorised in terms of being a 'core'¹² or 'soft' policy instrument (Blomqvist 2016). Core policies are those that the government must (by regulation or conviction) implement, while soft policies are used for guidance without statutory

¹² Blomqvist (2016) uses the nomenclature ‘hard’ and ‘soft’ to categorise policy instruments. Within the thesis the term ‘hard’ is substituted with ‘core’ to allow greater readability and reflect the notion that these policies are typically of greater importance to governments.

compulsion¹³ (Blomqvist 2016) (see Figure 3.1). In the thesis, English translations of statute and policy names are used. The original Indonesian nomenclature is included as footnotes to ensure accuracy.

3.1.1 National Marine Protected Area legislation

There are three primary pieces of national legislation that govern Indonesia's MPAs:

- **National Law No. 5/1990 on the Conservation of Biological Resources and their Ecosystems**¹⁴ (CBRE Law). This national law was the country's first legislation to specifically address marine conservation. It established basic principles for managing and using biological resources, natural habitats and protected areas, and created the two protected area categories of Nature Reserve Area (*Kawasan Suaka Alam*) and Nature Sustainable-Use Area (*Kawasan Pelestarian*) (Dirhamsyah 2006). Government Regulation 68/1998¹⁵ (hereafter PP No. 68/1998) further divided these two categories into eight types of protected areas¹⁶, which can be declared over land, sea or both. The Ministry of Forestry has jurisdictional responsibility for MPAs under the CBRE Law. However, a process has commenced to transfer marine areas designated under this law to the Ministry of Marine Affairs and Fisheries (MMAF). For this reason, the thesis focuses on the following two pieces of legislation.
- **National Law on Fisheries 31/2004**¹⁷ (later revised by National Law 45/2009). This legislation superseded National Law 9/1985 and was the first major law to influence the then newly created MMAF. The law gives the Ministry responsibility for fisheries management, which includes the protection of marine species and designation of MPAs (Waddell 2009; Patlis 2008). Three years later, the law was operationalised by *Government Regulation 60/2007 on the Conservation of Fish Resources*¹⁸ (PP No.

¹³Although the distinction between core and soft policies can sometimes be blurred, using these categories to analyse policy instruments can allow a deeper understanding of governance arrangements, including the extent to which specific policies will be implemented (Blomqvist 2016).

¹⁴ *Undang Undang Republik Indonesia Nomor 5 Tahun 1990 Tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya*

¹⁵ *Peraturan Pemerintah Republik Indonesia Nomor 68 Tahun 1998 Tentang Kawasan Suaka Alam dan Kawasan Pelestarian Alam*

¹⁶ Nature Reserve Areas can be designated as Nature Reserves (*Cagar Alam*) and Wildlife Reserves (*Suaka Margasatwa*). Nature Sustainable-Use Areas can be designated as National Parks (*Taman Nasional*), Grand Forest Parks (*Taman Hutan Raya*) and 'Nature Recreational Parks' (*Taman Wisata Alam*).

¹⁷ *Undang Undang Republik Indonesia Nomer 31 Tahun 2004 Tentang Perikanan*

¹⁸ *Peraturan Pemerintah Republik Indonesia Nomor 60 Tahun 2007 Tentang Konservasi Sumber Daya Ikan*

60/2007) (Syarif 2012). There are also a number of other ministerial regulations that guide the design and management of MPAs under this Law, including the *Ministerial Regulation on Management and Zoning Plans of Marine Protected Areas*¹⁹ (PERMEN-KP No. 30/2010) (which is a follow up of Article 17 of PP No. 60/2007) and *Ministerial Regulation on the Procedures for Determining a Marine Protected Area*²⁰ (PERMEN-KP No. 2/2009). *The National Law on Fisheries* and subordinate regulations create four types of MPAs: (i) Marine National Park (*Taman Nasional Perairan*), (ii) Marine Tourist Park (*Taman Wisata Perairan*), (iii) Marine Nature Reserve (*Suaka Alam Perairan*) and (iv) Fisheries Reserves (*Suaka Perikanan*). Jurisdictional responsibility for these MPAs aligns with the sea delimitations set by the *National Law on Regional Government 23/2014*²¹; except for Marine National Parks, inter-provincial reserves, areas of national strategic value (for example, defence) and conservation areas of national significance (for example, World Heritage sites), which are all managed centrally by MMAF (PP No. 60/2007, Article 16).

- ***National Law No. 27/2007 on Management of the Coastal Zone and Small Islands***²² (MCZSI Law) (later amended by National Law No. 1/2014) is the final piece of national legislation influencing MPAs. This law aims to ensure the sustainable use of Indonesia's coastal resources through cross-jurisdictional coastal spatial planning (Wiadnya et al. 2011). The law applies to coastal waters within 12 nautical miles of the shoreline and islands equal to or smaller than 2000 km² (MCZSI Law, Article 1). The *Ministerial Regulation on Conservation Areas in the Coastal Zone and Small Islands*²³ (PERMEN-KP 17/2008) contains more information on the designation and management of MPAs under this legislation. These statutes allow for the creation of four types of MPAs: Coastal and Small Island Conservation Areas (*Kawasan Konservasi Pesisir dan Pulau-Pulau Kecil*) (KKP3K), Maritime Conservation Area (*Kawasan Konservasi Maritim*) (KKM), Marine Conservation Area (*Kawasan Konservasi Perairan*) and Beach Area (*Sempadan Pantai*). Management responsibility of MPAs under the *MCZSI Law* also

¹⁹ *Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor Per.30/MEN/2010 Tentang Rencana Pengelolaan dan Zonasi Kawasan Konservasi Perairan*

²⁰ *Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor Per.02/MEN/2009 Tentang Tata Cara Penetapan Kawasan Konservasi Perairan*

²¹ National Law No. 23/2014 (*Undang Undang Republik Indonesia Nomor 23 Tahun 2014 Tentang Pemerintah Daerah*) designates that coastal waters from the shoreline to 12 nautical miles are the jurisdictional responsibility of provincial governments. The country's remaining marine territory is the responsibility of the national government.

²² *Undang Undang Replublik Indonesia Nomor 27 Tahun 2007 Tentang Pengelolaan Wilayah Pesisir dan Palau-Palau Kecil*

²³ *Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor PER.17/MEN/2008 Tentang Kawasan Konservasi di Wilayah Pesisir dan Pulau Pulau Kecil*

aligns with the jurisdictional sea delimitations set by the *National Law on Regional Government 23/2014*. Analysis in the thesis predominately focuses on KKP3K and KKM marine reserves. The reason for this is that limited information within policy documents exists on the other two types of MPAs. The above mentioned ministerial regulation states that a specific directive will be promulgated for Marine Conservation and Beach Area MPAs (PERMEN-KP No. 17/2008, Article 4); however, this has yet to be issued.

3.1.2 Key Institutional core-policies

Ministerial regulations or decrees promulgated by relevant government agencies constitute the second tier of Indonesia's MPA policy arrangements. Although not as strong as national laws, these instruments are still core MPA policies and should be adhered to by government authorities. As mentioned above, the thesis will predominately focus on MMAF ministerial regulations and decrees (as the country's lead agency for conserving marine biodiversity and managing MPAs). Below is a summary of key ministerial regulations and policy documents regarding MPAs:

- **National MPA coverage target.** As a signatory to the Convention on Biological Diversity, Indonesia has acceded to the 10% MPA global coverage by 2020 target set out in the convention's *Strategic Plan for Biodiversity* (CBD Secretariat 2016). The government has also committed to create 20 million hectares of MPAs by 2020 (DJKPPPK 2012).
- **The MMAF Strategic Plan (2015-2019)²⁴.** This strategic plan is the central guiding document for the ministry's activities. It follows the country's vision as defined by *The Medium Term Development Plan*²⁵. The plan states that the vision of the Ministry is to achieve a marine and fisheries sector that is independent, progressive and based on the national interest (KKP 2015b, 18). The plan's mission, purpose, strategic goals and key performance indicators overwhelmingly focus on economic and industry development (for example, increasing capture fisheries output), while only having limited references to

²⁴ Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 25/PERMEN-KP/2015 Tentang Rencana Strategis Kementerian Kelautan dan Perikanan Tahun 2015-2019

²⁵ Rencana Pembangunan Jangka Menengah Nasional 2015-2019

MPAs. Specific MPA focused targets to be achieved by 2020 include (KKP 2015b, p. 73-74):

- increasing MPA coverage to 20 million hectares (in line with the above mentioned national target);
 - adding 3.5 million hectares of marine reserve;
 - improving management effectiveness in 126 MPAs;
 - improving household income for the local communities of 110 MPAs;
 - creating 50 partnerships to support effective MPA management; and
 - effectiveness monitoring conducted in 180 MPAs.
-
- **Ministerial Regulation on Marine Conservation Area Networks²⁶** (PERMEN-KP No. 13/2014). This short ministerial regulation outlines the process for grouping existing conservation areas into MPA networks, which is defined as two or more marine reserves that cooperate on management within a particular area of shared biophysical features (Article 3). The regulation implements Article 19 of PP No. 60/2007.

 - **Technical Guidelines for Evaluating the Management Effectiveness of Aquatic, Coasts and Small Island Conservation Areas²⁷** (hereafter ‘Technical Guidelines for Evaluating MPA Effectiveness’). Promulgated by the Director General of Marine, Coasts and Small Islands, this decree supports the management of MPAs under both the *National Law on Fisheries* and *MCZSI Law*. The statute is a procedural guide for evaluating and classifying the effectiveness of MPAs through answering a series of questions on different aspects of management.

²⁶ *Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 13 PERMEN – KP/2014 Tentang Jejaring Kawasan Konservasi Perairan*

²⁷ *Keputusan Direktur Jenderal Kelautan, Pesisir dan Pulau-Pulau Kecil Nomor KEP.44/KP3K/2012 Tentang Pedoman Teknis Evaluasi Efektivitas Pengelolaan Kawasan Konservasi Perairan, Pesisir dan Pulau-Pulau Kecil (E-KKP3K)*

3.1.3 Other policy documents

The final category of Indonesian MPA policies exist largely outside formal legislative or ministerial statutes:

- **The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF).** This initiative is a 2009 non-binding intergovernmental agreement between Indonesia, Malaysia, Timor Leste, Papua New Guinea, Philippines and the Solomon Islands. The aim of CTI-CFF is to address marine and coastal environmental degradation and overcome the shared challenges of conserving biodiversity, creating sustainable fisheries and safe-guarding food supplies (Foale et al. 2013; George and Hussin 2010). The signatories' aspirations are contained in a Regional Plan of Action (RPoA), which has the overarching goals of (1) priority seascapes designed and effectively managed; (2) ecosystem approach to management of fisheries and other marine resources fully applied; (3) MPAs established and effectively managed; (4) climate change adaptation measures achieved; and (5) threatened species status improving (CTI-CFF 2009b). In the same month the initiative was signed, Indonesia's CTI Secretariat²⁸ finalised the country's National Plan of Action (NPoA) (CTI-CFF 2009a). This plan articulates how Indonesia will achieve the five RPoA goals.
- **Geographic Priorities for Marine Biodiversity Conservation in Indonesia** (Huffard, Erdmann, and Gunawan 2012). Jointly produced by MMAF and the *Marine Protected Area Governance Program* funded by USAID, this document prioritises suitable areas for future MPAs in support of the government's MPA spatial coverage target. Prioritisation occurred through a gap analysis and a series of expert workshops.
- **Development Strategy for Marine Protected Area Networks in Indonesia**²⁹ (DKKJI 2013). Produced by MMAF, this policy provides guidance on the formation and management of MPA networks.

²⁸ Indonesia's CTI secretariat is under the guidance of a national coordinating committee, which comprises of representatives from MMAF, the Ministry of Forestry, NGOs and academia.

²⁹ *Strategi Pengembangan Jejaring Kawasan Konservasi Perairan di Indonesia*

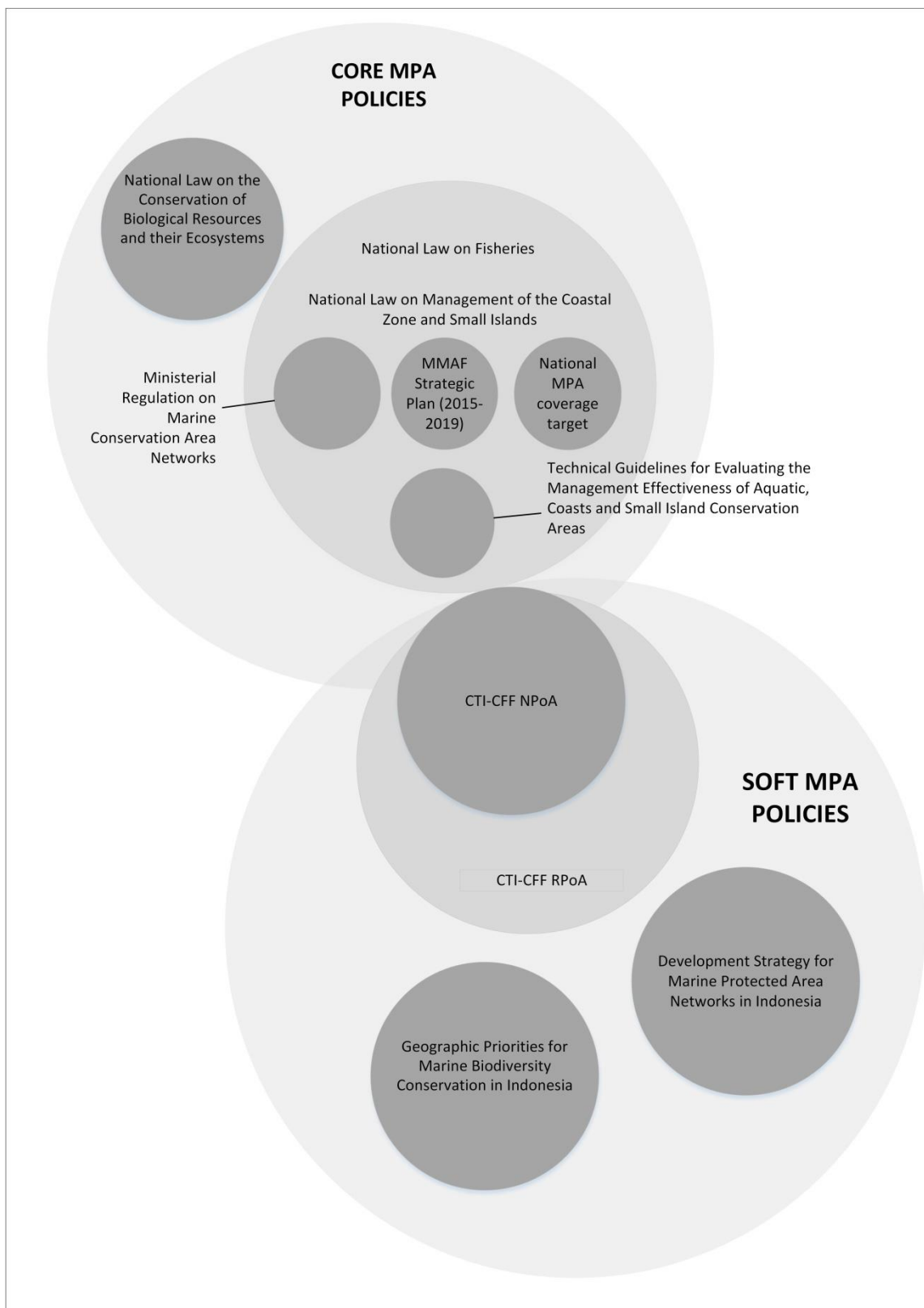


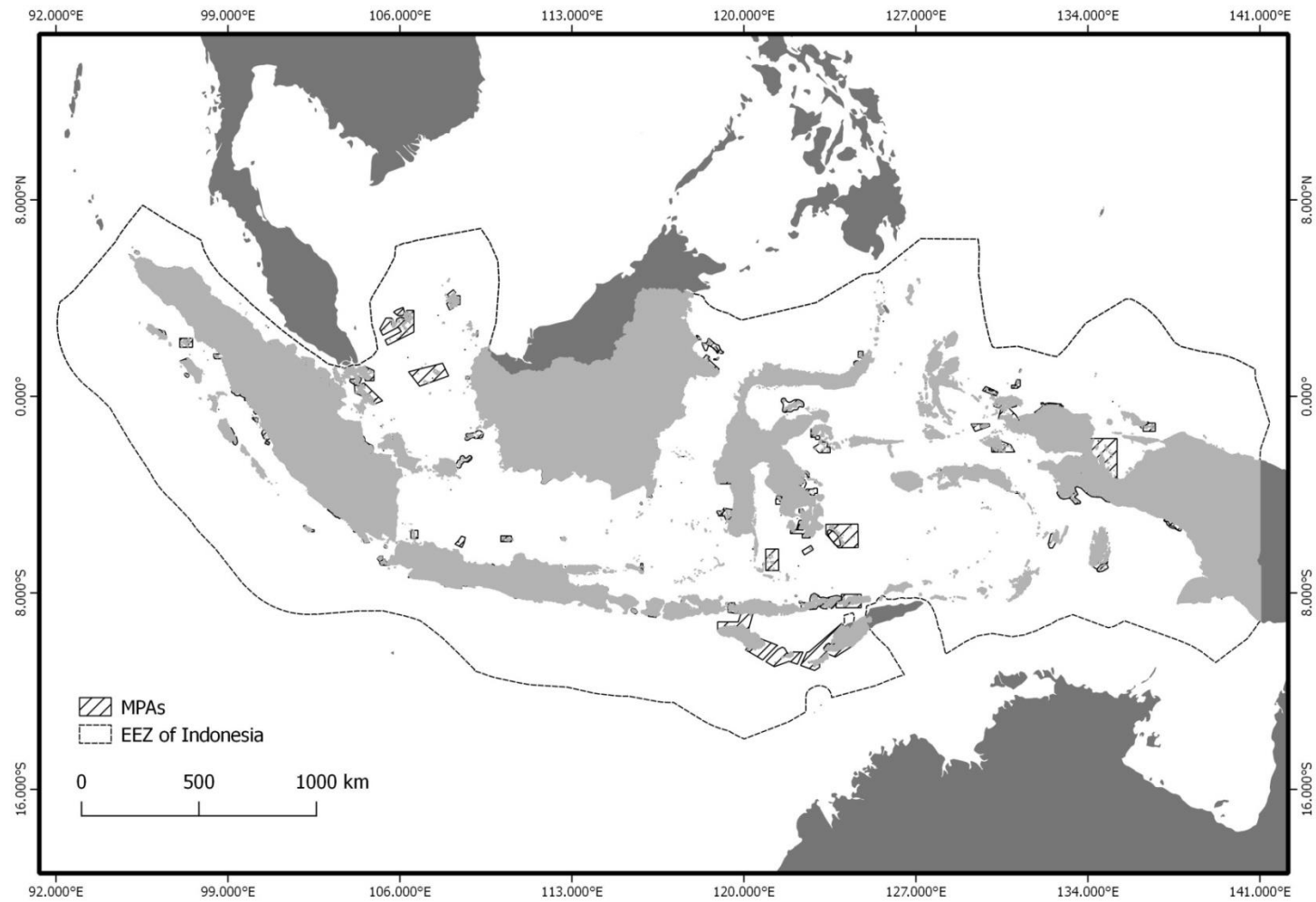
Figure 3.1 Indonesian Marine Protected Area policy arrangements. Core policy documents are legislative or ministerial statutes, whereas soft policies do not have a legal status but are used to guide government actions. CTI-CFF NPOA = Coral Triangle Initiative National Plan of Action. CTI-CFF RPOA = Regional Plan of Action. National Target = National Government’s target of creating 20 million hectares of MPA estate by 2020.

3.2 Analysis of Indonesia's Marine Protected Area policy against contemporary theory

At the end of 2016, Indonesia's MPA coverage extended over 17 million hectares (KKP 2016). Management responsibility for these reserves is shared between the Ministry of Forestry (27%), MMAF (31%) and regional governments (42%) (see Map 3.1 and Table 3.1) (KKP 2016). As mentioned above, a process is underway to transfer the Ministry of Forestry MPAs to MMAF (see section 3.2.3 for further details). MMAF's online database states that the total number of MPAs in the country is 154 (KKP 2016). Marine National Parks make up the largest proportion of these reserves (7,302,716 hectares), while district-based MPAs are the most numerous (89). These MPAs are characterised as having very low levels of effectiveness (KSDAE 2015; KKP 2015c; Burke et al. 2011; Green et al. 2011; Wiadnya et al. 2011). Of the 129 MPAs assessed using the *Technical Guidelines for Evaluating MPA Effectiveness*, only four achieved the standard of 'conservation area managed minimally' or better (see Table 3.2). Even comparatively well-funded MPAs have a pattern of poor enforcement (Campbell et al. 2012; Mangubhai et al. 2011). Community-based MPAs are not included in official government figures. However, Yulianto et al. (2013, 15) note that 342 community-based MPAs have been created under government and donor programs³⁰, covering an area of 9,970 hectares. These bottom-up approaches have also had mixed success in achieving conservation outcomes (Glaser et al. 2015; Gurney et al. 2014).

This section of the chapter examines how Indonesia's MPA policies reflect contemporary theory and practice. The six interconnected MPA policy elements outlined in the previous chapter are used to guide the discussion.

³⁰ Coastal Resources Marine Program (funded by USAID) and Coral Reef Rehabilitation and Management Project (Funded by World Bank and Asian Development Bank)



Map 3.1 The geographical distribution and extent of Marine Protected Areas in Indonesia (source: prepared by the author with spatial data from Conservation International Indonesia, Flanders Marine Institute 2016, UNEP-WCMC 2016 and ESRI 2002)

Table 3.1 Quantity and spatial extent of Marine Protected Areas in Indonesia

MARINE PROTECTED AREA TYPE	NUMBER	AREA (HECTARES)
Ministry of Forestry		
Marine National Park	7	4,043,541
Marine Tourist Park	14	491,248
Marine Wildlife Reserve	5	5,678
Marine Nature Reserve	6	154,480
Marine Affairs and Fisheries		
Marine National Park	1	3,355,352
Marine Nature Park	3	445,630
Marine Tourism Park	6	1,541,040
District Government MPAs	112	7,265,747

Source: KKP (2016)

3.2.1 Appropriate biophysical design

Biophysical design provides the foundation to underpin MPA conservation success. However, Indonesia's MPA policy prescriptions in this area are weak and unlikely to provide sufficient guidance for achieving broad scale protection of marine biodiversity.

Firstly, the country's national target of creating 20 million hectares of MPAs by 2020 sets out a clear policy direction, but is well below the spatial coverage targets argued for by experts (between 20 to 40% of each habitat protected in NTZs) (e.g., Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008). If the national target is achieved, roughly 5.9%³¹ of the country's territorial waters and 3.1% of its total marine sovereign area³² will be within MPAs. Importantly, these figures are for total MPA coverage, not the area under 'full protection'. The *National Law on Fisheries* and subordinate regulations specify that MPAs must have a two percent or greater Core Zone (*Zona Inti*) coverage, which is equivalent to an NTZ (PERMEN-KP No. 30/2010, Article 9). In contrast, the *MCZSI Law* and subordinate regulations state that every MPA must contain a Core Zone, but does not provide a percentage coverage benchmark (PERMEN-KP No.

³¹MPA spatial coverage calculations are based on jurisdictional sea coverage figures from MMAF (KKP 2015a).

³²The marine sovereign area includes the Exclusive Economic Zone (200 nautical miles) and areas of extended continental shelf. Nations have a sovereign right to exploit (and protect) natural resources within this zone.

17/2008, Article 31). If, for argument's sake, the two percent benchmark were applied to the national target, the extent of Indonesia's territorial waters in NTZs would be 0.12% and 0.063% of its total marine sovereign area.

Beyond the national coverage target, Indonesia's core MPA policy documents contain scarce detail on biophysical design. The national laws and subordinate regulations have guiding principles without specifying fundamental parameters such as spatial layout, reserve size and connectivity. The *Ministerial Regulation on Management and Zoning Plans of Marine Protected Areas* (under the *National Law on Fisheries*), for example, states that an MPA's Core Zone should be large enough to support fisheries management and ensure the continuation of ecological processes (Articles 9 and 10). Similarly, the *Ministerial Regulation on Marine Conservation Area Networks* also notes that MPAs should be designed in networks based on biophysical design considerations (Articles 3 and 7).

In contrast, the MPA soft policy documents provide greater direction on biophysical design. The CTI RPoA states that the ultimate target of Goal 3 (MPAs established and effectively managed) is that a 'significant percentage of the total area of each major near-shore habitat types [...] will be in some form of designated protected status, with 20% of each major marine and coastal habitat type in strictly protected no-take replenishment zones' (CTI-CFF 2009b, 30). However, this target is not in the Indonesian CTI-CFF NPoA, which instead specifies that it will 'develop a national grand strategy for networks of MPAs that is synchronized with Indonesian Fishery Management Areas' by 2010 (CTI-CFF 2009a, 39). This document is currently being prepared (Suraji, pers. comm.) and may provide an opportunity to fill the biophysical design policy gap. MPA strategic plans from other countries such as the United States of America (NMPAC 2015) or manuals developed for the CTI-CFF (Green et al. 2014; Fernandes et al. 2012) may offer some guidance. However, if the national strategy does not contain sufficient detail, then more prescriptive procedural guides or policies will be needed.

3.2.2 Socio-economic assessment and participation in planning

On the whole, Indonesia's MPA policies provide some basis to assess and predict social impacts. However, prescriptions for socio-economic assessment in core policy documents are vague, with there being no specific protocols or standards existing. This is also the case for participation in planning, where the power to design MPAs sits firmly with government institutions. Indeed, evidence suggests that some resource users believe they have been ignored during MPA design processes (Gustave and Borchers 2008; Majors 2008; Alder 1994).

For MPAs created under the *National Law on Fisheries*, a biological and social assessment must be conducted. The *Ministerial Regulation on Determining Marine Protected Areas* specifies that socio-economic data can include: the level of community support, conflict, potential threats, local wisdom and customs, significant fisheries, marine tourism opportunities, aesthetics and the ease of reaching the area (Article 15). It also notes that this data can come from sources that include public consultation (Articles 13, 14 and 15). Based on this assessment, the delegated authority (minister or governor) will decide on the feasibility, extent and type of MPA to be created (Article 22). The delegate also designates an organisational unit, which reviews the MPA's boundaries and prepares the management and zoning plan (Article 20). A committee consisting of relevant government officials is also established to provide recommendations on the boundary location (Article 23). The *Ministerial Regulation on the Management and Zoning Plans* stipulates that to support the management planning process, social, cultural and economic data³³ should be collected (Article 30 and 31). The regulation also states that this data should be incorporated into the management and zoning plan (Article 31).

The *MCZSI Law* has similar prescriptions for conducting socio-economic assessments. For KKP3K marine reserves, the *Ministerial Regulation on Conservation Areas in the Coastal Zone and Small Islands* specifies that MPA proposals must be assessed using biophysical and socio-economic research along with government policy (Article 11). This data can be collected from sources that include public consultation. Socio-economic data can include population density,

³³ This data should include information on the number of people, use patterns (for example, fisheries), livelihood dependency, local customs and tourism potential (PERMEN-KP No. 30/2010, Articles 30 and 31).

livelihoods, education, religion and beliefs, infrastructure, cultural heritage and local wisdom (Article 13). Based on the assessment, the delegate (minister or governor) will decide on the type and extent of the MPA (Article 16). One of the purposes of a KKM marine reserve is to protect traditional management practices (where customary law and institutions are extant) (Articles 7 and 8). A feasibility study must be prepared for this type of MPA, but surprisingly there are no requirements for public consultation as part of the designation process (Article 21). Management and zoning plans for both KKM and KKP3K marine reserves are conducted by a management unit created at the time of designation (Articles 16 and 30). These planning processes must be transparent, participatory and accountable; however, there are no prescriptions for how this is to be achieved. Other Indonesian MPA policy documents also share the same people centred approach, but are less relevant to this policy area.

The promulgation of socio-economic assessment and community consultation protocols that build on the existing legislative foundation offer a solution to the policy weaknesses described above. Ideally, these protocols should prescribe equitable procedures for fully understanding the costs and benefits among and within stakeholder groups (Adams, Pressey, and Naidoo 2010; Mascia, Claus, and Naidoo 2010). Procedures for mitigating negative social impacts should also be incorporated into these protocols. By reducing social impacts the overall success of the country's MPAs should be enhanced (e.g., Voyer, Gladstone, and Goodall 2012; Adams, Pressey, and Naidoo 2010; Mascia, Claus, and Naidoo 2010; Schreckenberget al. 2010; Mascia and Claus 2009). Procedural guides such as the *Methodology Manual for Social Assessment for Protected Area Facilitators* produced by the International Institute for Environment and Development (Franks and Small 2016) and the *Social-economic Assessment Toolkit* for MPAs prepared by the Australian Government (DEH 2005) could guide the development of these protocols. It is also important that the protocols contain a flexible choice of methodologies that allow MPA planning processes to be adapted to the local context. This flexible approach is essential because of the diversity of culture, social structures and economic conditions present across the Indonesian archipelago. In more developed areas with sufficient social and economic data, formal SIA processes supported by spatial prioritising tools (for example, Marxan and C-PLAN) might achieve the best outcome. Conversely, on the country's research poor outer islands, a greater emphasis on participatory planning approaches is needed.

3.2.3 Good governance and management

Indonesia now has a broad framework aimed at improving government integrity and probity, which is reflected in the country's MPA-specific legislation. For example, the *National Law on Fisheries* (Article 2) and the subordinate *Government Regulation on Fish Resource Conservation* (Articles 1 and 2) state that fisheries resources should be managed with the principles of justice, partnership, equity, unity, transparency, efficiency and adaptive management. Moreover, the *Ministerial Regulation on Conservation Areas in the Coastal and Small Islands Zone* states that planning for KKP3K and KKM marine reserves will be transparent and accountable (Article 30). While recognising the obvious importance of these higher level policy prescriptions, this section of the chapter focuses on the critical issues associated with implementing the governance and management arrangements.

The first policy challenge relates to the multiplicity of legislative arrangements that exist for MPAs. As noted above, the *National Law on Fisheries* and the *MCZSI Law* overlap within the 12 nautical mile zone from the shoreline, where these two statutes can create eight different types of MPAs. However, no published policy documents exist clarifying the criteria for choosing which of these MPAs to designate (beyond general prescriptions in the legislation). Moreover, the central government can have jurisdictional responsibility for MPAs in regional waters under certain circumstances (for example, Marine National Parks). This situation may generate confusion and disagreement over such things as permitting (Syarif 2012; Khazali pers. comm.; Mirza Pedju pers. comm.). Syarif (2012, 50) notes that differing interpretations of these laws, usually based on self-interest, create uncertainty and results in inter-governmental tension. However, the recent promulgation of the *Ministerial Regulation on the Utilisation of Marine Reserves*³⁴ may help to resolve some of the inter-governmental issues associated with permitting and the collection of revenue. This statute aims to establish the licencing, reporting and monitoring arrangements for capture fisheries, aquaculture, nature tourism and other activities for *National Law on Fisheries* MPAs. Finally, the fact that two national ministries (that is, Ministry of Forestry and MMAF) both manage marine reserves further complicates the country's

³⁴ *Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 47/PERMEN-KP/2016 Tentang Pemanfaatan Kawasan Konservasi Perairan*

MPA arrangements. However, the National Law 1/2014³⁵ addresses the issue, specifying that the Ministry of Forestry must transfer its MPAs to MMAF (Article 78). This transfer process will affect some of Indonesia's highest profile national parks including Bunaken, Togean and Kepulauan Seribu. Despite being a positive step, the transition so far has been slow and conflict-laden, with the majority of MPAs yet to be transferred (Dirhamsyah 2016). Some authors note that structural differences between the two ministries (for example, budgeting and staffing) make the process difficult (Megawanto 2014). The lack of coordination on marine issues is recognised by the government, which has created a Coordinating Ministry for Maritime Affairs and Natural Resources to oversee inter-ministerial issues (Dirhamsyah 2016).

Of greater significance for MPAs in Indonesia are the potential ramifications from the promulgation of *National Law on Regional Government 23/2014*. This piece of legislation transfers jurisdictional responsibility for near-shore coastal waters (shoreline to four nautical miles) from district to provincial governments (including the management of MPAs) (Article 27). This change will impact 112 MPAs covering 7.2 million hectares (KKP 2016). Despite the significance of the situation, MMAF has yet to develop a clear policy position to guide the transition process. Starting in 2017, national budget allocations for district MPAs will be given to provincial governments. MMAF has advised regional authorities that these funds must be delegated to district governments, which should in the interim continue to manage the MPAs (Meity Mongdong pers. comm.). Some scholars have discussed the transfer in the literature, albeit taking a rather pessimistic view toward the 'recentralisation' of natural resource management (Dirhamsyah 2016; Susanto 2016). These papers tend to offer limited tangible and constructive solutions, particularly regarding whether provincial governments can delegate authority to the district level for the long-term. This delegation may facilitate greater coordination of resourcing and capacity building across a region, while allowing already established management regimes to endure. In any case, urgent policy attention is needed for this issue.

³⁵ *Undang Undang Republik Indonesia Nomor 1 Tahun 2014 Tentang Perubahan Atas Undang Undang Nomor 27 Tahun 2007 Tentang Pengelolaan Wilayah Pesisir dan Pulau Pulau Kecil*

Beyond governance, Indonesia has a solid policy platform for assessing and improving management effectiveness. The MMAF Strategic Plan specifies that 126 MPAs will have improved management by 2020 (KKP 2015b, 73), which is a significant proportion of the country's marine reserves. This target is much-needed considering the very low levels of effectiveness (KSDAE 2015; KKP 2015c; Burke et al. 2011; Green et al. 2011; Wiadnya et al. 2011). Still, it is difficult to predict the target's actual impact since the strategic plan does not define 'improved management'. In any event, the *Technical Guidelines for Evaluating MPA Effectiveness* will probably play a significant role in measuring improvements. This procedural guide is possibly the country's most progressive MPA policy instrument, drawing on the work of experts such as Hockings et al. (2006) and Pomeroy et al. (2005). It is a rare example of a protected area management agency being willing to openly assess the effectiveness of its reserves (See Table 3.2).

Table 3.2 Management effectiveness hierarchy within the Technical Guidelines for Evaluating the Management Effectiveness of Aquatic, Coasts and Small Islands Conservation Areas

LEVEL / STAGE		CRITERIA		NUMBER OF QUESTIONS
1 (Red)	Conservation area initiated	1	Initial proposal	8
		2	Identification and inventory	
		3	Designation	
2 (Yellow)	Conservation area established	4	Organisational unit and personnel	11
		5	Management and zoning plans	
		6	Facilities and infrastructure to support management	
		7	Funding support	
3 (Green)	Conservation area managed minimally	8	Approval of management and zoning plans	21
		9	Management standard operating procedures	
		10	Implementation of management and zoning plans	
		11	Establishment of management and zoning arrangements	
4 (Blue)	Conservation area managed optimally	12	Boundary marking	28
		13	Institutionalisation	
		14	Resource management	
		15	Socio-economic and cultural management	
5 (Gold)	Self-reliant conservation area	16	Improving community welfare	6
		17	Sustainable financing	

Source: KKP (2012, 6)

3.2.4 Community empowerment

Research in Indonesia shows that community participation in conservation initiatives can build acceptance and enhance success (Indrawan et al. 2014; Cinner, McClanahan, et al. 2012; Syakur et al. 2012; Satria and Matsuda 2004). Numerous scholars also contend that community-based approaches can be an effective and low cost marine conservation strategy (Syakur et al. 2012; Satria and Adhuri 2010; McLeod, Szuster, and Salm 2009; Harkes and Novaczek 2002; Bailey and Zerner 1992). The country's MPA policy arrangements seem to acknowledge this and express a desire to involve communities in management. However, their rigid government-centric approach largely falls short of contemporary theory and practice.

At the highest policy level, the country's legislation creates MPAs where decision-making power is mainly controlled by government institutions. *The National Law on Fisheries* and subordinate regulations state that MPA management units should build partnerships with civil society, indigenous people, NGOs, private businesses and research institutions (PERMEN-KP No. 2/2009, Article 22; PP No. 60/2007, Articles 15 and 18). The recently promulgated *Ministerial Regulation on Marine Reserve Management Partnerships*³⁶ (implementing Article 18 of PERMEN-KP No. 60/2007) provides extra detail on these partnerships, particularly regarding the arrangements for working together. The statute, however, does not consider the integration of participation in decision-making. In contrast, the *MCZSI Law* was hailed as a watershed moment for integrated coastal management and community participation (Ginting 2010). Ginting (2010, 6) concluded that this law will place MMAF in a better position to empower coastal communities. Indeed, community rights are considered quite strongly in the marine spatial planning provisions of the legislation, which include livelihood protection, rights of access and conflict resolution mechanisms (National Law 1/2014, Articles 17 and 60). Interestingly, the *MCZSI Law* has limited references to participation in MPA management. It instead focuses on empowerment through strengthening community institutions and granting access to resources³⁷

³⁶ *Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 21/PERMEN-KP/2015 Tentang Kemitraan Pengelolaan Kawasan Konservasi Perairan*

³⁷ *The Ministerial Regulation on Conservation Areas in the Coastal Zone and Small Islands* states that the management authority should empower communities through such strategies as capacity building, institutional strengthening and granting access to resources for KKP3K marine reserves (Article 36). Importantly, use rights do not convey or recognise property rights (PERMEN-KP No. 17/2008, Article 36). Similarly, KKM should empower local communities through preserving traditional culture, strengthening customary institutions and socio-economic development (PERMEN-KP No. 17/2008, Article 38).

(PERMEN-KP No. 17/2008, Articles 36 and 38). Marine reserves under the *MCZSI Law* should also strengthen management through establishing communication channels with local communities (PERMEN-KP No. 17/2008, Article 39). Beyond these laws and regulations, institutional policies give varying attention to participation. The most relevant of these is the *Technical Guidelines for Evaluating MPA Effectiveness*, which highlights that to be successful an MPA must consider social-economic and cultural aspects. However, the guidelines identify participation as involvement in management processes and project implementation.

Although centralistic, these policy arrangements do allow the devolution of power to regional authorities (for existing district³⁸ and newly created provincial MPAs), which may result in more empathetic management approaches for resource dependent communities. Importantly, there have also been some attempts to establish forms of co-management for National Parks (for example, in Bunaken, Togean, Karimunjawa and Komodo) (Indrawan et al. 2014; Campbell et al. 2013; Sidangoli, Lloyd, and Boyd 2013; Djohani 2009). Still, these institutions generally focus on collaboration rather than sharing decision-making power, and have had mixed success in improving conservation outcomes (Campbell et al. 2012; Mangubhai et al. 2011). Bunaken National Park in particular has been seen as a model of stakeholder participation (Patlis 2008; Erdmann et al. 2004). However, recent research by Sidangoli, Lloyd, and Boyd (2013) suggest that conflicting agendas and motivations is making the process difficult. Despite this movement toward greater participation, community empowerment still overwhelmingly depends on the motivation of government staff within MPA institutions (Syarif 2012). The realignment of jurisdictional responsibility associated with the promulgation of *National Law on Regional Government 23/2014* may further isolate local communities from decision-making in existing district MPAs.

One of the most significant policy issues associated with community empowerment is the lack of genuine mechanisms in national MPA legislation to recognise and support community-based approaches (Yulianto et al. 2013). Notably, both the *National Law on Fisheries* and the *MCZSI Law* recognise and aim to protect customary management. The marine spatial planning

³⁸ As mentioned above, district-level MPAs continue to be managed by local governments despite changes in sea delimitations resulting from the promulgation of *National Law on Regional Government 23/2014*.

provisions of the *MCZSI Law* also give local communities the right to propose customary fishing grounds and territories to be incorporated into coastal spatial plans (National Law No. 1/2014, Article 60). This is an important step for protecting the rights of customary communities. However, spatial designation of fishing grounds does not constitute or create institutional MPAs. Moreover, the ability of communities to propose such areas will depend on the strength of their voice in planning processes. Most community-based MPAs continue to be designated under village statutes, which have a weak legal status and are vulnerable to changes in laws and policies at higher levels of government (Yulianto et al. 2013). Without legal recognition of customary institutions within national core-policies and the provision of technical and resourcing support, communities will find it difficult to implement effective management and enforcement regimes (Ban, Adams, Almany, et al. 2011; Weeks, Russ, Alcala, et al. 2010; Berkes 2006).

The CTI-CFF NPoA offers a possible strategy to overcome the above policy issues. The plan recommends ‘conduct[ing] a national review of existing and potential forms of MPA governance’ (Goal 3, Target 1). It is clear that a comprehensive evaluation of Indonesia’s MPA governance arrangements is needed, which examines how local communities and other stakeholders can be effectively empowered to manage coastal resources through flexible community-based and co-management models. The review should detail how community-based MPAs (created under local statutes or otherwise) can effectively be integrated into the country’s overall MPA legal framework. In doing so, the Indonesian Government may need to look to the experiences of other jurisdictions such as Vanuatu, Solomon Islands and Fiji, where customary institutions are recognised within national laws (Pulea 1993). The explicit legal recognition of community-based MPAs may contribute to overcoming the issues of scaling up and vertical integration (Gurney et al. 2014; Ban, Adams, Almany, et al. 2011; Weeks, Russ, Alcala, et al. 2010; Berkes 2006). It may also provide opportunities for funding as part of government budgetary processes. For co-management, the review should focus on how institutional models or mechanisms (existing and needed) can devolve power beyond regional authorities to communities and stakeholders.

3.2.5 Community support

Indonesia's MPA framework acknowledges the importance of improving community welfare and social-economic conditions for communities living within and around MPAs. At the legislation level, the *National Law on Fisheries*' subordinate regulation on promulgating MPAs (PERMEN-KP No. 2/2009) asserts that marine reserves should achieve sustainable use of fish resources so that the welfare of surrounding communities can be improved. The same regulation also states that during the MPA planning process, data collection should include determining the level of community support for creating an MPA (Articles 4 and 15). The *Ministerial Regulation on Management and Zoning Plans of Marine Protected Areas* similarly notes that MPA management should build the social, economic and cultural assets of an area, and that this can be achieved through programs such as socio-economic development (Articles 6 and 7). The *National Law on Fisheries* also provides for the designation of a Sustainable Fishing Zone (*Zona Perikanan Berkelanjutan*), where 'environmentally friendly' fishing, aquaculture and other economic activities are permissible (PERMEN-KP No. 30/2010, Article 11). The *MCZSI Law* offers stronger prescriptions for this policy area, explicitly outlining strategies to improve socio-economic conditions of local communities (PERMEN-KP No. 17/2008, Articles 34 and 38). For KKP3K marine reserves, this can be done through granting fishing rights, building community capacity and institutional strengthening (PERMEN-KP No. 17/2008, Article 36). Developing alternative livelihoods, promoting access to capital markets, assistance for pilot businesses and the provision of appropriate technology are offered as strategies for KKM marine reserves (PERMEN-KP No. 17/2008, Article 40).

Indonesia's other policy documents also highlight the need for MPAs to give a benefit to local communities. The MMAF Strategic Plan has the ambitious target of improving household income for 110 MPAs by 2020 (KKP 2015b, 74). Within the *Technical Guidelines for Evaluating MPA Effectiveness*, community welfare is highlighted as being essential for achieving the highest category of effectiveness (self-reliant). The RPoA states that the CTI-CFF should be implemented with the principles of supporting people-centred biodiversity conservation, poverty reduction and equitable benefit sharing (CTI-CFF 2009b, 7). Goal three of this initiative states that one of its targets is to establish a region-wide MPA system that 'generates significant

income, livelihoods, and food security benefits for coastal communities' (CTI-CFF 2009b, 30). This target, however, is not supported by specific food security benchmarks.

As can be seen, the policy arrangements described above provide a foundation for building support among resource users. However, the extent to which socio-economic outcomes are achieved and community support built will depend largely on the capacity and enthusiasm of local managers to implement appropriate programmes. Indeed, the case-study literature for Indonesian MPAs points to mixed success in this area (Gurney et al. 2014; Gustave and Borchers 2008; Majors 2008; Leisher, van Beukering, and Scherl 2007). For example, Gurney et al. (2014) study on the impacts of community-based MPAs designed to achieve the dual goals of conservation and poverty alleviation in North Sumatra (as part of a USAID-funded project) found that poverty reduction occurred predominately during the implementation phase, but not after the project was completed. Interestingly also, they found that none of the eight villages involved in this project still enforce their MPA rules. To improve the outcomes in this policy area, there needs to be greater detail in core policy instruments (ministerial decrees) on how to effectively implement potential strategies for enhancing local social-economic conditions. This should include outlining design and zoning specifications that ensure MPAs make a greater contribution to food security (for example, through spillover), provisions that give employment opportunities to local communities (for example, as rangers), and guidance on conducting successful livelihood programs.

3.2.6 Sustainable financing

The provision and continuity of funding is one of the most significant challenges for Indonesia's MPAs (Clifton 2009; Dutton et al. 2009; McQuistan et al. 2006). In 2006, it was estimated that the country's protected area funding shortfall was US\$ 82 million (McQuistan et al. 2006). No doubt, this figure has increased significantly with the rapid expansion of MPAs in recent years. The funding of Indonesia's MPAs aligns with jurisdictional responsibilities. The Ministry of Forestry funds marine reserves that it manages under the *CBRE Law*, while MMAF is responsible for centrally managed MPAs designated under the *National Law on Fisheries*.

District MPAs (under the *National Law on Fisheries* or the *MCZSI Law*) are funded by regional authorities.³⁹

Much of the contemporary thinking on sustainable financing is captured in Indonesia's MPA policy arrangements, albeit fragmented and predominately within soft policy documents. The national legislative instruments and institutional policies have limited guidance on MPA financing. The *Government Regulation on Fish Resource Conservation* (under the *National Law on Fisheries*) states that the funding for managing MPAs shall come from the following sources: (a) national or regional budgets; (b) levy on fisheries; (c) conservation service levy and other non-binding legitimate sources (Article 20). Moreover, the *Ministerial Regulation on Management and Zoning Plans of Marine Protected Area* notes that annual work plans should include funding sources and budget allocations for management activities (Article 8). The *MCZCI Law* gives the same limited consideration to funding. The *Ministerial Regulation on Conservation Areas in the Coastal and Small Islands Zone* states that the financing of protected areas in coastal waters and small islands can be derived from the state and/or regional budgets and other valid and non-binding sources (Article 42).

The CTI-CFF plans and the *Development Strategy for Marine Protected Area Networks in Indonesia* address sustainable financing issues in greater detail. CTI-CFF RPoA outlines a series of potential mechanisms to mobilise funds to support MPAs including (CTI-CFF 2009b, 33-34):

- Multi-country funding proposals to external donors in order to jointly develop activities designed to generate sustainable financing.
- Sharing of information, tools, and experiences on sustainable financing mechanisms and related issues (for example, sustainable financing plans, trust funds, tourism-based fees, payment for ecosystem services).
- Develop a large-scale regional Coral Triangle Partnership Fund.
- Engage with major companies in relevant industries with the aim of mobilising private sector financial and in-kind support.

³⁹ As mentioned above, national budget allocations for district MPAs have been given to provincial governments, which will for the interim pass these funds on to local governments to manage district MPAs.

The CTI-CFF NPoA provides more country specific information, stating that it will ensure sustainable funding for district and national systems of MPAs (CTI-CFF 2009a, p.41). The plan offers two activities to achieve this outcome: ‘establish national level sustainable financing plans that support national and district systems of MPAs, including needed regulatory, legislative, policy, and institutional measures in collaboration with other countries and donor agencies’; and ‘redirect perverse subsidies (on fisheries, oils, etc.) to support MPA establishment and effective management’ (CTI-CFF 2009a, p.41). *The Development Strategy for Marine Protected Area Networks in Indonesia* notes that the country’s MPAs are typically underfunded. It offers the following actions to address this issue: (i) articulating goals clearly so that funding sources and partners can act accordingly; (ii) identify funding from existing and new sources as well as reducing management costs; (iii) develop a strategy that includes a variety of financial mechanisms and management approaches; and (iv) identify management approaches that generate and allocate funding efficiently (DKKJI 2013, p. 46-47). The *Technical Guidelines for Evaluating MPA Effectiveness* also acknowledges that sustainable financing is essential for achieving the most effective category of MPA (self-reliant).

To improve the country's MPA sustainable financing policy settings, there needs to be a greater integration and mainstreaming of soft policy strategies into core ministerial activities. In particular, the CTI-CFF NPoA target of establishing national level financing plans that review regulatory arrangements is urgently needed to address the issue of underfunding. These plans need to emphasise that management costs and sustainable financing opportunities should be assessed during the design phase and recommend that a flexible regulatory framework be established to allow the implementation of contextually adapted funding mechanisms (that is, aligned with the governance model). Safe guards should also be put in place to ensure that commercial activities do not undermine the social and biological values of an MPA (Emerton, Bishop, and Thomas 2006).

3.3 Conclusions

The review presented in this chapter shows that Indonesia's MPA policy arrangements are complex and dynamic. These arrangements provide a reasonable policy foundation, which captures many aspects of contemporary MPA theory and practice. The *Technical Guidelines for Evaluating MPA Effectiveness* and the national MPA expansion target (20 million hectares by 2020) stand out as particularly important policy initiatives. Nonetheless, there are numerous strategic, structural and general policy weaknesses that will undermine long-term success.

At the strategic level, the 'multi-scale disconnects' described by Patlis (2008) nearly a decade ago still continue today. The move to 'decentralisation' and then 'recentralisation' (under National Law on Regional Government 23/2014) and the transition of MPAs managed under the Ministry of Forestry to MMAF have led to complex and confusing jurisdictional arrangements. The change to recentralisation is particularly significant and has the potential to undermine the on-going management of a considerable number of existing MPAs. This complexity is further augmented by the multiplicity of different types of MPAs and management institutions. These issues require urgent policy attention.

General MPA policy arrangements have adopted many contemporary concepts. However, there is a noticeable lack of policy detail and procedural guidance. Above all, significant gaps exist in the policy areas of biophysical design, socio-economic assessment, stakeholder participation in planning and community empowerment. To begin with, the majority of MPA ecological design parameters advocated for by experts are absent in core policies, and the national target for spatial coverage falls well short of theoretical benchmarks. Prescriptions for socio-economic assessment and stakeholder participation during planning are vague and poorly defined. Lastly, the authority to manage the country's MPAs sits firmly with government. There are no mechanisms to devolve power to communities and establish 'nationally' recognised community-based MPAs.

To improve the country's MPA policy framework, contemporary theory and practice should be integrated and mainstreamed. Protocols, manuals or other detailed core policy documents are required in the areas of biophysical design, socio-economic assessment, participation in planning

and providing social-economic benefits to local communities. There is also a need for a comprehensive evaluation of Indonesia's MPA governance arrangements (with a focus on community-based and co-management approaches) and the development of sustainable financing plans.

Chapter 4 – Policy in Practice: implementation of Marine Protected Area policy in Eastern Indonesia

The context in which MPAs exist profoundly influences management success. Eastern Indonesia is a melting pot of cultural and ecological diversity, where coastal communities are typically reliant on local marine resources. Some of these communities also have enduring customary marine management practices, albeit with varying levels of integrity (Adhuri 2013; Setiawan et al. 2012; Satria and Adhuri 2010; McLeod, Szuster, and Salm 2009; Harkes and Novaczek 2002; Thorburn 2000; Ruttan 1998; Pannell 1997).

Marine resources in the region face ever increasing levels of exploitation. Over the last 50 years, the number of domestic fishing boats in Indonesia has almost tripled, while motorised vessels among them increased more than 100 fold⁴⁰. Marine capture fisheries outputs have also grown by over 60% since 2000⁴¹. The country's fishing fleet is highly mobile with boats progressively pushing further east to exploit new fishing grounds, often leaving degraded ecosystems in their wake (Fox et al. 2009; Stacey 2007). Indonesian migrant fishermen can now be found living in some of the most remote parts of the country (Dutton et al. 2009), which has in some areas caused conflict over marine resource use and rights (Steenbergen 2013; Fox, Adhuri, and Resosudarmo 2005). In many cases, these migrants brought new and more efficient technologies that have been adopted by local communities, which has placed greater pressure on marine resources (Adhuri 2013; Steenbergen 2013; Fox et al. 2009). This movement of fishers and traders has ensured that even the most remote parts of Eastern Indonesia are connected and influenced by global markets (Foale et al. 2013).

The increased demand on Eastern Indonesia's marine resources underscores the critical role of MPAs in conserving the area's globally significant biodiversity. Far from the country's bureaucratic centres, it also provides an interesting location to analyse the on-ground

⁴⁰ These figures are calculated with data from Krisnandhi (1969) and the most recent MMAF statistics (KKP 2015a). Krisnandhi (1969, 51) states that there were 238,500 domestic fishing boats in 1965, of which 3260 were motorised. Official statistics from MMAF show that in 2014 this number had risen to 625,633 domestic fishing boats, of which 460,567 were motorised (KKP 2015a, 41).

⁴¹ This figure has been calculated with data from the FAO Fishery and Aquaculture Country Profile (FAO 2014) and MMAF official statistics (KKP 2015a). FAO (2014) states that in 2000 marine capture fisheries production was 3,762,000 tonnes. MMAF estimates that this figure rose to 6,065,060 tonnes in 2015 (KKP 2015a, 23).

implementation of Indonesia's MPA policies. This chapter will use Raja Ampat Islands MPA and Sawu Sea Marine National Park (Sawu Sea MNP) as case-study sites to examine how policies are being implemented in the field, and whether these experiences can enhance the effectiveness of the country's overall MPA policy framework. These sites were chosen because they offer contrasting examples of how Indonesia's national MPA policy arrangements are being implemented. Raja Ampat Islands MPA was established by regional authorities, while the creation of Sawu Sea MNP was driven by the national government.

4.1 Case study – Raja Ampat Islands Marine Protected Area

Raja Ampat Islands MPA consists of five geographically separated sections that span an area of 1,026,540 hectares (see Map 4.1⁴²). It is located in the Raja Ampat District Government area (hereafter 'Raja Ampat') of West Papua Province. The area is the world's most biodiverse tropical marine environment, being home to 1505 species of reef fish and 70% of the world's known corals (Mustaghfirin et al. 2012b; Veron et al. 2009). Raja Ampat also has 16 species of cetacean, dugong and four species of marine turtles (Mustaghfirin et al. 2012b; Wilson et al. 2010). The major threats to this marine environment include overfishing, logging, mining, oil and gas extraction activities and poorly planned coastal development (Mangubhai et al. 2012; Varkey et al. 2010). Raja Ampat also has a rich cultural heritage with its population of 45,923 consisting mostly of ethnic Melanesians from the Ma'ya tribal group (BPSKRA 2016; Palomares, Heymans, and Pauly 2007; Donnelly, Neville, and Mous 2003). The people of Raja Ampat are highly dependent on marine resources and have significant levels of poverty (Huffard et al. 2012). At the provincial level, nearly 38% of people in rural areas live below the poverty line (BPSPPB 2015), which is nearly four times the national average (BPS 2016). Raja Ampat also has enduring customary marine resource management systems, where the majority of communities assert ownership over coastal waters, and in some cases, actively manage use⁴³ (McLeod, Szuster, and Salm 2009). Economically, the fishing sector accounts for 50% of Raja

⁴² See Appendix 4.1 for a more detailed zoning map.

⁴³ Customary management of marine resources in Eastern Indonesia, commonly known as *sasi*, is a set of rules that regulate access to a specific territory or resources under the ownership or control of a specific social group (Steenbergen 2013). In the case of Raja Ampat, *sasi* typically involves the temporary closure of areas from exploitation (McLeod, Szuster, and Salm 2009).

Ampat's Gross Domestic Product and 82% of local economic activity (Huffard et al. 2012, 21). Tourism is increasing and becoming an important contributor to the economy.

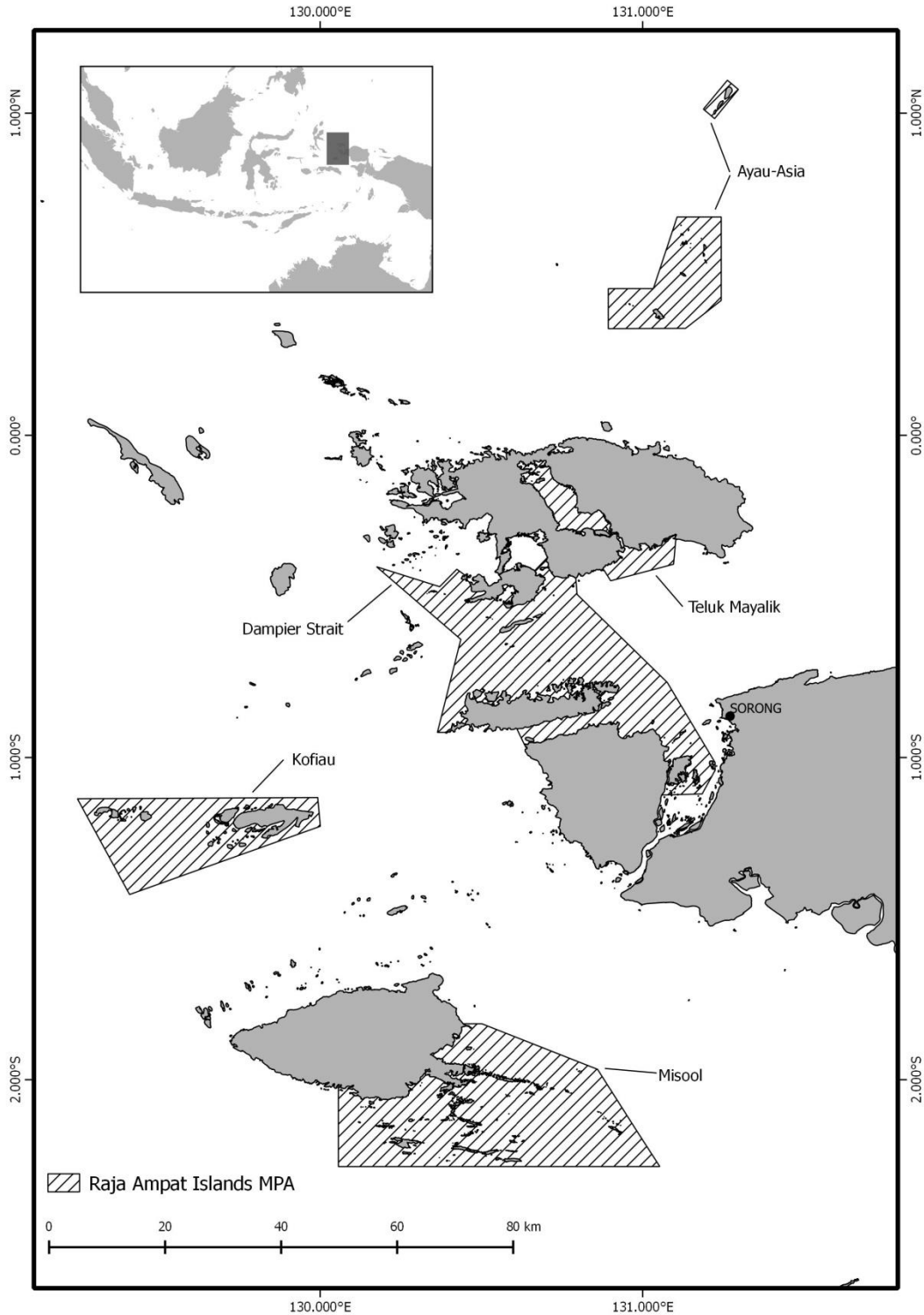
Starting in 2007, the District Head (*Bupati*)⁴⁴ of Raja Ampat created an MPA network through promulgating a series of regulations under the *National Law on Fisheries*⁴⁵. These declarations created the six MPA sections of: *Ayau – Asia, Teluk Mayalik, Dampier Strait, Kofiau, Misool* and *Kawe* (Map 4.1). Seven years later, the Minister (*Menteri*) of Marine Affairs and Fisheries formalised the zoning arrangements at the national level through a ministerial decree⁴⁶ (KEPMEN-KP No. 36/2014), declaring the MPA network as the *Raja Ampat Islands Marine Tourist Park (Taman Wisata Perairan Kepulauan Raja Ampat)*. Importantly, only five of the original six sections were included in this decree. In 2009, the Minister created a separate centrally managed Marine Nature Reserve⁴⁷ over the *Kawe* section (under the *National Law on Fisheries*). Notwithstanding the recent ministerial decree, some sections of the MPA have been actively managed for nearly ten years under local regulations. In 2012, the Raja Ampat District Government finalised the management plan. This plan states that the MPA's vision is to be managed effectively and sustainably with the principles of ecosystem-based management and biodiversity conservation, as well as supporting the long-term livelihoods and food security of traditional communities in Raja Ampat (Mustaghfirin et al. 2012b, 17). Lastly, planning and management of the MPA has, and continues to be, supported by Conservation International and The Nature Conservancy under the Bird's Head Seascape Coalition.

⁴⁴ A *Bupati* is the elected political leader of a District (*Kabupaten*) Government.

⁴⁵ *Peraturan Bupati Raja Ampat Nomor 66 Tahun 2007 Tentang Kawasan Konservasi Laut Kabupaten Raja Ampat; Peraturan Daerah Kabupaten Raja Ampat Nomor 27 Tahun 2008 Tentang Kawasan Konservasi Laut Daerah Kabupaten Raja Ampat; and Peraturan Bupati Raja Ampat Nomor 05 Tahun 2009 Tentang Kawasan Konservasi Laut Daerah Kabupaten Raja Ampat*

⁴⁶ *Keputusan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 36/KEPMEN-KP/2014 Tentang Kawasan Konservasi Perairan Kepulauan Raja Ampat Kabupaten Raja Ampat di Provinsi Papua Barat*

⁴⁷ *Keputusan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 65/MEN/2009 Tentang Penetapan Kawasan Konservasi Perairan Nasional Kepulauan Waigeo Sebelah Barat dan Laut di Sekitarnya di Provinsi Papua Barat*



Map 4.1 Raja Ampat Islands Marine Protected Area (source: prepared by the author with spatial data from Conservation International Indonesia and ESRI 2002)

4.1.1 Appropriate biophysical design

The Raja Ampat Islands MPA is exceptionally well-designed from a biophysical design perspective, with many of the contemporary theory prescriptions described in Chapter 2 being incorporated into the zoning layout. The above mentioned international NGOs supported the development of the zoning arrangements, which used the contemporary decision-support tool of Marxan (Mangubhai et al. 2015; Grantham et al. 2013; Agostini et al. 2012). The output of the analysis using this tool supported community and expert planning workshops that defined the final zoning layout (Meity Mongdong pers. comm.). Table 4.1 outlines the biophysical zoning criteria used to guide the planning process. The final zoning arrangements set aside 17.6% of the MPA's total area as NTZs, while 53.9% is designated for traditional management under the *Customary Management and Use Zone (Sasi dan Pemanfaatan Tradisional Masyarakat)*⁴⁸. The remaining areas are zoned for sustainable use (see Table 4.2). Notably, *the Customary Management and Use Zone* allows communities to continue to manage and exploit marine resources according to traditional customs and practices, which include closing areas for temporary or permanent protection (see section 4.1.4 for further details on this zone).

The protection of nearly 20% of the reserve within NTZs fulfils the lower end of recommended spatial coverage targets (e.g., Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008). There is also a good mix of large and small NTZs distributed evenly across the MPA: the majority of these are larger than recommended size (5 to 20 kilometres across) and spacing (1 to 20 kilometres) targets (Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008). Moreover, the planning process had specific targets for connectivity and representativeness (Table 4.1). However, without conducting a detailed spatial analysis, it is difficult to know the extent to which these targets have been met. Nevertheless, if the Raja Ampat Islands MPA can be managed effectively (that is, if zoning regulations are followed by resource users), it is highly likely that the marine biota including higher trophic species will be conserved within an interconnected network of NTZs and sustainably managed areas (Jaiteh et al. 2016; Glew et al. 2015; Katz et al. 2015). The presence of other MPAs will also further augment the protection of Raja Ampat's marine biodiversity (see section 4.1.3 and Map 4.2 for more detail).

⁴⁸ These figures are based on spatial data provided by Conservation International Indonesia.

From a national policy perspective, Raja Ampat Islands MPA demonstrates that the current arrangements are sufficiently flexible to allow a biophysically well-designed marine reserve to be created. The reserve’s relatively remote location, low population densities and the desire of local communities to secure tenure rights all probably contributed to a relatively large area being protected. Nonetheless, Raja Ampat Islands MPA should serve as a model to develop firmer national policy settings for biophysical design.

Table 4.1 Biophysical and socio-economic criteria for zoning the Raja Ampat Islands Marine Protected Area

BIOPHYSICAL CRITERIA	SOCIO-ECONOMIC CRITERIA
The size of each NTZ should be at least 10-20 kilometres across, except in coastal areas	Minimise negative impacts to the livelihoods of local communities
The maximum distance between two NTZs should be 15 kilometres	Protect areas of cultural value (to traditional communities)
At least 20%, with a target of 30%, of each habitat type protected in NTZs	Minimise conflict over resource use (e.g., between tourism and fisheries)
At least three repetitions of each habitat type represented in NTZs	Consider species that are important for community fisheries
If possible, choose areas that have a diversity of habitats for NTZs to ensure high ecological connectivity	Support subsistence and low impact fisheries
If possible, choose NTZs that are close to terrestrial protected areas to maximise integrated coastal management	Protect local community resource use by prohibiting destructive fishing practices
If possible, avoid fragmentation by including entire biological units in NTZs (e.g., seamounts)	Facilitate and support sustainable and low impact fisheries
Choose simple shapes for NTZs to minimise edge effect	Ensure that the MPA’s design supports small-scale and traditional fishing
Protect areas that are critical or unique, including: <ul style="list-style-type: none"> • habitat of endangered species; • ecologically unique and diverse communities; • endemic species, important areas for endemic biota and/or globally significant habitat; • areas that are particularly important for supporting the life stages of region’s biota such as fish breeding and turtle nesting sites; • nesting sites of seabirds; • crocodile habitat; • dugong habitat; and • unique pelagic habitats 	Consider species vulnerable to overfishing (e.g., sharks)
	Protect places that have tourism potential
	Support low impact environmentally friendly industry (e.g., pearl farming)
	Avoid placing the MPA or NTZs near existing shipping infrastructure

Source: translated and adapted from Mustaghfirin et al. (2012a, 30-31)

Table 4.2 Zoning categories of Raja Ampat Marine Protected Area

ZONING		PURPOSE	AREA (%)
Core (<i>Inti</i>)		Strict protection where use is restricted to research activities	0.6
Use (<i>Pemanfaatan</i>)		No-take zone that allows tourism and recreational activities	17
Sustainable Fisheries (<i>Perikanan Berkelanjutan</i>)		Allows for Sustainable fishing practices	22.5
Other Zones (<i>Zona Lainnya</i>)	Customary Management and Use (<i>Sasi dan Pemanfaatan Tradisional Masyarakat</i>)	To support sustainable livelihoods of traditional communities Only customary communities using traditional methods ⁴⁹ such as line fishing, fish traps and fish aggregation devices are permitted to exploit this zone	53.9
	Other Uses (<i>Pemanfaatan Lainnya</i>)	Shipping channels and providing for infrastructure development	6

Source: translated and adapted from Mustaghfirin et al. (2012a, 32-34) and KEPMEN-KP No. 36/2014

4.1.2 Socio-economic assessment and participation in planning

Of the 89 villages in Raja Ampat, 51 are located near or adjoining the MPA (Hess, Larsen, and Leisher 2011; Larsen et al. 2011; Lazuardi, Huffard, and Tjandra 2011). These communities are broadly characterised as deriving their income from a mix of fishing and farming, being relatively young in age profile and having lower levels of education and higher levels of unemployment (Hess, Larsen, and Leisher 2011; Larsen et al. 2011; Lazuardi, Huffard, and Tjandra 2011). The design of the MPA was supported by numerous studies completed by international NGOs on topics that include traditional marine tenure, illegal and underreported fishing, resource use patterns, perception monitoring and coastal rural appraisal (Hess, Larsen, and Leisher 2011; Larsen et al. 2011; Lazuardi, Huffard, and Tjandra 2011; Varkey et al. 2010; Wilson et al. 2010; McLeod, Szuster, and Salm 2009; Donnelly, Neville, and Mous 2003; McKenna, Allen, and Suryadi 2002). These studies provide a detailed picture of Raja Ampat's socio-economic landscape. They were also used to support the zoning planning process (Mangubhai et al. 2015; Agostini et al. 2012) (see Table 4.1 for the socio-economic criteria that

⁴⁹ The notion of 'traditional methods' is loosely defined in the management plan. In reality, the *Customary Management and Use Zone* allows for a range of low impact small-scale fishing activities (Mustaghfirin et al. (2012a, 33-34).

guided the zoning process of the MPA). Importantly, it is worth noting that no formal SIA process was completed.

Instead, the focus was on local community empowerment in decision-making (Agostini et al. 2012, Meity Mongdong pers. comm.). The process of creating MPAs in the region was initiated by Conservation International and The Nature Conservancy, which worked directly with traditional communities. These communities formalised their support for the creation of MPAs through a series of declarations or *cerita acara*⁵⁰ (Meity Mongdong pers. comm.). The Raja Ampat Traditional Owners Council (*Dewan Adat Daerah*) also declared their support for the MPA network. These declarations pushed the Raja Ampat government to formalise the MPAs through the above mentioned regulations. A similar process occurred with the zoning arrangements, where nearly all of the relevant local communities have provided their consent (Meity Mongdong pers. comm.). Mangubhai et al. (2015, 528) note that over 100 traditional management areas have been declared in support of the MPA.

By following a consent-based approach, the Raja Ampat Islands MPA has seemingly ensured that local community aspirations were incorporated into the MPA's design and, more importantly, potential social impacts avoided or mitigated. National policy settings should encourage such processes in other contextually similar locations.

4.1.3 Good governance and management

In 2009, the Raja Ampat Government created a management unit (*Unit Pengelola Teknis Dinas*) to oversee the MPA (including the Kawe section). In 2014, this management unit was granted *Badan Layanan Umum Daerah* (or public service agency) status, which gives it autonomy to oversee mixed funding sources and recruit non-civil servants (Rumetna et al. 2011).

Interestingly, the Raja Ampat Islands MPA was the first conservation area in Indonesia to receive this status. Currently, the management unit has 167 personnel consisting of technical (7), support (63) and field (97) staff (Meity Mongdong pers. comm.). There are also community

⁵⁰ *Cerita acara* is a formal signed declaration similar to a statutory declaration.

rangers who conduct regular patrols (see section 4.1.5 for further information on the community rangers).

The complexities and jurisdictional issues of Indonesia's MPA arrangements are reflected in Raja Ampat, which should serve as an example demonstrating why urgent policy reform and clarity on jurisdictional issues is needed. To begin with, the original MPA designation by the District Government was under the *National Law on Fisheries* (2007-09). However, as the process progressed, the District Government changed its approach and planned to formalise the MPA under the *MCZSI Law* as a Coastal and Small Island Conservation Area (KKP3K). This included preparing the management plan (*Rencana Pengelolaan Taman Pulau-Pulau Kecil Daerah Raja Ampat*) (Boli et al. 2014; Mustaghfirin et al. 2012b). The change of direction was due to advice from MMAF (Meity Mongdong pers. comm.). However, after receiving the relevant documentation from the District Government, the Ministry contradicted its own advice and designated the MPA under the *National Law on Fisheries* as a Marine Tourist Park (*Taman Wisata Perairan*). Although creating some confusion, it has so far had little practical influence on the management of the MPA.

The second governance issue relates to jurisdictional overlap. Besides Raja Ampat Islands MPA, there are three other marine conservation areas within the local government area. These reserves are either managed by MMAF (*West Waigeo Islands Marine Nature Reserve*⁵¹ and *Raja Ampat Islands Marine Nature Reserve*⁵²) or the Office of Natural Resource Conservation under the Ministry of Forestry⁵³ (*Kofiau Marine Nature Reserve*⁵⁴) (see Map 4.2). As noted above, MMAF declared *West Waigeo Islands Marine Nature Reserve* over the Kawe section of the District Government's MPA network. Since then, the two authorities have, in theory, been managing the same area under two different MPAs. However, both governments agreed in 2014 to collaborate, where field activities would be conducted by the District Government (Meity Mongdong pers. comm.). In contrast, *Kofiau Marine Nature Reserve* does not appear to have active management or conflict issues with local authorities.

⁵¹ *Suaka Alam Perairan Kepulauan Waigeo Sebelah Barat dan Laut Sekitarnya*

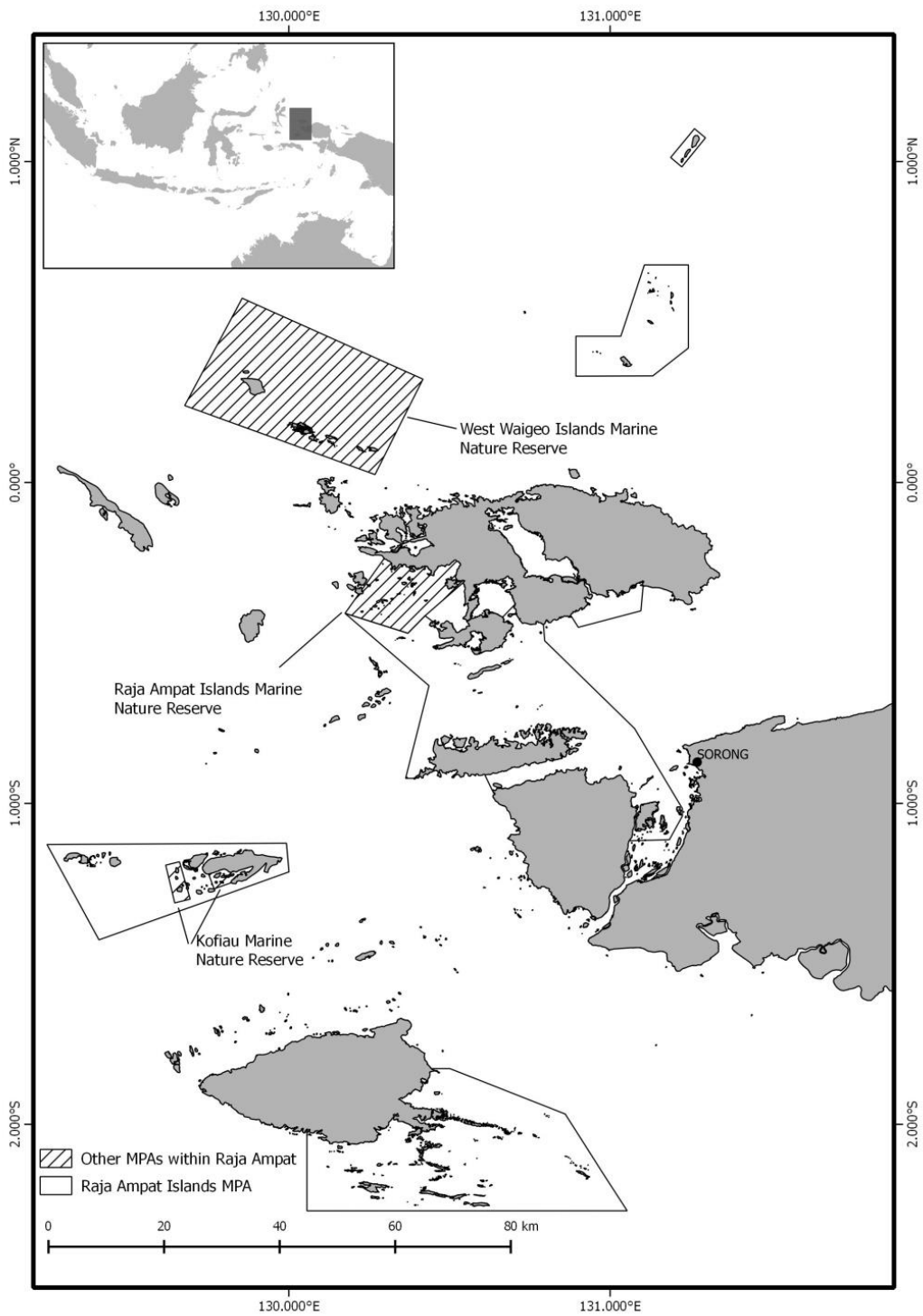
⁵² *Suaka Alam Perairan Kepulauan Raja Ampat dan Laut Sekitarnya*

⁵³ *Balai Besar Konservasi Sumber Daya Alam Papua Barat*

⁵⁴ *Cagar Alam Laut Kofiau*

The promulgation of the *National Law on Regional Government 23/2014* has created the final significant governance issue. As noted in the previous chapter, this law redesignated Indonesia's sea delimitations, transferring jurisdictional responsibility for the 0 to 4 nautical mile zone from district to provincial authorities. Within Raja Ampat, both levels of government are cooperating over this jurisdictional change with support from the Bird's Head Seascape Coalition; however, more direction is needed from the national government to resolve this issue (Meity Mongdong pers. comm.). This new law has created considerable complexity and confusion around the management of the MPA.

Beyond the challenges of governance, the Raja Ampat Islands MPA is one of Indonesia's most effective marine conservation areas (Glew et al. 2015; KKP 2015b). It is only one of four MPAs assessed by the *Technical Guidelines for Evaluating MPA Effectiveness* to be rated as 'conservation area managed minimally' or above (KKP 2015c). Moreover, the MPA achieved a comparably good result when assessed with the World Bank Score Card methodology (Glew et al. 2015; Leverington et al. 2010). Increases in coral cover and abundance of key fisheries species have also occurred (Glew et al. 2015), and studies show that local communities perceive the MPA to be legitimate (Hess, Larsen, and Leisher 2011; Lazuardi, Huffard, and Tjandra 2011). This success is mainly due to the influence of international NGOs on the design and management of the MPA, which embodies much of the contemporary theory and practice supported in the literature (Chapter 2). Katz et al. (2015) note that over the last twelve years, the Bird's Head Seascape Coalition has spent \$US 65 million to support marine conservation in the region. For Raja Ampat Islands MPA, these NGOs have implemented an extensive capacity-building programme, where management authority personnel were initially employed and trained by the NGOs and then transferred to the District Government (Meity Mongdong pers. comm.). As these organisations reduce their commitment, the challenge for the MPA will be to maintain the same level of effectiveness, which has proven difficult in other areas of Indonesia (Gurney et al. 2014; Sidangoli, Lloyd, and Boyd 2013). Nonetheless, the prospect of success is reasonable considering the long-term presence (>10 years) and the on-going commitment of these organisations (Baral, Stern, and Heinen 2007).



Map 4.2 Other Marine Protected Areas in the Raja Ampat District Government area (source: prepared by the author with spatial data from Conservation International Indonesia and ESRI 2002)

4.1.4 Community empowerment

As mentioned in the introduction to this chapter, customary rights and management systems or *sasi* are practiced in many parts of Raja Ampat, where rules typically focus on the type, quantity, timing and method of harvest (McLeod, Szuster, and Salm 2009; Donnelly, Neville, and Mous 2003; McKenna, Allen, and Suryadi 2002). Political, economic and social changes have seen these practices evolve into institutions that are governed by a range of traditional and religious leaders as well as by local government officials (McLeod, Szuster, and Salm 2009). As part of their study on *sasi* in Raja Ampat, McLeod, Szuster, and Salm (2009, 673) assert that ‘by building on the foundations of *sasi*, modern conservation strategies [that] reinforce local values and traditions, are more likely to have local support and buy-in, and are more likely to be sustainable’. The Raja Ampat Islands MPA has largely taken this approach, integrating elements of community-based management into a somewhat centralistic governance structure.

As noted above, the District Government currently has management responsibility for the MPA. Within the *Customary Management and Use Zone*, communities can manage and use these waters according to traditional practices, however. This arrangement essentially creates a *de facto* community-based MPA, which is supported by a wider governance framework that strengthens and legitimises customary ownership *vis-à-vis* outside exploitation. Local people who violate *sasi* typically receive penalties such as fines, confiscation of equipment and community service. The management authority will usually deal with ‘outsiders’ who breach MPA regulations, including within the *Customary Management and Use Zone*. In many respects, the MPA has overcome the issues of scaling up and vertical integration in governance structures common to many community-based arrangements (Ban, Adams, Almany, et al. 2011; Weeks, Russ, Alcala, et al. 2010; Berkes 2006).

The Raja Ampat Islands MPA also has some weaknesses related to community empowerment. Firstly, the MPA has an advisory committee that provides guidance on management activities, which consists solely of government representatives (Meity Mongdong pers. comm.). There are no community representatives on this committee, or indeed on other bodies that advise on or participate in higher-level decision-making. It is entirely possible that this lack of participation

will undermine the long-term success of the MPA and potentially erode the rights of customary communities (e.g., MacNeil and Cinner 2013; Andrade and Rhodes 2012; Pollnac, Crawford, and Gorospe 2001). For example, in the future, the government may choose to alter the zoning arrangements or reduce enforcement and monitoring efforts in the *Customary Management and Use Zone*. The *National Law on Regional Government 23/2014* may also move decision-making power away from communities. For these reasons, local communities and stakeholders need to be given a stronger voice at the higher levels of management. National MPA policies should also provide greater certainty and institutional empowerment for customary communities.

4.1.5 Community support

The people of Raja Ampat are highly reliant on coastal marine resources. To gain broad community support, the Raja Ampat Islands MPA will need to secure and enhance resource availability and provide economic development opportunities for local communities.

These objectives were certainly considered in the MPA's design (see Table 4.1), and post-establishment empirical evidence suggests that tangible livelihood and food security benefits have resulted. First of all, the zoning arrangements allocate nearly 54% of the MPA's total area for the exclusive use and management of customary communities. Research by Conservation International shows that exploitation by outsider fishers has reduced by over 90%, fish biomass has on average increased by 114% and local fishers' catch per unit of effort significantly improved within the MPA (Katz et al. 2015, 16-17). The marine reserves' NTZs will probably enhance resource availability through spillover as well (Russ and Alcala 2010; Leisher, van Beukering, and Scherl 2007; Roberts et al. 2001). Lastly, the State of the Seascape Report prepared by the Bird's Head Seascape Coalition concluded that food security has increased in all of the MPA sections (Glew et al. 2015).

The expanding dive tourism industry is also providing economic and employment opportunities for the people of Raja Ampat. During the 2015/16 tourist season, over 16,000 visitors entered the MPA either staying on liveaboard vessels (limited to 40), in resorts (12) or at family operated homestays (60) (Seeley 2016). These businesses have created over 600 new jobs, while

homestays have generated around US\$ 1.5 million gross annual turnover (Elson, Latumahina, and Wells 2016; Seeley 2016). However, anecdotal evidence suggests that most of the more senior or skilled positions (for example, dive guides) tend to be occupied by people originating from outside Raja Ampat. This often occurs in remote areas that have emerging tourism industries (e.g., Bennett and Dearden 2014; Walpole and Goodwin 2001; Goodwin et al. 1998). The development of a family homestay network, which received support from the Bird's Head Seascape Coalition, offers an example of how local communities can benefit directly from tourism. That said, there is still a need for government strategies such as employment quotas (for senior positions) and capacity development to build participation in the industry. Finally, the management authority has provided direct benefits to local communities through employment and disbursement of community development grants. As mentioned above, the management authority has 167 personnel, the majority of which are from the local area (Meity Mongdong pers. comm.). The MPA also has a community ranger programme, where villages take turns to patrol within each section of the reserve. These patrol teams typically consist of 6 to 10 community rangers who receive over \$US 5 per day depending on the activity (Meity Mongdong pers. comm.). The community ranger positions are also rotated within villages. The user fee system (see section 4.1.6 for further detail) funds the salaries of the community rangers and associated operational costs. Lastly, the MPAs Community Fund (associated with the user fee system) has disbursed over \$US 150,000 in community livelihood projects to date (Seeley 2016).

From a national policy perspective, the Raja Ampat Islands MPA has been able to generate benefits to local communities with limited policy guidance. These benefits will potentially lay a foundation for long-term success, with perceptions studies showing that community support for conservation is relatively high (68 to 80.5%) (Hess, Larsen, and Leisher 2011; Lazuardi, Huffard, and Tjandra 2011). Above all, the MPA should be used to guide the development of firmer national policy settings on how to provide socio-economic benefits and build community support.

4.1.6 Sustainable financing

Securing adequate and on-going funding for Raja Ampat Islands MPA has been at the forefront of the management authority and NGO partners' efforts to create an effective reserve.

During the design and establishment phases, the MPA received considerable financial support from international donors through the Bird's Head's Seascape Coalition (Katz et al. 2015). The reserve's total annual expenditure (cost of management) is roughly \$US 1.7 million (Katz et al. 2015, 26), which calculates to be \$US 1.65/hectare of the MPA; well below the global median cost (\$US 7.75/hectare) (Balmford et al. 2004). In 2007, the District Government established an annual user fee system for visitors entering the MPA, which now sits at 500,000 IDR (\$US 40) for domestic and one million IDR (\$US 80) for international visitors. Under the current arrangements, 70% of collected funds are used for MPA management (operational and non-operational) and a minimum of IDR 1.5 billion per year is allocated to a Community Fund (approximately \$US 122,000) for supporting livelihood enhancement projects (Atmodjo, Lamers and Mol 2017). In 2015, the user fee system generated over \$US 1 million (Katz et al. 2015). The remaining funds for management costs come from government budget allocations and NGO support. As mentioned above, the District Government has also gained public service agency status for the management authority. This status allows collected user fees to be retained by the management authority. Without this model, income would return to government general revenue and be disbursed as part of normal budgetary processes. It is projected that revenue generated from the user fee system will rise to \$US 1.4 million by 2020, which with government contributions will be sufficient to fully and sustainably fund the MPA (Katz et al. 2015).

As can be seen, the Raja Ampat Islands MPA has largely adopted best-practice sustainable financing approaches. The MPA should serve as an example to guide national policy. The Bird's Head Seascape Coalition has also been working to establish a \$US 38 million trust fund to ensure on-going sustainable financing of the other MPAs in the region (Katz et al. 2015). Within Indonesia, this is an exemplary case of sustainable financial planning, which should be used to guide national policy.

4.2 Case study – Sawu Sea Marine National Park

Located in Nusa Timur Tenggara Province (NTT), the Sawu Sea Marine National Park (Sawu Sea MNP) is Indonesia's largest MPA having an area of 3,355,352 hectares. The park is separated into four sections that extend from Flores to West Timor, which together cover ten districts (Kupang, Rote Ndao, Timor Tengah Selatan, Sabu Rajua, Manggarai, Manggarai Barat, Sumba Timur, Sumba Tengah, Sumba Barat, Sumba Barat Daya) and 195 villages (MKP 2014) (see Map 4.3⁵⁵). The MPA protects a range of habitats including deep-oceans, fringing reefs and mangrove forests. It is important habitat for up to 22 species of cetaceans (14 whale, 7 dolphin and dugong) including the Blue and Sperm whales (MKP 2014; Kahn 2005). There are also 532 coral species, 11 of which are endemic or sub-endemic, 350 species of coral reef fish and 5,320 hectares of seagrass (MKP 2014). On the social side, Sawu Sea MNP has 17 ethnic groups that live within or adjoining the reserve. Forms of customary management practices exist in more than 20 places within the MPA (MKP 2014, 59). The number of fishers is on the rise, and now constitutes roughly 5% of the provincial population of 5,120,061 (Ayutyas 2016; MKP 2014, 57). The province of NTT also has a poverty rate considerably higher than the national average (Ayutyas 2016; BPS 2016). Sawu Sea MNP area suffers many of the environmental threats that are common throughout Indonesia, including overfishing and habitat degradation from coastal development and destructive fishing practices (MKP 2014).

The creation of Sawu Sea MNP was announced by Indonesia's President at the World Oceans Conference (Manado, 2009), and then formalised under the *National Law on Fisheries* through a ministerial decree⁵⁶. In 2014, the national park became operational with the promulgation of the reserve's management and zoning plan⁵⁷, which states that its vision is to be sustainably and collaboratively managed in order to ensure the continuation of marine biodiversity, cultural values and society's prosperity (MKP 2014, 223). The Ministry of Marine Affairs and Fisheries manages Sawu Sea MNP through a management unit based in the provincial capital of Kupang.

⁵⁵ See also Appendix 4.2 for a more detailed zoning map.

⁵⁶ *Keputusan Menteri Kelautan dan Perikanan Republik Indonesia Nomor KEP.38/MEN/2009 Tentang Pencadangan Kawasan Konservasi Perairan Nasional Laut dan Sekitarnya di Provinsi Nusa Tenggara Timur*

⁵⁷ *Keputusan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 5/KEPMEN-KP/2014 Tentang Kawasan Konservasi Perairan Nasional Laut Sawu dan Sekitarnya di Provinsi Nusa Tenggara Timur; Keputusan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 6/KEPMEN-KP/2014 Tentang Rencana Pengelolaan dan Zonasi Taman Nasional Perairan Laut Sawu dan Sekitarnya di Provinsi Nusa Tenggara Timur Tahun 2014-2034*

The four zoning categories of the MPA have protection levels that range from NTZs to allowing commercial fishing activities (See Table 4.3). In contrast to Raja Ampat Islands MPA, the majority of Sawu Sea MNP remains available to exploitation from commercial vessels between 5-30 gross tonnes (78.5%). Small-scale fishing boats (below 5 gross tonnes) are permitted in 95.9% of the reserve. The MPA's design and planning received support from The Nature Conservancy.

Active management of Sawu Sea MNP has only recently begun. For this reason, the discussion in this section of the chapter predominantly focuses on the design process, zoning arrangements and proposed activities (as outlined in the management plan). Until now, there has been limited published peer-reviewed literature concerning this MPA.

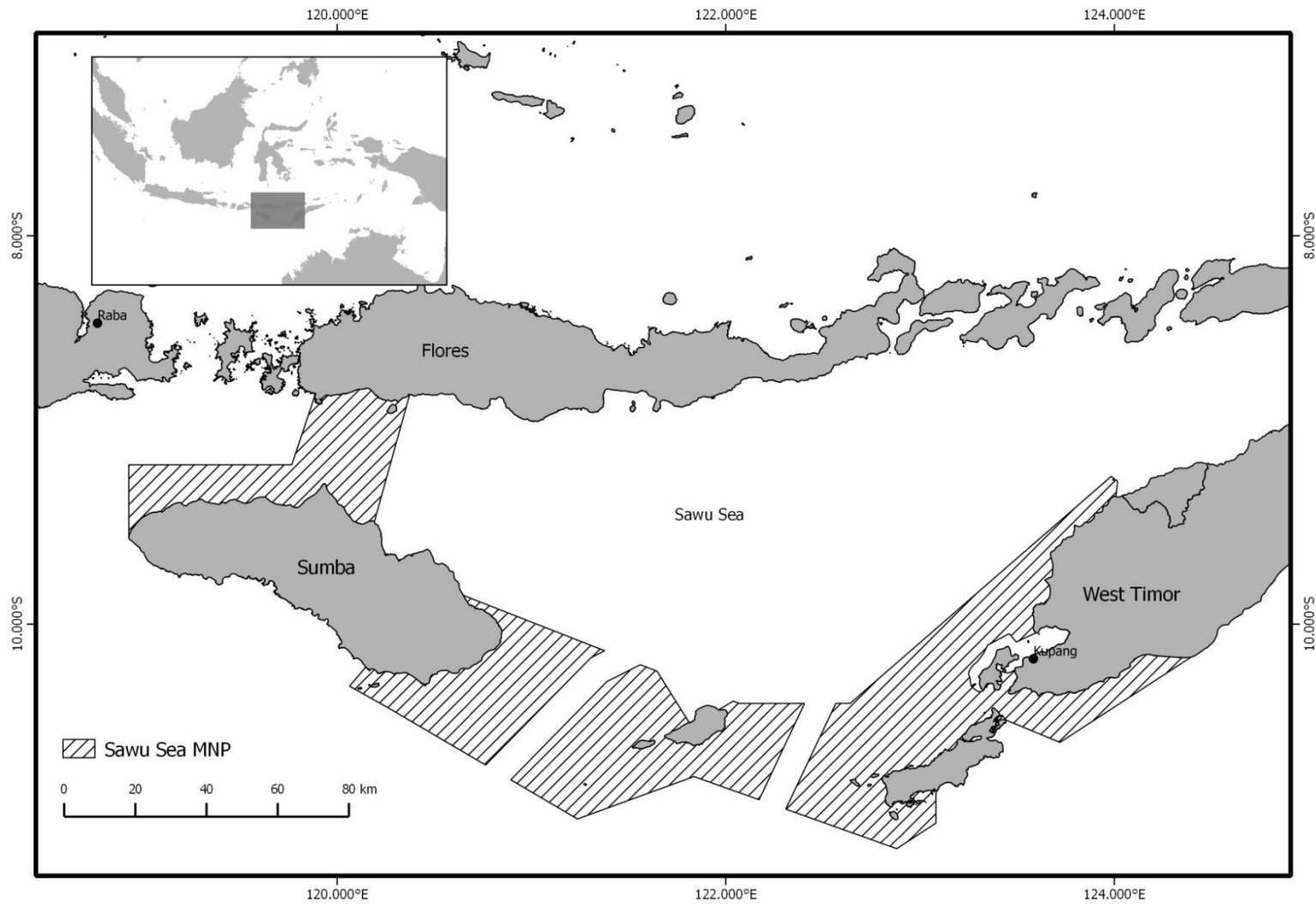
Table 4.3 Zoning categories of Sawu Sea Marine National Park

ZONE		PURPOSE	TOTAL MPA COVERAGE ⁵⁸ (%)
Core (<i>Inti</i>)		Protect areas of high ecological significance that are in good condition (e.g., spawning sites)	2.37
Use Zone (<i>Pemanfaatan</i>)		Conserve biodiversity, while allowing sustainable tourism and recreation (fishing and extractive activities are prohibited)	1.75
Sustainable fisheries Zone (<i>Zona Perikanan Berkelanjutan</i>)	General (<i>Perikanan Berkelanjutan Umum</i>)	Allow sustainable commercial fishing for vessels under 30 gross tonnes (gear restrictions apply)	41.51
	Traditional (<i>Perikanan Berkelanjutan Tradisional</i>)	Support the activities of local artisanal fisheries (small-scale or traditional)	17.34
	Cetacean (<i>Perlindungan Setasea</i>)	Conserve the habitat and migration corridors for important cetacean species, while allowing sustainable use by artisanal fishers	36.98
Other Zone (<i>Lainnya</i>)	Local Wisdom (<i>Kearifan Lokal</i>)	Protect areas of traditional value, including places that are unique or have customary institutions undertaking marine resource management ⁵⁹	0.02
	Tourism and Aquaculture (<i>Pemanfaatan Pariwisata dan Budidaya</i>)	Allow non-extractive tourism while protecting environmental services that support small-scale sustainable aquaculture activities (fishing is prohibited)	0.013

Source: Translated and adapted from MKP (2014, 82-194)

⁵⁸ The percentage of 'total MPA coverage' for each zone was calculated by the author using area figures contained in the management and zoning plan (MKP 2014, 82)

⁵⁹ The *Local Wisdom Zone* also allows for a range of small scale fishing activities.



Map 4.3 Sawu Sea Marine National Park (source: prepared by the author with spatial data from Conservation International Indonesia, UNEP-WCMC 2016 and ERSI 2002)

4.2.1 Appropriate biophysical design

The development of the zoning arrangements for Sawu Sea MNP followed a similar process to Raja Ampat Islands MPA. An analysis using the spatial decision-making support tool of Marxan was conducted with the support of The Nature Conservancy (MKP 2014; Wilson et al. 2011). This tool used more than 50 different data layers that focused on conservation values, management costs and social-economic considerations (for example, resource use patterns) to identify optimal zoning scenarios against pre-defined objectives (MKP 2014; Wilson et al. 2011). The output from this software was then modified based on feedback from stakeholders⁶⁰ and scientific experts (MKP 2014; Wilson et al. 2011). Table 4.4 outlines the biophysical and socio-economic considerations that were used to guide the planning process.

Broadly, Sawu Sea MNP's biophysical design followed national MPA policy prescriptions, as well as contemporary marine conservation theory to a lesser extent. The targets highlighted in the management plan are largely guided by the literature (e.g., Green et al. 2014; Laffoley et al. 2008), with goals such as protecting unique sites, replicating each habitat within NTZs and having specific spatial layout requirements (for example, NTZs with a minimum diameter of 10-20km) (See Table 4.4). However, the management plan fails to clarify the extent to which these targets are incorporated into the zoning arrangements. Indeed, when examining the area within NTZs (4.14%), the actual coverage is well below the management plan target (10%). Moreover, a visual analysis using GIS software suggests that the majority of NTZs are probably too small and far apart to provide sufficient protection to higher order trophic groups and allow a reasonable level of connectivity (Fernandes et al. 2012). Nonetheless, the significance of Sawu Sea MNP should not be underestimated. Nearly 139,000 hectares of its waters are fully protected. Research also shows that even small NTZs can contribute to conservation outcomes (Roberts 1997). From a national policy standpoint, Sawu Sea MNP demonstrates that firmer policy settings are needed for biophysical design. This will ensure that the country's MPAs achieve greater biodiversity outcomes.

⁶⁰ These stakeholders predominately consisted of government officials and academics from local universities.

4.2.2 Socio-economic assessment and participation in planning

The Sawu Sea MNP management plan expresses a strong commitment to mitigate social impacts and provide sustainable livelihoods for small-scale fishers. On the surface, these aspirations seem to have been incorporated into the zoning arrangements. Over 95% of the MPA is available for varying levels of resource use and 17.4% is exclusively for small-scale fishing vessels. The vast majority of the coastline is included in the *Sustainable Fishing Zone (Traditional)* and 768 hectares has been designated as *Local Wisdom Zone* to support traditional management practices.

Similar to Raja Ampat Islands MPA, the design of Sawu Sea MNP was supported by research on resource use patterns, recreation and tourism potential, livelihoods and indigenous customs (MKP 2014; Syofyanto, Fajariyanto, and Koliham 2011). This body of research includes a study prepared by The Nature Conservancy that carried out participatory mapping in 110 villages (Syofyanto, Fajariyanto, and Koliham 2011). However, these studies did not examine potential social impacts of the MPA or strategies to mitigate adverse effects. Instead, decision-makers relied on the spatial decision-making support tool of Marxan to fulfil socio-economic objectives (see previous section).

According to the management plan, stakeholder participation occurred during the design of the MPA at the national, provincial and district levels of government, as well as directly with communities. A working group was also formed to provide advice on the planning process, which consisted of representatives from provincial government departments, local universities, police, social and environmental NGOs and the business sector⁶¹ (MKP 2014, 3). Peer-reviewed literature or other sources do not document the extent to which the MPA reflect stakeholder and community aspirations. Based on the author's experience in the field, a lack of awareness about the MPA and its regulations exists among local communities.

Overall, the process to create Sawu Sea MNP illustrates the weaknesses of national MPA policy. Without prescribed methodological guidance for the collection of social data and community stakeholder participation in planning, the process remained open to interpretation

⁶¹ Representatives from local communities do not appear to have participated in the working group.

and potential bias. Going forward, there is a need to assess potential impacts to resource dependent communities associated with the current zoning arrangements.

Table 4.4 - Summary of the biological and socio-economic criteria used to guide the design of Sawu Sea Marine National Park

BIOLOGICAL CRITERIA AND TARGETS	SOCIAL-ECONOMIC CRITERIA AND CONSIDERATIONS
10% of each marine habitat within NTZs (with a target of 30%)	NTZs located near relevant supervising field stations (e.g., police or navy)
30% of marine turtle nesting sites protected	The rights of local communities are respected, and they are given an opportunity to participate in the zoning decision-making process
20% of the crocodile population protected	Provide for the continuation of traditional practices and protection of culturally important sites
5% of pelagic habitats protected	Minimise negative impacts on the livelihoods of local communities
5% of shark and manta ray habitat protected	Minimise user-based conflict (e.g., between tourism and fisheries)
5% of cetacean habitat and migration corridors protected	Provide for the needs of subsistence and low impact fishers
Each zone has a minimum diameter of 10-20 km, except where coastal communities are highly dependent on marine resources (in these cases, NTZs should be at least 1 km ²)	Ensure that species important for subsistence and small-scale fishers are sustainably managed (e.g., sea cucumber)
Three replications of each habitat type protected in NTZs	Facilitate and support low impact sustainable commercial fisheries
Choose sites for NTZs that are close to the coastline to maximise the protection of coastal habitats	Encourage potential tourism
Place whole biological units within NTZs (e.g., seamounts and lagoons)	Encourage environmentally friendly low impact industry (e.g., pearl farming)
Protect critical and unique sites (e.g., areas of high diversity, endemic biota and globally significant habitats)	Ensure that NTZs are not located near existing infrastructure
Protect areas that are important for the key life stages of the MPA's biota (e.g., fish aggregation sites, shark breeding locations, turtle nesting or feeding sites, seabird rookeries)	
Consider resilience to climate change (e.g., protect a range of water temperatures)	
Protect species that are susceptible to overfishing (e.g., groupers)	

Source: translated and adapted from MKP (2014, 72-80)

4.2.3 Good governance and management

Sawu Sea MNP is contextually similar to Raja Ampat Islands MPA; extending over a vast area with sections of remote and sparsely populated coastlines (Map 4.3). As mentioned above, the management authority is located in the provincial capital of Kupang, with field stations situated around the MPA. Operating in such a context, the success of the MPA is tied to local community support and the willingness of resource users to comply voluntarily with park regulations (Arias et al. 2015).

Like Raja Ampat Islands MPA, the jurisdictional complexities of Indonesia's MPA arrangements manifest in Sawu Sea MNP. This national government MPA covers 11 local government authorities (that is, 10 districts and one province). Without careful coordination, tension between the MPA and these local authorities might emerge, particularly around permitting and collection of revenue (Syarif 2012). Moreover, many of the threats to the reserve originate from the jurisdictional area of other government authorities (for example, land based runoff). The management plan recognises the need to collaborate with the Provincial Government and district authorities. For example, the third mission of the MPA is to support the regional development of the province (MKP 2014, 223). The MPA will also establish a number of conservation committees and forums to consult with stakeholders, including local government authorities (see section 4.2.4 for further detail). It is also worth noting that Sawu Sea MNP encircles *Teluk Kupang Marine Tourist Park (Taman Wisata Alam Laut)*, which may create confusion in the local area.

Beyond jurisdictional issues, many of the good governance principles such as transparency, accountability, fairness, adaptability and legitimacy are highlighted in the management plan. For example, the fourth mission of the MPA is to implement management systems that are based on prudence, integration, adaptiveness, participation and collaboration (MKP 2014, 223). Adaptive management is particularly important for centralistic MPAs such as the Sawu Sea MNP (Lockwood et al. 2012; Jentoft, Son, and Bjørkan 2007; Hockings et al. 2006). The management plan identifies a range of strategies such as institutional strengthening and establishing a planning, monitoring and evaluation system to achieve this outcome; all of which are highlighted in the literature as being essential steps for implementing adaptive management (Ban, Adams, Almany, et al. 2011; Christie and White 2007). Moreover, there is a regulatory requirement to review the plan of management every five years. Surprisingly, the management plan barely focuses on encouraging voluntary compliance. Given the centralistic nature of the MPA, perceived legitimacy by local communities will be a substantial issue (Mangubhai et al. 2011).

4.2.4 Community empowerment

In contrast to Raja Ampat Islands MPA, Sawu Sea MNP has largely adopted a centralistic top-down governance approach, which aims to collaborate with stakeholders but not devolve power in decision-making. As noted above, the MPA is controlled by MMAF through a management unit based in Kupang.

The MPA's management plan identifies the need to develop collaborative systems and mechanisms (Objective 6 of Mission 4) (MKP 2014, 226). The plan notes that effective collaborative partnerships should be based on mutual trust, respect and benefit (MKP 2014, 251). The principal mechanism for achieving this will be through forming a Conservation Committee (*Dewan Konservasi*) at the provincial level and Conservation Forums (*Forum Konservasi*) for each district government area. These bodies will consist of representatives from government, academia, NGOs and other stakeholders, and will be tasked with promoting government policies, seeking input, coordinating management programs and raising funds. It is not clear the extent to which local community representatives will be given an opportunity to participate in the forums. Similar consultative mechanisms have been used in other marine national parks in Indonesia (Halim, Soekirman, and Ramono 2008). However, some of these MPAs have been associated with poor conservation success and low levels of social acceptance (for example, Komodo, Wakatobi and Berau (Kusumawati and Visser 2014; Mangubhai et al. 2011; Gustave and Borchers 2008; Majors 2008). The management authority will also socialise and undertake public consultation on the management plan with stakeholders and local communities during the first year of operation (MKP 2014).

Contemporary literature suggests that a flexible approach is needed for establishing MPA governance arrangements, where the level of participation should be adapted to the local context. Centralistic top-down approaches such as that adopted for Sawu Sea MNP are better suited to areas that have high population densities, commercial threats, absent customary arrangements and higher levels of migration. Sawu Sea MNP does indeed have some areas with these characteristics (for example, Kupang); however, it also has many others that are far better suited to bottom-up approaches (that is, extant customary management institutions, low population densities and weak government institutions) (Brewer et al. 2012; Cinner, McClanahan, et al. 2012; Ostrom 2009; Muehlig-Hofmann 2007; McClanahan et al. 2006;

Cinner 2005; Crawford et al. 2004; Johannes 2002; Agrawal 2001). For this reason, it is highly likely that the current arrangements do not represent the most appropriate governance model to achieve conservation success. It is recommended that the management authority move toward co-management where local governments and other relevant stakeholders, including communities, are genuinely involved in decision-making. This may involve learning from co-management models developed in other parts of Indonesia such as Bunaken National Park in North Sulawesi, where a multi-stakeholder board was established with regional authorities to guide operational activities (Patlis 2008; Erdmann et al. 2004). It is important that co-management arrangements have an effective legal structure to reduce conflict between stakeholders and the management authority (Sidangoli, Lloyd, and Boyd 2013). In more remote locations, decision-making power should be devolved by empowering local communities to manage marine resources, which may include granting territorial rights (Glaser et al. 2010). Where customary institutions exist, the MPA should consider establishing community-based management arrangements similar to those that operate in Raja Ampat Islands MPA. For this to happen, a thorough understanding of local institutions, political hierarchies and socio-economic factors is needed to examine a community's suitability (Steenbergen 2016; Warren 2016; Cinner, McClanahan, et al. 2012; Ostrom 2009; Cinner and Aswani 2007; Agrawal 2001).

4.2.5 Community support

Building community support and overcoming socio-economic barriers is particularly important for MPAs that have a high number of resource dependent communities such as Sawu Sea MNP. As with national policy arrangements, the Sawu Sea MNP takes a strong people-centred approach, which aims to enhance community welfare. It also partially captures the three MPA strategies identified in contemporary literature as having the potential to benefit local communities in the Asia-Pacific region. As noted in Chapter 2, these are enhanced fisheries outputs, provision of employment opportunities and livelihood development programs.

First of all, the zoning arrangements seem to have been designed with the goal of providing fisheries benefits to local communities. As noted above, 17% of the reserves' total area and the majority of its coastline is designated for the exclusive use of small-scale fishers. However, this zone is still open to exploitation by outsiders who use appropriately sized boats

and fishing gear⁶². This may lead to the overexploitation of fish stocks from being a partially 'open access' resource (Christy 1982). It is quite plausible that fishers from surrounding areas will travel to the MPA to exploit its resources, depleting fish stocks that support local livelihoods. The management authority may need to consider establishing territorial rights over fishing grounds within this zone to reduce fishing pressure and encourage local communities to sustainably manage resources (Wilén, Cancino and Uchida 2012; Christy 1982).

Beyond the MPAs design, the management plan states that marine resources will be developed optimally and sustainably for the welfare of people in the region (Mission 1). It also identifies a range of objectives aimed at achieving this mission including promoting economic development and tourism (MKP 2014). The MPA's first five-year action plan has activities centred on building community capacity to manage fisheries businesses and the development of sustainable livelihood plots (MKP 2014). The second five-year action plan aims to have functioning alternative sustainable livelihood programs in each region of the MPA (MKP 2014). With alternative livelihood initiatives having mixed success in the country, the potential contribution of these programmes will depend on sufficient funding, community capacity and a willingness to adapt to the local context (Stanford et al. 2013; Sievanen et al. 2005). The management authority will also need to ensure continued enforcement of the reserve's regulations. In promoting tourism, the MPA should ensure benefits flow to resource dependent communities and prevent elite capture by local leaders or outsiders. This might include such actions as capacity building programs, micro-financing schemes and mandated employment quotas (Walpole and Goodwin 2001; Shah and Gupta 2000; Goodwin et al. 1998). There appear to be no plans to establish a community ranger programme, similar to that of Raja Ampat Islands MPA.

⁶² There are no permitting requirements in the *Sustainable fisheries Zone (Traditional)* for small-scale fishers.

4.2.6 Sustainable financing

Sustainable financing is a critical issue for such a vast and diverse MPA. The management plan identifies that a focus of Sawu Sea MNP is to develop a system of sustainable financing (Mission 4, Objective 4), with the following goals:

- complete an analysis of funding needs;
- complete an opportunity analysis of sustainable funding sources;
- develop standardised financial systems to support management activities;
- develop alternative funding mechanisms; and
- implement a financial system that is professional, transparent and accountable (MKP 2014, 236).

The management plan goes on to suggest possible strategies for achieving these goals, including entry fees, tour operator charges, collection of funds from tourism activities (for example, selling souvenirs), charging for the use of public facilities and sourcing funds from external donors (MKP 2014). Interestingly, the management plan identifies that a similar approach to Raja Ampat Islands MPA will be taken by establishing a *Badan Layanan Umum* or public service agency within three years of the MPA being established (MKP 2014). The public service agency will allow collected user fees or non-government funds to be retained for supporting the national park's management. The Conservation Committee participants have also been identified as having a role in raising external funds (MKP 2014).

Overall, the Sawu Sea MNP management plan captures much of the contemporary thinking on sustainable financing. As noted in the second chapter, sustainable financing mechanisms should be considered during the design process and adapted to the local context (Ban, Adams, Pressey, et al. 2011; Emerton, Bishop, and Thomas 2006; McClanahan 1999). A financial sustainability study was conducted early in the design process with management costs and funding options given some consideration (Pet and Widodo 2009). If established, the public service agency will provide a platform for the management authority to raise additional funds and augment government budgets. The mix of market-based approaches and external funding sources outlined in the management plan offer a flexible approach to raising revenue.

Tourism related fees might generate funds near large population centres and recreational hotspots such as Rote Island. The development of a whale watching industry may also be a

possible source of funding. Lastly, greater consideration should be given to payment for ecosystem service schemes such as Blue Carbon⁶³, which may offer a revenue stream for maintaining and restoring coastal carbon stores (Alongi et al. 2016).

4.3 Conclusions

This chapter of the thesis examined Raja Ampat Islands MPA and Sawu Sea MNP as case study sites to analyse the on-ground planning and implementation of Indonesia's national MPA policies. Contextual and institutional factors have led these sites to be very different from each other. The Raja Ampat islands MPA was established by the local government with a strong focus on community-based management. Raja Ampat also has enduring customary marine resource management systems, where many communities assert ownership over coastal waters. The creation of Sawu Sea MNP, on the other hand, was driven by a national government ministry (MMAF) using a conventional centralistic approach. Both case-study sites followed policy prescriptions, and the national level policy issues described in Chapter 3 are reflected in the two sites. However, planning and implementation in Raja Ampat Islands MPA is more closely aligned with contemporary theory, and can help guide the development of tighter policy settings across Indonesia's MPAs.

During the design phase, both MPAs attempted to follow the biophysical design principles outlined in contemporary theory. Raja Ampat Islands MPA, in particular, better met these parameters (for example, area in NTZs). If effectively managed, the MPA will protect the region's marine biota including higher trophic species. In contrast, the Sawu Sea MNP, which has a much lower percentage of NTZs, may not be as successful. Both MPAs undertook social assessment studies and conducted community consultation, but lacked a comprehensive social-economic impact assessment process. However, the Raja Ampat Islands MPA's consent-based approach has ensured that local communities were seemingly empowered in the design process, and that social impacts were mitigated through negotiation. The widespread development of local community agreements (*cerita acara*), suggest that the MPA has broad support. National MPA policies should encourage such planning approaches.

⁶³ As noted in Chapter 2 of the thesis, 'Blue Carbon' initiatives typically involve polluting entities paying for the restoration and protection of mangrove forests and marine habitats through credit schemes or other mechanisms (Bos, Pressey, and Stoeckl 2015; Mohammed 2012; McLeod et al. 2011).

Jurisdictional issues existed at both sites. For Raja Ampat Islands MPA, these included confusion about which legislation should be used to declare the MPA (*National Law on Fisheries* or *MCZSI Law*), jurisdictional overlap with nationally managed MPAs (for example, *Kofiau Marine Nature Reserve*) and uncertainty around the implementation of *National Law on Regional Government 23/2014*. For Sawu Sea MNP, being a centrally controlled MPA, conflict with local authorities will need to be carefully managed. These are all serious issues that require urgent policy reform. Beyond governance issues, Raja Ampat Islands MPA is one of the country's most successful marine reserves, embodying many of the policy approaches promoted by contemporary theory. In particular, high levels of voluntary compliance are probably the result of its perceived legitimacy among local communities. However, as the level of support from international NGOs reduces, a major challenge for the MPA will be to maintain the same level of effectiveness.

The two case-study sites have very different approaches to community participation. The Raja Ampat Islands MPA has successfully integrated community-based management within a broader regulatory framework. The *Customary Management and Use Zone* has essentially created *de-facto* community-based MPAs that exclude outsiders and overcome the issues of scaling up and vertical integration. Sawu Sea MNP, on the other hand, is a centralistic MPA that probably needs to move to a co-management model to help build support among stakeholders and local communities. There are also some differences in sustainable financing between the two sites. Through the implementation of best-practice approaches (user fees and government budgeting), Raja Ampat Islands MPA will be sufficiently and sustainably funded by 2020. The Sawu Sea MNP, although much earlier in the process, has identified a number of strategies that may provide a sufficient funding base. The use of the public service agency mechanism by both MPAs is an innovative solution for overcoming the limitations of government budgetary processes.

Lastly, the Raja Ampat Islands MPA has seemingly been able to build widespread community support through providing a range of social benefits, including livelihood enhancement, food security, economic development through tourism and direct employment with the management agency. As is the case for sustainable financing, the Sawu Sea MPA is only in the early stages of operation. It is planning to implement programmes such as alternative income development and growing the tourism industry, which may provide benefits to local communities in the future.

Chapter 5 - Conclusions

There is a substantial and urgent need to improve the effectiveness of Indonesia's MPAs (KKP 2015c; KSDAE 2015; Campbell et al. 2012; Burke et al. 2011; Green et al. 2011; Mangubhai et al. 2011; Wiadnya et al. 2011). This is both to ensure the continuity of the country's globally significant marine biodiversity, as well as to support the livelihoods of coastal communities in the face of increasingly widespread resource depletion. If MPA design and management continue on the same trajectory, it is likely that healthy marine ecosystems will only be found in remote areas and a small number of reasonably well-managed reserves. A solid policy framework is a fundamental prerequisite for effective conservation initiatives.

This thesis conducted a comprehensive review of Indonesia's MPA policy arrangements. Although a number of authors have written about this topic (Siry 2011; Wiadnya et al. 2011; Patlis 2008; Dirhamsyah 2006), the literature to date has not rigorously examined the current arrangements *vis-à-vis* contemporary thinking for MPAs. To fill this gap, the thesis firstly explores contemporary theory and practice to identify the policy elements that are essential for creating effective MPAs in the Asia-Pacific region (Chapter 2). It is argued that these elements are appropriate biophysical design, socio-economic assessment and participation in planning, good governance and management, community empowerment, community support, and sustainable financing. These elements form the conceptual framework that was used to analyse the country's MPA policy arrangements (Chapter 3). The thesis also examined the Eastern Indonesian case-study sites of Raja Ampat Islands MPA and Sawu Sea MNP to explore how policies are being implemented in the field (Chapter 4).

Overall, Indonesia's MPA policy arrangements still suffer from the problem of 'multi-scale disconnect' previously described by several authors (e.g., Patlis 2008; Dirhamsyah 2006; Satria and Matsuda 2004). The move to 'decentralisation' and then 'recentralisation', overlapping legislative instruments and the multiplicity of management institutions has created a complex and sometimes confusing jurisdictional framework. Nonetheless, these arrangements still provide a reasonable policy platform that captures many aspects of contemporary theory and practice. The two case-study sites provide contrasting examples of

how Indonesia's national MPA policy arrangements are being implemented. Raja Ampat islands MPA was established by the local government with a strong focus on community-based management, while the creation of Sawu Sea MNP was driven by the central government Ministry of Marine Affairs and Fisheries (MMAF) using a conventional 'centralistic' approach. National strategic, structural and general policy weaknesses are present and affect the management of both sites.

To improve the country's MPA performance and overcome the main policy weaknesses, the thesis recommends that attention be given to the five policy areas listed below. The heterogeneity of Indonesia's coastal communities and environment mean that a 'one size fits all' approach will not work. It is important that an adaptive and flexible ethos be incorporated into the MPA policy framework.

1. Clarification on jurisdictional and institutional overlap

The country's MPA policy arrangements suffer three main jurisdictional and institutional overlap issues. First, there are three main pieces of legislation that influence the management of the country's marine reserves. This jurisdictional crossover is a historical legacy from the evolution of marine resource management. The process of transferring MPAs from the Ministry of Forestry to MMAF should be accelerated so that there is a single institutional umbrella overseeing policy development for marine conservation. Moreover, there needs to be clear prescriptions for selecting which MPA to designate in the overlap zone between the *National Law on Fisheries* and the *MCZSI Law* (12 nautical miles out from the shoreline). The promulgation of *National Law on Regional Government 23/2014* is one of the most serious challenges for MPAs in the country. This piece of legislation transfers jurisdictional responsibility of district MPAs in nearshore coastal waters (shoreline to four nautical miles) from district to provincial governments. As noted in Chapter 3, the change will affect 112 MPAs covering an area of 7.2 million hectares. This issue requires urgent policy attention. In particular, there needs to be clarification on the institutional arrangements for transferring control of these areas. Some authors have argued that the recentralisation of natural resource management will have a negative impact, and contend that the change should be reversed (Dirhamsyah 2016; Susanto 2016). However, this thesis takes a more circumspect view. The challenges that district governments have faced in managing natural resources after decentralisation are well documented (Wever et al. 2012; Patlis 2008; Dirhamsyah 2006; Fox, Adhuri, and Resosudarmo 2005). The involvement of provincial governments in MPA

management may allow greater coordination of marine conservation efforts (e.g., budgeting and site prioritisation). However, it is critical that the delegation of authority to district governments be examined and clarified. This is particularly important for established MPAs that have management regimes already operating, as well as in circumstances where district government oversight may result in more effective outcomes.

2. Institutionalisation of community-based and co-management arrangements

There is now widespread recognition among scholars, practitioners and government officials that greater levels of community and other forms of local stakeholder participation in Indonesian marine conservation can improve success (e.g., Indrawan et al. 2014; Cinner, McClanahan, et al. 2012; Satria and Matsuda 2004; Clifton 2003; Bailey and Zerner 1992). This is certainly acknowledged in the country's MPA policies. However, the rigid and centralistic approach toward governance of these arrangements means that they fall well short of prescriptions arising from contemporary theory and practice. Indeed, policy opportunities to create genuine community-based and co-management arrangements are limited. To date, attempts to facilitate greater participation in MPA management have typically been through advisory boards or similar mechanisms (Djohani 2009; Halim, Soekirman, and Ramono 2008; Patlis 2008; Erdmann et al. 2004). The Sawu Sea MNP is also proposing to use this approach through establishing a range of consultative forums. Most of Indonesia's current community-based MPAs are designated under village laws, which are legally weak and vulnerable to changes in higher level laws. It is also worth noting that the coastal spatial planning provisions of the *MCZSI Law* give communities the right to propose customary fishing grounds and territories. However, spatial designation of fishing grounds does not constitute or create institutional MPAs.

As suggested by the Coral Triangle Initiative National Plan of Action, it is recommended that a comprehensive evaluation of Indonesia's MPA governance arrangements be undertaken, and the outcomes incorporated into the country's core MPA policies. This review should examine how local communities and other stakeholders can be empowered to manage coastal resources through flexible community-based and co-management models. In particular, the issue of how to integrate community-based arrangements into the country's overall MPA legislative and policy framework should be investigated. The Raja Ampat Islands MPA approach to empowering local communities through creating *de facto* (and nested) community-based MPAs within a wider governance framework should be considered as a

model for other contextually similar locations. It is also important that the issues of vertical integration be overcome (Gurney et al. 2014; Ban, Adams, Almany, et al. 2011; Weeks, Russ, Alcala, et al. 2010; Berkes 2006). For co-management, the review should focus on how institutional models and mechanisms can genuinely devolve power beyond regional authorities to communities and other stakeholders.

3. Building legitimacy and support with local communities

A fundamental issue for the managers of Indonesia's MPAs is how to ensure resource users voluntarily comply with reserve regulations. The reality in most parts of the country is that conducting widespread surveillance and enforcement is too difficult and expensive. As noted in Chapter 2, resource users are more likely to comply with MPA regulations where they perceive them to be legitimate, fair, transparent and accountable (Pomeroy et al. 2015; Stern 2008; Sutinen and Kuperan 1999; Ostrom 1990). There are also a range of management approaches (for example, community empowerment) and socio-economic factors that can influence compliance (e.g., Cinner, McClanahan, et al. 2012; Leisher, Mangubhai, et al. 2012; Walmsley and White 2003). Providing tangible benefits to local communities can significantly contribute to building legitimacy and support. The country's policy framework does in part provide a foundation for achieving this outcome, including the MMAF Strategic Plan's target of improving household income in 110 MPAs by 2020. However, a greater level of detail outlining strategies for enhancing local socio-economic conditions as prescribed in contemporary theory should be incorporated into core policy documents. Moreover, the concrete strategies implemented in Raja Ampat Islands MPA should be used to guide policy development. This includes the zoning arrangements (allocating nearly 54% of the MPA's total area for traditional communities), employment of local people in the management authority, establishing a community ranger programme and developing a homestay network to support community-based tourism.

4. Tighter policy prescriptions for biophysical design

Appropriate biophysical design lays the foundation for achieving successful conservation outcomes in MPAs. However, Indonesia's policy prescriptions in this area are weak, and unlikely to provide sufficient direction for achieving broad-scale marine biodiversity protection. Although the country's national target of creating 20 million hectares of MPA by 2020 sets out a clear policy direction, it will only result in the designation of roughly 5.9% of the country's territorial waters and 3.1% of its total marine sovereign area within MPAs. This

coverage is well below the levels advocated by experts (Between 20 to 40% of each habitat type protected in NTZs) (e.g., Green et al. 2014; Fernandes et al. 2012; Laffoley et al. 2008). The case-study sites demonstrate the variability to which biophysical design parameters are being implemented across the country. Raja Ampat Islands MPA has nearly 20% of its area within NTZs, while for Sawu Sea MNP this number is only 4.14%. It is recommended that MPA biophysical design parameters advocated for by experts be better incorporated into core policy documents such as ministerial decrees. The design process for Raja Ampat islands MPA may also serve as an example to develop firmer policy settings.

5. Mainstreaming contemporary theory and practice in core policies

Beyond the issues raised above, there is also a lack of policy depth in some other areas of MPA design and management. The thesis found that prescriptions for socio-economic assessment in core policy documents are vague. This is also the case for participation in planning, where the power to design MPAs sits firmly with government institutions. To improve the country's policy framework in these areas, contemporary MPA theory and practice should be better integrated and mainstreamed into core policy documents such as procedural guides and protocols. The development of a clearer approach to sustainable financing is also required. This approach should emphasise the need for management costs and sustainable financing opportunities to be considered during the design phase of an MPA. It should also identify how a flexible regulatory framework can be established so that contextually adapted funding mechanisms can be implemented.

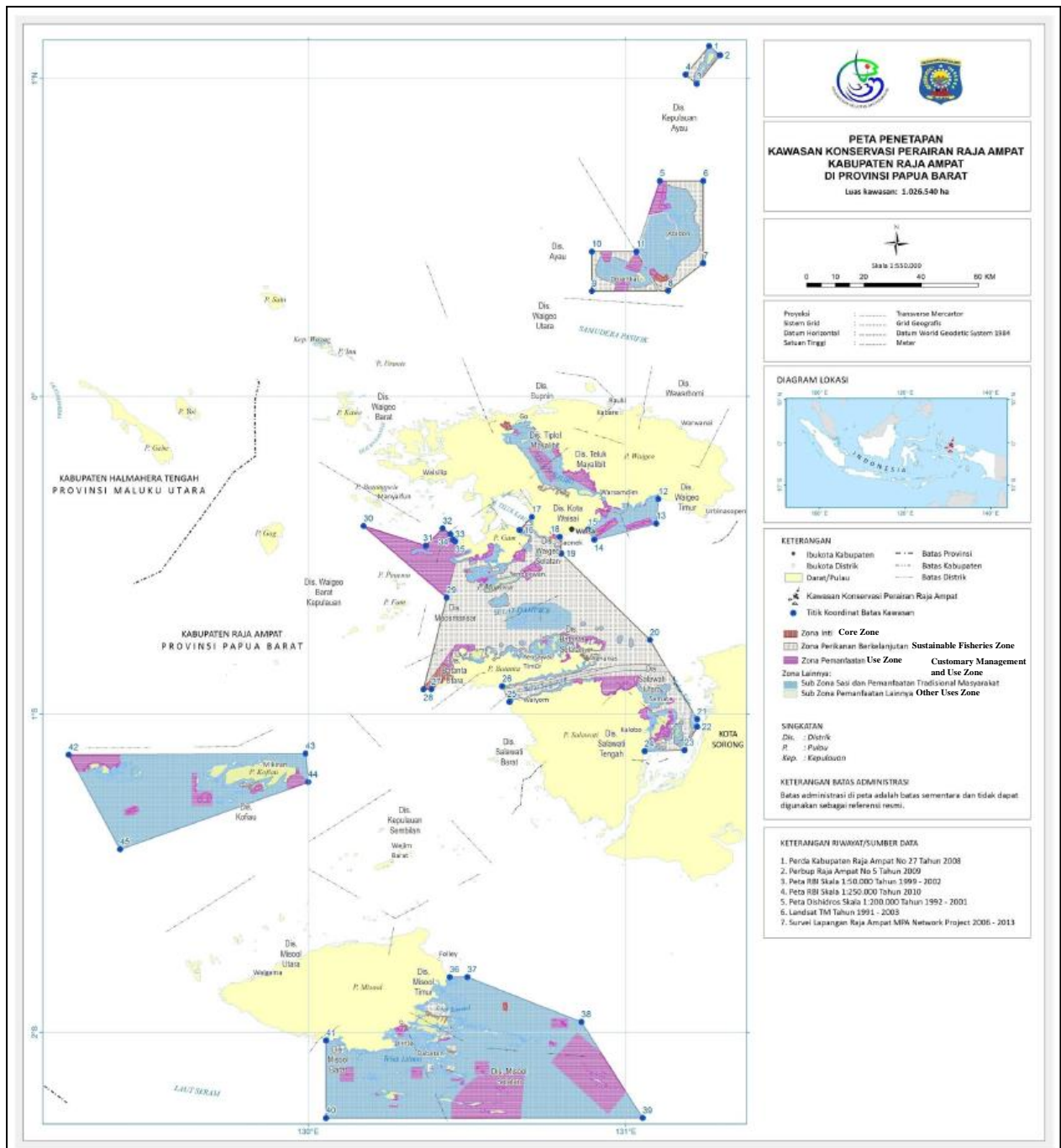
Appendices

Appendix 1.1 Expert informants

NAME	POSITION/EXPERIENCE	DATE OF INTERVIEW
Alexander S. Tanoby	Project Leader, Sawu Sea Marine Protected Areas Development Project, The Nature Conservancy	26 March 2014
Dr. Dedi S. Adhuri	Indonesian Institute of Sciences (<i>Lembaga Ilmu Pengetahuan Indonesia</i>)	3 February 2014
M. Imran Amin	Deputy Director Marine Program, The Nature Conservancy	7 February 2014
Dr. Johannes Subijanto	Deputy Director Coral Triangle Centre	18 September 2013
Matt Fox	Marine Programme Advisor, Conservation International	15 August 2013, and numerous ongoing discussions thereafter
Meity Mongdong	Manager Governance, Bird's Head Seascape, Conservation International	Various discussions between 9-13 December 2013 during a field visit to Raja Ampat Islands MPA, as well as ongoing communications thereafter
Mirza Pedju	Area-Based Conservation Manager, The Nature Conservancy	Various discussions between 21-27 March 2014 during a field visit to Sawu Sea MNP
Muhamad Khazali	Marine Policy Manager, Conservation International	16 April 2014
Dr. Rili Djohani	Executive Director, Coral Triangle Centre	18 September 2013
Riyanto Basuki	Ministry of Marine Affairs and Fisheries	4 February 2014
Suraji	Ministry of Marine Affairs and Fisheries	4 February 2014
Dr. Tiene Gunawan	Marine Programme Director, Conservation International	3 February 2014

Note: the table lists the key informant's position at the time of the interviews. Some of the informants have since been promoted or changed organisations.

Appendix 4.1 Zoning arrangements for Raja Ampat Islands Marine Protected Area



Source: KEPMEN-KP No. 36/2014

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