

The bridging role of non-governmental organizations in the planning, adoption, and management of the marine protected area network in Raja Ampat, Indonesia

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ABSTRACT

Coral reef ecosystems are among the most diverse habitats on earth, providing essential social and ecological services. Raja Ampat, Indonesia - located in the Coral Triangle, the heart of marine biodiversity - has a rich history of traditional management, which included area-based management tools akin to modern marine protected areas (MPAs). Decentralization and restoration of tenure rights in 2001 provided an opportunity for resurgence and stronger recognition of these traditional systems. Conservation non-governmental organizations (NGOs), noting the remarkable biodiversity and increasing threats due to destructive fishing practices, worked with local communities to facilitate community-based MPAs as a conservation strategy. Here we employed a case study approach to assess the specific bridging strategies utilized by NGOs during the adoption, implementation and management of the Raja Ampat MPA Network. This descriptive case study included six targeted in-depth interviews and other secondary sources. Our results suggest that NGOs played different roles over time in the MPA process. Interviewees identified specific initiatives that occurred during this process, which involved multiple bridging tools. Three of these key initiatives are: the Tourism Entrance Fee System, the Raja Ampat MPA Patrol System, and the Blue Abadi Fund. The specific bridging tools employed included: linking stakeholders, co-producing knowledge, providing access to resources, facilitating community engagement, and building capacity. Recent research has pointed to social and ecological effectiveness of the Raja Ampat MPA Network, which could in part be attributed to the bottom-up approach facilitated by NGOs, including through bridging practices. However, we also note the limitations of this study in only providing an NGO-centric perspective which may be more nuanced if other stakeholder perspectives could have been obtained.

1. Introduction

Marine systems, which provide critical ecosystem services, are severely threatened by overfishing, climate change, pollution, and habitat destruction [20,50,91]. Coral reef ecosystems provide extensive ecological and social benefits including coastal protection, biodiversity conservation, and food security [46,49,65,90,91]; however these ecosystems are among the most threatened [20,46]. Given their ecological value and contributions to community wellbeing, conserving coral reef systems is both locally and globally important.

Marine protected areas (MPAs) are one of a number of area-based tools among national governments for conserving marine ecosystems [7,47,65,66,91]. The use of area-based management tools is not novel; the practice of seasonally closing and limiting human activity in marine areas can be traced back at least hundreds of years to communities in Oceania and Southeast Asia, including Indonesia [22,54,55]. MPAs can provide ecological benefits by conserving biodiversity and providing environmental resilience and can also benefit communities by

improving food security and providing alternative sources of income through tourism [10,25,46]. However, poor design combined with lack of capacity and community engagement can result in the creation of top-down, centralized 'paper parks' which have no community buy-in [31]. When conservation initiatives are established instead from the bottom up, starting with establishing locally-driven links between conservation and livelihoods, communities are more likely to participate and feel ownership over resources; further, the communities are more likely to benefit from the conservation initiatives [14] and the MPA is more likely to be ecologically effective [24].

Social-ecological systems are complex, integrated systems in which humans are part of nature [17]. Examining MPAs through a social-ecological lens has become more common in recent decades and can help to consider possible trade-offs between social acceptance and ecological success [8,16]. Best practices for implementing MPAs with attention to both social and ecological outcomes are emerging in the literature and in practice, and include empowering local communities through ownership, reinvigorating traditional resource management

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practices, and ensuring local communities retain access to their property [26,70,97,104].

Bridging organizations facilitate connections between actors through the co-production of knowledge, providing access to new connections, and vertical and horizontal collaboration [15]. Bridging organizations can connect a range of stakeholders at a variety of levels through forms of 'strategic bridging' [29] and enable actors to connect with stakeholders that they might have not been able to connect with otherwise [97]. In this role, bridging organizations have facilitated governance of ecosystems services in watersheds in Montreal, Canada [86] worked with communities to implement MPAs in Bali [12,13], and enabled co-management in a wetland biosphere reserve in Sweden [44]. Organizations can 'bridge' across governments, users, and other stakeholders through a variety of tools [15,29,97]. Some of these tools include: facilitating connections between different communities, governments, and stakeholders at various levels of governance; building capacity of local communities through meaningful participation; integrating customary knowledge with 21st century conservation theory [12]; improving access to information and resources, co-producing knowledge; and building local-government institutions [15].

Many institutions can act as bridging organizations, including non-governmental organizations (NGOs), science institutions, and local stewardship groups [29]. NGOs are well-positioned to be bridging organizations because they can bring together various unrelated actors and create partnerships that would have not otherwise existed [109]. Specific NGOs (e.g., Conservation International, the Coral Triangle Center, and Reef Check) have acted as bridging organizations in Bali to help communities establish MPAs through bottom-up approaches [12, 13]. This has integrated local actors into the planning for an MPA and led to stronger social outcomes [12,26,104].

1.1. Case study: Raja Ampat, West Papua

The Raja Ampat Islands ecoregion, located in eastern Indonesia, is the 'bullseye' of the Coral Triangle, harboring more types of fish and coral than anywhere else on the planet; more than 1638 reef fishes and 534 hard corals, ~67% of the world's described species [2,3,72,99]. For centuries, the remarkable biodiversity in the region was maintained by Raja Ampat's remote location and adherence to traditional resource management practices. Raja Ampat, or the *four kings*, is named after the four main islands Batanta, Misool, Salawati and Waigeo, and is located in the westernmost region of the Province of West Papua [1,72] (Fig. 1). Traditionally the 117 villages of Raja Ampat maintained exclusive rights to, and responsibilities for, a specific swath of ocean, a traditional marine tenure system referred to as *Hak Adat* [73]. In addition, and similar to communities in Oceania and other parts of eastern Indonesia, communities in Raja Ampat have been practicing a traditional resource management system known as *sasi* for hundreds, if not thousands of years [45,55,62,73]. *Sasi* includes a variety of management tools, including seasonal closures akin to modern MPAs [45,73].

The traditional management systems used across eastern Indonesia, including *sasi*, were compromised by the tumultuous impacts of hundreds of years of colonization which included centralized government, commodification of resources, and increasingly destructive fishing practices [69,72,82]. Indonesia was colonized by the Dutch in 1602, and Holland only granted Independence to Indonesia in 1945, though they retained control over the region of present day West Papua until 1969 [108]. In 1997, the Indonesian government entered a new era of reform (*reformasi*) where it shifted towards a more decentralized state towards granting provinces regional autonomy; this was achieved in West Papua in 2007 [80,81,105]. In 2001 and 2008, respectively, the Papua and West Papua Provinces were granted 'Special Autonomy' by Law No. 21/2001 and Law No. 35/2008 which restored traditional resource rights to the province and allowed for more community ownership of natural resources and revitalized traditional resource governance and customary tenure [84,108]. In 2002, a new regency level of government

was established in the Raja Ampat region, which was situated under the provincial government [1,73]. Every regency, including Raja Ampat, is led by an elected regent, or *Bupati*, who manages all of the districts within the regency.

Recent pressures related to unsustainable resource use, development, and population growth (including immigration from other regions of Indonesia) severely threaten the region's rich biodiversity and the communities which depend on it [69,85]. The Regency of Raja Ampat comprises almost 1500 islands spanning approximately 43,000 km² [1, 72] (Fig. 1) and has historically maintained a relatively small population [72]. However, under a centralized government Raja Ampat's resources technically belonged to the state. Remoteness and small population sizes insulated the region temporarily, but by the 1980 s, fishermen from outside of Raja Ampat began traveling to the region to harvest the abundant resources [94]. Main threats to the marine biodiversity stemmed primarily from overfishing and illegally capturing sharks and finfish for the live reef fish trade, as well as unsustainable development from exploitation of resources [69].

In the early 2000 s, just as the Special Autonomy Law passed, international conservation organizations - World Wildlife Fund for Nature (WWF), Conservation International (CI) and The Nature Conservancy (TNC) - began conducting ecological and social assessments in Raja Ampat and the broader Bird's Head Seascape - the region encompassing largely West Papua (Fig. 1) [33,72]. While largely working towards the same goals, the three large NGOs developed spatial delineations with WWF focusing on the eastern Bird's Head region and CI and TNC working in the northern and southern regions of Raja Ampat, respectively. Based on the social and ecological assessments in Raja Ampat, CI and TNC reported findings on a highly biodiverse ecosystem with strong community ties to the environment, but highly threatened by shark finning, sea turtle hunting, overfishing, and illegal fishing practices. Most of these threats were coming from fishers who lived outside of Raja Ampat, however some community members had also begun engaging in illegal fishing activities [37,72]. The reports highlighted a range of conservation actions that could benefit both the ecosystem and people, including community engagement, developing alternative economies to replace reliance on illegal fishing, and setting aside areas for conservation [33,72].

In Raja Ampat, after CI and TNC identified priority conservation areas through surveys and worked to understand community perceptions of marine resources, they discovered widespread community concern regarding marine resources [63], and proposed MPAs as a solution. Prior to NGO engagement in Raja Ampat, one MPA (*Raja Ampat*) had been established by the National Government. However, the MPA was not routinely patrolled and lacked community engagement. Since MPAs aligned with the traditional practices in the region and with government initiatives, CI and TNC began working directly with communities towards developing a network of MPAs [1,42,70]. To create ecologically effective MPAs and facilitate community ownership and engagement, CI and TNC worked with the communities of Raja Ampat towards creating a network of community run, bottom-up MPAs. From 2007–2008, six additional MPAs were developed around Raja Ampat, including the Ayau-Asia Islands, Dampier Strait, Mayalibit Bay, Kofiau and Boo Islands, West Waigeo, and South East Misool MPAs (Fig. 1). These six newly established MPAs, plus the previously established Raja Ampat MPA, together comprise the Raja Ampat MPA Network.

Hypothesizing that NGOs can potentially provide a powerful bridge between government and communities, facilitating rights, enabling resource access, and connecting modern scientific tools with traditional practices regarding MPAs, we sought to specifically study the role of TNC and CI in the Raja Ampat MPA development process as a case study in environmental governance. In our qualitative case study, we sought to identify the timeline of core initiatives in the planning, adoption and management of the Raja Ampat MPA Network. We further sought to identify how NGOs (CI and TNC) acted as bridging organizations in the planning, adoption, and management of the Raja Ampat MPA Network,

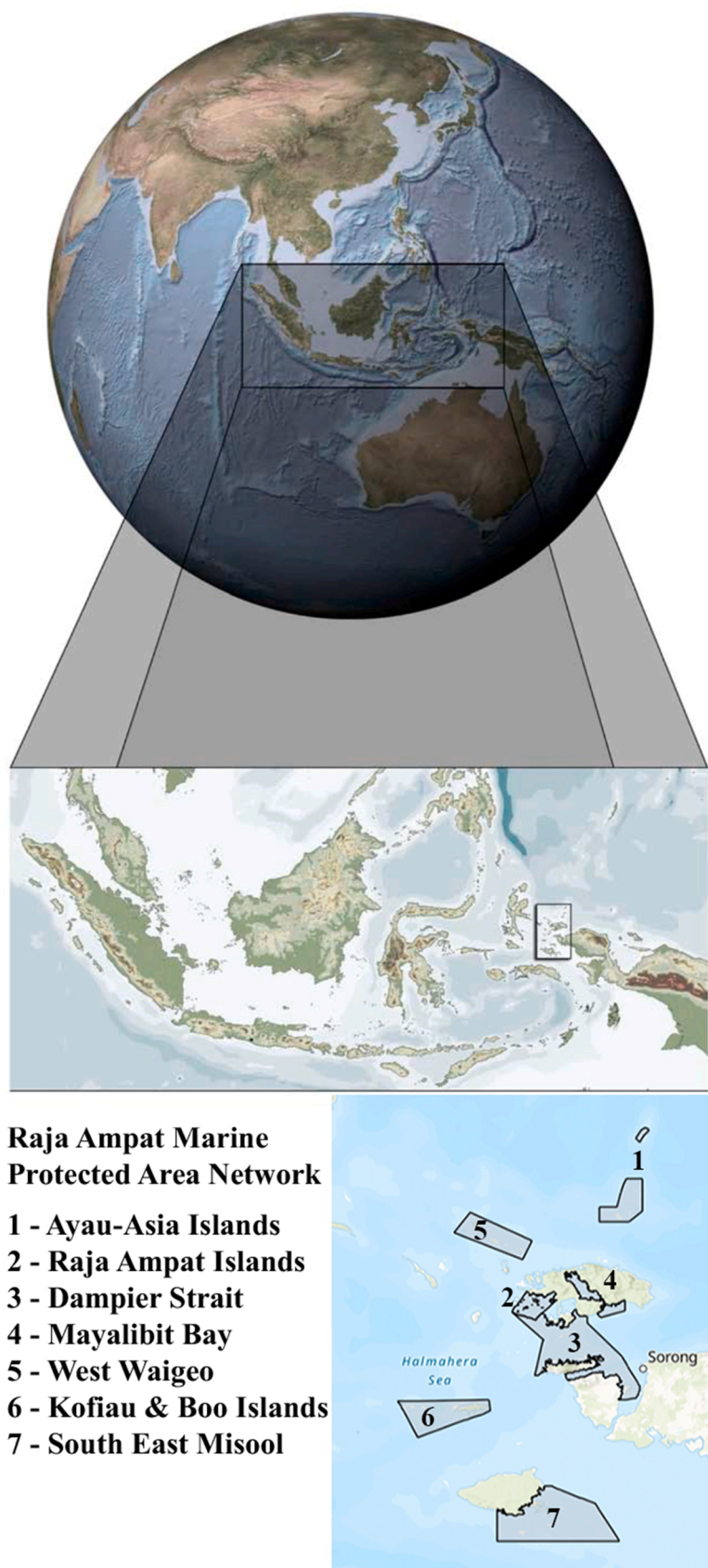


Fig. 1. Map illustrating the Bird's Head Seascape, showing its geographic location and the network of seven marine protected areas (MPAs) in Raja Ampat. The Regency of Raja Ampat is located within the rectangle, which is expanded in the bottom panel. Each of the MPAs constituting the Raja Ampat MPA Network (as of 2008) are labelled 1–7.

including what specific bridging tools they employed. We further reflected on the role of these techniques towards building a socially and ecologically effective MPA network, while also noting the limitations of the scope of this study.

2. Methods

To evaluate how NGOs acted as bridging organizations in the design, adoption, and management of the Raja Ampat MPA Network, we used a case study approach. Case studies can be useful when evaluating real-world scenarios that are highly dependent on various contextual factors with the goal of finding probabilistic causality [107]. For this study, our case consisted of the broader process around establishing the seven original MPAs in the Raja Ampat MPA Network from approximately 2001 to 2021.

In our case study, we conducted a series of in-depth, semi-structured interviews with six key informants to collect information pertaining to the design, adoption, and management of the Raja Ampat MPA Network. We initially sought to target individuals representing local communities, government officials and the two main NGOs (CI and TNC), however due to limitations imposed by the COVID-19 pandemic, our ability to get into the field was severed as was our capacity to interview local communities and government officials remotely. Thus, we choose to target all the individuals holding senior staff positions at CI and TNC that had been deeply involved in the development of the Raja Ampat MPA Network. Due to interviewees representing CI and TNC perspectives, we thus present a descriptive case study, from the NGO perspective, but also grounded in literature and other sources of evidence to help present a more comprehensive perspective.

We completed a total of six interviews which comprised all the senior managers at CI and TNC who were responsible for designing and implementing programs which contributed to the design, adoption, and management of the Raja Ampat MPA Network. The first interview was held with an essential key informant (M. Erdmann) who was involved with all stages of the implementation of the MPA Network across the entire duration of the process 2001. This key informant provided an in-depth oral history through a series of interviews (14 h total). The additional five interviewees were each involved in various aspects (and time periods) of the design, adoption, and management of the Network. Each of the five additional interviews spanned approximately one hour (19 h total). By the end of our sixth interview, we achieved saturation [101] towards understanding the timeline and bridging roles of TNC and CI in the Raja Ampat MPA network.

Interviews were conducted from October 2020 through May 2021 and were held over Zoom or WhatsApp. Prior to each interview, participants were briefed on the scope of the interview and were asked to provide their consent to record. The sole WhatsApp interview was not recorded, however almost verbatim notes were taken to ensure an accurate record of the interview. All interviewees were asked questions relating to the planning and design, adoption, and implementation as well as management aspects of the MPA Network. These questions included, but were not limited to: how the MPA Network was initiated; social and ecological factors that went into the design; the process of adoption and implementation across levels of governance (local to regional to national); management of the MPA Network; and the various roles that NGOs played throughout this process (see [Appendix](#)). To supplement interview data, secondary sources were reviewed and analyzed. These sources included peer-reviewed literature, popular media, internal NGO monitoring reports, and management and zonation plans. The lead author conducted all interviews with the assistance of the senior author (CMB). All interviewees reviewed the manuscript to ensure validation of the data and information presented. Due to more extensive involvement, two interviewees joined as contributing co-authors and are not quoted in the results.

NVivo (Version 12.0) was used to analyze and code interview transcripts. We used a mixed grounded theory approach [27,32] and coded

the transcripts using theory-driven and data-driven codes [32]. To create the theory-driven codes and generate a codebook, we reviewed relevant literature by Berdej and Armitage [12], Berkes [15], Brown [109], and Crona and Parker [29] to identify key theories on bridging organizations, including those important for NGOs engaging in bridging situations [9]. After analyzing the data according to theory-driven codes, we then employed open coding, where we analyzed transcripts line-by-line and created new, data-driven codes for concepts that emerged from the data [27,32,92]. We then employed axial coding, identifying relationships within codes to identify possible categories or themes [95]. These themes were further refined using the constant comparison method [27,92]. Finally, we crafted concept charts and models to explore how themes were related, and then continued to refine categories ([9]; Maxwell, 2013). We also crafted a timeline of key events. We present our final categories below, and showcase core initiatives which exemplify, and cross-cut, these categories. We further chart the key connections established by potential bridging actions in the establishment of the Raja Ampat MPA Network.

3. Results and discussion

3.1. Process and timeline

CI and TNC, in their role as bridging organizations, engaged in different ways over time in the process regarding the Raja Ampat MPA network, with three distinct phases of engagement ([Fig. 2](#); based on case study interviews and document analysis): planning, adoption, and management. Each of these phases are discussed below.

The planning phase occurred from 2001 through 2007, where both CI and TNC demonstrated the highest levels of engagement. Ecological and social assessments conducted from 2001 to 2003, resulted in a series of recommendations of conservation actions for the Raja Ampat region including identifying potential MPA sites, promoting community engagement in conservation planning, building capacity of field staff and local community members, and implementing policies to enforce traditional tenure [33,72]. Following the ecological and social assessments conducted by CI and TNC from 2001 to 2003 ([Fig. 2](#)), TNC then convened a meeting in Tomolol on the island of Misool in 2003 ([Fig. 2](#)) and brought community members, traditional leaders, government officials and other relevant stakeholders together. The objective of the meeting was to gain a stronger understanding of the social environment of Raja Ampat and evaluate any perceived threats [88]. The meeting resulted in the ‘Tomolol Declaration’, a social contract between the communities, local governments, and NGOs, and declared that Raja Ampat was a biologically and socially important region that required protection.

Following the social and ecological assessments, CI and TNC sought funding to pursue working in Raja Ampat. The first major source of funding for conservation work in Raja Ampat was granted by the Gordon and Betty Moore Foundation in 2004, followed by significant contributions from the Walton Family Foundation and the David and Lucile Packard Foundation. This combination of long-term donors collectively supported the work of WWF, CI and TNC in the Bird’s Head Seascape and generated a multi-NGO partnership between the three groups which supported collective goals and joint initiatives. In this way, the NGOs could each play a similar facilitating role in their respective geographic regions of interest (WWF in the eastern Bird’s Head, CI in northern Raja Ampat, TNC in southern Raja Ampat) without having to compete for funding. In Raja Ampat, this funding spearheaded efforts by CI and TNC to begin surveying communities regarding the social dimensions of the region, to create capacity building programs, and to conduct community meetings. When the communities decided that MPAs could be a viable option for protecting their natural resources, the CI and TNC collectively worked with the communities to delineate boundaries that worked with the community ownership and tenure that had been practiced for centuries, reinventing their local institutions and practices.

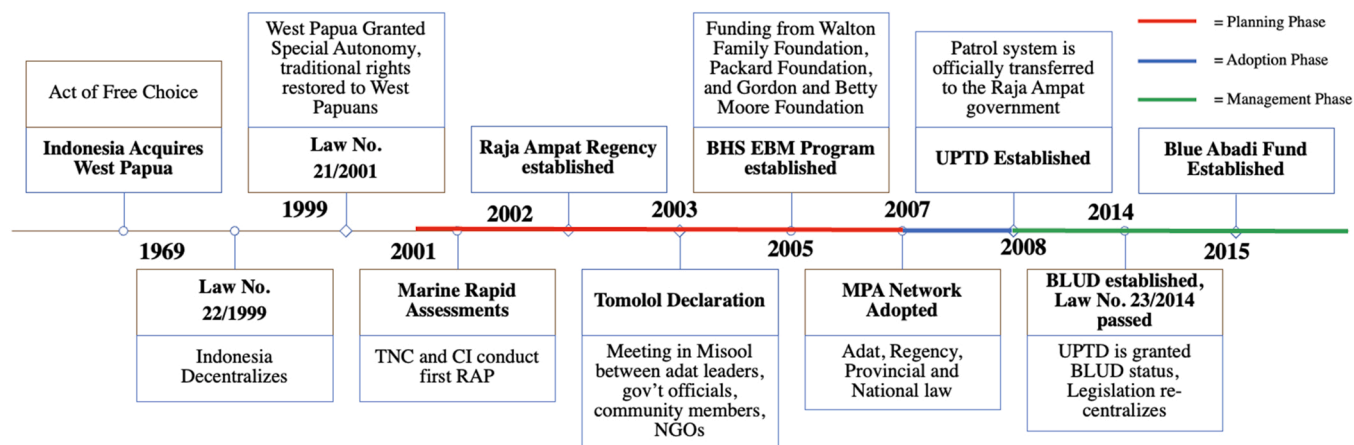


Fig. 2. Timeline illustrating key events in the planning, adoption, and management of the Raja Ampat MPA Network. The planning phase occurred from 2001 through 2007, up to the adoption of the MPAs. The adoption phase spanned one year from 2007 to 2008, and was followed by the management phase, which began in the latter part of 2008 and is still ongoing (timeline based on case study interviews and document analysis).

“When the idea of MPAs came up, it was presented as a way to reinforce traditional Papuan rights and tenure. The borders [matched] tenure boundaries, rather than government administrative boundaries, so it was the community tenure boundary and those communities with tenure who were going to make a decision about that area. And I think that was a really important distinction, because it spoke to that rights issue, and they were presented to be a solution for food security and a solution for autonomy and maintenance of rights” (L. Katz, personal communication, 2021).

The adoption phase occurred between 2007 and 2008, when the MPAs were officially adopted by traditional *adat* law, the Raja Ampat Regency Government, the West Papua Provincial Government, and the Indonesian National Government. In addition to the previously established Raja Ampat MPA, six new MPAs were adopted to form a network of seven MPAs. Each MPA in the Network was established to fit the social and biological needs of the community and ecosystem. While some of the MPAs were prioritized for their biological significance (i.e., Ayau-Asia Islands, West Waigeo, South East Misool, Kofiau and Boo Islands), others were prioritized for their social importance (i.e., Mayalibit Bay), and others prioritized for both ecological and social significance (i.e., Dampier Strait). CI worked primarily in the northern regions of Raja Ampat with the Ayau-Asia Islands, Dampier Strait, Mayalibit Bay and West Waigeo MPAs, while TNC worked in the south with the Kofiau and Boo Islands and South East Misool MPAs.

The social and ecological dimensions of each of the seven MPAs were distinct. The Ayau-Asia Islands MPA, the northernmost MPA in the Network, hosts the largest grouper spawning aggregation site in Eastern Indonesia, and is critically important for reseedling the expansive reef systems in Raja Ampat [48]. The West Waigeo MPA, located in the northwest corner of Raja Ampat, has been under the tenure of only two villages, each adhering to *sasi* and customary management practices. The low density of people and commitment to *sasi* has historically maintained much of the biodiversity leading to a healthy and diverse marine system. The Mayalibit Bay MPA hosts mangroves and murky waters with crocodiles; vastly different biodiversity from the coral reef ecosystems that Raja Ampat is known for. Further, Mayalibit Bay is known as the cultural heart of Raja Ampat, home to the Maya - the original communities of Raja Ampat. Dampier Strait is the ecological heart of the region; this MPA harbors the most biodiverse reefs in all of Raja Ampat [19] but sits adjacent to the capital city of Raja Ampat, Waisai, making it also socially important. The Kofiau and Boo Islands MPA is located in the southwest part of the network and hosts healthy coral reefs and a migration corridor for whales and dolphins [35]. The South East Misool MPA is the largest and southernmost MPA in the Raja

Ampat MPA Network, home to mangrove forests, coral reefs, marine lakes, and sea turtle nesting beaches [67].

The management phase, which occurred from 2009 through present (2021), is characterized by the official implementation of the Raja Ampat MPA Network, plus various programs including the Raja Ampat MPA Patrol System, the Blue Abadi Fund, and the Tourism Entrance Fee system [85]. These three initiatives are discussed below, including the bridging roles that NGOs played in these initiatives.

3.2. Key projects and initiatives

Interviewees identified specific initiatives that occurred throughout the process of the MPA network, many of which involved multiple bridging tools. Three of these key initiatives are: the Tourism Entrance Fee System, the Raja Ampat MPA Patrol System, and the Blue Abadi Fund. Each of these are described below.

3.2.1. Tourism entrance fee system

Bridging organizations have been instrumental in helping communities establish and build capacity towards ecotourism initiatives, by building capacity, empowering communities, and fostering improved collaboration (e.g., in the forests of Paraguay, [52]; and the MPAs of Bali, [12,13]). Together, CI and TNC worked to employ various bridging tools - including connections, access to resources, and advising - towards building a sustainable tourism industry and associated entrance fee system which employed local community members and contributed to the newly established economy. Focusing the economic development plan on tourism, rather than extractive industries like mining and forestry, was advised to local government officials as a way to sustainably contribute to the economy (M. Erdmann, personal communication, 2020).

By 2004, the Raja Ampat Regency implemented an economic development plan focused on tourism and sustainable fisheries. The tourism industry and associated entrance fee system for Raja Ampat was modelled off of a tourism system in Bunaken, Sulawesi and adapted to fit within the Raja Ampat communities' norms and traditions [38]. The entrance fee system was officially launched in 2009 and in the first year of operation, the fee system generated \$74,000 USD [85]; M. Erdmann, personal communication, 2020). While revenues from the tourism entrance fee were originally set to cover costs of the patrol system, the revenues in the first year were not sufficient. Thus, initially the cost of the patrols was covered by the NGOs, and the money generated from the fee system in the first year went directly to the community. To decide where the money should be dedicated, TNC and CI consulted a small community stakeholder group, who illustrated the high rates of infant

mortality and malnutrition in the region. The revenues were then put directly back into the communities by implementing prenatal and postnatal health clinics in all Raja Ampat villages (M. Erdmann, personal communication, 2020). In the years following, enough revenues were generated by the entrance fee system to support the patrol system. By 2012, the tourism entrance fees reached \$370,000 USD, and hit \$2 million USD by 2019 (M. Erdmann, personal communication, 2020). The fees are now structured to support the Raja Ampat MPA Patrol system, and the Blue Abadi Fund [85], both of which are discussed below.

3.2.2. Patrol system

Bridging organizations can act as a conduit between local communities and various layers of government [13,15], and can generate innovative approaches to bringing organizations together [109]. Together, in their respective regions, CI and TNC worked with communities, government officials, and various stakeholders to create a patrol system for the network, and in doing so, utilized bridging tools of capacity building, innovation, and linkages/connections.

In 2008, directly following the adoption of the Raja Ampat MPA Network, a community-based patrol system was deployed in each of the MPAs. This patrol system was facilitated by CI and TNC in collaboration with local communities to be eventually transferred to the government. To build capacity and engagement in preparation of the transfer, CI and TNC implemented a bottom-up, rolling patrol system based off of a successful program in Bunaken National Park [38]. Every two weeks, a new group of community members would visit the patrol post and work with the few permanent staff staged at each post. Patrol boats were typically composed of two law enforcement officers and a few individuals from different villages. This system allowed almost every community member in each village to experience two weeks at the patrol post with the goal of building community amongst individuals and distributing resources equitably. The goal of the NGOs was to empower local communities to feel ownership and pride over their MPAs, integrated communities with local government officials, and build capacity for the future (M. Erdmann, personal communication, 2020; M. Mongdong, personal communication, 2021).

Management of the patrols was transitioned in 2012 to the Raja Ampat Regency government via the *Raja Ampat MPA Network Management Authority* (known locally as the UPTD KKP Raja Ampat) (M. Erdmann, personal communication, 2020). After a few years at the regency level, CI and TNC sought out a legal designation that would allow the patrols to be as financially autonomous as possible and took an innovative approach to acquiring a special public service status for the UPTD. This status – known as a *Regional Public Service Agency Regional Technical Implementing Unit* (referred to as BLUD) was successfully granted to the management authority in 2014. This status – traditionally used for hospitals in Indonesia – allowed them to receive grants and manage entrance fee and other revenues directly (without needing to pass them through local government coffers), and also to hire professional (non-civil servant) staff and pay them professional salaries. The UPTD now works in collaboration with local law enforcement and the Indonesian Navy to patrol all of the Raja Ampat MPAs [19].

3.2.3. Blue Abadi fund

Bridging organizations often have access to large funding sources from international donors [15]. Planning for a sustainable trust fund in the Bird's Head Seascape (the broader region encompassing Raja Ampat) began shortly after NGOs began working in the region. The goal was to implement a fund that could support the conservation initiatives for the entirety of the Bird's Head Seascape, which included the Raja Ampat MPA network [77]. In doing so, CI and TNC employed bridging tools related to financial resources, linkages/connections, innovation, and capacity building. The NGOs working in the Bird's Head Seascape used connections to international donors and government entities to establish a fund that was self-financing, could fill funding gaps in the

region, and would avoid a long-term dependency on international philanthropy [75]. In 2015, a preparation grant for the Blue Abadi Fund was approved by the Global Environment Facility and in 2017 the project was approved for implementation [41]. The Blue Abadi was designed by CI's Global Conservation Fund, TNC, WWF, and local consultant Starling Resources, and established with a few large funders and partners, including the three main NGOs working in the Bird's Head Seascape, Global Environment Facility, the Walton Family Foundation, and the John D. and Catherine T. MacArthur Foundation [18]. Administration of the fund is executed by the Indonesian Biodiversity Foundation ("KEHATI") and supported by the Ministry of Marine Affairs and Fisheries and CI, TNC and WWF.

The two main objectives of the Blue Abadi Fund are to: 1) support the effective co-management and enforcement of the Bird's Head Seascape network of 12 MPAs (which includes the seven in the Raja Ampat network); and 2) mobilize and empower a network of local NGOs in the Bird's Head Seascape to complement government-mandated conservation efforts through: environmental education and community outreach; improved monitoring; sustainable development of coastal livelihoods; and stronger networking, coordination and capacity development of Seascape stakeholders [18].

Those involved in the creation of this trust fund also ensured that large international NGOs like CI and TNC were unable to receive funding from the Blue Abadi, such that grants were focused exclusively on local NGOs, universities and other civil society partners. A unique aspect of the Blue Abadi Fund is a dual funding track; one primary grant track and a smaller granting track called 'INOVASI', which funds innovative projects by small local NGOs (M. Erdmann, personal communication, 2020; L. Katz, personal communication, 2021), with both tracks operating on an annual basis [75]. In February of 2017, the government of Indonesia, CI, TNC, and WWF initiated the first round of funding for the Blue Abadi. Funding has been ongoing since then [85]. When the trust fund reaches its full capitalization, it will be self-sustaining and will rank among the largest conservation trust funds in the world at \$37 million [18,75].

3.3. Bridging actions

Interviews with representatives from CI and TNC revealed a wide range of bridging actions in the planning, adoption, and ongoing management of the Raja Ampat MPA Network. Nine categories of bridging tools were derived from our analysis (Table 1). Below we present these categories, followed by key initiatives which cross-cut multiple categories.

3.3.1. Advising

Bridging organizations can facilitate trust and leadership, which can provide the opportunity for advising [15]. Additionally, bridging organizations can lean on their expansive networks to find relevant expertise and information to offer to communities [4]. NGOs advised communities and governments on conservation initiatives and specific tourism planning and best practices. One of the most critical instances of advising occurred at the very beginning of CI and TNC's engagement with the local Raja Ampat government. The *Bupati* of Raja Ampat had originally intended for the economic development plan of the region to be focused on extractive industries. NGOs sought to advise between communities and governments, helping to communicate local community needs and concerns:

"The initial economic development plan for Raja Ampat was 'let's cut down all the forests and we'll mine all the nickel' so we were able to very gently suggest 'hey, if you look at all of the angst coming from many traditional Papuan communities, it's all because of illegal forestry and big mines ... look, you've got this amazing marine wonderland at your doorstep, the communities don't need mines, what they want is just basically standard food security of their fisheries.'" (M. Erdmann, personal communication, 2020)

Table 1

Final categorical themes derived from interviews, with a description of the category and an example quote. In our specific case, reference to NGOs refers to TNC and CI; reference to communities refers to the local communities of Raja Ampat.

Category	Description	Exemplary Quote
<i>Advising</i>	When NGOs advise between governments and communities regarding conservation initiatives and decision making	"The [government was constructing] their development platform, reflecting on the existing development program and income and budget from which was from mining and logging and capture fisheries. So TNC and CI together discussed with [the government] about sustainably developing the area ... and a potential long term sustainable income source – non-destructive income – like tourism." (M. Mongdong, personal communication, 2021)
<i>Community engagement</i>	When NGOs interact with communities through conversations, engaged listening, focus group discussions, outreach, and media	"CI did a schoolkids jamboree, we produced community tabloids, a newsletter circulating to communities, talking about biodiversity and how important the place is, everything." (M. Mongdong, personal communication, 2021)
<i>Access to resources, financial and physical</i>	When NGOs provide financial resources (access to funding, creating funding mechanisms) and/or physical resources (providing boats, building materials, and educational materials)	"We put a lot of energy into conservation education work there. we also put more energy into some sanitation and health care initiatives which, in general, we didn't have a lot of money to do but [we] felt like we needed to because it was really needed by the communities - that was clear." (M. Erdmann, personal communication, 2020)
<i>Co-production of knowledge</i>	When NGOs collaborate with local communities and/or stakeholders to produce context specific knowledge through a dynamic and iterative process	"And the important thing we wanted to do is to actually keep track of exactly how [many sea cucumbers] they caught during the <i>buka sasi</i> open fishing season. So, by having the buyers right there with their scales, every day, people are coming in, here's my 30 sea cucumbers, they weigh in, get paid, ... [and] what was beautiful about that is now we actually had detailed records of exactly how many kilos of sea cucumbers, crayfish and trochus were pulled out of the water there, which could be shared with communities to enable them to make data-driven decisions on the next round of <i>sasi</i> temporary fishery closures." (M. Erdmann, personal communication, 2020)
<i>Capacity building, education, and training</i>	When NGOs build capacity of communities and government officials; this includes education and training in 21st century MPA management	"... if these sites were going to be 1) not paper parks and 2) co-managed and really led by communities, there was going to need to be some serious skill building around MPA management. So we partnered with NOAA in the US and their International MPA capacity

Table 1 (continued)

Category	Description	Exemplary Quote
<i>Exposure</i>	When NGOs expose communities to new political, economic, scientific and educational processes and systems; and/or expose outside communities (e.g., scientists, recreational divers) to the social and ecological elements of Raja Ampat	building program and designed a targeted multi-year capacity building program on various aspects of MPA management." (L. Katz, personal communication, 2021) "In 2009 we published a book, 'Diving Raja Ampat' ... and the idea ... this was again part of our looking forward to prevent problems of crowding and mass tourism - we wanted to make sure that everyone knows there's 100 + dive sites in Raja Ampat. And those are just the ones that we've explored in the recent past, you could easily find another 200 dive sites! So we published this book that sold like wildfire; it sold so well in fact that we then published in 2012 a follow on called 'Diving Indonesia's Bird's Head Seascape'." (M. Erdmann, personal communication, 2020)
<i>Knowledge diversity</i>	When NGOs facilitate integrating different knowledge systems and perspectives (including regarding social or biological dimensions)	"...it basically was a yearlong conversation in which we had a team of really well-trained extension officers who went village to village, to 100 villages, and spent days in each one forming relationships, understanding and really listening to what communities were struggling with, what their aspirations were, what their struggles with marine resource use and poaching and whatnot." (L. Katz, personal communication, 2021)
<i>Adaptation</i>	When NGOs facilitate communities and governments in adapting to the unique circumstances of Raja Ampat and/or during unexpected changes	"...you have to adapt to the individual situations in the villages and that [was] a way into the hearts and minds of the people of Ayau. They were pretty happy with our program to help them grow pigs, because they reckoned that pork is better than sea turtle meat anyway." (M. Erdmann, personal communication, 2020)
<i>Linkages and connections</i>	NGOs connecting the local communities to external organizations (e.g., Starling resources, NOAA, University of Papua, local NGOs, Vulcan)	"We also selected a team of five mentors, and [then] we had these more experienced MPA practitioners from Indonesia, and there was a Professor from the State University of Papua, there were two people from The Nature Conservancy, I had a person reporting under me who led the capacity building program who was also a mentor, and all of them translated for the NOAA leaders..." (L. Katz, personal communication, 2021)

The NGOs also advised the government on how to potentially meet those needs. In this case, CI and TNC advised the new regency government to engage in sustainable tourism instead of mining and forestry. If well designed and executed, sustainable tourism can achieve both conservation and economic goals [5,87]. However, it can also lead to unintended negative social and ecological impacts (e.g., costs and benefits distributed unevenly in communities, loss of traditional practices and livelihoods; environmental degradation from overuse) [21,53,58,59,96]. Indeed, some interviewees did note negative impacts to tourism, particularly impacts associated with mass tourism. To ensure sustainable limits to growth, the NGOs worked with the *Bupati* and an outside consultant to establish a set of tourism management regulations for the MPA Network. These regulations included a limit on the number of dive boats in the MPAs at any time, a diver code of conduct, and local hiring goals for newly established homestays (M. Erdmann, personal communication, 2020). Additionally, one diving spot in the Dampier Strait experienced environmental degradation from overuse, so CI worked to create a reservation system to limit the number of dive boats on the reef at a particular time, and each individual boat is limited to a 45-minute time slot. Despite these potential negative impacts, in the case of Raja Ampat (and the wider Bird's Head region), sustainable eco-tourism was considered a better alternative (in terms of social and ecological outcomes) than industrial extraction (forestry, mining, fisheries) which were being proposed by the government at the time [69,85].

3.3.2. Community engagement

Bridging organizations can coordinate meaningful engagement with communities and relevant stakeholders to foster acceptance and collaborative decision making for conservation initiatives [12]. When communities are engaged in the planning and decision-making process for MPAs, they are more likely to take ownership of the MPA, accepting and following the rules as well as participating in management activities [24,25]. The Special Autonomy Law offered communities greater ownership over local natural resources. The law also provided NGOs an opportunity to work alongside communities in Raja Ampat towards establishing a bottom-up, community-implemented MPA network (M. Erdmann, personal communication, 2020).

In the planning phase, social assessments were conducted to understand the marine tenure and social perceptions of the region, and the boundaries of the MPAs were drawn as a joint effort between communities and NGOs (M. Erdmann, personal communication, 2020; [1]). The MPAs were thus designed with communities and to meet community needs. Interviewees described that CI and TNC worked during this time to have communities stand in front, so that they could stand behind and back up the communities if needed. For example, when communities talked to the government about the MPAs, the NGOs could support by coming in and explaining the technical aspects. During the adoption phase, CI and TNC worked with communities, including traditional leaders, and government officials to facilitate establishment of the MPA Network. The MPAs were supported by communities, then adopted by the Raja Ampat Regency, the West Papua Provincial Government, and the Indonesian National Government (M. Erdmann, personal communication, 2020). The NGOs in Raja Ampat then worked closely with various government agencies and the local communities to implement these MPAs.

3.3.3. Access to resources

Bridging organizations can connect communities to financial support and resources that would not have otherwise been present [12,15]. In Raja Ampat, NGOs were able to contribute significant time and resources because of key long-term funders including the David and Lucile Packard Foundation and the Walton Family Foundation, who both contributed to the project for more than a decade (M. Erdmann, personal communication, 2020). Interviewees emphasized the importance of access to external funding: "This program is unusual, and a lot of the things that we can say, and the lessons that we have, and the role the

NGOs played is only possible and only enabled because we had very significant funding on a long-term basis" (L. Katz, personal communication, 2021). Donors, which were brought in by CI and TNC, were a significant part of the planning, adoption, and management of MPA Network, and also contributed towards the above-mentioned Blue Abadi Fund which now contributes a large amount of funding towards local and national NGOs in the Bird's Head and wider Indonesia (M. Erdmann, personal communication, 2020; L. Katz, personal communication, 2021).

In Raja Ampat, CI and TNC further supplied the communities of Raja Ampat with physical resources for MPA management and community well-being. The NGOs, funded by the large donors mentioned previously, provided educational materials, building materials, and patrol boats for the patrol stations (M. Erdmann, personal communication, 2020). Working with the unique social and ecological circumstances of each MPA community, additional resources were sometimes provided. For example, in the Mayalibit Bay MPA (Fig. 1), the people living in the villages surrounding the Bay were highly marginalized and needed dedicated resources supporting health and wellness. Beyond assisting with the MPA process, CI invested in building toilets and septic tanks, and supplying the communities with improved access to medical care (M. Erdmann, personal communication, 2020).

3.3.4. Co-producing knowledge

Bridging organizations can co-produce knowledge with communities [15,44], which refers to a participatory approach to generating new knowledge between researchers, community members, and users, bringing together a variety of knowledge sources [73,110]. Many communities in Raja Ampat practiced traditional *sasi* operating on an open and closed *sasi* timeline each year for certain parts of their territorial waters (M. Erdmann, personal communication, 2020). In West Waigeo, for example, the open *sasi* period previously occurred for one month every year, meaning for 11 months out of each year, harvesting invertebrates was off limits (closed *sasi*). However, for approximately one month each year, communities were able to harvest invertebrates including trochus, sea cucumber, and lobsters (open *sasi*). In this West Waigeo region, community members would harvest these species each year and sell them to buyers for a profit. Shortly after the West Waigeo MPA was established, CI organized a controlled extraction during the open *sasi* period where data on the species type, total weight, and price was collected for the first time, resulting in foundational data on these species. Allowing these animals to mature for the majority of the year aligned well with the biology of the invertebrates, however if the communities kept *sasi* 'closed' for a longer period of time, the organisms would have more time to grow and spawn and reseed the region. To measure the impact of closing *sasi* for three years rather than one year, CI facilitated another controlled extraction and again recorded data on biomass and price. After three years, the organisms had higher biomass and sold for more than they had previously, and again contributed to new data on these three species. This new data helped both CI and communities monitor and evaluate the health of these organisms over time, and new knowledge is continuously being co-produced on these three types of invertebrates (M. Erdmann, personal communication, 2020).

3.3.5. Capacity building, education, and training

Bridging organizations can build local capacity by educating and training community members, a crucial component of creating capable leaders [4]. Long term sustainability and management of the network would require a blend of 21st century MPA techniques and traditional management systems to address the long-term sustainability and management. To build additional capacity of the local communities, CI and TNC worked with the U.S. National Oceanic and Atmospheric Administration (NOAA) and the West Papuan Provincial government under the Ministry of Marine Affairs and Fisheries to create a comprehensive MPA Management Capacity Building Program (L. Katz, personal

communication, 2021). This program included modules and curriculum that focused on six key areas: MPA 101, Management Plan and Zoning, Sustainable Fisheries in MPAs, Sustainable Tourism in MPAs, Enforcement of the MPAs, and Stakeholder Engagement (M. Mongdong, personal communication, 2021). The program was originally used to educate the MPA managers that had been selected by the CI and TNC teams, with the intention that these managers would be able to pass along the information amongst community members. This led to widespread capacity building and facilitated both vertical and horizontal knowledge sharing, which is a key feature of bridging and effective governance [15].

3.3.6. Exposure

Bridging organizations can facilitate engagement between local and outside communities, providing exposure to new ideas and knowledge [15]. In Raja Ampat, there was two-way exposure: communities of Raja Ampat were exposed to new political and educational experiences while the wider world became familiarized with Raja Ampat's globally important coral reef ecosystems. When CI and TNC were working on strategic planning for the region, long-term sustainability of the network was incredibly important (M. Erdmann, personal communication, 2020; L. Katz, personal communication, 2021). Because NGOs knew they would not be able to provide support in the region indefinitely, they focused efforts on creating a profitable and sustainable tourism destination that could be managed and run by local communities and regional government officials. To expose the outstanding biodiversity of the region and to reduce the footprint of tourism on more popular or known reefs, they published two different diving guidebooks: the first in 2009 [56], and the second in 2011 [57].

The exposure of Raja Ampat's coral reefs was far-reaching, and tourism became lucrative for the Regency of Raja Ampat, and the exposure of the communities to the outside world was equally valuable. Many of the individuals that actively participated in the patrols continued working in conservation, including in the Raja Ampat region as MPA managers, others have pursued graduate degrees outside of Indonesia or work in Parliament (M. Erdmann, personal communication, 2020).

3.3.7. Knowledge diversity

Bridging organizations can aid in linking various knowledge and resource systems to facilitate two-way learning [12,15,39]. These organizations can facilitate restoration of traditional knowledge systems, access to existing knowledge, and produce new knowledge with and for communities [15,93]. In Raja Ampat, CI and TNC focused in part on working with communities to revitalize customary management and traditional law [70,73]. The traditional community, or *adat community*, holds a great deal of power in decision making. With the Special Autonomy Law passing, there became an opportunity to investigate prosecuting illegal fishermen under traditional *adat* law rather than the formal legal system (M. Erdmann, personal communication, 2020; M. Mongdong, personal communication, 2021). By facilitating the adoption of the MPAs, the NGOs enabled communities to govern and prosecute with *adat* law. In doing so CI and TNC reinforced the importance of the traditional knowledge systems of the region and worked to empower communities and governments in different ways of thinking. Further, CI and TNC brought training and knowledge regarding 21st century ecosystem-based management practices which could be blended with *sasi* to strengthen long-term sustainability and management.

3.3.8. Adaptation

With increased connections to various networks and ways of thinking, bridging organizations can also aid in adaptation and improve resiliency when unexpected situations arise [4,15,97]. When Indonesia was decentralized by Law No. 22/1999, marine resources came under the jurisdiction of the regency, so the MPA boundaries were created with the regency guidelines (M. Erdmann, personal communication, 2020).

In 2014, by Law No. 23/2014, the government recentralized the jurisdiction back to the Provincial level, creating a rift between the regency and provincial levels, and confusion amongst the patrol teams (S. Vulpas, personal communication, 2021). The NGOs, given their connections to both the regency and provincial governments and outside consultants, were able to help alleviate the situation:

"In 2016, basically the whip cracked about this transfer of authority for MPAs from regency to provincial level, and we had to get very serious. We had been working in the background, speaking with the Provincial level already, but now we had to massively ramp up the process of transition. So, we did, and through a lot of work, TNC put a huge amount of effort into this, Starling [Consulting] put a bunch of effort into it, and we managed to get the regulations in place to transfer the whole [MPA] management unit over to the province" (M. Erdmann, personal communication, 2020).

Adaptation was not only facilitated in times of change, but also in other ways throughout the Raja Ampat MPA process. For example, CI and TNC worked with communities to adapt to each individual situation to develop a network of unique MPAs each tailored to their local condition (see, e.g., Table 1).

3.3.9. Linking across scales and levels

Connecting relevant stakeholders can be one of the most effective bridging strategies for fostering better conservation outcomes ([14]b). NGOs in the Raja Ampat MPA Network facilitated connections between a wide variety of stakeholders in government, science, education, and private sectors, forming linkages between at least 12 different institutions (Fig. 3). This included connections between multiple levels of government and between communities and government as well as direct connections to funding sources, international consultants and the University of Papua. These linkages increased knowledge diversity, provided access to alternative funding sources, and built capacity in communities. These connections facilitated by CI and TNC also facilitated co-management, which refers to sharing of power and responsibility between government and local resource users, but can also include other broader networks [16]. This co-management in Raja Ampat exists between the multiple levels of government and local communities, and also includes the facilitation by CI and TNC, and the support by the other linked institutions (Fig. 3).

3.4. Social-ecological outcomes

Throughout the Global South, larger international NGOs have been criticized as driving neocolonial conservation, driven to serve the interests of global powers and which harms rather than supports communities [58]. Further, tourism has been described as a "neocolonial phenomenon" [106], which describes the act of cultural or ecological tourism as a continuation of colonialization [30], or a "subtle but pervasive racism" [76]. Further research in Raja Ampat is needed to tease out community views on the Raja Ampat MPA network, including the role that CI and TNC played in the process. However, studies have suggested that the Raja Ampat MPA Network is both socially and ecologically effective [6,64,85]. By 2010, initial assessments of MPA familiarity and trust showed that 93% of respondents felt an MPA would be beneficial for their family, and 71% of respondents acknowledged that cyanide fishing, bomb fishing and fish poisoning is illegal [64]. Over the period from 2012 through 2019, illegal fishing and destructive fishing decreased overall with the exception of the North Raja Ampat islands which had had a slight increase in destructive fishing only. Biomass increased in the Northern Raja Ampat islands in both no-take zones and sustainable use zones, and Southern Raja Ampat islands saw increases in sustainable use zones [85]. Out of the studied social objectives, tourism increased in Raja Ampat as a whole from 2007 to 2019, resulting in higher funding for the area's tourism entrance fee system, patrol system, and Blue Abadi Trust Fund [85]. Further, two new MPAs

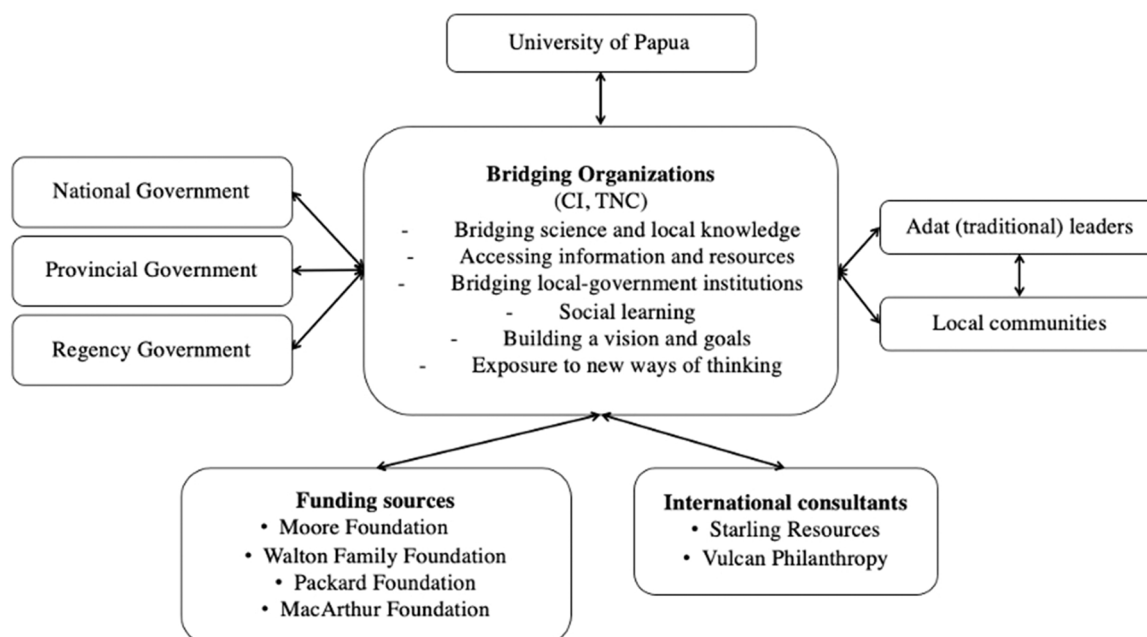


Fig. 3. Key connections between institutions established by CI and TNC as bridging organizations in the planning, adoption, and management of the Raja Ampat MPA Network. Core bridging actions are listed in the center of the figure.

have also been added to the Network including the Fam Islands MPA and the North Misool MPA, both initiated from the communities themselves. Importantly, the MPAs in the Raja Ampat network were not designed as exclusionary (where communities access were removed); rather community rights were honored. In this way, CI and TNC arguably sought to advance social equity while also driving marine conservation outcomes [11]. The outcomes thus far indicate that the Raja Ampat MPA network may indeed benefit communities while also conserving biodiversity, though further research over longer time periods is needed.

4. Conclusion

This case study of bridging organizations in Raja Ampat presents a unique system where international NGOs were able to work with a newly formed government that regained control over their natural resources and could build upon their traditions of customary natural resource management. Both CI and TNC worked with the communities to reestablish their *sasi* traditions, helped to emphasize the importance of traditional *adat* law, and facilitated local communities towards building an MPA grounded in *sasi* and supported by 21st century MPA theory. This process resulted in a community-accepted, ecologically representative MPA Network that fostered collaboration and ownership and led to positive ecological outcomes.

The role of the bridging organizations changed over time from a more active role in the planning phase to an advisory role in the management phase. As of November 2020, both CI and TNC are still working as bridging organizations in the Raja Ampat region. The COVID-19 pandemic has heavily impacted the MPA Network, and resulted in layoffs, decreased revenues from the tourism entrance fee system, and the re-introduction of external threats. CI was able to help lessen the impact by finding emergency funding for the BLUD patrol system through one of their past donors. This demonstrates bridging organization's ability to continuously support conservation development projects through their established linkages and connections and bridging roles and demonstrates how these organizations can lessen the impacts of unexpected changes. It however shows the potential vulnerabilities of the current governance structure of the MPA Network.

This research aims to contribute to a growing body of literature that demonstrates the potential role that NGOs can play as bridging

organizations to foster socially and ecologically effective MPAs. Through this case study, we demonstrated bridging tools employed by both CI and TNC when working with communities in the planning, adoption, and management of the Raja Ampat MPA Network. By viewing the coastal environment through a social-ecological lens, bridging organizations have the ability to facilitate effective MPA Networks that can benefit ecosystems and livelihoods alike.

CRediT authorship contribution statement

Casey White: Conceptualization, Methodology, Formal analysis, Investigation, Visualization, Writing – original draft, Writing – review & editing. **Sangeeta Mangubhai:** Investigation, Validation, Writing – original draft, Writing – review & editing. **Lukas Rumetna:** Investigation, Validation, Writing – original draft, Writing – review & editing. **Cassandra Brooks:** Conceptualization, Methodology, Investigation, Supervision, Visualization, Writing – original draft, Writing – review & editing.

Positionality statement

Authors: Lead author Casey White completed this research for her MS thesis at the University of Colorado Boulder and has had no involvement in the Raja Ampat MPA network. Senior author Cassandra Brooks served as Casey White's thesis advisor and has only tangentially been involved in the Raja Ampat MPA network (through assisting with video interviews in 2011 for the Guardians of Raja Ampat media tour executed in 2015 supported by Conservation International). Beyond the role as author, Brooks is not currently involved in any work in Raja Ampat. Author Sangeeta Mangubhai worked for The Nature Conservancy (TNC) as the Portfolio Manager for the Bird's Head Seascape during the time period of 2008–2011 and the Senior Technical Advisor from 2011 to 2013, and was intimately involved in the working with communities in Raja Ampat during the development of the MPA network. Mangubhai has not been involved since. Author Lukas Rumetna worked for TNC as the Outreach Coordinator for Raja Ampat during the time period of 2005–2011 and was intimately involved in working with communities in Raja Ampat during the development of the MPA network. Rumetna remains involved in the role of the Program

Manager for the Bird's Head Seascape at the Yayasan Konservasi Alam Nusantara (YKAN), an Indonesia National NGO affiliated with TNC.

Interviewees: Mark Erdmann currently serves as Vice President of Conservation International's Asia-Pacific marine programs and was deeply involved, and remains deeply involved, in the Raja Ampat MPA network during the entire period covered in this study. Susie Vulpas was involved in the Raja Ampat MPA network as Conservation International's Marine Program Coordinator during the time period 2018–2021 and is currently working as the Indonesian Program Development Advisor for Yayasan Konservasi Cakrawala Indonesia. Laure Katz currently serves as Conservation International's Vice President for Blue Nature and as the Co-Lead of the Blue Nature Alliance and was very much involved in the Raja Ampat MPA network during the time period 2008–2017. Laure held multiple roles including the Indonesia Marine Program Coordinator, the Seascape Management Advisor for CI Indonesia, both Senior Manager and Director roles in CI's Seascape Program, and Senior Director for the Connected Oceans Program. Meity Mongdong currently serves as the Director of Yayasan Konservasi Cakrawala Indonesia's (YKCI's) West Papua conservation programs, and was deeply involved in the design and implementation of the Raja Ampat MPA network and the training of local MPA staff from 2005 until present.

Due to the critical time investment and key information provided, all interviewees were invited as co-authors, however, only two had the capacity (timewise and institutionally) to join and assist in the writing and editing process.

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APPENDIX

Interview guiding questions

1. Can you state your name and position for the record?
2. How long were you involved with the process of establishing marine protected areas (MPAs) in Raja Ampat?
3. What role did your organization play in coordinating local communities with government officials to establish MPAs?
4. We are interested in understanding NGOs as co-managers, can you explain what role have independent conservation organizations have played in this process? Examples?
 - a. Who else was important in this process?
 - b. What else was important in this process?
 - i. Sasi?
 - ii. Leadership?
 - iii. Government?
 - iv. Threats to biodiversity?
5. What were the main goals of your organization's involvement with the communities of Raja Ampat?
 - a. Where were your goals met? (i.e. where were you successful)
 - b. Where were your goals not met?
6. What was your main role in the MPA process for Raja Ampat?
7. Why did your organization begin working in the Raja Ampat region? (i.e. government, biodiversity conservation, other?)
8. Which MPAs were your organization involved with?
 - a. Can you describe the extent of your organization's involvement and activities?

- b. What other organizations did you work with?
9. In what ways did you and your organization physically engage with the local communities in the region?
 - a. With the government officials?
 10. Which specific MPA(s) did you work with?
 11. In your organization's opinion, not your own personal opinion, what were the most influential factors in driving adoption of the MPAs in Raja Ampat?
 - a. What were the roles of individuals?
 - b. What were the roles of scientists?
 - c. Did threats to biodiversity play a role?
 12. In your organization's opinion, not your own personal opinion, how important of a role did the decentralization of Indonesia play in establishing these MPAs?
 - a. What about the Special Autonomy Law in particular?
 - b. Any other important laws?
 13. Did your organization work with the Ministry of Marine Affairs and Fisheries?
 - a. Can you describe a time when you had successful engagement with MMAF?
 - b. Can you describe a time when you were unsuccessful working with MMAF?
 14. In your organization's opinion, not your own personal opinion, how important of a role did *sasi* play in communities adopting these MPAs?
 - a. How has *sasi* changed in the time period from when you started working in the region to now?
 15. How long was the period from your first engagement with the communities of Raja Ampat to the adoption of the MPAs?

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