

Management of Marine Protected Areas in India

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The contributions of Marine Protected Areas vary greatly depending on their size, age, types and intensity of resource extraction in their area and level of financial support for management. Taking India as a typical example, how modern legal rationality, especially with respect to conservation, is entrenched in the idea of territorial control, undermines the efforts of the forest department in seascapes, and triggers conflicts, is described. Marine conservation should be motivated by a non-territorial rationality and engage seriously with alternative approaches such as dynamic co-management and legal pluralism.

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In the wake of global threats such as climate change, ocean acidification and intensified resource extraction, the world's seas are at risk. As a result, many nations have adopted Marine Protected Areas (MPAs) as a tool for conserving biodiversity and ecosystem functions. This has intensified in recent times, and developing countries, in particular, have been facing considerable international pressure to increase the number of MPAs in order to meet the Aichi Biodiversity Targets for 2020, that is, to extend the protected area network to cover 10% of the oceans (Marinesque et al 2012; Bax et al 2016). However, the subject of how MPAs should be designed and managed continues to be seriously debated on two fronts. First, there is considerable difference of opinion amongst conservationists because a multitude of factors, such as size of the area, its habitat heterogeneity, life history traits of the focal species, the decision-making process followed, and the type of monitoring adopted, all constrain ecological effectiveness (Fox et al 2012). A more mundane constraint is that the financial resources required to establish such conservation territories are usually hard to estimate in the first place, and developing countries have for long found it difficult to muster the necessary resources to maintain and manage such areas over the long term (McCrea-Strub et al 2011; Bruner et al 2004).

The second contested aspect is that MPAs are usually managed as though they are "wild spaces," since they are primarily set up to preserve biodiversity at various scales, whereas the reality is that many marine areas are "peopled spaces." This has triggered much discussion on how best to manage MPAs so that they can also contribute to good social outcomes such as improved food security, resilient livelihoods, strong cultural links with

natural resources, etc. In the absence of integrated approaches, communities that use marine resources begin to face severe restrictions and eventually, strongly oppose MPAs (Kearney et al 2012; Bennett and Dearden 2014). These fundamental flaws in planning, design and maintenance have turned many MPAs either into mere "paper parks" or serious "social failures" (Rife et al 2013; Christie 2004). Overall, these studies indicate that some of the key factors that determine the conservation success of MPAs are choice of location and size as well as support from local communities, coupled with the availability of funding and trained personnel.

While there is extensive literature on how to tackle the above-mentioned challenges, in this article we focus on a comparatively understudied aspect that nevertheless poses a major challenge to realising conservation goals of MPAs. Broadly influenced by the work of scholars who have grappled with the role of law in territory-making and its attendant conflicts, we suggest that the legal rationality that underlies the creation and maintenance of MPAs itself acts as a major barrier to their effectiveness (Roth 2009; Bluwstein and Lund 2018). Focusing on India as a typical example of a developing country that aspires to meet global conservation targets, we argue that the legal framework for the establishment of protected areas is an intrinsically territorial one, which is unsuitable for the fluid nature of seascapes and this has had detrimental effects on the basic conservation practices of the main actor, that is, the forest department.

We use a combination of interviews and observations from two prior studies—one conducted in the Gahirmatha Marine Sanctuary in Odisha and another in the Rani Jhansi Marine National Park in the Andaman Islands—to focus attention on the routine challenges that field staff of the forest department face and thereby highlight the pervasive and counter-productive effects that a territorial approach has on stated conservation goals for seascapes. We conclude with some suggestions on how the current situation can be improved so as to

contribute to effective and fair marine conservation practices.

Methodology

This paper is a *post facto* analysis derived from fieldwork carried out during two previous studies since we found similar governance issues cropping up in both sites. The observations on conservation practices at the Gahirmatha Marine Sanctuary (GMS) are drawn from fieldwork carried out by the first author, over three seasons—December to April—from 2012 to 2015. This was part of a study on marine turtle conservation and coastal development in Odisha (Ramesh 2018). For the purpose of this article, we have drawn on semi-structured and opportunistic interviews with 17 respondents, including retired and serving officials of the Odisha forest and fisheries departments, Indian Coast Guard, advocates at the district court in Kendrapara and administrators at the district jail.

Observations on the second case, the Rani Jhansi Marine National Park (RJMNPN), are drawn from fieldwork carried out by the second author in a project to assess the management challenges associated with MPAs in the Andaman Islands. Here we have used data from 15 semi-structured interviews conducted between May 2018 and January 2019, with representatives of the forest, tourism, fisheries, revenue, and agriculture departments, the Directorate of Shipping Services, the Indian Coast Guard, a fish-worker's union, members of the local island administration, and other local stakeholders (Bijoor et al 2018). During the course of both studies, identities of all respondents were kept confidential and detailed notes were maintained on all interviews. These were later transcribed and analysed according to inductive codes, in order to identify common themes (Bernard 2006).

Territorial Roots of Conservation

Biodiversity conservation in India is a demanding process that involves the management of species across diverse biophysical settings, from scrub jungles to sea-grass meadows. Yet, laws and policies rarely acknowledge ecological specificity and instead support a uniform “blueprint” approach. This is especially

true of the marine realm (including the coast) for it has consistently remained on the margins of larger discussions about wildlife protection in India. One major contributing factor is that the Indian Wildlife (Protection) Act, 1972 (wildlife act), which defines the ambit of the state forest departments, has been biased towards charismatic species and terrestrial ecosystems. For instance, the latest amendments (2006) and amendment bills (2013 and 2017) focus almost entirely on the conservation and protection of tigers, rhinos, and forests.

Over the years, the wildlife act has maintained a stark silence about wildlife protection in seascapes *per se*. It appears to assume that all ecosystems can be managed as “forests” and therefore that marine wildlife and MPAs can be managed with the same set of practices as used on land. As a result, although millions of people along the Indian coastline are dependent on marine resources for their livelihood, marine wildlife conservation is practised along the same exclusionary, protectionist lines as terrestrial conservation. An additional complication is that we are yet to evolve a formal definition of marine property rights and hence there is no legal framework to support claims over marine spaces and resources that have been traditionally managed by certain communities (Sridhar and Shanker 2007).

The second reason is that the power of the modern nation state is also defined in implicitly terrestrial terms (Brenner and Elden 2009). This is pronounced in the case of the Indian Forest Department because at the time of establishment, one of its key mandates was the management of terrestrial resources in the form of timber-bearing trees (Rajan 2006). Even the department's pyramid of authority closely corresponds to nested and clearly defined spatial units: typically, wildlife conservation in a state is headed by the chief wildlife warden who is also the principal chief conservator of forests (PCCF); next in the hierarchy are the regional chief conservators of forests (RCCF), each of whom is in charge of a circle. Circles are divided into wildlife divisions (protected areas are also treated as divisions), which are headed by a

divisional forest officer and the many ranges that make up the division are overseen by range officers. Each of the range officers supervises foresters who, in turn, are responsible for smaller spatial units called sections and each section is divided into several beats with a forest guard taking responsibility for three to four beats (Fleischman 2010).

Therefore, “grounded,” territorial practices of governance are deeply entrenched in the legal and institutional frameworks that guide the Indian Forest Department. However, the same agency is also in charge of marine conservation and this raises the question of what happens when routine land-based management practices are grafted on to a dissimilar region such as a seascape.

Background to the MPAs

In India, the Ministry of Environment, Forest and Climate Change distinguishes between sanctuaries and national parks in terms of the focus and extent of protection enforced. Wildlife sanctuaries focus on protecting select fauna and ensuring favourable habitats for the same, whereas national parks focus on the ecosystem as a whole, including the flora, fauna and the larger land/seascape. Moreover, a range of human activities is permitted within the former, whereas they are banned in a national park. However, the GMS has a long history of intense conflict associated with it whereas the RJMNPN does not (Silas et al 1983; Sridhar 2005; Ramesh and Rai 2017). Hence, many of the challenges and consequences of imposing a territorial conservation approach on seascapes are more pronounced in the first site than in the second.

Gahirmatha Marine Sanctuary: The beaches and coastal waters of Kendrapara district in northern Odisha host one of the largest reproductive congregations of olive ridley turtles (*Lepidochelys olivacea*) in the world. In winter, thousands of turtles migrate here to mate in the nearshore waters and if this is successful, it is followed by nesting on land. This area is particularly famous for the occurrence of *arribadas* or mass-nesting events, which have been reported to occur here from the 1970s onwards. During an

arribada, hundreds of thousands of female turtles nest simultaneously along a small section of the beach (Shanker et al 2003). However, large-scale incidental mortality of these turtles during fishing operations has been of great concern from the beginning and finally in 1997, the Gahirmatha Marine Sanctuary was notified to conserve the offshore turtle congregations (Silas et al 1983; Ramesh and Rai 2017).

The sanctuary extends over 1,435 square kilometres (sq km) and all forms of fishing are banned in the core area of 725.5 sq km that lies adjacent to the coastline (Sridhar 2005). Small-scale fishing is allowed in the buffer area, but mechanised fishing (including trawling) is not permitted anywhere within the boundaries of the sanctuary. Moreover, under the Orissa Marine Fisheries Regulation Act (amended in 2005), several area and seasonal closures have been instituted with respect to mechanised fishing, especially during the turtle-breeding season. However, these are poorly enforced by the fisheries department—due to several reasons that have been discussed elsewhere (Ramesh and Rai 2017)—whereas the forest department's own efforts are mostly concentrated on managing the nearshore waters which comprise the core zone.

Rani Jhansi Marine National Park: This national park in the Andaman Islands was notified in 1996, in the region known as Ritchie's archipelago, for the purpose of protecting marine and terrestrial biodiversity. The archipelago consists of Swaraj Dweep (formerly Havelock), Shaheed Dweep (formerly Neil), Sir Hugh Rose, Outram, Henry Lawrence, John Lawrence, East or Inglis, Peel, Wilson and Nicholson Islands as well as South, Middle and North Button Islands. During the colonial period, these islands were sites of timber extraction, but two of them are now prime locations for the tourism industry, with nearly four lakh tourists visiting the Andaman and Nicobar Islands in a year, Swaraj Dweep and Shaheed Dweep are among the most visited islands in the Andamans (NTI Aayog 2018). The MPA section covers an area of 256.14 sq km and encompasses Outram, Henry, John Lawrence, and the three Button Islands; all forest extraction,

fishing, and tourist visitation are prohibited within its boundaries.

On-ground Management Challenges

Boundary demarcation: Once a protected area is notified, the area and resources within it become state property and its boundaries need to be demarcated to clearly establish the legal claim of the forest department (Baden–Powell 1882). Patrolling along the perimeter is another important practice because it reinforces the state's claim in both practical and performative ways: it helps to reinforce a visual boundary as well as to detect and defend the area from trespassers. However, as mentioned earlier, such techniques were originally developed for terrestrial conditions since the forest department was set up in colonial times to manage timber resources (Rajan 2006).

In the case of the GMS, this preliminary step of boundary demarcation has itself been fraught with challenges. First, the perimeter is large, so using buoys as boundary markers is an expensive option and although a few were installed in the past, they were soon damaged or dislocated. Second, the boundaries do not correspond to any discernible ecological or topographic feature and hence, cannot be visually distinguished at sea without the help of a GPS set and hydrographic charts. Since the latter are restricted maps, most field staff themselves have access to only a diagrammatic map of the GMS, which typically indicates the sanctuary area as a rectangle against a flat blue background. Therefore, the physical extent of the sanctuary is ambiguous to them, especially with reference to where the strictly protected core area ends and the buffer area begins.

Similarly, in the case of the RJMNP, the lack of demarcated boundaries has led to recurring conflict between fishers and the forest department, as the extent of the no-take zones—areas where fishing is completely banned—within the MPA are unmarked and unclear to fishers. As a result, it becomes particularly challenging to meet conservation goals by preventing fishing within the protected area. Moreover, a busy shipping lane

passes right through the park, hence the directorate of shipping services and the tourism department require all vessels to install GPS trackers to ensure that they stay within the shipping lane. These trackers are also required of fishing boats, to ensure that they do not stray into the MPA but so far, this has been hard to enforce. In an attempt to clarify the on-ground situation, the Andaman Lakshadweep Harbour Works was commissioned to install buoys at the boundaries of the MPA. However, this is yet to be completed because as mentioned earlier, buoys are not only costly to install but are also not durable installations given that this is a cyclone-prone region.

Even within state forest departments, personnel across ranks recognise the pitfalls of this focus on demarcation to impose a “fortress” model of conservation in seascapes. However, they continue with such practices because their role is defined by the wildlife act and due to familiarity with the practices.

Seascape skills: Due to the territorial framing of the wildlife act, the management of marine areas is a blind spot in the administrative system, from the Ministry of Environment, Forests and Climate Change (MOEFCC) downwards. Hence, although there are 24 marine protected areas in peninsular India and 106 more in the associated archipelagoes, training programmes of the Indian Forest Service at both state and national levels are geared towards the management of terrestrial ecosystems (primarily forests) (Sivakumar et al 2014). In addition, senior officers get transferred every two to three years and as a majority of these posts are in terrestrial areas, they do not get sufficient on-field exposure to seascapes. This has contributed to deep institutional discomfort with working at sea and an inability to actively oversee such areas. For example, the official management plan for the GMS had not been finalised at the time of this study even though it had been notified almost two decades ago. Similarly, the RJMNP too is yet to acquire a finalised management plan although it was created 23 years ago. Nevertheless, popular opinion in both locations attributes the failure of coastal development projects

to the “obstructive nature” of conservation agencies, especially the forest department.

At a more fine-grained level, field personnel are hired through recruitment procedures that basically test their fitness for terrestrial duties and hence, many who eventually get posted to MPAS suffer from such acute seasickness that it prevents them carrying out even routine offshore duties. Moreover, in the case of the GMS, supplementary marine training programmes were conducted only for a few years after the establishment of the sanctuary, so officers complained that at any given time a large proportion of the field staff could neither navigate at sea nor swim. An officer’s description of how they caught a poaching trawler several years ago illustrates the risks field staff face due to inadequate training:

In fact, I had a harrowing experience ... 3 o’ clock [in the morning] suddenly a huge trawler appeared ... a Bengal trawler, huge one ... we overpowered them, seized them and then we tied to our boat, took all the boat men ... and after sometime, the second boat, then the third ... a whole group. And ours is a little boat, we arrested 30 people and tied them up and at gunpoint, we kept them [there]. So in the process, we also got disoriented and ... we were unable to know where we are. And these people were good seamen, these people we had arrested. So they could take us anywhere. So that was a threat, if there was mutiny, there were 30 people and we were about 15 or so at the most. We were a smaller number, night had fallen, fog had descended, nothing was visible ... So we stayed the entire night there and only early morning, by around 4 o’clock, we could see the horizon. That was ... we were about 20 km from Dhamra. We were apprehensive that they [the trawl fishers] could take us to Bengal or even to Bangladesh.

A similar lack of screening for marine skills and the limited opportunities to acquire or improve them has resulted in field staff of the RJMNP patrolling mainly the coastal or island sections of the park. Although Swaraj Dweep per se does not fall within the area of the RJMNP, field staff are restricted to monitoring the sea via the beach at Krishnanagar, because it is the closest shore to the MPA. However, in a bid to upgrade the training provided to staff in the Andaman and Nicobar Islands, the forest department has, of late, actively sought opportunities to improve diving and marine species identification skills. Forest officials have been engaged in SCUBA diving courses sponsored by the

Wildlife Institute of India and there have also been attempts to organise workshops on marine taxonomy and ecology to help the staff identify species under threat, as well as species to be avoided, and how to respond effectively to injuries ranging from jellyfish stings to crocodile attacks.

Overall, the specificities of working in seascapes have been neglected by the MOEFCC and as a result, it has so far not provided forest personnel with even basic practical skills. On the other hand, one progressive element of the current National Wildlife Action Plan (NWAP), 2017–31, is that it recognises the need to address marine conservation as a specialised domain (MOEFCC 2017). It acknowledges that frontline staff should be provided with capacity building and training programmes, to better equip them to handle the challenges of marine conservation. It also recommends that national training institutes should modify their syllabi to address the requirements of forest staff posted on the coasts and islands. However, this remains to be translated into practice.

Institutional support: Due to fiscal constraints, many MPAS often face a shortage of seaworthy patrol boats. For example, in the GMS, only a single speed boat was available for patrolling a core area of over 700 sq km. Further, due to legal disputes over the hiring process, many field posts were vacant. Therefore, the sanctuary was administered as an extended range of the neighbouring Bhitarkanika Wildlife Sanctuary and National Park, and a small team of about six people were assigned to patrol it. Moreover, the main thrust of their conservation practice was to keep out poaching trawlers. This was a high-risk job because trawl fishers are aggressive at sea and the industry wields considerable political power in Odisha (Ramesh and Rai 2017). However, field staff received no special training, pay or insurance to compensate for the risks faced during offshore protection work. As a result, in February 2013, more than 8,000 staff—up to the level of forest rangers—went on strike across Odisha for more than two weeks and one of their main demands was that they should receive a higher salary as well as benefits comparable to that of the state police force.

In the case of the Andamans, the creation and maintenance of public infrastructure remains a considerable challenge across departments due to a range of factors such as the high dependence on imported materials combined with the distance from the mainland, erratic connectivity and power supply, and the shortage of labour. For instance, some panchayat members in Swaraj Dweep pointed out that while the tourism industry has indeed provided employment to an increasing proportion of the local population, it has also resulted in a corresponding shortage of labour for other sectors, because they do not offer comparably high incomes. Limited connectivity also makes coordination between various offices and departments tedious. For instance, one panchayat member said:

We still use letters for communication. There is no point making [communication] digital because the bandwidth is so bad. Even if we have internet here at Havelock [Swaraj Dweep], other places in Andamans don’t, so you can’t reach them unless you send a fax or letter. So we just use letters as a common medium.

As a result, even routine work such as the construction of footpaths and collection of solid waste proceeds at a very slow pace. In such a situation, where terrestrial infrastructure and maintenance is itself lagging behind, it is unrealistic to expect the forest department to find the labour and resources to develop and maintain the seaward infrastructure required for state-of-the-art MPA management. Additionally, limited connectivity between islands (due to rough seas and inclement weather) also means that frontline staff have only sporadic access to basic necessities such as electricity, potable water and medical facilities. This makes it difficult to maintain field camps and keep up conservation activities across large sections of MPAS.

Intersectoral coordination: In most marine areas, the lack of intersectoral coordination greatly hampers conservation activities undertaken by the forest department because the larger seascape is a multi-use area and any type of enforcement requires the support of several government agencies. However, even for such actors, who habitually work at sea, the

need for a clear territorial division of responsibilities is ingrained, whereas the fluidity of the seascape militates against this. Moreover, each agency has a separate map of jurisdiction that does not recognise the fundamentally multi-use nature of the region. This leads to confused and sometimes outright contrary forms of implementation, all of which bear down on fishers in the area. With an increase in the diversity of activities—be it shipping, diving, tourism, or port development—there is a corresponding rise in confusion over the rules and practices followed by these various groups within the same seascape.

For instance, both domestic and foreign trawlers are known to poach in Odisha's regional waters. The division between different agencies is such that the forest department (and armed police) patrol within the sanctuary, marine police outside the sanctuary but up to 22 km of the shoreline, the Coast Guard from coastline to 370 km (that is the entire exclusive economic zone [EEZ]) and the Indian Navy beyond that. However, their capabilities vary considerably since the marine police that is in charge of coastal security is even more ill-equipped and poorly trained than the forest department, and there is frequent confusion over which actor should pursue a vessel that has fished illegally in the sanctuary and then fled further offshore (Mohanty 2015).

Consider another example—in the case of the RJMNP, the forest department rules explicitly prohibit fishing within the MPA, but this rule is not mentioned by the fisheries department when issuing licences for fishing. Moreover, some dive sites such as Sebastian Hill, Pilot Reef, and Pit Stop lie in the buffer zone and around the fringes of the MPA but not all dive operators are aware of MPA-related regulations. Such confusion results in a patchy management of marine areas, whereas it could be addressed by improved communication and shared maps between the fisheries, tourism and forest departments. Unclear jurisdictions and ambiguous boundaries, coupled with a lack of communication with local stakeholders, add to the public's resistance to conservation. A fisher complained,

If the Forest Department's role is to manage the forest then why are they interfering in the

water? ... We have licenses for fishing here, but there are only three fishing sites where we can actually go to. There are so many vague rules here that sometimes I feel that we should just go to Burma [Myanmar] for fishing.

It would help to prominently display zonation maps in public areas so that concerned stakeholders such as fishers and dive operators are made aware of spatial restrictions.

Charging and prosecution of trespassers: Ambiguity about a marine sanctuary's boundaries also places the forest department at a legal disadvantage. For instance, when staff of the GMS apprehend people for fishing inside the core zone, it has been hard for them to convince the courts that this is illegal because clear property markings are absent. Besides, frontline staff claim that GPS sets do not always work well when they are at sea and they are sometimes unable to note the location at the time of arresting fishers for poaching. Recalling an incident when they seized a trawler, an officer admitted,

We had to engage a lot of advocates and all to fight our case because we had a very weak case—legally, we are not supposed to seize the trawlers [without a magistrate present] and we could not define where exactly we seized them, whether that is part of the prohibited area or not ... In all our operations, we somehow waded through the whole muddle.

In any case, forest departments usually have very limited authority at sea. In order to make arrests, personnel on patrol duty have to be accompanied by armed policemen and a magistrate. If a vessel is seized, they have to file a case against each member of the poaching vessel and this can be undertaken only with the assistance of the regular police force. It can become a lengthy process if the fishers are from neighbouring states because files have to be sent across state bureaucracies. Moreover, the cooperation of the fisheries department is essential to berth the impounded vessel and auction its catch. Finally, there is a lag period of many months between the time of arrest and the court hearing, but in Odisha neither the forest nor the fisheries department have the budget and the legal authority to confine the fishers and provide them with food. Regular police stations, which have the necessary authority and facilities,

require documentation proving that the crime was committed within their territorial jurisdiction before they can “open a file” and accept the responsibility. Moreover, police jails in coastal areas are usually small and cannot accommodate an entire trawling crew.

Unlike the GMS, there is no high-intensity conflict around RJMNP although ambiguous boundaries make it taxing to enforce rules, particularly with respect to “no-take” and “inviolate” zones. The boundaries of no-take zones in the RJMNP have remained unmarked since the creation of the park, making the extent of no-take zones unclear to fishing vessels. In such a situation, every time a conflict between the fishers and forest officials arises, boundaries can be negotiated to either's advantage.

Local support: The forest department also faces informal resistance from within the legal system because actors, such as advocates, the police and jail authorities, view the arrest of fishers as “harassment of the poor” and are reluctant to cooperate. For example, in Odisha, a police personnel likened the death of turtles during fishing operations to a road accident caused by a dog suddenly darting across, in front of a larger vehicle. He felt arresting people for such accidents was too harsh a measure. Similarly, an advocate who regularly takes on pro bono cases explained that turtle conservation rules have resulted in the arrest of trawling crews, many of whom are poor migrant workers, but the actual owners who control the operations from afar are never penalised. Further, the crew often get paid with a proportion of the catch and there are no laws mandating any minimum wage. Hence, unless they return with a good catch of commercially valuable species, it is hard for them to make a living—since the sanctuary area is believed to be a rich fishing ground, many of them try to flout the restrictions. Trawling crew are also not members of workers' unions, so they are entirely dependent on the trawler owner's assistance even when they are in jail. Small-scale fishers, on the other hand, have vociferously complained of harassment by the field staff even though it is officially recognised that their fishing practices

do not pose a threat to turtles. It is also true that they have been arrested far more frequently than mechanised fishers (Ramesh and Rai 2017). In general, conflicts between the Odisha Forest Department and fishers receive wide coverage in local newspapers and television channels and the popular perception of turtle conservation (and by association, the forest department) along the Odisha coast is that it is “anti-people.”

Similar conflicts have arisen in the case of the RJMNP, where the forest department’s view on conservation of marine spaces has taken the form of clamping down on fishing and tourism-related activities. As a consequence, conservation efforts are viewed with hostility by the fisheries and tourism departments, as well as the numerous people who depend on either sector for their livelihoods. These tensions are also exacerbated by the fact that there is little to no interaction between these stakeholders. For instance, conversations between the forest department and the fishers are limited to the giving out of instructions from the former to the latter. Fishers are agitated because no-take zones have been forced upon them and there is no definition of boundaries, which has left them vulnerable to penalisation regardless of their location.

On the other hand, the forest department too is unable to implement no-take zones or take action against rule-breakers for similar reasons. The friction between the fish-worker’s association and the forest department intensified during a meeting between the two in 2015, after which a project to establish boundary markers was immediately proposed to the central government and it now awaits funding. In a setting where the two main stakeholders have divergent commitments, building support for conservation becomes an uphill task. It may therefore be paramount to develop a formal platform for communication, feedback and redressal of grievances associated with the management of MPAs.

Intersecting Laws

The wildlife act intersects with other laws such as the Coastal Regulation Zone (CRZ) Notification (amended in 2018), and the respective Marine Fisheries Regulation Act (MFRA) passed by states and union

territories. The CRZ recognises four categories of coastal areas and imposes restrictions on the kinds of development permitted in each. For example, CRZ-1 covers ecologically important areas such as seagrass beds, mangroves and all MPAs, while CRZ-4 covers intertidal areas and the region from the low-tide line to 12 nautical miles (nm) outwards. In broad terms, the CRZ supports small-scale fishing and habitation by traditional communities in many areas while banning some types of industries. However, it permits construction of coastal infrastructure for arresting erosion, security-related port development, desalination plants, etc.

Therefore, depending on the context and project, it may further support restrictions imposed by the wildlife act or dilute them in the region surrounding an MPA. The MFRA, on the other hand, focuses completely on regulating fishing within 12 nm. This is because fishing up to 12 nm, that is, within territorial waters, is controlled by the state, while fishing from 12 nm to 200 nm—the outer boundary of the EEZ—is controlled by the centre. It specifies the zones to be used by mechanised and non-mechanised vessels, the type of gear permitted, the temporal closures to be implemented, etc. While a detailed analysis of various coastal regulations is beyond the scope of this article, it is important to note that in the absence of easy access to information regarding which activity is permitted where and co-management, there is bound to be confused and conflict-ridden implementation.

Lessons from Other Countries

The report on Boundary Making for Marine Managed Areas recognises the importance of stakeholder involvement and identifies several best practices including setting clear goals to allow for better zonation, paying attention to existing customary or legal rules, and factoring in how boundaries may need to shift according to economic and climatic changes (MBWG 2006). It also suggests that where physical demarcation is difficult due to technical reasons, clear and well-communicated delineation can prevent conflict. For example, the latter can be accomplished by mapping MPA boundaries on geographic information systems (GIS) and freely

distributing printed maps to stakeholders. In countries such as Thailand and Japan, zoning of marine spaces has been successfully implemented by using participatory mapping with GIS technology. This helped to determine multi-use zones and resolve conflicts among different communities (Lunn and Dearden 2006). Co-management strategies have also been adopted in Japan, under the Integrated Coastal Zone Management framework. Here, the government sets conservation priorities and identifies regulations that are applicable to an MPA, based on existing patterns of use. The claims and interests of primary stakeholders (such as fishermen and everyday citizens) are given precedence over others. While this may under-value biodiversity that has no immediate human use, it has enabled the sharing of authority and responsibility between the government, fishers, non-governmental organisations (NGOs) and others (Sanders et al 2013). Indonesia and Philippines have gone a step further by facilitating community-driven efforts in the form of Locally Managed Marine Areas (LMMAs) and these have benefited both conservation and livelihoods (Syakur et al 2012; Diedrich et al 2016). Such examples offer important lessons for redesigning marine conservation in India.

Conclusions

We have argued that one of the main reasons why the conservation of marine ecosystems continues to be a difficult task is that the rationality of conservation laws and the practices they support are typically derived from terrestrial situations and this renders them ineffective in seascapes. We focused on India as an example of a typical developing country and described how one of its most influential conservation laws—namely the Indian Wildlife (Protection) Act—espouses a strongly territorial rationality and a derived set of exclusionary practices which are at odds with the dynamic, fluid and multi-use nature of seascapes in the country. Therefore, one of the most important ways to address this lacuna would be to reframe the wildlife act in a manner that supports a range of management approaches that take into account the biophysical diversity of the country, rather than prescribe only one.

Another key factor that has acted as a barrier to effective conservation is that MPAs are embedded in multi-use landscapes that support a range of activities, from commercial and recreational fishing to scuba diving and water sports. As a result, the very multiplicity of stakeholders and agencies responsible for governing these marine spaces combined with divergent goals has led to conflicts over implementation. Hence, it is crucial that the legal framework for biodiversity conservation at least takes into account the mixture of claims, rights and regulations that exist in these regions, to support wholistic and inclusive efforts. Failing which, as the frontline narratives provided here indicate, an overly territorial approach as dictated by the current framing of the wildlife act tends to trigger considerable conflict between different stakeholders and their divergent expectations of what a “well-governed” marine space should be.

A legal framework for conservation that pays due attention to rights and livelihood concerns would also be in tune with the overall global trend, which has been a move towards more flexible and inclusive governance of MPAs. One of the most promising of these is the framework of legal pluralism that accommodates both normative and institutional diversity (Bavinck et al 2014). This framework is often used to describe places such as coasts and marine environments, where multiple legal traditions are in place and may even be contradictory and uncoordinated. By recognising the plurality of decision-makers and stakeholders involved, the framework allows for the sharing of responsibility and accountability.

Efforts to implement this framework require the involvement of NGOs, civil societies and user associations, whose knowledge base, interactions and concerns play an important role in deciding the rules of the space. While certain aspects of this framework—such as how power can be shared, property rights organised, and procedural times reduced—need further deliberation and strengthening (Bavinck and Gupta 2014), it provides considerable space for practices based on cooperation and transparency, both of which are crucial for the long-term viability of MPAs and the credibility of the

forest department. Further, the current NWAP suggests co-management as an effective system of governing spaces with legal plurality, wherein multiple stakeholders play a role in resource use and rule making. By incorporating these considerations and learning from progressive approaches followed elsewhere, perhaps the legal rationality governing the establishment and maintenance of MPAs in India can evolve and adapt on par with the dynamics of the marine ecosystem itself.

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