

# Coastal Ecology and Fishing Community in Mumbai

## CRZ Policy, Sustainability and Livelihoods

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A critique of the Coastal Regulation Zone rules studies their implementation, and violations in the Mumbai Metropolitan Region, which has experienced massive growth due to rapid economic transformation and urbanisation, resulting in degradation of and damage to sensitive coastal ecologies. Mumbai's artisanal fishers, especially the Kolis, are intensely subjected to survival and livelihood pressures. Sustaining the livelihoods of the Kolis and preserving coastal ecosystems is crucial for the city's sustainability. An evaluation of the state's role in implementing CRZ rules links the politics around CRZ to larger issues of livelihood and environmental sustainability. Field research in selected sites provides insights for small-scale fishery-based livelihoods and environmental sustainability.

The Coastal Regulation Zone (CRZ) notification of 1991 by the Ministry of Environment and Forests (MoEF) was a key landmark in Indian environmental policy and legislation. Following the setting up of the MoEF in 1985 at the state level, the notification indicated a seriousness of intent by the Indian state to protect and conserve environmental resources, and the livelihoods of resource-dependent populations. However, the onset of economic reforms and liberalisation at the same time, in 1991, meant that the protective provisions of the notification were either violated or not implemented, and several amendments were promulgated, which diluted its provisions. As a result, provisions restricting development activities solely to those requiring waterfront and foreshore facilities were rarely implemented. A large number of environmentally-destructive projects, including industries, tourism facilities, and infrastructure, have come up in coastal areas causing irreversible damage to fragile coastal and marine ecosystems, and destroying the livelihoods of coastal communities, especially the fisherfolk.

Sustaining the livelihoods of fishing communities and preserving the health of coastal ecosystems and biodiversity are crucial for the overall sustainability of coastal regions of India. The increasing vulnerability of coastal regions to climate-related extreme events further attests to the need for preventing further degradation of coastal ecosystems.

The CRZ notification was issued by the MoEF in February 1991 under the provisions of the Environment (Protection) Act, 1986. There have been over 25 amendments to this notification till date as several state governments and other stakeholders have expressed difficulties in implementing its provisions, citing the imperatives of promoting "economic growth." There has been tremendous pressure from industrial, tourism, mining, port and other lobbies for amending the CRZ rules, which were seen as restrictive. The amendments were made essentially to permit activities that were not permitted earlier in the CRZ areas (Panigrahi and Mohanty 2012). After several rounds of reviews and drafts, and some public consultation exercises, the MoEF announced a new CRZ notification in 2011 (MoEF 2011).

While the long process of consultation, drafting, and review, spread over several years, did involve fishing communities and their representatives, and it created greater awareness of coastal regulation problems among the fisherfolk, the final notification left much to be desired and came under heavy criticism from fisheries and environmental activists (Sharma 2011).

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This paper links the politics of policymaking with reference to coastal zones, to broader debates on livelihood and environmental sustainability. Based on primary and secondary research on the impact and violation of CRZ rules in the Mumbai Metropolitan Region (MMR), it attempts to draw insights for small-scale fishing livelihoods and environmental sustainability issues in one of India's largest urban agglomerations, which is facing increasing pressures of urbanisation, industrialisation, and land-use changes. Covering selected fishing villages across the MMR, including Cuffe Parade, Colaba, Mumbai Port Trust, and Sewri in the south, Mulund and Thane in the north, and Chimbai in the west (Figure 1), this paper discusses the violation of CRZ rules and its consequences, and the (failure of) implementation of these rules.

**Figure 1: Selected Fishing Villages, MMR**



Source: BMC records, 2016 (GIS map prepared by authors).

As per Mumbai's fish production data (2005–09), available on the Department of Fisheries website (DoF nd), there is a pattern of declining fish production at the district level, zone level, as well as the centre level (Tables 1, 2 and 3).

Urbanisation has led to the rapid destruction of mangroves (Rajashekariah 2011) and other important components of the

coastal ecosystem, adversely affecting small-scale fisheries—the principal source of livelihood for traditional fishing communities in the Mumbai region. Fishers in localities such as the Thane–Mulund creek and Bhandup village have gradually abandoned fishing and adopted other occupations. Mangrove ecosystems play a crucial role in sustaining coastal ecology and urban biodiversity, as they act as flood barriers and as spawning grounds for different aquatic species. In addition, traditional small-scale fishers are also threatened by large-scale commercial fishing activities, which involve big trawlers<sup>1</sup> and purse seiners. State and municipal agencies such as the Municipal Corporation of Greater Mumbai (MCGM) and Maharashtra Coastal Zone Management Authority (MCZMA), while implementing CRZ rules and evolving an Integrated Coastal Zone Management Project (ICZMP) for the coastal and marine ecosystems, have also allowed several violations to happen, and have failed to protect the sustainable livelihoods of fisherfolk.

**Table 1: District-wise Fish Production in Maharashtra** (in metric tonne)

Name of District	2005	2006	2007	2008	2009
Mumbai	1,60,594	1,81,888	1,84,679	1,62,681	1,59,560

**Table 2: Fishing Zone-wise Fish Production in Maharashtra**

Name of District	Name of Zone	Fish Production in Maharashtra, Zone-wise (in metric tonne)				
		2005	2006	2007	2008	2009
Mumbai	Manori	14,923	9,111	10,819	21,160	29,929
	Versova	57,798	50,020	65,463	53,561	46,594
	Mumbai	1,933	7,807	6,150	2,360	1,923
	Sasoon Dock	35,241	48,334	39,708	29,883	34,077
	Ferry Wharf	50,699	66,616	62,539	55,717	47,037

**Table 3: Centre-wise Fish Production in Maharashtra**

Name of Zone	Name of Fish Landing Centre	Fish Production in Maharashtra, Fish Landing Centre-wise (in metric tonne)				
		2005	2006	2007	2008	2009
Mumbai	Chimbai	128	473	353	155	134
	Mahim	389	1,282	780	257	355
	Worli	313	1,324	1,130	464	285
	Cuffe Parade	505	2,275	2,290	771	618
	Mahul	183	1,011	636	444	206
	Trombay	414	1,442	961	269	325

Source: DoF (nd).

The absence of a clear valuation of the long-term ecological and socio-economic benefits of maintaining and conserving coastal ecology and related livelihoods has resulted in problematic urban environmental management in the region. Coastal and marine ecology includes highly diverse habitats such as coral reefs, mangrove forests, sea grass beds, estuaries, salt pans, and open-ocean and deep-sea habitats, all of which are ecologically and economically significant. The violations of CRZ norms are more the norm than the exception all over India, as several studies show (Devaraj et al 1999; Joseph and Balchand 2000; Menon et al 2007; Sharma 2011; Panigrahi and Mohanty 2012). This is true of the MMR as well.

The following discussion unveils the evolution and modification of coastal regulation policies as a political process. Notwithstanding the sincerity in the original drafting of the CRZ notification of 1991, and subsequent reviews culminating in the CRZ notification of 2011, the entire process has been heavily

influenced by the political economy of decision-making deriving from economic reforms and liberalisation 1991 onwards.

### CRZ: Evolution, Amendments and Violation

Coastal zones are some of the most densely populated and economically dynamic regions of the world. In India, many of the urban agglomerations and densely populated regions are located in coastal zones. There is, thus, immense pressure on the environment and marginal/subsistence livelihoods, which have been historically quite sustainable. Coastal areas tend to have better access and richer resources, and, thus, always have attracted human activities, but the complexity in understanding and managing coastal ecosystems has led to both misuse and abuse. As such, rapid population growth due to urbanisation and industrialisation along the coastline, indiscriminate use of coastal resources, and high incidence of natural hazards along the coastal belt (Panigrahi and Mohanty 2012) have gone hand in hand.

Coastal zones as the area of interaction between land and sea are influenced by changes in both terrestrial and the marine environment (Pernetta and Milliman 1995). Over the years, growth of population leading to increasing pressure on land, globalisation of the economy, technological development, and increasing competition for coastal resources have caused conflicts between resource users. Panigrahi and Mohanty (2012) show that unsystematic use of coastal resources and conflicts along the coastal zone in India have continuously led to the deterioration and degradation of coastal ecosystems.

In Mumbai, the effects of economic growth, reclamation, change in land use, and destruction of coastal environment have led to pollution of waterbodies and have had negative impacts on the marine and coastal ecosystem, with adverse effects for fishing livelihoods (Murthy et al 2001). India's artisanal fishing communities have been disaffected and displaced by urban development, which has served to further impoverish them, as seen in Mumbai's extant fishing villages (Warhaft 2001).

There are various agencies to look after coastal ecological issues, but these agencies are working disjointedly, without coordination or at cross purposes, thus, defeating the principle of integrated coastal management as enshrined in various laws and notifications. Environmentalists have brought to light and are fighting several cases against the CRZ violations, but the main focus of environmentalists is to save or preserve the biodiversity and environmental health of coastal areas, with decreased emphasis on, or no attention to, the livelihoods of resource-dependent people in coastal areas. The mutual dependence of environmental health and resource-dependent livelihoods is often ignored as seen in the case of the forestry and wildlife sectors in India. Conservation of biological diversity is a common concern and is integral for the sociocultural and economic development of populations, as well as for disaster mitigation. Local participation in biodiversity and mangrove sustainability issues are both seen to be significant, as local champions for environment can make a huge difference in terms of effective environmental governance.

This lack of concern for resource-dependent communities or "ecosystem people" (Gadgil and Guha 1995) is leading to growing commercial exploitation, substantial land use change, loss of biodiversity, continued alienation of indigenous communities, and the creation of administrative, policy and legal measures that remain paper tigers (Wani and Taraporevala 2012).

The CRZ notification of 1991 was made under the provisions of the Environment (Protection) Act, 1986 with the express purpose of preserving the coastal environment—in particular, ecologically fragile areas—by regulating land use all along the coast. At the same time, the sustainability of traditional artisanal fishing livelihoods was a key concern. The notification imposed restrictions on industries, operations and processes in areas notified as CRZs (Sridhar 2005).

The CRZ notification of 2011 uses the 1991 notification as its base, and also codifies the 25 amendments to the notification during the intervening period. The posited objectives of the new notification include provision of livelihood security to fishing communities and other local communities living in the coastal areas, conservation and protection of coastal stretches, and promotion of developmental activities in a sustainable manner (Sharma 2011). The notification defines the CRZs to include the land area from the high tide line (HTL) to 500 m on the landward side, as well as the land area between the HTL to 100 m or the width of the creek, whichever is less, on the landward side along tidal-influenced waterbodies connected to the sea. The 2011 notification seeks to promote and reconcile three social, environmental, and economic objectives: protection of livelihoods of traditional fisher communities, preservation of coastal ecology, and promotion of economic activities that necessarily have to be located in coastal regions.

The 2011 CRZ notification introduces the concept of a Coastal Zone Management Plan (CZMP), to be prepared with the full involvement and participation of local communities (Bharucha and Ashar 2011). For regulating coastal activities, the coastal stretches within 500 m of the HTL on the landward side are classified into four categories as shown in Table 4 (p 51).

As per the CRZ survey of Greater Mumbai, 1998,<sup>2</sup> a total of 146 sq km fall in CRZ I, while CRZ II covers 42.70 sq km, and CRZ III, 13.82 sq km. Approximately half of Mumbai is estimated to fall within the CRZs (Sharma 2011).

One of the new features of the CRZ 2011 notification is the introduction of CZMPs, which will regulate coastal developmental activity and are to be formulated by the state governments or the administrations of union territories. In the MMR, the redevelopment of approximately 146 existing slums in CRZs have been permitted, provided that the stake of the state government in the project is not less than 51%. Redevelopment and reconstruction of old, dilapidated, and unsafe buildings in CRZ II has also been permitted. Also, the floor space index (FSI) or floor area ratio (FAR) prevailing in the Town and Country Planning Regulations as on the date of the project being sanctioned will apply (Panigrahi and Mohanty 2012).

The implementation of the CRZ notification of 1991 was by and large ignored by many state governments. Vested interests from various lobbies, such as tourism and industry, continuously

sought to get clearances and exemptions in violation of the notification (EQUATIONS 2008). The CRZ notification has been amended from time to time, and each amendment has ended up diluting the letter and spirit of the law, which considerably weakened its provisions. The positive and adverse effects of the CRZ notification of 2011 are outlined in Table 5.

In line with neo-liberal economic and governance shifts in the last two decades, along with the reversal of gains in economic security and civil rights by market expansion, the market and state have also contributed to the annulment of earlier progress on the environmental front. Further, in the case of the CRZ policy, the failure to check violations has proceeded, along with the lack of a comprehensive understanding of coastal issues from the perspective of the social sciences. From a policy sociology perspective, there has been no real conversation with the people who are the main stakeholders in coastal areas. Consultations were purely for the sake of form, and as several fish worker organisations and environmental activists have pointed out, the CRZ notification of 2011 did not incorporate concerns and suggestions of peoples' organisations or their representatives.

Perhaps, then, as M Burawoy (2005) suggests, we need a turn towards public sociology, since the policy has failed and the government refuses to seriously implement or support the CRZ notification. This paper contributes to a public sociology debate, public sociology being viewed as "the conscience of policy sociology," especially when there is lack of conversation in the form of public hearings, or the state refuses to seriously incorporate larger public concerns and is unable or unwilling to implement the policy effectively.

Part of the criticism of the CRZ notification of 2011 relates to ambiguity in defining bay and seafront land (Lewis 2013). While the 2011 notification prohibits construction on the seafront at least up to 500 m from the HTL, in the bay, it extends

coastal protection landward up to 100 m or for the bay's width, whichever is less. Panigrahi and Mohanty (2012) show that a large number of terms were not defined in the 1991 notification, including "foreshore and water front activities," "traditional rights and customary uses," "local inhabitants," "gaothans<sup>3</sup> and fishing villages," "new constructions," "reconstruction," "repairs," "buildings," "local architectural styles," "industries," "projects," "processes," "activities," "temporary structures/sheds," etc. Many of these terms continue to be used in a vague sense in the new notification as well. They suggest that such ambiguities enable the state agencies to amend and interpret the rules as per their need. The vagueness enables the state to be flexible when responding to so-called development needs, but the same flexibility was never used to address environmental challenges, or the livelihood and social needs of the poor and the resource-dependent people.

As the coastal zone generally features many economic and developmental activities, including agriculture, forestry, fisheries, transport and manufacturing industries, it is imperative that we accord priority to the conservation of natural resources and the coastal ecosystem to ensure their sustainable development. Hence, many countries with coastal zones have evolved ICZMPs, especially from the beginning of the 1990s (Devaraj et al 1999). In Canada, the Atlantic Coastal Action Program (ACAP), established in 1991, seeks to promote strong participation of local residents in managing coastal resources (Robinson 1997). The United States adopted a Coastal Zone Management Act, along with an Integrated Coastal Management (ICM) programme, which incorporates the knowledge of fisherfolk and other coastal stakeholders (Tibbetts 2002). South Africa has established national, subregional, and regional indigenous and local community biodiversity advisory committees (Sunde and Isaacs 2008), many of which address coastal environmental concerns.

**Table 4: CRZ Categories and Their Location in Mumbai**

CRZ Categories	Features	Research Areas in Mumbai
CRZ I	Ecological sensitive area, declared as "No Development Zone" (NDZ); contains—national parks/marine parks, sanctuaries, reserve forests, wildlife habitats, mangroves, corals/coral reefs, close to breeding and spawning grounds of fish and other marine life, rich genetic biodiversity, area low and high tide line as defined in the CRZ notification.	Cuffe Parade, Colaba, Thane—Mulund creek, Sewri, Mahulgaon, Chembur.
CRZ II	Areas already developed up to or close to the shoreline; developed areas refer to substantially built-up urban areas, and are provided with drainage, approach roads and other infrastructural facilities such as water supply and sewerage mains. Up to 500 metres from the coastline.	Badhwar Park, Colaba Koliwada, Bhandup Village, Chimbai Koliwada
CRZ III	This zone refers to undisturbed areas, and rural areas (developed and undeveloped); areas within the municipal limits or in other legally designated areas which are not substantially built-up; gaothans and koliwadadas.	Some koliwadadas and gaothans in the MMR come under CRZ III
CRZ IV	Coastal stretches in the Andaman and Nicobar, Lakshadweep and Small Island except those designated as CRZ I, CRZ II, and CRZ III. Area of up to 12 nautical miles from the high tide line.	

Source: Prepared by authors from Sridhar (2005) and MoEF (2011).

**Table 5: Positive and Negative Outcomes of CRZ Notification 2011 and Its Amendments**

Positive Aspects of CRZ 2011	Negative Aspects
Imposes restrictions on activities in the coastal zone.	Allows non-polluting industries such as IT services in CRZ of special economic zone.
Prohibits setting up of new (or expansion of existing) industries as well as units for power generation.	Foreshore facilities for thermal power plant are allowed.
Flow of untreated wastes and effluents into the coastal ecology and waterbodies are prohibited.	In SEZ areas, beach resorts and recreational facilities are permitted.
Construction activities in CRZ I area are prohibited.	CRZ 2011 seems to address needs of builder lobby, tourism, infrastructure sector, and industries, rather than the fishing community.
For the development of local community, there is provision for construction of jetties, dispensaries, schools, public rain shelters, community toilets, bridges, roads and provision of facility for water supply, drainage and sewerage.	Notification is badly structured and organised; difficult for common people to understand (Panigrahi and Mohanty 2012).

However, studies show that coastal zone management is not a complete success in many countries of the world. Cao and Wong (2007) show that conflicts between groups and sectors, along with environmental degradation, are to be seen in several coastal zones in China. They document the impact of anthropogenic coastal activities on ecosystem health, habitat degradation, aquatic species loss, and decline in fish spawning sites. In the case of Europe, J McKenna et al (2008) show the shortcomings of an approach to ICZMPs that does not prioritise strategic principles either for specific stakeholders, or for environmental sustainability. Shipman and Stojanovic (2007) argue that, similar to developing countries like India, a democratic deficit hinders effective implementation of coastal management strategies in European countries as well, as the local stakeholders are not adequately consulted.

The National Fishworkers' Forum (NFF)<sup>4</sup> was involved in intense negotiations with the MoEF in the lead-up to the CRZ 2011 notification. The NFF voiced strong opposition to the 2010 pre-draft of the notification, as it did not incorporate the inputs provided by them during the series of consultations in 2009–10. The NFF felt that the 2010 draft was barely different from the 2010 pre-draft. There was also a lack of agreement on a number of important points, such as the New Mumbai airport, which is to come up in fragile CRZ areas and was made possible through several exemptions facilitated by amendments to the CRZ notification of 1991. There has been much pressure on environmental regulations in the Mumbai region citing economic growth and development imperatives, and the need for “special considerations.”

While some of the NFF's suggestions were incorporated in the draft (such as dropping SEZs, regularising all existing fisherfolk housing in the CRZs, changes in provisions for Mumbai fisherfolk, long-term development plan for fishing villages, etc),<sup>5</sup> many other inputs were simply ignored or not incorporated. In addition, some of the new provisions such as housing for fisherfolk were included in such a way that they would benefit the real estate sector, and non-fisherfolk communities as well, thus providing scope for encroachment on traditional fishing community lands. While concessions pertaining to basic facilities for daily fishing activities have been given in the No Development Zone (NDZ) of CRZ III (between 0 m and 200 m), these are seen to be inadequate as simultaneously concessions are also given to government and real estate actors in CRZ II (built-up municipal areas).

Hence, the NFF decided to launch a struggle against the CRZ notification of 2011 in February of that year. While the NFF continued to oppose many of the notification's provisions, it also wished to work in close cooperation with the MoEF in implementing it, as many provisions favourable to fishermen were incorporated in the draft. A fundamental demand of the NFF has been that the “inalienable right of fishing communities to their habitats” be recognised and that they should have “representation in decision-making” (Sharma 2011).

According to the NFF chairperson, fisherfolk community associations had been assured of adequate representation in the national and state-level Coastal Zone Management Authorities

with representation of at least three people. However, this was not reflected in the CRZ 2011 notification. The MoEF had agreed on the provision to convert Critically Vulnerable Coastal Areas (CVCA) to Community Managed Coastal Reserves (CMCRs), but this too was not acted upon. The NFF is also deeply concerned that the provision that allows new construction within the 100 m to 200 m NDZ in CRZ III has been loosely worded, leaving scope for large-scale encroachment and construction activity. In addition, the NFF continues to oppose the location of nuclear power plants and other developmental activities not requiring foreshore facilities in the CRZ I. Further, FSI concessions given in Mumbai for slum rehabilitation in order to facilitate the participation of private builders in coastal areas is opposed by the NFF.<sup>6</sup>

It is against this background that one can evaluate the consequences and implications of long-term CRZ violations, urban development, and the failure to effectively implement CRZ rules on fishing communities and their livelihoods in the MMR.

These impacts on fishing communities, direct and indirect, via environmental degradation, are studied using semi-structured and unstructured interviews, and focus group discussions. The interviews, discussions, and the questions in the field concerned encroachments on fishing spaces, CRZ violations, negotiation processes, fisher resistance, contestations, and their implications for fishing livelihoods and fisher spaces. The study was carried out in several sites in the MMR where encroachments and CRZ violations have been felt the most by the fishing community, who are seeking to resist the loss of livelihood and living spaces in diverse ways.

### Fishing Community and Their Livelihoods

In Mumbai, the traditional Koli fishing community is widely accepted as an indigenous community (Warhaft 2001) that has been in the region before the onset of the urbanisation process during British colonial rule. The fisher people and their history are closely linked to the development of the city. Urbanisation and capitalist development has marginalised or impoverished the artisanal fishing community from their livelihoods and living spaces. The effects of larger processes of transformation are observed in increasing physical displacement of the community, incursion of inappropriate technology and competition from commercial fishing, overfishing, and declining catch. The Kolis have been confronted with an unstoppable barrage of projects (Warhaft 2001), programmes and policies stemming from transnational, national, regional, and local developments.

Nationally, the central government has continuously promoted many destructive projects in coastal areas. According to CRZ notifications, SEZs are to be avoided in CRZ I, but the government itself initiated an amendment to promote SEZs in a CRZ notified area in the region. CRZ violations are observed in 134 acres of land in the Thane creek in the Mulund–Thane belt, which falls under CRZ I. The 134 acre mangrove area has been reclassified from CRZ I (NDZ) to CRZ III, to permit the setting up of an SEZ around 2005.

The proposed land for the SEZ project is barely 200 m off the Thane creek. It was surrounded by a thick cover of mangroves

on three sides, some of which have been cleared for construction. Inter-tidal waters can be seen in and around the plot. Thane and Mahim creeks are probably the most polluted locations today. Mahim bay and Thane creek were once excellent fishing grounds, with flourishing oyster beds and lush mangroves on the fringes. Due to recent industrial and domestic activities and high levels of pollution, fishing has drastically declined and is almost non-existent as a livelihood. Massive increase in benthic<sup>7</sup> productivity and depletion shows the damage caused by pollution to the coastal environment. The Thane creek exhibited low values of dissolved oxygen, which has further destroyed the marine flora and fauna (Murthy et al 2001).

At a time when fisherfolk still lose their lives at sea for want of a simple lighthouse, the state government at various points of time authorised and supported gigantic port projects for international trawlers, whose mass fishing techniques plunder fish species and damage the coastal ecology. At the local level, development projects and urbanisation threaten seaside settlements in almost every *koliwada* (Koli hamlet) in the city (Warhaft 2001).

At present, there are more than 27 *koliwad*s and around 88 *gaothans* in Greater Mumbai, of which more than 16 *koliwad*s and 23 *gaothans* fall under the CRZ.<sup>8</sup> Most are located on the seashore or close to it, in a city where waterfront housing carries attractive price premiums. Pollution, lack of basic amenities, declining catch, increasing costs, inadequate housing, and loss of space for trade-related activities are the major issues affecting Koli families. In Cuffe Parade<sup>9</sup> in South Mumbai, the livelihoods and living spaces of the fishing community are sandwiched between the migrants from outside Mumbai (from Palghar and Boisar in the MMR and from the north Indian states of Uttar Pradesh and Bihar), and the rapidly expanding elite housing estates. Some migrants have encroached the fishing spaces on one side of the Koli settlement, and on the other side, elite residential households restrict fisherfolk from using their spaces for fishing activities citing sanitation and aesthetic reasons. Due to the decline of catch, Koli women are forced to go for domestic work in apartments nearby and take up other miscellaneous jobs to earn an income.

### Rampant Violations

CRZ violations are quite rampant in fishing areas in the *koliwad*s. In Cuffe Parade, in the name of beautification, 60 sq m of land was reclaimed, for the purpose of building a garden, and dense mangrove cover was destroyed; a clear violation of CRZ I. Despite being the oldest residents of the area the fishing community has become a minority. They are economically and socially marginalised, and voiceless compared to the later occupants, and hence the CRZ violation becomes an issue of environmental justice (Bullard 1994). The elites have the capacity to influence the state, as they have powerful political, bureaucratic, and media connections. The fishing community is unable to offer a unified front as they are divided into several ethnic and political groups with different interests. The fishing community (being daily earners whose livelihood depends

on weather conditions, season, tides and pollution in the area) is unable to sustain its protests over a long time on issues such as CRZ violations, land grab, etc. Most *koliwad*s in Mumbai have come under attack from specific development projects or their negative externalities.

Ranade (2008) describes encroachment by working-class migrants on fisheries livelihood and residential spaces. Encroachment leads to a decline in the availability of land, where there is already a restriction on FSI; they cannot increase their floors more than 2.5 FSI. As their families grow bigger, two or three generations of fishing households began staying in one small room because of non-availability of land, and the problems of expansion. A significant but pertinent problem is the case of newly married couples. According to a respondent during the field research, parents are helpless in providing them a separate room. At the same time, as the infamous Adarsh housing scam in the same area reveals, the elite are able to get away with CRZ violations and access posh housing, while the traditional fishing community suffers from a housing crisis.

In the new CRZ notification, the government is not clear about the provision of “other local communities” in the NDZ. Hence, fishing communities are asking the government to clarify whether they plan to provide any amenities to the fishing community and other local communities that reside near the coastal area, most of the latter being migrant groups (Menon et al 2007).

In general, developments along the coast in Mumbai (as in other parts of India) have proceeded in an informal, uncoordinated and unsustainable manner, resulting in conflicts over coastal land use and degradation of coastal resources. Even without human intervention, coastal zones constitute a dynamic and constantly changing environment. Along with constant encroachment and decline in traditional livelihood patterns, many coastal areas have become too polluted to support marine life. This has severely affected fishing, which continues to be an important income supplement, even as several fishing households send some family members into other occupations.

At Versova, dead fish are being washed ashore because of untreated effluents polluting the water. The same is observed in Cuffe Parade, Bhandup village, Thane–Mulund creek, and Sewri. In Cuffe Parade, pollution forces small fishermen to go in up to 10 nautical miles for fishing. These small fishermen cannot go deeper into the sea because they do not have the capacity or the boats required for fishing in the deep. There, they face competition from trawlers and purse seiners. Their smaller nets get entangled with trawlers and purse seine nets, causing damage and financial losses. In the Thane–Mulund creek, the main reasons for coastal pollution include industrial construction and dumping of debris, sewerage flow directly into the sea, and destruction of mangroves. Private companies are letting their waste water, effluents, and chemicals into the sea. Fishermen complain that the combined effect of these environmental problems is a situation where “mosquitoes are multiplying and breeding, not fish.” In Sewri creek the discharge from the Mumbai Port Trust (MPT) includes coal and oil, which are directly dumped into the sea. Due to this, the

local mangroves are drying up and being destroyed. To keep the mangroves from extinction, fishermen brought plant species from other areas and planted them.

Environmental damage resulting from depleting mangroves has several implications. Mangroves are nurseries for marine life, and provide food for wetland aquatic species, birds and mammals. They filter toxins like heavy metals and prevent their entry into the food chain. Mangroves are important sites for fish breeding, and for crustaceans. The health of mangrove ecology directly impacts fishing livelihoods, which are almost totally dependent on daily fish catch. The poor implementation of CRZ notifications in the region is substantially to blame for the degradation of the coastal mangrove-based ecology (Chouhan 2012).

In theory, CRZ policies are envisaged to protect not just the environmental health of coastal ecosystems, but also coastal livelihoods, especially of fishing communities. However, there seems to be a lack of will in implementing the CRZ rules. Coastal degradation juxtaposed with new forms of “class conflict” between artisanal fish workers on the one hand and elites, or real estate players, and commercial trawlers, on the other, have marginalised sustainable livelihoods, which also contribute to coastal ecosystem maintenance and providing ecosystem services to the city and its regions.

For centuries, the coastal fish economy was sustained by artisanal fisherfolk operating small, unmechanised craft, supplying fish to inland markets. In the 1960s, big business (private limited companies) began to enter the fisheries sector. The expansion of trawler fleets and catching fish primarily for export led to major changes in the ecology and economy of fisheries. Subject to a squeeze on livelihoods, some of the fishers themselves transformed from artisanal fishers to commercial trawler owners (Pontee 2013). A rapid increase in fish landings in the early years of trawling was followed by stagnation and relative decline in some parts of India, especially Kerala. This conflict gave rise to a widespread movement—involving strikes, processions and violent clashes with trawler owners—particularly in Kerala, in which small fishermen pressed for restrictions on the operations of trawlers. Fishing livelihoods have been seriously undermined through growing deterioration of the environment facilitated by flawed policies and violations of well-intended ones. The origins of such conflicts are thus seen to lie in the process of development itself (Kurien and Achari 1990).

As Gadgil and Guha assert, “conflicts over natural resources typically pit against each other two equal antagonists. ... While forests, water and other natural resources are diverted to produce energy and commodities for the rich, the poor are made to bear the social and environmental costs of economic development, whether in the form of the declining availability of natural resources, a more polluted environment, or—increasingly—physical displacement” (Gadgil and Guha 1994: 103, 119). This brings in the problem of “distributive justice” as an integral component of environmental justice and sustainability. Critiquing the excessive focus on the idea of economic efficiency, they point out that social conflicts around natural

resources are the central environmental problem in India, unlike the issues of conservation or protection that are characteristic of western environmental debates.

### Social Conflicts Over Resources

The conflicts in the Mumbai region clearly reflect Guha and Gadgil’s contention that environmental politics are more to do with social conflicts over resources than with the issues of conservation. The violation of CRZs and its effects on fishing livelihoods and the resource base reveal that, in fact, conflicts over resources and issues of conservation go together. In a study of coastal zone management problems in Goa, Noronha (2004) stresses the need to address three interconnected policy problems: resource depletion, pollution/resource degradation, and resource-use conflicts. All three problems are prominent in the Mumbai case as well.

Many studies, however, neglect the last of these as they are usually carried out by resource scientists. The role of the fishing community in ecosystem maintenance and sustenance is not taken seriously, and it is imperative to consider their sustainability contributions as Devaraj et al (1999) show in their study of coastal zone issues in Kerala. Similarly, Joseph and Balchand (2000) point out that the ICZM plans of many developed countries primarily address the sustainable use of coastal resources, and given their low population density and other sociocultural and economic differences, we need to evolve plans that are more suited to the Indian “cultural, political, economic and historical conditions.”

In Cuffe Parade, the fishing community has been displaced from their locality due to the intense pressure of government-supported land reclamation on the sea side, particularly in areas where traditional fishing activity (boat mooring/beaching departure and landing) is most concentrated. Laxman Dhanur and Parshuram Mehar, two fish worker activists, state:<sup>10</sup>

Before 1965, the area was under the sea here and the fishing community were engaged in small-scale fishing. This is where we were fishing and we were engaged in other related activities such as weaving nets, drying the fish etc. However, we were residing in nearby areas at Azad Nagar, Sudan Zopadi and Jamshedji Bandar in the Colaba area. In the year 1965–66, the government began reclaiming this area for constructing residential and commercial buildings for the rich.

The fishing community in Cuffe Parade consisting of 200–250 affected families has long protested against this reclamation as it took away the sole means of their daily livelihood. The present day Nariman Point (Mumbai’s central business district), the Oberoi Hotel area, and other elite residential areas have gradually encroached on fishing community spaces since 1973. The local fisherfolk who used to live in these areas had to shift out due to continuous reclamation and development of land in the Colaba coastal belt. Loss of living and work spaces eroded their livelihoods, forcing them to move and settle in areas adjacent to high-end housing complexes in Cuffe Parade and Badhwar Park, as a mark of protest to stop further reclamation.<sup>11</sup>

Even as encroachment and displacement facilitated by CRZ violations were taking place, the state failed to take adequate

steps for coastal conservation. The state-level MCZMA was constituted by the MOEF under the Environment (Protection) Act, 1986. The MCZMA has the power to take necessary measures for protecting and improving the quality of the coastal environment and preventing, abating and controlling environmental pollution in coastal areas. However, the jurisdiction for taking action against CRZ violations resulting in destruction of mangroves still rests with the forest department of the state government. This splitting of jurisdiction has created problems in effectively addressing CRZ conservation problems, as the body to which complaints are sent does not have the authority to recommend or take action against violators, usually the real estate firms in Mumbai.

In 2009, 24 complaints against CRZ violations were registered in Maharashtra. The MCZMA did issue letters to the concerned violators. However, not even one complaint was taken up for action against the cited violations. In 2010, there were 42 complaints registered, of which only 10 complaints were under a directive process, while the rest were only issued letters to stop the violations on CRZ sites. In 2011, there were 99 complaints registered against CRZ violations. The MCZMA stopped work only in three cases, while 20 cases were “considered” and discussed for possible action in a meeting of the MCZMA, for alleged CRZ violations. The non-availability of proper records on CRZ violations raises basic questions about what action was taken or recommended in these 20 cases, and in the remaining 79 cases.

The MCZMA wrote to the city’s municipal commissioner on the matter of identifying koliwadās in Mumbai and developing an ICZMP with the consensus of the local community on 14 April 2011. According to a BMC official responsible for CRZ activities, the ICZMP is still under process. Regarding 1991 and 2011 CRZ violations, he stated that letters were issued to concerned agencies and parties, but he is yet to get a proper status and action taken report. The task of preparation of a CRZ map (required scale 1:4000) has been allotted by the BMC to the Institute of Remote Sensing (IRS) in Chennai, but the report is still awaited. There is, thus, considerable inaction and delays on the part of concerned agencies, which enables violators to get away with environmentally destructive actions, compromising the livelihoods of artisanal fishing groups, and the sustainability of coastal ecosystems. From the very beginning, the enforcement agencies have been extremely apathetic with regard to the implementation of the CRZ norms, as indicated for instance in the non-availability of CRZ maps in the required scale since the 2011 notification.

The rich Indian experience with decentralised governance, especially in managing natural resources, has been dismantled through top-down implementation of policies such as those pertaining to coastal ecosystems. These structures of policy formation and implementation are challenged by the “environmentalism of the poor” (Guha and Martínez-Alier 1997). Environmentalist discourses in general “hold the poor” or resource dependant community “to impossibly high ecological standards” (Baviskar 1995), even as the state itself cites national economic objectives in ignoring such standards.

In the context of Indian environmentalism vis-à-vis the issues of sustainability and distributive justice, this paper argues that the failure of the central and state governments to effectively implement CRZ norms, and their role in amending the rules to favour private and public “development” lobbies is a clear-cut indication of its unwillingness to effectively address environmental concerns, as well as the livelihoods of resource dependent populations. In some ways, it reflects the behaviour of a “cunning state” (Randeria 2003) as it puts in place environmental norms and regulations, but does its best to ensure their non-implementation, and actively facilitates or turns a blind eye to their violation. The state notionally abides by international and national environmental norms, and seemingly accepts environmental and livelihood concerns through an ostensible participatory process, but selectively cites development obligations when permitting ecologically destructive policies, which also adversely affect resource dependent communities.

The state’s neglect and failure in effective coastal management also ends up ultimately adversely affecting entire regional populations through enhanced vulnerability to natural hazards. By choosing particular neo-liberal development models, the state ignores alternative formulations of development, sustainability, and livelihood protection. The end result, as we can see, is the dilution and weakening of enlightened and environmentally sensitive regulations such as the CRZ rules.

## Conclusions

This paper lends support to activist and environmentalist voices that show livelihoods of the fisherfolk in Mumbai and other coastal regions in severe jeopardy, reflected in their ongoing and past struggles. Artisanal fisherfolk have been squeezed out by large trawlers (some of whom are from within the Koli community) and infrastructure projects in the coastal areas of India. In the last few decades, India’s coastal stretches have become sites of random and unsustainable development pressures. Hence, environmental concerns are observed to arise out of the sheer imperative of human survival. This reflects what has been termed as the “environmentalism of the poor” (Guha 1989), which is married to the concern of social justice, on the one hand, and sustainability, on the other. This perspective argues that the present patterns of resource use have been disadvantageous to local communities and devastated the ecosystems.

The CRZ notification was published with the intention of bringing a balance between the diverse and sometimes contradictory needs of infrastructure development, preservation of the ecosystem, and livelihood security of the fishing community. However, from the very beginning, the enforcement agencies have been extremely apathetic with regard to the implementation of CRZ norms, as indicated, for instance, in the non-availability of CRZ maps in the required scale. One of the major criticisms levelled against the CRZ notification is that it deliberately ignores the issues of public participation and the local (coastal) context and issues. We can see that the problem of implementation of the CRZ rules has arisen because the



coastal state authorities have not taken the issues of enforcement seriously.

A review of research and voices from the field reveal that CRZ policy is only a paper tiger, and it raises the basic questions about whom the policy was designed for, and who are actually benefiting from it. It shows the unwillingness of the government to implement it effectively. The Indian central government, while formulating the policy, did not accept the concerns of the fishing community and other stakeholders in their entirety. The problem of encroachment by migrants is a major issue hampering fishing livelihoods in CRZ I areas. Ranade (2008) documents migrants from other parts of the state and country entering into Mumbai fishing spaces encroaching upon their livelihoods, spaces, and environment. Encroachment is leading to the scarcity of land (Parthasarathy 2011) and pushes the indigenous Koli fisherfolk out of fishing activities (Ranade 2008).

The consequences are quite severe as may be noticed from the following facts:

- (i) Most koliwadadas no longer have jetties for anchoring/mooring boats, repair of nets, drying fish, nets, etc, and for other fishing activities.
- (ii) No land is available for selling fish; hence fisherwomen are forced to occupy footpaths alongside the roads, or other public spaces.
- (iii) Due to density of land and space occupied by migrant encroachment, it is difficult to provide for schools and health facilities, as well as housing in koliwadadas.
- (iv) Increased density of population and commercial/industrial activity has led to dumping of waste and pollutants into the sea, as a result of which small fish species have declined drastically.<sup>12</sup>

Several public sector industries such as Hindustan Petroleum Limited (HPL), Bharat Petroleum Limited at Mahulgaon in Chembur, Bhabha Atomic Research Centre (BARC) at Trombay, MPT at Sewri, and Jawaharlal Nehru Port Trust at Elephanta Island are located in CRZ areas and their activities are severely polluting the coast near the sea shore, affecting fish breeding and fish catch. Murthy et al (2001) show that many areas in Mumbai are polluted by industrial, commercial, and refinery wastes, which seriously has an impact on fishing livelihoods apart from devastating the local ecologies. In Cuffe Parade,

Bhandup village, Chimbai, and Sewri heavy pollution and destruction of dense mangrove area is observed. The process of marginalisation and the loss of livelihood among the artisanal fishing communities have shifted them into the category of “ecological refugees.”<sup>13</sup> In spite of all this, there is near total absence of any effective policy measures to address these problems.

The CRZ 2011 appears to be a balancing act of the government. The state has tried to satisfy the “development” lobby, fishing community, and environmentalists through this notification, but it will yield better results if the government implements the rules effectively by prioritising the needs of the fishing community and the imperatives of environmental conservation. Otherwise, this notification will lead to problems similar to the earlier ones. There is a need to have coastal zone management committees that represent local fishing communities. The notification articulates environmental concerns and livelihood security of the fishing community on paper, but there is little implementation in the field.

Coastal problems cannot be managed successfully as separate issues or as a single issue, such as pollution or wetland loss or fisheries depletion, as these problems are interrelated. The aims and objectives of the 74th Constitutional Amendment (1992) to decentralise decision-making in urban areas of India is not taken seriously while planning and implementing CRZ rules. The 74th amendment gives urban local bodies more powers and functions to operate independently of higher government agencies. It provides autonomy to the citizen-centric planning process, and offers more opportunities for citizen participation in local governance at many levels, in budgeting, planning, land use and zoning issues. Ramachandran et al (2005) show the significance of integrating coastal zone management with a decentralised approach in villages in Kerala, for successful maintenance of coastal ecosystems, even as local communities derive the benefits of this success.

CRZ-related agencies must link up with decentralised urban local bodies to oversee ongoing coastal activities and to coordinate with these agencies in ensuring environmental protection, and stop further deterioration of Mumbai’s sensitive coastal ecological system, as well as the marginalisation of livelihoods of the fishing communities.

#### NOTES

- 1 Big trawlers refers to draggers, which are commercial fishing vessels. Some of the big trawlers are owned by Kolis themselves individually or in association with external non-fisher partners.
- 2 Survey maps were provided by the BMC assistant engineer in October 2013. According to BMC officials, the new survey was done by BMC in May 2012, but they have not received final approval from the respective authorities.
- 3 *Gaothan* is a portion of the land of a village which is ordinarily used for settlement. *Gaothan* or “village site” means the land included within the site of a village, town or city as determined by Section 122 of the Maharashtra Land Revenue code (Lands of Maharashtra nd).

- 4 This section is based on interviews with Rambhau K Patil (President of National Fishworkers’ Forum (NFF) and President of Maharashtra Machhimar Kruti Samiti) in July 2011. The details on the NFF’s stand against the CRZ 2011 notification was narrated by him and also provided in the form of written documentation.
- 5 Interview with Rambhau Patil (President of NFF) in April 2012.
- 6 Interview with Rambhau Patil (President of NFF), in April–May 2012, and documents obtained from him on NFF meetings.
- 7 “The benthic zone is the ecological region at the lowest level of a body of water such as an ocean or a lake, including the sediment surface and some sub-surface layers. Organisms living in this zone are called benthos, for example,

the benthic invertebrate community (Wikipedia Contributors nd).

- 8 Information collected from BMC records, 2012, provided by BMC assistant engineer in May 2012.
- 9 The Cuffe Parade *koliwada* is situated on one of the most valuable pieces of real estate in the world, a small patch of land near the Backbay Reclamation, in expensive downtown Colaba (Warhaft 2001).
- 10 Interview with chairperson and general secretary of the Machhimar Sarvoday Sahakari Society, Badhwar Park, Cuffe Parade, Mumbai in April–June 2012.
- 11 Interview with Laxman Dhanur, Chairman, and Parashuram Mehar, Secretary of Macchimar Sarvodaya Sahakari Society; also based on household survey of Badhwar Park, Cuffe Parade area in April–June 2012.

- 12 Findings are on the basis of field visits to the study area in April–June 2012.
- 13 The term was coined by Guha and Gadgil (1995).

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## EPWRF India Time Series Expansion of Banking Statistics Module (State-wise Data)

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