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Handling the Legacy of the Blue Revolution in India—Social Justice and Small-Scale Fisheries in a Negative Growth Scenario

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Introduction

The blue revolution[1] represented a forceful attempt by different levels of the Indian state to modernize Indian capture fisheries from around the mid-1950s onward. It was justified with recourse to the rhetoric of development: India's abundant marine resources would be marshalled to address the protein deficiency of the masses. Moreover, the blue revolution would help to uplift the country's poor fishing population and bring them into the development trajectory.

In terms of stimulating production in Indian fisheries, blue revolution efforts were very successful. This is highlighted by production figures. In 1950–1951, marine fish production was 534,000 metric tons; by the late 1990s, it had peaked in the range of 2.8–3 million metric tons (Yadava 2001). As was the case in many other developing countries (Platteau 1989), the marine fisheries had meanwhile divided into two parts: a harbor-based trawler fishing industry and a very sizeable small-scale subsector spread out along the beaches. The conflicts between the two categories of fishers were, and are, numerous, as they tend to ply the same fishing grounds and target the same species.

Social justice and distribution issues have not been at the forefront in planning discussions with regard to capture fisheries in India, as they have been in agriculture (cf. Byres 1998). As we shall see, fisheries development planning also bore little concern for resource management until very recently when fish stocks have shown increasing signs of stress. The root cause for both phenomena is the myth of large and unexploited fish stocks. As long as development planners could adhere to the imaginary idea of ever-increasing growth in production and earnings, the disparities created by the blue revolution could be waved away as irrelevant. After all, couldn't every small-scale fisher aspire to joining the league of trawler owners?

Figure 1 demonstrates the leveling of fish catches in India since the 1990s, a trend which is considered to be related to an ecological crisis in the marine sector (Kurien and Achari 1994; Mathew 2000; Salagrama 2001). As the overexploited condition of fish stocks has become ever clearer, with the necessary implication that absolute fishing effort has to decrease, the al-

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[1] We refer to what is now known as the first blue revolution in capture fisheries, the second blue revolution taking place three decades later in aquaculture (cf. Stonich and Bailey 2000).

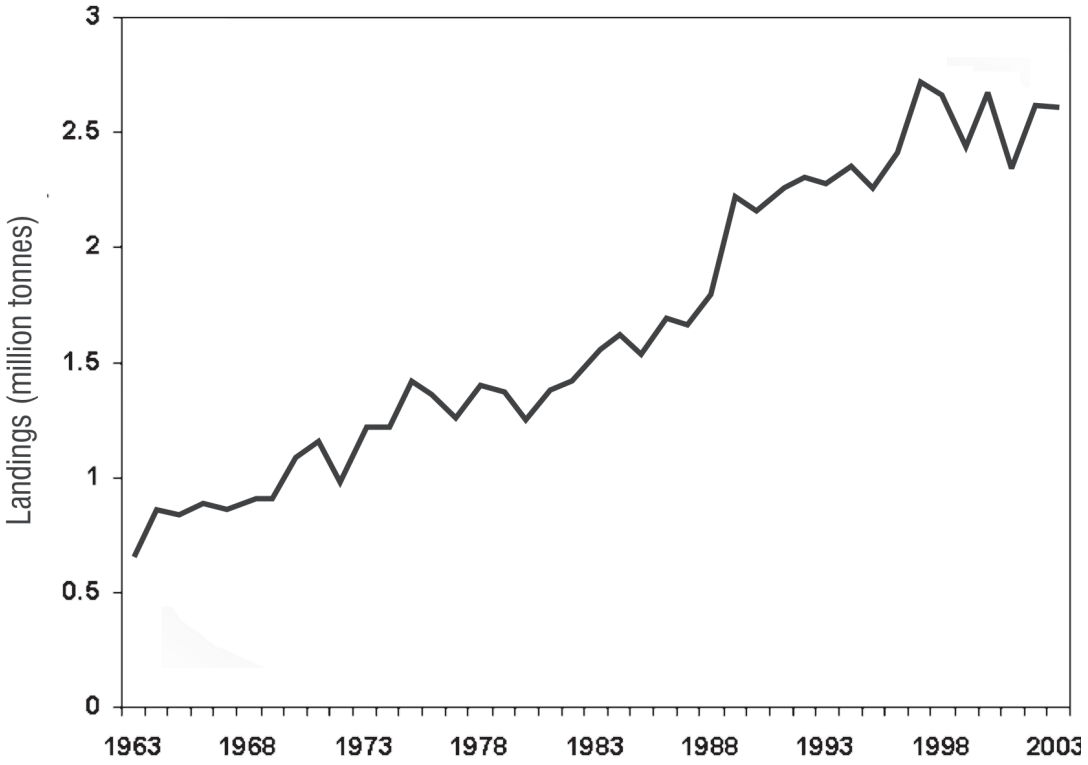

Figure 1. Indian marine fish landings, 1963–2003 (source: CMFRI 2005).

location of returns from remaining stocks becomes critical. This is an issue, nonetheless, that policymakers in India prefer to sidestep because it so pregnant with possibilities for conflict. We argue, however, that without a conscious and firm effort to incorporate well-formulated and explicit policies of distribution based on social justice, fisheries in India stand little chance of avoiding continued degradation and social upheaval.

The next section discusses the issue of social justice in fisheries from a general perspective. This is followed by an analysis of the social justice implications of the growing crisis in two major fisheries regions in India: Tamil Nadu and Gujarat. We conclude the paper with a discussion of possible policy options for fisheries governance at the state level that confront the legacy of the blue revolution head on by incorporating a strong concern for conservation and for social justice in distribution, with particular attention to the small-scale sector.

Social Justice in Fisheries

Philosophers have long debated the meaning of social justice and what principles should be applied in determining the fairness of a particular distribution of rights and responsibilities. Anthropologists have contributed to this discussion the insight that justice varies from one society, and societal position, to the next. There is thus no true or correct meaning of justice (Campbell 2001)—instead, there are many emic perspectives[2].

[2] The emicetic distinction is a classic element of anthropological theory. Emic refers to the culturally specific view, or the view from within. Etic refers to the view of the outsider, often in reference to a supposedly more objective or value neutral position (Pike 1954).

But social justice is also discussed from the viewpoint of commonly accepted—or universal—principles or criteria. International law, agreements, and declarations contain many examples hereof. For the purpose of an etic assessment of social justice, however, as Sen puts forward, one minimally requires "a working agreement on some basic matter of identifiable intense injustice or unfairness" (Sen 1999), a statement that acknowledges that there are also possible alternative etic perspectives. In fisheries, the most widely acknowledged reference point for an etic approach to social justice is the Code of Conduct for Responsible Fisheries (CCRF). The code includes several clauses that refer to social justice. The most prominent of these is Article 6.18, which, recognizing "the important contributions of artisanal and small-scale fisheries to employment, income and food security," voices a call for the protection of small-scale fishers. This appeal ties into other expressions of international law, such as those furnished by the International Labor Organization, and is of direct relevance to our topic.

Social justice is recognized to apply at various time and scale levels. One distinction is between intergenerational justice and justice among people in the present time. Concerns about ecosystem health and the sustainability of extractive practices are closely linked to notions of intergenerational justice, where development "meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development 1987; Sumaila 2003). In the present day, depending on the scale and the units of focus, analysts may discuss social justice as an issue of north and south, or, at the other end of the continuum, among individuals, households, or genders. In this paper, our concern is primarily with justice at the subsectoral level or, in other words, among categories of small-scale and semi-industrial fishers. We follow the suggestion that members of these categories may have different perspectives on what constitutes justice and injustice.

It is reasonable to suppose that perceptions of justice and injustice are linked to the character of an occupation. Capture fisheries is one of the last hunting professions and shares with other hunting societies a number of traits such as an emphasis on skill, luck, and competition (Acheson 1981; Van Ginkel 2003). The marine environment being uncertain and dangerous, and the rights to wild fish not obvious in advance, fishers display a great tolerance for difference. At the same time, ethnographies reveal an egalitarian ethos and a concern for issues of justice.

This connects in part to conceptions of fishing rights. Researchers have demonstrated that fishing societies, whether 'traditional" or newly established, design and enforce rules for fishing practice. This is logical: "resource allocation is never unstructured because continuity in the production of basic goods is never unimportant" (Benda-Beckmann 1995; following Dalton 1967). Such regulatory practices take the form of boundary and access rules (Schlager and Ostrom 1993) and also identify agencies and processes of rule making and adjudication. The conclusion is that as long as fishers operate within a common framework of rights and responsibilities, social justice issues are capable of being addressed and handled. From this perspective, problems are most likely to arise when fishers do not share the conceptions of just fishing practice (cf. Charles 2001).

In the following section, we discuss the nature of the blue revolution in two Indian states, Tamil Nadu and Gujarat. Our observations are structured by analysis of the place of intergenerational and intersector redistribu-

tive justice in the two states. What have the two states done to promote justice in these two areas, and what new policies are they proposing to address them?

Before we proceed with this task, it is important to indicate the methodological basis of our data and arguments. This paper is based on the findings of long-term ethnographic fieldwork conducted by both authors in their respective regions. Arguments, where not substantiated by secondary sources, are derived from interviews, both formal and informal, personal observations, and surveys. The number of informants consulted by each author runs into the hundreds. In Tamil Nadu, data were collected over the periods 1994–1996 and 2001–2005. In Gujarat, data were gathered in 1997–1998 (Gujarat Commissioner of Fisheries, Government of Gujarat 1998) and in 2004–2005 (Gujarat Commissioner of Fisheries, Government of Gujarat 2004). The locations of Tamil Nadu and Gujarat are indicated in Figure 2.

The Blue Revolution and the Creation of Social Injustice at the Subsector Level

Tamil Nadu

In response to a thrust by the Union Government of India (India 1951), the government of Tamil Nadu initiated in the 1950s the first phase of what was to become a blue revolution of capture fisheries in the state (Tamil Nadu 1972). The term "revolution" is actually not too grand for the effort it undertook; the supplanting of the "primitive" small-scale fisheries, by a new and modern fishing indus-

Figure 2. India's major coastal states.

try. Trawlers were the cornerstone of the revolution. In the next decades, the Fisheries Department promoted trawler fishing through massive subsidy schemes and training programmes, as well as via the construction of harbours, jetties, boat-building yards, and cooling facilities (MPEDA 1978, Bay of Bengal Programme 1983; Bavinck 2001b).

Its exertions were successful in two important respects. First of all, the program quickly caught on among fishers and nonfishers alike. The number of trawlers rapidly increased, and private entrepreneurs soon stepped into what was initially a governmental monopoly. The Fisheries Department was thus able to discontinue its programs in support of trawler fishing in the 1970s, without this affecting the further development of the industry. In 2000, the state counted upwards of 8000 small trawling vessels divided over 12 harbors and piers, spread evenly along the 1,000-km-long coast. Second, the new trawling subsector made an important contribution to the annual increase of fish harvests in the state. Table 1 provides figures on the number of small-scale and trawler craft operating in Tamil Nadu in the period of 1948–2000, as well as the growth of marine fish production.

Three outcomes surprised planners of the first hour, however (Bavinck 2001b:65, 67). The first was that trawlers did not come to supplant small-scale fishing in the state. To the contrary, as Table 1 also demonstrates, the small-scale subsector in fact has continued to grow. It predominates in the 591 fishing villages that dot the state's coastline, altogether feeding and employing approximately 600,000 people (Tamil Nadu 2000). The persistence of small-scale fishing does not mean that the technology on which it relies has stagnated. Largely ignored in the early phase of the blue revolution, small-scale fisheries underwent change through the introduction—from public and private sources—of nylon twines and new kinds of netting and, much later, of outboard engines and new vessel designs (Bavinck 1997). The natural increase of the fishing population contributed to an absolute increase of fishing effort also in this sector.

The second surprise was that the new trawler fishers did not proceed to underexploited offshore and deep sea areas, but instead concentrated on the same inshore fishing grounds as small-scale fishers. With the advantage of hindsight, it is clear that this choice was rational in view of the concentration of fish stocks, as well as the experience and expertise of the people involved. It resulted, however, in massive competition between the modern and the small-scale sectors, as well as in the large-scale destruction of gear.

Third, the supposed infinite fish stocks proved not to be as limitless as expected, with catches

Table 1. Craft and production figures from Tamil Nadu (1948 and 2000).

Year	Small-scale vessels	Trawler vessels	Trawler catches (metric tons)	Total fish catch (metric tons)
1948	13,204	0	0	27,135
2000	41,770	8,009	200,468	377,483

leveling off in the 1990s (cf. Tamil Nadu 2004), and catches per unit of effort declining (Sanpath 2003:103). Stakeholders in the fisheries now agree that overfishing is taking place in the Tamil Nadu inshore zone, and that there is urgent need for a limitation on growth, if not a real reduction of fishing effort (Sridhar 2005; fieldwork notes). This brings us to the core of this paper, the investigation of social justice.

From an emic perspective, the blue revolution in Tamil Nadu had important social justice effects. Small-scale fishers are, according to their own perception, the major victims. Along this coastline, fishing is an old activity, resulting also in the development of special fishing castes. Left alone by government until the launch of the blue revolution, fishing communities themselves have taken charge of regulation. This resulted in a chain of preferential fishing areas, covering most of the inshore waters of the state, and a practice of banning, or regulating, harmful fishing technologies. Each fishing hamlet has its own council that decides on fishing matters and resolves disputes (Bavinck 2001a, 2001b).

The introduction of trawling threw these fishing communities into turmoil. Here was a new category of fishers that fish at will, paying no attention to the prerogatives of hamlet councils or to the rights and responsibilities prevalent in small-scale fishing. According to local perception, they behave like bandits, using their superior engine power to prowl the inshore seas, damaging gears, appropriating high-value shrimp, and disappearing into the night. This is experienced, to quote Sen (1999), as acts of "intense injustice," and continuously protested as such. Such objections are voiced in court, via demonstrations and petitions, and frequently also via direct action, for example through the hijacking and ransoming of trawler vessels (Sundar 1999; Bavinck 2003).

For trawler fishers, the world of justice is constituted differently. They and their professional associations tend to remember that the Indian Constitution provides every citizen the right to work where and how he or she pleases and that it was the Indian government that in fact urged their conversion to trawler fishing. They point out their economic contribution, the many difficulties of their trade, and their continuing efforts to settle the problems that arise with their compeers, the small-scale fishers. Finally, they note the many ways in which the government has been making their lives difficult: first of all through the Tamil Nadu Marine Fishing Regulation Act (1981), which designates the inner zone of three nautical miles out of bounds for trawlers, even though it is barely enforced. More recently, they bemoan the annual monsoon ban of 6 weeks that the government has implemented for trawler fishing, presumably for conservation purposes. From a social justice standpoint, they therefore emphasize that the trawler fishing subsector has also been short-changed (Bavinck 2001b).

And what would an etic view of social justice in Tamil Nadu's marine fisheries look like? It might stress the employment and income-generating potential of small-scale fisheries in a societal context of poverty and job scarcity. It could highlight the historical rights of marine fishing castes to the occupation and the natural resources on which it depends. Finally, it could examine the extent to which small-scale fishers were and are capable of harvesting the resources presently captured by trawler fishers. While supporting the position of small-scale fisheries, an etic perspective could also, however, emphasize the rights of trawler fishers to fair settlements.

The government of Tamil Nadu has wrestled with the heritage of the blue revolution ever

since its real contours emerged. In the period between 1970 and 2000, its main concern has been with defusing the conflicts that occurred between the small-scale and trawler subsectors. This was the main intention of the Marine Fishing Regulation Act. As this act failed, for various reasons, to fulfill its purpose, the authorities have instead built on agreements between the conflicting parties to establish very local, temporary settlements (Bavinck 1998, 2003).

Recently, however, conservation has become a point on the governmental agenda. It figures most clearly in what has become known throughout India as the monsoon ban, a closed season in Tamil Nadu of 6 weeks for trawlers, which is meant to enhance the recruitment of fish stocks. There is evidence (Haastrecht and Schaap 2003) that this measure is, however, disputed.

Gujarat

The history of fisheries development in Gujarat has been marked by the state's sociocultural distinctiveness. While fishing in many parts of the world is socially marginal, this has been particularly true of Gujarat where a devout Hindu vegetarian population has dominated the state. As a consequence, the hinterland of Gujarat's coasts did not historically provide a significant market for fish products, which meant that the fishery was comparatively small considering its large potential and already export oriented (Bombay State 1958; Johnson 2002). This distinctive cultural context has had two important implications for the development of the Gujarat fishery. First, as fishing became more lucrative, Gujarat's fishers faced little competition from other Gujaratis interested in fishing. Second, the small size of the fishery and the region's abundant resources meant that, in comparison to other states, indigenous institutions for resource management and allocation were few. For such a religious state, it is unsurprising that Hinduism provided the exceptions: certain religious days of the month were prohibited for fishing, as was the sacred month of Sravan at the end of the monsoon.

Gujarat's fishery has changed dramatically since the 1950s. In the early years of that decade, the most lucrative economic sector on the coast of present day Gujarat was shipping, the fishery was unmechanized, total catch was at most 5% of current levels (around 22,000 metric tons), and the fish trade was entirely domestic and focused on low-value dried fish (see Johnson 2002). Large-scale change was in the offing, however, as central government development policy emphasized the high potential for growth in food production in agriculture and fisheries to support India's modernization (India 1951). As the first Indian five year plan goes on to state, this was to be growth with equity. In addition to technical development of fisheries and processing, a vibrant cooperative sector was to be established to ensure that the benefits of development were distributed fairly.

The heyday of state development planning for fisheries in Gujarat lasted from the mid-1950s to around 1970. In the first years of intervention, local state agencies were faithful to the broad vision of growth with equity. The introduction of motorization and modern gears proceeded alongside the establishment of cooperatives (Bombay State 1958, 1962; Gujarat Department of Fisheries 1963). The balance shifted rapidly in favor of growth in the1960s, however, as the considerable export potential of prawns became apparent. Cooperatives failed to take root except as vehicles through which the state was able to channel a variety of subsidies and, early on, engage in fish marketing (Gujarat Department of Fisheries 1963; Johnson 2002).

The key parameters of growth-oriented intervention by the state in fisheries were the provision of subsidies, technological extension, and training for the adoption of motorization, new boat designs, and new materials for gear, particularly synthetic nets. The first target of these interventions from the mid-1950s to the early 1960s was the existing small-boat sector. It was only after 1962 that the push began to promote trawling and trawler fishing did not become accepted by local fishers until the late 1960s (Johnson 2002). The Gujarat Department of Fisheries continued to encourage mechanization and innovation in the small-scale sector as well as the trawler sector, likely because the largest population of fishers in the state lived in coastal villages where berthing trawlers is impossible.

Fisheries development through the late 1990s seemed a tremendous success for both small scale fishers and trawler fishers. By the mid-1970s, a strong, primarily urban, and harbor-based trawler sector had emerged, and initiative for fisheries development passed to the fishers from the state. Under fisher leadership, with strong state support, the Gujarat fishery boomed from the late 1980s through to the 1997–1998 season. Catches peaked in that year, reaching the level of 702,355 metric tons and exports of fish products grew in value to US$165 million[3] (Gujarat Commissioner of Fisheries, Government of Gujarat 2004). A sense of the magnitude of the growth in the Gujarat fishery can be seen in Table 2.

As with Tamil Nadu, however, the small scale sector has had a dynamic development history as well since the 1960s. It is spread among the 188 fishing villages and harbors along the Gujarat coast and likely accounts for the majority of the fishing population of about 300,000 in 1998[4] (Gujarat Commissioner of Fisheries, Government of Gujarat). Technological evolution has been substantial, with a complete revolution in craft and gear types, patterns of fishing, and species targeted (Johnson 2002). Unlike Tamil Nadu, Gujarat small-scale fishers were early adopters, from the early 1950s, of motorization. They continue to contribute a significant proportion of total catch, 31% in 1998–1999, as Table 2 shows.

[3] This figure is calculated from the export value from Gujarat of 6,378,500,000 rupees given in Gujarat (Gujarat: 57) using an exchange rates of 38.61, which is an average of rates taken at two monthly intervals throughout the main fishing season of September 1997 to mid-May 1998.

[4] The population figure is a rough estimate based on Gujarat Department of Fisheries data from its 1998 census (Gujarat 2000), which do not divide the marine fishing population into small scale and large scale.

Table 2. Craft and production figures, Gujarat, 1960–1961 and 1998–1999 (Gujarat Commissionerate of Fisheries).

Year	Small-scale vessels	Trawler vessels	Trawler catches (metric tons)	Total fish catch (metric tons)
1960–1961	3,531	0	0	79,412
1998–1999	15,199[a]	6,749	380,645	551,660

[a] This figure includes nonmechanised craft (9,222) and outboard motor powered canoes (6,242) but excludes the inboard motorboat sector using gill nets and bag nets in which there are 4,117 craft.

The boom ended abruptly in the 1998–1999 season with a collapse in prices and a 21.6% decline in catch. The ensuing years have been grim: total catches have stagnated after four decades of steady increase, export revenues have declined, there is ample evidence of resource degradation (Mathew 2000), and most fishers are facing a serious financial crunch. The crisis has been a particularly hard for the trawler sector, which has suffered an abrupt reversal of fortunes. Many trawler owners have been forced to reduce their fishing time to a few months of peak season and have been driven to sell off their assets to meet their costs. The economic trigger for the crisis was the Asian economic flu of the late 1990s, which drove prices down as demand evaporated. Demand and prices have since recovered, but rising input costs, particularly of diesel, have continued to press fishers financially. The ecological side of the crisis had deeper roots and warning signs that are now evident in retrospect. Among these was the overfishing of high value species, such as penaeid prawns and pomfret, by the early 1980s (Johnson 2001; Kizhakudan and Thumber 2003; Kizhakudan et al. 2003; Nair et al. 2003).

The judgment by small-scale fishers of the social justice of the current situation in Gujarat is likely to vary regionally[5]. In South Gujarat and the Gulf of Kachchh regions, small-scale fishers are facing the loss of their livelihoods due to competition for coastal space and resources with industrial and agricultural development, which, incidentally, pose a significant threat to coastal ecology (Hiraway 2000; Kizhakudan et al. 2003). In the ocean-facing area of peninsular Gujarat, small-scale fishers are more concerned about overfishing and point to trawlers as being the principal culprits. As in Tamil Nadu, small-scale fishers and trawler fisher operations overlap in coastal waters of up to about 40 fathoms in depth. Small-scale fishers are resentful of damage to their gear caused by trawling and the dangers that trawlers pose to small craft. The frustrations of the small-scale sector occasionally manifest themselves in incidents of boarding, violence, and boat capture directed towards offending trawler vessels, although this has been a less common and less organized phenomenon than in South Indian waters (cf. Kurien 1991; Bavinck 2001b).

Many boat owners in the trawler sector have been stunned by the reversal of their fortunes since the fishing crisis began in 1997–1998. The crisis has been particularly hard on those with small numbers of boats, old boats, or those with low reserves of capital. The rapidity with which the economic crisis has undermined their financial security has caused many to wish that they could leave the sector. Indeed, evidence from a number of interviews conducted in 2005 indicates that a process of consolidation has been taking place in the sector, with fish traders buying the boats of their insolvent trawler-owning creditors. Leaders of the trawler sector are now talking about measures for conservation and have accepted the 2004 government ban on the construction of new vessels. They are clear, however, that the small-scale sector has to pull its weight also, and stop fishing in the monsoon, a practice that has increased in recent years. As yet, the only sense of injustice voiced by trawler fishers is against the licenses granted by the Indian government to industrial fishing boats for operation in Gujarat's waters.

[5] The basis for this paper is research conducted along the most important fishing area of coastal Gujarat from Navabandar to Okha. The authors have only indirect reports of conditions in other areas.

[6] In the two major fishing ports of peninsular Gujarat, large numbers of migrant crew for trawler are hired from South Gujarat and other Indian states, especially Andhra Pradesh.

Major tensions over social justice between the sectors have not yet emerged in the Gujarat fishery. This may reflect the common experience of generalized development and growth and the now generalized depression that all sectors have faced. The continental shelf in Gujarat is also the widest in India, which reduces intersectoral conflicts over space. Finally, Gujarat's fishers and the fisher owners of trawler vessels[6] are linked through economic and caste relationships, which may defuse conflicts.

By supporting growth in all motorized sectors, the State Department of Fisheries implicitly pursued a strategy based on equality of opportunity. It had the good fortune to implement its policies in a context of an underexploited fishery with abundant resources, which brought economic success across the board, with low levels of conflict, even if the trawler sector got the largest share of the resource. The crisis since 1998 has shaken the Department of Fisheries into a more proactive role, a major success of which has been to finally get the Gujarat Government to pass the Gujarat Fisheries Act in 2003. The act includes explicitly conservationist and redistributive provisions. First, it prohibits the catching, processing, and sale of juvenile and "under-sized" fish and lists a number of protected species. Second, it prohibits bottom trawling within a 9-km zone from shore and in Chapter III, regulation 21, it calls upon fisheries officers to "protect the interest of traditional fishermen such as country crafts or canoes." These provisions could make the fishery more sustainable and equitable. They would necessitate a good deal of adjustment and financial hardship for the dominant class of trawler owners, however, as they stand the most to lose in such a re-equilibrating of the fishery. As this group is so powerful in the main fishing zones of Gujarat, they are unlikely to abide by the provisions of the act unless the state is able to convince them of its necessity and its utility for them.

Despite the very different contexts, an etic perspective on justice in the Gujarat fishery could come to similar conclusions as those for Tamil Nadu about the preferability of strengthening the small-scale sector at the expense of the trawler sector. The same caveat applies, however, that the trawler fishers will need fair settlements. It is important also that destructive gears in the small-scale sector be eliminated and efforts continue to be made to build their capacities to diversify their livelihoods away from dependence on fishing.

Comparison

The fisheries of Tamil Nadu and Gujarat are in similar positions at present, both are facing stagnation and possible decline due to overfishing and other threats to their marine ecology. At the heart of their difficulties is the legacy of India's blue revolution; the promotion of growth-oriented fisheries development policies with relatively little attention to issues of conservation and distribution. Primary in both cases was the promotion of export-oriented trawler fisheries, which have come to dominate fisheries production in the two states. At the same time, the pattern of development in the two states has differed in ways that could become significant for future ecological conditions and intersectoral relations in each state.

The first major difference between the two states is the degree to which fishing has been integral to social, economic, or even mental space. While in both states, fishers have low social status; in Gujarat, fishing was historically marginal to the point that the fishery had a domestic export orientation even prior to modernization. This meant that fishing in Tamil Nadu in the 1950s was relatively more

economically and institutionally developed than in Gujarat. Most notably, the small-scale fishing sector had developed a system for management and resource allocation. The historical marginality of the Gujarat fishery has left a relative absence of such institutions but also a freedom from having to cope with outsiders moving into the fishery. Gujarat's fishery has also not faced the intensity of intersectoral conflict over allocation rights as in Tamil Nadu.
The second major difference between the development histories of Tamil Nadu and Gujarat has been the role of the state fisheries departments. The Tamil Nadu department has had to focus its energies on intersectoral conflict management, an issue that has been much less present for the Gujarat department. Since the end of its leadership position as fisheries developer in the 1970s, the Gujarat Department of Fisheries has acted primarily as provider of subsidies, issuer of registrations, and collector of data. There is a parallel between the institutional histories of the departments in the two states, however, in that both settled into relatively passive roles in relationship to their fisheries after initially strongly interventionist periods.

Fisheries in Tamil Nadu and Gujarat are now both facing the stark reality of stagnating catches, few new possibilities for expansion, and rapidly growing coastal populations. For the two states, this is a key period of fisheries transition during which hard choices will have to be made in order to reconcile conservation with employment and livelihood needs. Each state has blue revolution legacies and particular, institutional, sociocultural, political, and economic realities that shape their room for action. In both states, fishers and their organizations have power and legitimacy that state organizations lack. At the same time, however, fisher populations are fragmented along lines of caste, class, sector, and religion, and their position has been shaken by the current ecological crisis. Should the state be able to rise to the challenge, these conditions present an opportunity for charting a new course in fisheries management in Tamil Nadu and Gujarat. In the following section, we speculate on possible futures for these fisheries, the more optimistic of which envisage the state, the fishers, or the two together taking a proactive stance.

Evaluation

Policy Alternatives

1. Status quo scenario
All parties stick their heads in the sand and wait and see what happens. Price increases might cushion the effects of increasing environmental problems or a process of silent emigration from the sector might reduce fishing effort sufficiently. Alternatively, there may be severe civil unrest that will have to be suppressed. The motto, however, is "problems frequently solve themselves. In any case, we hope they will not arise in our period of tenure."

2. Technocratic scenario
Efforts are made to address problems of resource overexploitation and livelihood erosion within existing policy parameters. Thus, government sidesteps issues of participation and fairness, and formulates a set of limited measures, such as the implementation of closed seasons. Trawler and small-scale fisher organizations may take steps, such as the establishment of artificial reefs, or agree not to use gear types that are recognized as particularly deleterious.

3. Radical scenario 1
The government decides to abolish trawler fishing and obtains subsidies from international organizations to buy out existing trawler fishermen.

4. Radical scenario 2
Trawler and small-scale fisher organizations realize the gravity of the situation and frame a joint action plan that is also aimed at "waking up" the government to its responsibilities. This plan proposes limitations on new entrants to fisheries, market regulation, resource monitoring, and government support for the growing class of jobless fishermen.

5. Radical scenario 3
Separately, or as a result of scenario three or four, a comprehensive comanagement process (cf. Wilson et al. 2003) is established to reduce fishing effort and engage the contentious issue of sectoral resource redistribution. Fisher organizations are formally recognized and involved in the policy process.

Each of these scenarios has implications for intersectoral social justice. Scenario one does nothing to redress current patterns, with the likelihood that inequality and social conflict will increase. If effectively implemented, scenario two could extend the life of the current patterns of social and economic organization of fishing. In the longer term, however, it is unlikely to counter current trends to overfishing and distributional inequity. From an etic perspective, the third scenario is most promising in terms of ecological sustainability and distribution of the resource among the largest number of fishers. Scenario four would not necessarily result in greater distributional justice within the fishery, as that outcome would depend on which group was to lead the formulation of the action plan. Scenario five also holds no guarantees in increasing social justice, although its collaborative potential at least holds out the possibility of a more inclusive process.

In both Tamil Nadu and Gujarat, evidence would lead us to argue that the scenario most likely to inform policy making in the near future is the technocratic one. State departments of fisheries do seem to be moving beyond scenario one, even if many members of the departments still would prefer to preserve the institutional status quo. Scenarios three and four are both unrealistic under current conditions. Trawler owners in both states have too much power for an outright ban on trawling while numerous and entrenched divisions between fisher groups make highly unlikely their collaborating to develop an action plan. Implementation of the fifth scenario in any well-developed way seems unlikely. The Tamil Nadu government is not at all in favor of devolution and there is little to indicate a more favorable policy in Gujarat. On an informal level, however, consultations within a framework of, for example, responsible fisheries might be held as a way of opening a dialogue on building more innovative management processes. A more inclusive process would also have to face the challenge of engaging the deep-seated social divisions mentioned above.

In Gujarat, the most compelling evidence of an acknowledgment of the need to change is the new fisheries act. It recognizes that there are limits to fishing and contains some promising elements from a social justice perspective. Nonetheless, the main regulatory thrust of the document places it within the technocratic scenario. It advocates a host of technical restrictions on fishing such as mesh size limitations, the banning of fishing with electricity and explosives, licensing, and area restrictions, and lays the foundation for a possible future quota management system. The degree to which these regulatory elements will be implemented remains to be seen and depends a great deal on their acceptance by fishers. The Fisheries Department itself is insufficiently staffed and motivated to push through the changes on its own.

In Tamil Nadu, representatives of the Fisheries Department are now orally acknowledg-

ing that there are major environmental problems to be addressed. There is some movement towards a technocratic scenario, trying to make changes by introducing a closed season for trawling; promoting the shift of trawlers to longlining; targeting new species; prohibiting specific extremely deleterious gears such as purse seines and pair trawling; declaring a marine park in Ramnad district mainly for biodiversity reasons; and, together with trawler owner associations, limiting the number of new trawlers. There are also some smaller programs for awareness building on the need of small fishers to move to other occupations. All this in the context of a department that is suffering cuts in budgets and has lost a lot of its earlier luster and motivation. It is not yet poised for a larger and more substantial policy shift.

Conclusion

The long-term legacy of the blue revolution in Tamil Nadu and Gujarat has now become evident with serious problems of overfishing due in large measure to powerful trawler sectors in both states. An ecologically sustainable future for these fisheries that also meets distributional equity criteria justice would require reversing the trend to ever-intensified production that the blue revolution has triggered. In the final section of our paper, we have spelled out a number of "radical" scenarios that might form the basis for such a policy reversal. For the reasons we enumerated, none of these radical proposals are likely to be implemented. They are useful thought exercises, nonetheless, as in pushing the bounds of the possible, they may create more room for action in practice.

Realistically, the political, economic, and social constraints on radical state and fisher action mean that, at least under current conditions, technocratic solutions are likely to dominate fisheries policy in Tamil Nadu and Gujarat. It should be remembered that these are an improvement over past regimes premised on limitless growth and they should be supported to the degree that they effectively relieve ecological pressure while supporting livelihoods. At the same time the clear limits of technocratic policies for addressing the causes of overfishing and social injustice provide a strong rationale for intensified efforts by researchers, fisher leaders, nongovernmental organization workers, and concerned government officials to press for bolder actions to reconcile Indian fisheries with conservation and social justice.

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References

Acheson, J. M. 1981. Anthropology of fishing. Annual Review of Anthropology 10:275–316.

Bavinck, M. 1997. Changing balance of power at sea. Motorisation of artisanal fishing craft. Economic and Political Weekly 32:198–200, Mumbai, India.

Bavinck, M. 1998. "A matter of maintaining the peace", state accommodation to subordinate legal systems: the case of fisheries along the Coromandel coast of Tamil Nadu, India. Journal of Legal Pluralism 40:151–170, University of Birmingham, School of Law, Birmingham, UK.

Bavinck, M. 2001a. Caste panchayats and the regulation of common pool resource usage in India: fisheries along Tamil Nadu's Coromandel coast. Economic and Political Weekly 36:1088–1094, Mumbai, India.

Bavinck, M. 2001b. Marine resource management: conflict and regulation in the fisheries of the Coromandel coast. Sage Publications, New Delhi.

Bavinck, M. 2003. The spatially splintered state: myths

and realities in the regulation of marine fisheries in Tamil Tadu, India. Development and Change 34:633–658, Blackwell Publishing, Oxford, UK.

Bay of Bengal Programme. 1983. Marine small-scale fisheries of Tamil Nadu: a general description. Bay of Bengal Programme, Madras, India.

Bombay State. 1958. Annual report of the department of fisheries Bombay state for the year 1956–57. Department of Fisheries Bombay State, Nagpur, India.

Bombay State. 1962. Department of fisheries annual report 1959–1960 part ii Gujarat region. Bombay State Department of Fisheries, Bombay, India.

Byres, T. J., editor. 1998. The Indian economy: major debates since independence. Oxford University Press, Delhi, India..

Campbell, T. 2001. Justice. St. Martin's Press, New York.

Charles, A. 2001. Sustainable fishery systems. Blackwell Scientific Publications, Oxford, UK.

CMFRI (Central Marine Fisheries Research Institute). Production trend: all India marine fish landings. 2005. Available: http://www.cmfri.com/cmfri_trend.html. (April 2005).

Dalton, G. 1967. Traditional production in primitive African economies. Pages 61–80 *in* G. Dalton, editor. Tribal and peasant economies, readings in economic anthropology. University of Texas Press, Austin.

Gujarat Department of Fisheries. 1963. Annual administration report of the department of fisheries (1-7-1961 to 30-6-1962). Ahmedabad, India.

Gujarat Commissionerate of Fisheries. 1998. Present status of the fisheries sector in Gujarat state [western India]. Gandhinagar, India.

Gujarat Commissioner of Fisheries, Government of Gujarat. 2004. Gujarat fisheries statistics 2002–2003. Gandhinagar, India.

Hiraway, I. 2000. Dynamics of development in Gujarat. Economic and Political Weekly August 26-September 2:3106–3120, Mumbai, India.

India. 1951. "Food policy for the plan", first five year plan. Planning Commission, Government of India, Delhi.

Johnson, D. 2001. Wealth and waste: Contrasting legacies of fisheries development in Gujarat since 1950s. Economic and Political Weekly 36:1095–1102, Mumbai, India.

Johnson, D. 2002. Emptying the sea of wealth: globalisation and the Gujarat fishery, 1950 to 1999. Doctoral dissertation. University of Guelph, Ontario.

Kizhakudan, J. K., and B. P. Thumber. 2003. Fishery of marine crustaceans in Gujarat. Pages 47–56 *in* M. R. Boopendranath, R. Badonia, T. V. Sankar, P. Pravin, and S. N. Thomas, editors. Sustainable fisheries development: focus on Gujarat. Society of Fisheries Technologists, Cochin, India.

Kizhakudan, S. J., J. K. Kizhakudan, H. M. Bhint, D. T. Vaghela, and K. N. Fofandi. 2003a. Investigations on the creeks of Saurashtra. Pages 87–92 *in* M. R. Boopendranath, R. Badonia, T. V. Sankar, P. Pravin, and S. N. Thomas, editors. Sustainable fisheries development: focus on Gujarat. Society of Fisheries Technologists, Cochin, India.

Kizhakudan, S. J., K. V. S. Nair, and M. S. Zala. 2003b. Demersal finfish resources of Gujarat. Pages 57–66 *in* M. R. Boopendranath, R. Badonia, T. V. Sankar, P. Pravin, and S. N. Thomas, editors. Sustainable fisheries development: focus on Gujarat. Society of Fisheries Technologists, Cochin, India.

Kurien, J. 1991. Ruining the commons and responses of the commoners: coastal overfishing and fishermen's actions in Kerala state, India. United Nations Research Institute for Social Development, Geneva, Switzerland.

Kurien, J. and T. R. T. Achari. 1994. Overfishing the coastal commons: causes and consequences. Pages 218–244 *in* R. Guha, editor. Social ecology. Oxford University Press, Delhi, India.

Mathew, S. 2000. Gujarat fisheries: time to move from exploitative to conservation and management regime. Workshop on Current Situation in Fisheries Sector in Gujarat, Gujarat Institute of Development Research, Ahmedabad, India.

MPEDA (Marine Products Development Authority). 1978. Export potential survey of marine products in Tamil Nadu. MPEDA, Cochin, India.

Nair, K. V. S., J. K. Kizahakudan, and S. J. Kizhakudan. 2003. Marine fisheries in Gujarat-an overview. Pages 1–10 *in* M. R. Boopendranath, R. Badonia, T. V. Sankar, P. Pravin, and S. N. Thomas, editors. Sustainable fisheries development: focus on Gujarat. Society of Fisheries Technologists, Cochin, India.

Pike, K. L. 1954. Language in relation to a unified theory of the structure of human behavior. Summer Institute of Linguistics, Glendale, California.

Platteau, J. P. 1989. The dynamics of fisheries development in developing countries: a general overview. Development and Change 20:565–597, Blackwell Publishing, Oxford, UK.

Salagrama, V. 2001. Coastal area degradation on the east coast of India: impact on fishworkers. Paper presented to the conference Forging Unity: Coastal Communties and the Indian Ocean's Future, Chennai, 9–13 October 2001.

Sanpath, V. 2003. India national report on the status and development potential of the coastal and marine en-

vironment of the east coast of India and its living resources. GF/PDF Block, B Phase of FAO/BOBLME Programme. Food and Agriculture Organization of the United Nations, Rome.

Schlager, E., and E. Ostrom. 1993. Property-rights regimes and coastal fisheries: an empirical analysis. Pages 13–41 *in* T. L. Anderson and R. T. Simmons, editors. The political economy of customs and culture: informal solutions to the commons problem. Rowman & Littlefield, Lanham, Maryland.

Sen, A. 1999. Development as freedom. Oxford University Press, Oxford, UK.

Sridhar, V. 2005. 'A good occasion for change': interview with Prof. John Kurien, fisheries economy expert. Frontline 22(3):18–20, Chennai, India.

Stonich, S. C., and C. Bailey. 2000. Resisting the blue revolution: contending coalitions surrounding industrial shrimp farming. Human Organization 59:23–36.

Sundar, A. 1999. Sea changes: organizing around the fishery in a South Indian community. Pages 79–114 *in* J. Barker, editor. Street-level democracy: political settings at the margins of global power. Kumarian Press, Toronto.

Sumaila, U. R. 2003. Three essays on the economics of fishing. Fisheries Centre, Vancouver.

Tamil Nadu. 2004. Policy note 2004–2005. Animal Husbandry and Fisheries Department, Chennai, India.

Tamil Nadu. 2003. Statistical Handbook 2003. Department of Economics and Statistics, Chennai, India.

Tamil Nadu. 2000. Tamil Nadu marine fisherfolk census year 2000. Department of Fisheries, Chennai, India.

Tamil Nadu. 1972. Towards a blue revolution: Report of the task force on fisheries 1972–1984. Plan document 5. State Planning Commission, Madras, India.

Van Ginkel, R. 2003. Whatever happened to maritime anthropology: the European experience. Proceedings of the MARE Conference, People and the sea: threats, conflicts and opportunities, August 30-September 1, 2003, Amsterdam.

Van Haastrecht, E., and M. Schaap. 2003. A critical look at fisheries management practices: the 45-day ban on trawling in Tuticorin District, Tamil Nadu, India. Master's thesis. University of Amsterdam, Amsterdam.

Von Benda-Beckmann, F. 1995. Property rights and common resources. Paper read at Conference on Agrarian Questions, May 22–24, Wageningen, The Netherlands.

Wilson, D. C., J. R. Nielsen, and P. Degnbol, editors. 2003. The fisheries co-management experience. Accomplishments, challenges and prospects. Kluwer Academic Publishers, Dordrecht, The Netherlands.

World Commission on Environment and Development. 1987. Our common future. Oxford University Press, Oxford, UK.

Yadava, Y. S. 2001. Report of the national workshop on the code of conduct for responsible fisheries. Bay of Bengal Programme, Chennai, India.