

Muddy waters

The Indian Supreme Court's judgement on regulating aquaculture will have a varying impact in the State of Andhra Pradesh

Any attempt to study fisheries (marine and inland) in the south Indian State of Andhra Pradesh has to contend with the basic drawback that the available reports and secondary data are extremely superficial. The problem is worsened by the fact that none of the data—neither from the Central Marine Fisheries Research Institute (CMFRI) nor the State government—seems to have been seriously utilized to arrive at conclusions and policy decisions. Only under pressure do agencies bother to collate information into a particular format. Whatever data is available thus exists in an inert, unformatted and poorly presented fashion.

For instance, the State Government's handbook on fisheries quotes a figure of 177,000 as the total number of marine fishermen in the coastal districts. But coastal Andhra Pradesh comprises different regions like Telengana and Rayalaseema. And within these, there also exists a marked differentiation amongst the types of fishermen, based on whether they fish in the interior areas, in rivers or in the sea.

A broad categorization of Andhra Pradesh would start with the Krishna-Godavari delta area, with Nizampattnam as one boundary. South of Nizampattnam is the open, beach-based fishery, where *kattumarams* (catamarans) operate. North of Nizampattnam, up to Kakinada, is the delta region, entirely a fertile, paddy-growing area, rich in mangroves. Here, the fishing community lives largely by the river banks, fishing either in the river or in the sea (accessing the sea through the river mouth). In the delta region there is, by and large, no beach-based fishery. Only north of Kakinada can be found, once again, a beach-based fishery where *kattumarams*

operate. As far as data is concerned, aquaculture is an area which has been relatively better researched in Andhra Pradesh, since several NGOs have worked to gather information. Nonetheless, analyzing the available facts leads to the impression of some sort of confusion and lack of clarity.

Even though, at the ground level, many people are aware of what is actually happening in Andhra Pradesh, the information that has been projected to the outside world, particularly in the present controversy over the implementation of the Coastal Regulation Zone (CRZ.) notification, seems to relate more or less to the southern districts of Nellore and Prakasam, where the corporate invasion has triggered the movement against aquaculture.

However, the Krishna-Godavari delta region, which accounts for approximately 70 per cent of the total aquafarm area of Andhra Pradesh, presents a distinctly different picture. The southern beach zone contains about 20 per cent of the aquafarms, while another five per cent lie along the beaches of the north. Totally different sets of issues and problems are raised by beach-based aquaculture and aquaculture in the delta region.

The conversion of paddy fields into aquaculture farms, which is definitely a matter of major concern, occurs entirely in the delta region. But this region has other problems, which tend to be overlooked.

Corporate entry

The initial entry of the corporate sector and private investors took place in the beach-based aquaculture in the south of Andhra Pradesh—probably because, among other factors, the area is close to the city of Madras. Some of the farms are

situated right on the beach, pumping in sea water. Others are by the side of salt-water creeks.

For the fishermen operating from the beaches, the first problem faced is 'land grab'. In this part of Andhra Pradesh, land has traditionally been cheap, and large areas of apparent wasteland are easily available. But how much of these really constitute wasteland is a moot question. Some areas have been used to grow casuarina trees, some were used by fishermen for small-scale cultivation, while other areas have long remained as the village commons.

Such land has been acquired by the corporate sector and private investors in various ways. Some have been straightforward, outright purchases. In other cases, after a plot of land was bought, local bosses have used incentives, influence and even muscle power to grab the surrounding areas too.

The other problem typical of the area is more technical. Due to their greater porosity, sandy beaches are not very suitable for aquaculture. The salt water from the aquafarms seeps into the surrounding areas and affects the groundwater. In many of the villages, agriculture in the neighbouring areas was thus badly affected. Hence, technically, beach-based aquaculture does not appear very healthy—with some notable

exceptions. As it is based on substantial externalities, such aquaculture is unlikely to be technically and economically sound, especially if the externalities have to be avoided or paid for.

In some areas, hatcheries have constructed long pipelines to pump in water from the sea. This has led to, for instance, shore seines and gill-nets getting trapped in the pipelines. Pumping in large quantities of water creates some turbulence and so fish may avoid the area. Thus, fishermen would feel strong negative externalities on their fishing operations.

Furthermore, fishermen's access to the sea has been curtailed or hampered. What was previously common, open land through which the fishermen could freely walk has now been closed, with guards posted to check the passes issued to them. Often, [he fishermen see this as a terrible kind of indignity.

Buckingham Canal

A related problem centres on the Buckingham Canal, which flows through the whole beach area up to Madras. For the aquafarms in the south of Andhra Pradesh, the Buckingham Canal has become the favourite dumping ground for all the waste from aquaculture. This silts up the canal, which, in any case, has long been neglected environmentally. Fishermen of the area have often blamed

the polluted Buckingham Canal for their skin diseases, as well as for being a breeding ground for mosquitoes.

These complaints have motivated the NGOs of the area to take the lead in mobilizing public opinion against aquafarms. Some NGOs also implicated themselves in the Supreme Court case.

For these very tangible reasons, the Nellore and Prakasam districts of Andhra Pradesh, where corporate private investment has taken place on a large scale, have become the focus of the anti-aquaculture movement.

In the delta region, however, the situation is quite different. This is not to imply that the aquaculture practised there is more justifiable or healthy. Not only do the problems differ, so do the actors. Most often, people who have been cultivating paddy, especially in the Krishna district, which accounts for more than half the total aquafarm area of Andhra Pradesh, have *en masse* shifted to prawn culture, attracted by the tremendous difference in profitability.

In paddy cultivation, an annual profit of Rs 10,000 per acre is considered good. Prawn culture, on the other hand, can fetch up to Rs 100,000. Even those who initially hesitated finally plunged into aquaculture. The profits made in the first year have been used to buy or lease more land for the second season.

Strictly speaking, the aquafarm boom began only in 1991, even though a slow diffusion had set in since the late 1980s, as medium-sized farmers and private investors started learning about aquaculture.

Between 1991 and 1992, the area in Andhra Pradesh under aquafarms doubled. A further doubling occurred over the next two years, as the majority of aquafarmers chose to reinvest their earnings. Many of these farms are five or 10 acres in size, the largest ones going up to 20 acres. The smaller ones are around two acres in area.

There are also quite a few two-hectare farms, most of which belong to investors

from the fishing community. Medium-sized farms of five to 10 acres (large in a normal agricultural context, but regarded small in aquaculture) are considerable in number, while truly large farms are rare. Many of the small farms do not have proper legal documents to establish ownership rights. Several are leased from neighbours.

Though both fishing and agricultural communities have sunk money into the new aquafarms, investors from the agriculture sector dominate since they had more land to start with, as well as better access to funds.

The truly big farms in Nellore and Prakasam districts present an awesome sight—beautifully laid out ponds of half or one ha size and 10 to 12 ft deep, fed with large pipelines. In contrast, in the delta region, the ponds are very shallow, with side trenches merely a couple of feet below the level of the existing paddy fields. This prevents any exchange of water, after the initial pumping-in period. The water in these ponds thus remains stagnant.

Capitalist agriculture, based on cash crops like tobacco, exists in Prakasam. However, Nellore's economy is still largely feudal. Most paddy fields there belong to landlords from the Reddy community. They are also the ones who control fishing villages through the head of the village. Usually, the relationship with the local landlord community facilitates the sale of land belonging to the fishing village—often for a song.

Other areas lack similar large tracts of land for sale. Even when available, small- and medium-sized farmers would not easily part with their land. In a sense, therefore, the failure of land reforms and the existence of a feudal economy helped the development of this particular kind of aquaculture in the Nellore district of Andhra Pradesh.

Initially, the aquaculture in this area was very extensive, fed with wild prawn seed and natural feeds like oilcake mixed with fishmeal.

New rush

Subsequently, once manufacturers of aquaculture industry the boom began,

inputs for the (like feed, chemicals and antibiotics) established roots in the area. In towns like Nellore and Machillipatnam, hoardings for shrimp feed prominently crowd out advertisements and billboards for other consumer goods.

As a result, hatcheries began getting into the business. In the initial stages, hatchery production was much below demand. So wild seeds were greatly sought after. Lured by the Rs 3 or Rs 4 paid for each seed, children and women used nylon drag-nets to catch prawn seed in the river mouths. This undoubtedly would have badly affected marine prawn production.

Once hatcheries began operating, however, the price of prawn seed dropped to less than half a rupee. But wild seed collection continues, since there exists some consumer demand for shrimps reared from natural wild seed.

Soon enough, in Andhra Pradesh's aquaculture industry, the corporate sector found itself in the doldrums, mainly due to the outbreak of disease in aquafarms in 1994 and the enormous seepage of water from the ponds, which raised the cost of maintaining the farms. For this sector, therefore, the Supreme Court judgement is the proverbial last nail in the coffin. In the delta region of Andhra Pradesh, where only extensive

aquaculture is practised, the investment in farms has been meagre—only Rs 10,000 to Rs 15,000 per acre for conversion from paddy land.

Interestingly enough, this raises the question of the intensity of aquaculture, an important focus of the ongoing debate in India on the worth of aquafarms. Intensity does not appear to be the crucial factor. Though it undoubtedly matters in attempts to control or regulate the industry, the more basic and significant question is whether the technology used is appropriate for the particular social and natural environment where the aquafarms operate. It is very clear that in Andhra Pradesh, the smaller aquafarmers using extensive techniques have destroyed their businesses and the environment in perhaps a more damaging fashion than the bigger farms.

Poor water management and the nature of land being not especially suited for aquaculture, coupled with the small farmers' inability to invest in water treatment technology, have been behind this disaster. Yet, the profits from aquaculture were far greater than those from paddy cultivation. This continued to motivate 'the pink gold rush'.

Approval unlikely

To be fair, the Government of India and the Marine Products Export Development Authority (MPEDA) may never have

approved these farms. All of them were in the informal sector, and were started without technical support by ordinary farmers in a merely pragmatic, unorthodox, unconventional and unscientific manner.

Many of them began their ventures by observing and copying the practices of neighbouring farms, some of which were closer to brackish water areas and benefited from technical support. Some farmers even visited aquafarms as far up as Kakinada. Others leased part of their land to outsiders from Vijayawada, for instance, and used the money earned to then build up their own farms.

At the height of the boom, the area under aquaculture in Krishna district went up to 32,000 ha. (The actual area of paddy converted is not clear. Some government officials say it amounts to between 2,000 ha to 5,000 ha. It is also unclear how much mangrove area has been lost. While one official figure is 500 ha, another fisheries official claims 80 per cent of all mangroves have been converted. This seems to be an extreme estimate.)

With disease affecting most aquafarms in 1994, the entire industry collapsed. Tragically, most of the farmers' investments had been made from huge borrowings. The smallest loan amounted to Rs 20,000, but most other, debts ranged from Rs 100,000 to Rs 500,000. Some of those who could not repay their debts committed suicide.

Since 1995, the area under aquaculture has shrunk to 20,000 ha. Many farmers who earlier harvested shrimps twice a year, during summer and winter, have now confined their farming to a single summer harvest, since it is in winter that water salinity is low and the chances of disease higher. These farmers are also risking reinvesting their earnings from that single crop so that they can repay their debts. Overall, however, the situation is far from even. Some farmers have got good returns, while others have only sunk further into debt.

The Supreme Court judgement has now created panic. In Andhra Pradesh, the limit of 500 m from the High Tide Line

(HTL) stipulated by the Coastal Regulation Zone (CRZ) notification is not the major problem. Perhaps only 10 per cent of the farms will be affected by this ruling. The average fishing village can be one to three km from the HTL. As protection against cyclones, the government has built a large shelter belt of casuarina trees between the villages and the HTL. In such a context, some people will be drastically hit by the 500-in limit, but certainly not everyone.

The truly crucial matter relates to the distance from the salt-water creeks and canals. The original 1991 CRZ notification puts it at 100 m from creeks and canals. Subsequently, in 1994, it was amended to 50 m. But it is unclear whether the amendment is still valid.

Each State was asked to draw up its own Coastal Zone Management Plan (CZMP). Andhra Pradesh's plan, which runs into almost 5,000 pages, is reportedly the most elaborate and, from an environmentalist point of view, perhaps the best. Andhra Pradesh's CZMP has been very generous in stipulating the distance from creeks and canals as 500 m.

Since the Ministry of Environment and Forests has accepted the plan, and its approval has been conveyed to the Supreme Court, there is currently a strong belief that implementation of the Supreme Court ruling means observance of the 500-in limit from creeks and canals. This is what the Collector of Krishna district and the Assistant Director in the Department of Fisheries have told the people. This interpretation implies that around half the total number of farms in the area will simply have to close down. For instance, in Kandeleru creek in Nellore district, an important area for the corporate sector, whether the limit from the creek is 50 m or 500 m will critically determine the future of farms there.

Ensuring compliance with the Supreme Court's orders is the responsibility of the district administration, specifically the District Collector and the Superintendent of Police. But confusion reigns.

Differing impressions

In other districts of Andhra Pradesh, like West Godavari and East Godavari, officials in the local administration seem

to be under the impression that implementation of the Supreme Court judgement means a limit of either 50 m or 100 in, not 500 m. So, most of the aquafarmers are not overly bothered. The original notification stipulates a limit "not less than" 100 in, the actual limit to be decided by each State government, according to its CZMP. In the case of Andhra Pradesh, the plan has made the limit 500 m.

The Supreme Court judgement, however, creates more problems for Andhra Pradesh than it solves. In Tamil Nadu, the ruling deals a deathblow to the aquaculture industry, especially in the Tanjore delta region, home to big corporate investors.

But in the Krishna-Godavari delta in Andhra Pradesh, most of the farmers are small-scale operators who have invested either their own savings or personal loans, and who simply do not have the option of declaring bankruptcy. These minor farmers and fishermen are bound to lose their land to the moneylenders. Thus, large-scale dispossession and loss of land will occur in the Krishna-Godavari delta.

On the other hand, consider the Vashista Godavari, a distributary which divides the east and west sides of the Godavari. On one side lie very well-developed farms which could not possibly pose any

major problem to the environment or the locals, but these farms are the ones which will be affected by the 500-in limit ban, while many undeserving companies will be allowed to remain. Ironically, in cases like these, those who pose the least threat are the ones closest to salt-water areas.

Naturally, responses to the Supreme Court judgement have been varied. In Machillipatnam, farmers quickly formed an association and, on 14 February, rallied in a demonstration against the proposal to destroy their prawn farms. Krishna district is likely to witness some resistance from the farmers, but this will be equally mixed. Some of the farmers will succumb to pressure, while others will defy and fight attempts to raze down their farms. A problem of law and order may arise, which may even provide a safe and convenient excuse for the government administration not to go ahead with the destruction of the aquafarms.

Evidently, unless there is a proper rehabilitation plan for farmers, including aid to convert aquafarms back to paddy fields, the tragedy slowly unfolding in the delta region will spell the end of the small-scale aquafarmers. But this tragedy is largely of their own creation.

Already disease-hit

Even prior to the Supreme Court ruling, a large number of these farms had already been devastated by disease and poor

water management, and several farmers were already in deep debt. Thus, a huge disaster was in the making in any case. But, in some of the areas of Andhra Pradesh, the Supreme Court judgement robs aquafarmers of any chance of recovery.

In analyzing the problems posed by aquaculture, it is important to examine the agriculture-aquaculture interface. There is a danger in viewing aquaculture as a problem area which exists in the fisheries sector. Had it been seen as an agricultural problem, within the jurisdiction of agricultural officers, a greater balance would have occurred in perceiving and understanding the way natural resources have been used.

A related problem is the economic return that agriculture entails, particularly in the Krishna district of Andhra Pradesh. Despite the existence of a wide distributary of the Krishna river, the area suffers from an acute problem of water salinity. Many of the canals and distributaries of the Krishna are saline up to 10km or 15 km inland from the sea. The farmers thus have to depend on irrigation canals coming from further up. Those who live at the tail-end of these canals do not get this water as easily, so they end up using saline water. Clearly, environmental issues differ from socioeconomic and equity issues. Given the nature of the political economy that currently exists in India, it seems very unlikely that aquaculture can ever be made environmentally and socially sound. How can a farmer be prevented from cultivating what he wants on his own land? On the other hand, ironically enough, it may be easier to check and regulate the corporate sector.

Interestingly, within this sector, a new trend of employing a team of technical experts to turn around sick aquafarms can be observed, especially within the 50-in limit. Often, the starting point is a corporate farm which has been devalued by disease and could be bought cheap by a new entrepreneur who then brings in turnaround specialists. Yet, even these new ventures will have to contend with the judgement. In its interim ruling, the Supreme Court had banned the pumping of sea water and groundwater, and

conversion of paddy fields into aquafarms. These conditions would have crippled the industry. But, in its final judgement, the Court has only taken recourse to the CRZ norms: No aquafarms other than 'improved traditional' ones will be permitted within the CRZ. Although paddy field conversion has been disallowed, nothing has been specifically said about the fields already converted.

Further, whether the new regulatory authority for aquaculture to be set up under the terms of the Supreme Court judgement will be able to tackle all these problems is not very clear. The essential focus of the judgement thus does not appear to be aquaculture problems in toto, with an unambiguous ruling on the entire gamut of issues. Rather, it has preferred to stick to the strict implementation of the CRZ norms, apart from mandating the formation of a regulatory authority.

Although it has propounded very useful principles like the 'polluter pays' norm and the 'precautionary approach', which can be followed up by this new authority, the Supreme Court judgement does not state where aquaculture can be legitimately carried out. Had the focus of the judgement been purely environmental, it would have considered the whole range of issues raised by the operations of the aquaculture industry in India. Instead, the Supreme Court has somewhat limited itself to the CRZ notification.

It also remains vague to what extent the new regulatory authority will be able to rectify the situation. Usually, duly constituted authorities prove efficient only in implementing measures like licensing and taxation, for instance, which ensure the future health of a sector. But today in India a drastic step like razing down farms can only be taken by the Supreme Court. ❧

This analysis by V.Vivekanandan, Co-ordinator of ICSF's Animation Team, is based on a recent tour of the aquaculture areas of Andhra Pradesh