

Finger-striking saltwater irrigation away?

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IRRIGATION by application of sweet waters is commonly understood. Saline waters are also used in production of solar salts and cultivation of irrigated shrimps. Salt production by solar evaporation (*the other being the rock salts*) is one of the most ancient industries in the world. The world salt production is estimated at 181.5 million tons per year while the Asia total is said to be of 36.5 million tons. Bangladesh produces between <1 and > 1.5 million tons of solar salts a year varying with the coastal weather and other influencing factors. Similarly, the world shrimp production is guesstimated at 500,000 tons, of which approximately one-third is the irrigated shrimps. Asia contributes 80 percent of the world total. Bangladesh produces only 25,000 tons per year which is only 10 percent of that produced by Thailand.

Saltwater irrigation is the key input in production of both the solar salts and irrigated shrimps. In most developing countries including Bangladesh, solar salts and irrigated shrimps are produced along the coastline. The small salt farms and shrimp fields are scattered along the coast and do not let themselves put to any regulatory provisions of the government. Very

often, precise figures regarding its location, extent of holdings and production statistics are not available and even if so, it remains debateable because the data referred to, in most cases, has either been manipulated or documented to be skimpy.

Salt farming in the Gangetic delta is probably the beginning of coastal engineering germinated from within the social science. The ancient community known as *malongis* in *Chandradwip*, the present Bakerganj-Patuakhali, in the south-western coast of Bangladesh started farming salt by dam-retaining the sea waters at astronomical high tides and then naturally drying by solar heat within the terraced compartments aisled by mud. The widespread grids of these aisles in series kicked-off the sedimentation process eventually triggering the land reclamation engineering. The science that further shared the concomitant development of the nation's coast was raising the lands for secured homesteads and digging the trenches for domestic consumption of sweet water. The human habitation thus gradually surged up the coast resulting in cutting of the natural mangrove for increased settlement. Over time salt farms continued to be pushed seaward by rice cultivation reversing the direction

Saltwater irrigation is seen by many as a serious threat to food security and coastal ecology in general and, degradation of soil and water quality in particular, including impacting the flora and fauna. But finger-striking the saltwater irrigation away as business as usual by the water resources planners may not be appropriate in the perspective of overall national planning.

of habitation settlements towards the coastal potentials. The abundance of upland freshwater flow combined with local run-off in a favourable condition of adequate natural drainage accelerated this process.

Shrimp cultivation on the other is not as old as salt farming but not even a new phenomenon in the south-western coast of Bangladesh. Farmers used to construct shallow, seasonal enclosures on the banks of rivers and canals to grow shrimp as an extra source of income. The dynamic version of the modern embanking along the inter-tidal ribbon is the living geometry of the mudflat arising out of these human activities in the coastal regions of Bangladesh.

During early 1960s, the social science was engineered by the government for providing support to the coastal community in protecting their lands, crops, and properties from saltwater intrusion and other cataclysms. Thus the concept of



A saltwater irrigation canal within the protected area

"prevention of saltwater intrusion" had taken the root in water resources planning for development of the country's coastal regions. Salt production has historically been given the posterity in planning by the government. Projects of million dollars have so far been planned, implemented and rehabilitated during the last close to 50 years where saltwater irrigation component remained in the rear seat; the rice cultivation being dominant.

Between 1757 and 1831 there

occurred many revolts of *malongis*, the indigenous salt-producers, resisting the then British colonial prohibitions on salt production. At a far later stage in early 1970s salt farming was accompanied by irrigated shrimp cultivation for its high export potentials. Local initiatives were backed by the Local Govt. Engineering Department (LGED) in early 1980s. The conflicts thereafter between the public agencies (BWDB and LGED) surfaced in early-1990s. The huge

paddy lands turned into salt farms and shrimp fields shrunk even the grazing surface; the most recent is in Teknaf. The coastal community driven by socio-economic factors thus all along seen to have ignored the central planning concept and bent upon the saltwater irrigation by drill/cut-opening the embankment system encountering the water planners' "prevention of saltwater intrusion" concept, in many parts of the coastal farming, resulting in potential conflicts between the public and private initiatives.

Despite potential conflicts, 11,769 ha of lands under salt farming in 1964 over the last four decades have increased to almost 60,000 ha.

Further in 1975, the area mudflat arising out of these shrimp cultivation was 1330 ha which during the last 30 years increased to 150,000 ha; some are of the opinion of even 400,000 ha. Saltwater irrigation has accordingly increased across the coast. Salt farming and shrimp cultivation along the way remained hinged to saltwater irrigation.

As a consequence, many of the water resources projects in the coastal regions have failed to perform as effectively as originally conceived and, as efficiently as designed except for enhancing the degree of safety to life and property of the coastal population. Saltwater intrusion within the protected area has rather been useful for the beneficiaries in cases where foreshore is thin. This has reversed the traditional management of water culminating in sub-optimal use of the coastal water resources. Saltwater irrigation for salt farms and shrimp fields instead of preventing its intrusion accordingly impacted the operational modes of the hydraulic infrastructures evolving from the local needs. For example, the flood control and appurtenant structures that were planned and designed to automatically drain the excess water from within the protected area and plug the inflow of seawater corresponding to astronomical tides, are on the ground being operated by the beneficiaries for the opposite purposes to satisfy their requirements. The water managers and designers are seen providing tacit support to farmers' water demands by minor modification in the operation of gates while the planners at the head end remain as onlookers for years.

Statistically, chemical industries apart from human consumption are a large bulk consumer of salts for chloral kali manufacture. Compared to the underdeveloped and developing countries, industrial requirements of salts are several times more than the edible consumption in the developed countries. Inversely in Bangladesh, the ratio of edible to industrial consumption of salts is closely 2:1. The demand for salts is increasing

with the growth of population as well as with the development of industries. The government's recent thrust on relocating and reorganising the tannery industries will further up the salt requirements over the immediate next years. Again, the shrimp production in Bangladesh is export driven and labour intensive. Currently about 600,000 rural labours are engaged in shrimp cultivation. Shrimp production has very high potential in the global market for Bangladesh as a new entrant. It is increasingly contributing its share in national export earnings and creating rural employment opportunities.

Salt production in the country is below the national requirements thus necessitating frequent import except for the bumper production year. Shrimp alone constitutes more than 70 percent of which 95 percent is irrigated, to total export earnings from all the agro-based products of the country. Saltwater irrigation, on the contrary, is seen by many as a serious threat to food security and coastal ecology in general and, degradation of soil and water quality in particular, including impacting the flora and fauna. Apart from the above, social scientists, environmentalists, economists, coastal engineers and even world leaders are in the recent time foreseeing the need of a sustainable retreat from the coastline in the backdrop of Asian tsunami disaster. A long-term vision, one for import and the other for export, orienting the production strategy for salt and shrimps is thus needed to be incorporated in planning the future coastal water resources projects including land use zoning alongside an effective mitigation plan. Finger-striking the saltwater irrigation away as business as usual by the water resources planners may not thus anymore be appropriate in the perspective of overall national planning.

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