

# Utilization of saline areas

## in the northern India by cultivation of Vannamei shrimp —A silent revolution

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*The success of the shrimp farming in north India can be a game changer not only for the farmers but also for the country as whole as shrimp is not only a high value commodity but also has a high export value. Besides other benefits, shrimp farming in saline wastelands of northern India has immense potential for generating lot of employment opportunities on a long term basis.*

**Keywords:** North India, Saline areas, Shrimp farming

INDIA is endowed with a long coastline and hence offers scope for large utilization of marine wealth. Since long, fishermen in India have been involved themselves in traditional marine fishing. In the seventies, fishermen started concentrating on catching shrimp due to high profitable returns on account of its export value. Brackish water shrimp farming was started in a big way during nineties especially in the coastal districts of Andhra Pradesh and Tamil Nadu and also proved to be a highly remunerative venture for the entrepreneurs.

Incidentally, in many pockets in

the inland states, the subsoil water has become saline or semi saline due to some or the other reasons with the salinity generally ranging between 5 parts per thousand (ppt) and 15 ppt. These pockets are prevalent in northern states like Rajasthan, Western Uttar Pradesh, many parts of Punjab, Haryana and even elsewhere (Fig. 1). Getting encouraged by the successful pilots conducted by the CIFE, Rohtak centre, some of the saline affected farm land in district Rohtak in Haryana were converted by the farmers for culturing tiger prawn i.e. *Penaeus monodon*. However, in view of non-availability

of quality tiger prawn seeds, the farmers have now gradually switched over and initiated cultivation of the white legged shrimp or the *Litopenaeus vannamei*.

The saline lands, which are otherwise unsuited for any other agricultural activity can be effectively utilised for culturing brackish water shrimp viz. the popular White leg shrimp, Pacific white shrimp or Vannamei shrimp. Incidentally, large patches of land are available in the aforementioned states where saline soils exists along with saline ground water. Saline or semi saline waters can no longer be used for irrigation



Fig. 1. Salt deposits seen in vast tracts in Mathura district rendering the land unsuited for other agricultural use



Fig. 2. Farmers found using HDPE lining in the ponds with high seepage

or drinking. It is toxic to plants, and high sodium levels in them makes the soil hard, compact and reduces the ability of the soils to absorb water. Irrigation water becomes toxic to most plants at concentrations above 1.50 ppt. Salinity may not be dangerous to humans, but water becomes non-potable for human consumption beyond 0.50 ppt.

Being relatively expensive and to some extent risky and skilful venture, as at present, small farmers and marginal farmers have not come forward to adopt the activity in a large way. Being capital intensive activity, bigger farmers, who have relatively more risk bearing capacity, have initiated the shrimp farming activity in these saline lands (Fig. 2). Discussions with experts in the field reveal that approximately 2.5 to 3.0 million hectare area in the northern Indian plain region suffers from the problems of higher salinity. This is not only alarming but has also resulted in rendering these areas unsuited for any other productive agricultural use. Using a conservative estimate, even if 20% of the existing saline wastelands are utilized for its cultivation, the country will be in a position to produce nearly 2.0 million metric tonnes shrimp or Vannamei per annum (Fig. 4). Being a high valued food product, the country would thus be able to produce a high valued protein and would also earn huge foreign exchange besides generating tremendous employment in the farm sector.

Farmers in these areas are practicing Vannamei shrimp farming in pond usually measuring one to two acres. Wherever there is high amount of

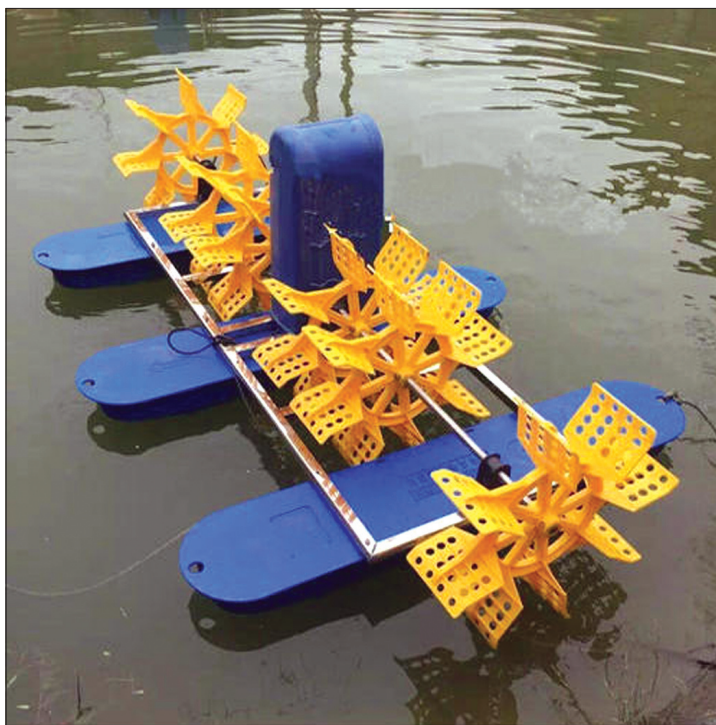


Fig. 3. Paddle wheel aerators used for aeration and increasing oxygen level in the pond

seepage, the farmers use polythene linings in the pond bottom so that water could be retained (Fig. 2). The shrimp ponds are scientifically constructed facilitating easy drainage and drying after each harvest. Important management aspects like maintenance of water supply, treatment of organic and inorganic fertilizers, maintenance of water parameters, adequate seed stocking, feed management using formulated feeds and proper aeration are being scrupulously followed (Fig. 3).

The average production of shrimps in the saline shrimp farms of northern India is approximately 3,500 kgs/acre/crop. Many of the

farmers presently prefer cultivation of only one crop in a year. This is due to the fact that the shrimps are not able to tolerate cold temperatures during the winters (November to March). However, efforts are being made by the entrepreneurs to take two crops of shrimps in a year in near future. The average farm gate price being fetched by the farmers when sold to the exporters and processors ranges between ₹ 350 and ₹ 400 per kg. Thus, by and large the activity is economically quite viable keeping in mind the fact that it is being carried out in areas which otherwise unsuitable for any other agricultural purposes.

Feedback received from various stake holders reveal that operational cost for one crop for one acre Vannamei shrimp farming in north India may be around ₹ 7 lakh. As against this, the total income per acre per crop works out to be approximately ₹ 11 to ₹ 12 lakh. Gradually, the operational cost comes down whereas, the income per crop increases, thus, resulting in enhanced income of farmers. Such cost model or may be replicable in all the northern states of the country namely the western Uttar Pradesh, Rajasthan, Punjab, Haryana and even in the rural areas of the National Capital Region. Despite the farmers doing well, some

of the constraints coming in way of the success of the activity are timely availability of quality inputs like the shrimp seeds (which are to be transported from coastal states), formulated feed and probiotics etc. Besides these, other important aspect is the fluctuating market for the shrimps. Availability of credit and insurance support, besides, proactive role of the nodal



Fig. 4. Priced Vannamei harvest

departments in providing guidance and training to the entrepreneurs will also go a long way in the success of the shrimp farming in the ensuing future.

Farmers taking up shrimp farming are also being encouraged by extending them subsidy support under the Government of India's "Blue Revolution Scheme". Good amount of subsidy support at the rate of 40% for farmers belonging to the general category (60% support for SC/ST/Women farmers) is extended under the scheme. Perceiving some amount of risk in the activity, bankers as of now are not very keen in supporting the activity.

There is however a need for conducting specialized intensive training on shrimp farming for the existing as well as prospective farmers. More soil and water testing

laboratory need to be established in potential districts as the entire shrimp farming State depends upon the stability of the water parameters like dissolve oxygen content, pH, ammonia, nitrates, nitrites, alkalinity, hardness and elements like potassium, calcium, magnesium etc. Further, establishment of processing/storage facilities for shrimp farming along with other meat products in potential districts will go a long way in popularizing the activity and benefitting the farmers.

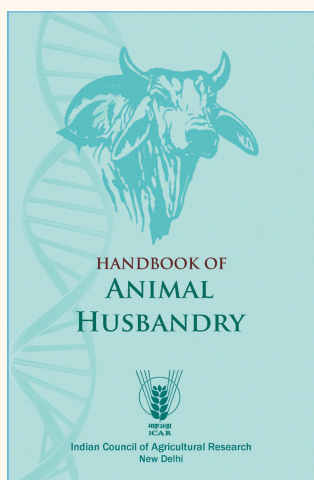
The important role played by the Regional Centre of the Central Institute of Fisheries Education (ICAR) situated at Rohtak, Haryana, and the respective departments of different States should to be appreciated for popularising the shrimp cultivation and building

capacities of the farmers. In fact, the CIFE centre at Rohtak has been instrumental in providing regular extension services in most of the farmers of Haryana, Punjab, Rajasthan and Western Uttar Pradesh. The activity which is immensely popular in the coastal belt of the Country has also proved to be an economically viable activity in the saline affected lands of north India. Due to the efforts given by the CIFE, many shrimp farms on a large scale have come up in areas which are not only arid and semi-arid but where the ground water cannot be used for any other purpose due to the high salinity.

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