Vol XXIII
No. 4

ISSN 0019-5014

CONFERENCE
NUMBER

OCTOBER-
DECEMBER
1968

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

The equation suggests that there is great scope for maximizing the returns from systematic fish cultivation by increasing the doses of feed, as one unit increase in feed increases output by Rs. 89.50. The maximum returns, however, would not have been adversely affected by decreasing the labour charges.

Conclusion and Policy Implication

The case studies show the profitability of fish cultivation to the extent of Rs. 2,305 per annum per acre under systematic fish cultivation. The profit margin of Rs. 349.56 is relatively low in natural fishery, because of its seasonal nature involving little investment and management cost. The benefit-cost ratios for the systematic fish cultivation and natural fishery are 3 and 6 respectively. This brings us to the question : what should be the policy for the development of fishery resources? Clearly, an individual farmer of the low income sector has no adequate resources to undertake the arduous task of constructing hand-dug tanks or ponds for fish cultivation. It is for the policy-makers to consider fish farming as a specialized investment programme for assisting farmers to solve their low income problems by increasing their aggregate farm production.

ECONOMIC ASPECTS OF FISHERIES DEVELOPMENT IN BIHAR

DINESHWAR PRASAD

Lecturer in Economics
Ranchi College
Ranchi University, Ranchi (Bihar)

The object of the paper is to describe what is being done and to evaluate the present contribution of fisheries in Bihar. Bihar, with 20 per cent of the total production of the country, is a leading producer among Indian States of fresh water fish. The total annual catch of fish increased from 37,000 tonnes in 1956-57 valued at Rs. 5.6 crores to 46,000 tonnes in 1967-68 valued at Rs. 7 crores. Thus the total catch in the State increased by 9,000 tonnes during the last eleven years. The increase appears impressive, but if compared with the fish production in other States the impression is changed. The rate of increase in fish production in the States of West Bengal, Madras, Kerala and Maharashtra during the same period has been much faster.

The fishery in the State is poorly developed. Fishing is not scientifically organized. Much of the production is drawn from subsistence fishing of wild stocks in rivers, canals and tanks. Subsistence fishing is often not recorded. Fish culture in fresh water areas of this part of the country is important. The areas of fresh water culture include wet paddy fields.

Fishing plays a minor role in the economy of Bihar. Only a small portion of the State's population earns its living by fishing. By and large, fishing is a

part time job and is carried on a small scale. In the D.V.C. reservoir areas of Bihar it provides however employment to a significant number of people on a permanent basis. Even in these areas the number of full time fishermen is negligible.

Fishing in Bihar is largely a hereditary pursuit. The skill and technique of fishing are thus carried down from one generation to another. The fishermen have the advantages of long experience and traditions, but are not well equipped with modern techniques and methods. The industry thus suffers from an element of backwardness.

Pisciculture is not alike in all parts of Bihar. In Chotanagpur it is a sort of mixed culture. Various types of food suitable for different kinds of fishes are available in different layers of tanks. For this reason tanks are broadly divided into three layers—bottom, middle, and top. The seeds are so distributed as to be shared by all the three layers in fixed proportions. In such a mixed culture the seeds consist of three varieties—*Mirgal*, *Rehu* and *Katla*, their proportions being 30:30, and : 40 per cent respectively. The food requirements of the three varieties are different and are to be met in different layers of the tank water. Similarly, their maturity periods also vary.

Pisciculture practised in the paddy farms of Ranchi and Dumka is known as paddy-cum-fish culture. The experience of growing fish with paddy in these farms has proved rewarding. The culture has yielded good results. In such farms, the yield of paddy has, it is claimed, gone up by 9 per cent. Fishes serve as a source of manure and a means to fight against insects.

Efforts are being made to increase fish production in all possible ways. New techniques and scientific culture are encouraged, but traditional methods are also aided to. With better management of the inland water, fish culture in ponds and reservoirs has better prospects in the State, particularly in view of the increase in the number of dams and reservoirs. The systematic fish culture is being practised in the State. It concerns itself with the stages of development, *i.e.*, collection of the eggs, hatching them and caring for the fry for a short time and management of tanks. Government tanks have been made into a sort of seed farm for the fishes. Eggs from various sources are hatched in these tanks, and when they grow to fry size they are distributed for culture, this is called transplantation of fish seeds.

II

The economic problem of fisheries development arises from various factors, *e.g.*, a high degree of uncertainty and risk involved in production, variation in fertility depending on the availability of food for fish and variety of fishes, fluctuations in weather conditions. Because of the prevalence of share system of distribution of catches, fishermen are not quite sure of their rewards in terms of both yield and price. Competition with other animal protein and the consumer's preference also play an important role. High perishability, seasonal variation in supply, inelastic nature of supply in the short period are other contributing factors to the problem.

Over or indiscriminate fishing of young fishes is another problem. Fishing is not controlled to ensure a regular and dependable yield of catch. This problem is mainly because of the fact that the fishermen are not generally the owners of tanks and rivers. The fishermen lack in the knowledge of population dynamics and biology of the fish stock. Generally the long-term interest of the stock of fishes is neglected for the fishermen are interested in obtaining a maximum yield in a single catch. The best use of the resource in terms of larger and cheaper supplies of fish to the consumer and better income to the fishermen is necessary. Fishery being an exhaustible resource requires planning and replacement of species.

The economic condition of the fishermen poses serious problems to the development of fisheries. They are poor and therefore highly indebted to private financiers. Their financial dependency on the middlemen robs them of initiative, investment and planning. Besides, in the absence of organized marketing and fishermen's co-operatives, prices are unsteady and fluctuating and very often catches prove unprofitable.

Fishermen co-operative societies are few and have failed to make any impact on the condition of fishermen. Most of these societies are, in fact, defunct. The dominance of private traders in the co-operatives is very common, and consequently even a partial replacement of the middlemen by the co-operatives could not be achieved.

The fishermen have no settled rights on culture areas. Government enters into agreement with the private parties for the settlement of water areas. Generally an annual rental is fixed by public auction. Half of the catch goes to fishermen and the other half goes to the owner of the resource. Once it is settled, Government has no control on the preservation of the resource, though it is generally accepted that no fish weighing less than a kilogram should be caught. There is no legislation in the State preventing fishermen from catching under-sized fishes, for the Government is interested in the realization of revenue only.

The private owners of water resources do not invest in pond development. They were lacking in resources and enterprise. Since 1952 Government provided subsidy to private tank owners for development purposes. In the beginning the subsidy was 50 per cent of the cost of development and now it has been reduced to 25 per cent. Even now, the capital investment and use of advanced technology are negligible in Bihar.

Absence of scientific knowledge of pisciculture and of social encouragement create further problems. Besides, the supply of seed is not uniform throughout the State. The problem of the supply of fish seed is more acute in the Chotanagpur region of the State because the 'Major carp' variety breeds in running water only. For this purpose the Ganga and Sone rivers are best suited. In hilly areas of Chotanagpur, rivers are short, shallow and flashy and dry up after the rains. During the rains even owing to swift currents, the plateau rivers are not fit for fish breeding. Mirror carp variety breeds in stagnant water and can easily be grown in the tanks and reservoirs of Chotanagpur. But the yield of this variety is low and is, therefore, not preferred for commercial fishery.

Even in the Ganga, conditions for the successful breeding have recently deteriorated. Owing to the construction of barrage on the Sone, the flow of water besides being regulated has become scanty. The fishes breed well when they are free to move against ceaseless currents. Consequently, the supply of spawn from the Ganga has diminished. To overcome this difficulty, an induced breeding system has been introduced. But, so far, the result is not very encouraging. Proper conditions and adequate facilities for such breeding are also lacking. Electric induction method to attract fishes in groups for easy catch was successfully demonstrated by the Russian experts. But the method is yet to be implemented in Bihar.

General poverty and low purchasing power of the people offer little incentive to develop fishery. In the menu of an average family in Bihar, fish is considered to be an item of luxury. The average per capita annual consumption of about 2 pounds of fish in Bihar is much below the national average. Besides the dietetic habit of the people is such that they do not feel much for fish. Consequently, 22 per cent of the fish production goes to the external market, particularly to Calcutta. The bulk of consumers as well as producers of fish in Bihar are mainly people originating from Bengal and the people living in the bordering areas of Bengal. But even these people owing to the paucity of finance sell the fresh catches and buy dried fish.

For the proper management, three important steps have been taken : (1) limiting the size of catches, (2) closing areas for fishing and (3) regulating the frequency of catch. In river Sone near Sone barrage a sanctuary for breeder fish has been declared and catching of breeder fish has been prohibited.

Steps have been taken to prevent the large scale mortality of spawn. The percentage of survival of fry is usually low. Poor maintenance of tanks results in the pollution of tank water and proves fatal to fry. Unscientific manuring of culture areas also proves harmful to fishes. Natural factors, as stated earlier, also affect breeding. Among the natural factors, the chemical properties of soil and water and fluctuations in weather conditions are of great importance. Owing to the variability of natural factors, breeding conditions vary in different parts of the State. Darbhanga is a most fertile area for fish breeding. On an average, 12,000 out of 20,000 fries survive and grow well. On the other hand, the survival rate is lowest in the Chotanagpur region. Out of 20,000 not more than 6,000 fries survive.

The yield of fish from tanks is about $1\frac{1}{2}$ quintals per acre of water area. This is rated to be a very low yield. Even this is highly variable from place to place and from season to season. The yield is usually high in the Ganga plain and in the border areas of West Bengal. The yield is lowest in the districts of Ranchi, Hazaribagh and Palamau.

Bihar with about 35,000 acres of perennial ponds, about 2,00,000 acres of jheels and 1,000 miles of perennial river channels, offers vast scope for the development of fresh water fishery. Reservoirs of large irrigation projects offer additional areas for fish culture. We can step up production to a great extent by improving the management and by introducing controlled and rational fishing.

The possible lines of development are proper exploitation of fisheries, more extensive stocking and manuring of tanks and training of fishermen in the improved methods of fish rearing, catching, handling and storage.