CHAPTER - VIII

CONCLUDING OBSERVATIONS AND SUGGESTIONS

Though the views about the Management of Fishery Resources Development in Haryana have already been brought to light in the preceding chapters, concluding observations and remarks may lead to repetition of the discussion. But an integrated view of the entire analysis and approach to the work done in useful and is, therefore, endeavoured here.

Administrative Structure

India holds seventh in total and second in inland fish production rank in the world. The fishery sector has gained its importance, the world over in last one decade. There are fulledged Ministries of Fishery in many developed and developing countries like Japan, Peru, Norway, Philippines etc. In India fishery development programmes are supervised by a division in the Ministry of Agriculture. The reorientation and expansion of the fisheries activities in the country are required to achieve the rapid and stable growth in comming years. The nature and the magnitude of the problems should be handled
with more responsibilities and authorities. The present status of Fisheries Division in the Ministry of Agriculture should be raised to Department of Fisheries having two separate wings (i) Marine Fisheries and (ii) Inland Fisheries for the better management of fishery programmes in the country.

2. The development of inland fisheries has become an integral part of the rural development. It provides commercial, recreational and subsistence fisheries for the poor fisher-folks and fish farmers in the villages. It contributes 39.2 per cent to the total fish production in the country. In addition to this, out of the total, more than 40 per cent persons are engaged in inland fisheries. The management of inland fisheries is a proactive action of the government for the welfare of fisher-folk in the rural areas. Now it is a prime duty of law makers, planners, administrators and scientists to look its proper management and development. There are eight Fisheries Research Institutes in India. Out of these, seven are dealing with the developmental research for marine fisheries. Only one Institute, based at Barrakpore (West Bengal) looks after the research and developmental work of inland fisheries sector for all the states. It has been observed that this Institute circulates the 'Stero-type Fishery Technology' irrespective of different agro-climatic conditions in the different states. It is proposed that the activities of this Institute should be decentralized by establishing four
Regional Research Centres supported by one Research Sub-Station in each State to unravel the specific problems and to evolve the area based fishery technology.

3. It is observed that the allocation of portfolios at the level of ministers in Haryana are not uniform. In the past, there had never been an independent minister for fisheries. The Department of Fisheries from time to time had been clubbed with other departments under the charge of a minister. The concept of Government for considering the fisheries apart from agriculture has a retarding affects on its development. The fisheries is very much allied to agriculture having analogies in operations, problems, command areas and type of beneficiaries. Clubbing the fisheries with the departments like Local Bodies, Town and Country Planning, Urban Estates, Colonization, Finance, Parliamentary Affairs, Wakf, Irrigation and Power, Home etc. has no relevancy. Moreover, at the Centre level, all agricultural and allied departments like Agricultural Research, Crop Husbandry, Fisheries, Animal Husbandry, Dairy etc. are dealt with the single Union Minister for Agriculture. It has also become inevitable for Haryana whose economy is agri-based to give high priorities to agriculture and allied subjects. Considering the socio-economic and political situation in the

1. See Annexure-III of Chapter-II - Organisational Structure.
State, it is suggested that all the subjects in the sphere of agricultural development such as Agriculture, Animal Husbandry, Fisheries, Forestry, Dairy, Co-operation and Rural development should be given to a senior Cabinet Minister to unify the policies and directions. He should have political capability to take decisions over various issues.

4. It is also observed that there is no uniformity in allocation of departments at Secretary level in Haryana. The disintegration of various subjects of agriculture at Secretary level generates various administrative and managerial complexities. There are numerous inter-departmental problems which are in conflict with interests of many other departments. A single incharge can better solve these problems without falling into controversies and making a prestige issue. Placing the Fisheries Department with other unlike departments under a single Secretary bound to have an adverse bearing on its working. The fisheries except for a small period had never been under the Secretary for Agriculture in the past. It is suggested that a post of Agricultural Production Commissioner should be created in Haryana on the pattern of Uttar Pradesh Government. Agricultural Production Commissioner should be of the rank of senior Financial Commissioner next to the Chief Secretary. He should be made incharge of Agriculture and allied departments

1. See Annexure-IV of Chapter-II - Organisational Structure.
having competency to plan, direct, guide and co-ordinate the various subjects within the agriculture sector.

5. Fisheries Department is a technical department manned by more than 70 per cent technical persons. It is essential for every person who deals fisheries to have a sound knowledge regarding water eco-system, life-cycle, fish behaviour and requirements of its development. The study reveals that at secretariat level in Haryana, there is no technical person in decision-making process. The secretariat have to depend on the directorate even over the petty technical matters. In Union Ministry of Agriculture a double tier system of technical as well as non-technical personnels has been adopted. All the technical proposals are processed by technical persons and after plugging all technical lacunae, it is put up to higher officers for decision. It is suggested that similar process be adopted in Haryana by creating a post of Fisheries Officer equivalent to the Assistant of Secretariat and a Deputy Director equivalent to the Under Secretary. All the technical proposals should be dealt by Fisheries Officer channelized through Superintendent, Deputy Director, Joint Secretary, Secretary, Minister and Chief Minister. Keeping in view, the nature of duties and working of the department, it should be declared a technical department and the fishery development services should be treated as essential services in the State.
6. Development in the sense of state building and socio-economic progress are the major goals of the state. The responsibility for realizing development goals rests mainly with the Government. The task is extremely difficult and complex and requires major role to play by the Fisheries Department, Haryana. It helps in implementation of governmental policies and programmes in the fields. The analysis of working and organisation of Fisheries Department, Haryana reveals that the structure is neither an efficient nor fits in the democratic set up of the Government. The present structure is characterised by centralization of powers at directorate level. The field officers are to depend on the directorate even for petty matters. Decentralization of powers to the lower level means to boost morale by conferring higher responsibilities on the lower staff. The greater decentralization of powers and delegation of authorities are necessary for effective implementation of plan projects. The study reveals that the span of control in the department is very wide. In spite of intermediary posts of senior Class-II and Class-I, the Head of the Department supervises the work of 21 field offices directly. It creates loose administrative control and difficulties in managing the developmental activities. It is necessary to secure a balance of the span of control. It is felt that the various activities of the department at district level are not integrated mainly due to the non-coordination between same rank
It is inevitable to have a senior supervisor to integrate various activities of the department. It is also observed that there is no unity of command in the present structure at district level. District Officers get orders from Director as well as Deputy Commissioners. Sometimes the duality of command creates conflicting and confusing situation. This situation should be tackled with great care keeping in view the departmental objectives. A model has been designed for utilizing the services of existing man-power in proper way.¹ All the field offices should be grouped into four zonal offices headed by a senior Class-II and Class-I officers for securing co-ordination, supervision and integration of various activities. The zonal head should be bestowed upon more powers and facilities for better management of the fisheries in the State.

7. It is also observed that there is no planning and monitoring cell at directorate level. The planning infrastructure available in the present set-up at fisheries directorate is ill equipped which in turn leads to delay in the sanction of the schemes. It is suggested that a separate planning-cum-monitoring cell should be constituted which should be responsible for collection of basic data, fixing of priorities, targets, preparation of projects and time schedules of work, progress analysis and concurrent evaluation, sound control over

¹. See Figure-II of Chapter-II - Organisational Structure.
the budget, monitoring and deciding the detailed action programmes for the implementation in regard to the sectoral development.

8. After visualizing the job chart and posting of employees at various level, it is observed that some posts are overburdened while others have no work at all. The division of labour is not properly distributed among the various organs of the organization. The overlapping of work and duties are also frequent owing to distinction of duties for various posts. It has also been observed that some field offices are under-staffed while others are over-staffed. It is suggested that: (a) the nature of duties for every post should be defined carefully at the time of its creation; (b) the posting of staff should be done as per need of area and programmes; (c) periodical assessment of duties and performance should be conducted; and (d) the posts having same nature of duties, pay scales and service conditions should be clubbed under one designation.

9. The present pay structure has been studied in detailed. The pay structure in the department is unplanned. All the 45 existing categories are clubbed into 13 pay scales. No criteria has been kept in view at the time of clubbing of pay scales. The post of Fisheries Officer having basic qualification as bachelor degree in Science; the Assistant Fisheries Officer with qualification of intermediate and the Assistant having qualifi-
cations of matriculate have been put under one scale of Rs.1400-2600. Similarly Establishment Officer governed by Haryana Fisheries Services Group 'B' rules and Superintendent who is governed by Group 'C' rules are clubbed under one scale. Such type of pay structure created the ill-will and heart burning among the employees which indirectly give adverse affect to the working of the department. For the correct fixing of the pay scales, an analysis of job is required which can be done by establishment section of directorate and secretariat. A rationalization of pay structure should be done at priority to avoid frustration among the employees. It should be on more scientific lines. It is suggested that the remuneration should be related to (i) educational requirements; (ii) level of duties and responsibilities; (iii) conditions of service; and (iv) levels of administrative capabilities. It is, therefore, the anomalies in pay scales should be removed by the Government as soon as possible to avoid resentment among the employees.

Human Resources Development

The development of human resources by way of training and education is a socialization process for the individual's growth which aims to change the skill, knowledge, attitude, awareness and performance. The present study reveals that more than 70 per cent employees of the Fisheries Department, Haryana are to perform technical duties. Out of the total employees
only 13 per cent are trained. The existing pattern of training is not sufficient. Although, the department is having a scheme for providing the training to the staff since its inception, yet only 38.3 per cent targets have so far been achieved.
Considering the need of the inservice training a model has been designed by re-orienting the existing pattern involving all categories from grassroot level to top level.\(^1\) It is suggested in the model that there should be three type of trainings: (a) basic training, (b) extension training, (c) short-term training, which should be provided to the various categories considering the nature of duties and administrative capabilities of the employees. The basic training which should have a comprehensive syllabus be imparted to the key posts who are to work at the village level, tehsil level and district level. These posts have more public contacts. This training should be given only just after entry into government service. The probation should only be cleared after the successful completion of the training. The extension training should be provided to the middle level officials to equip them with the various methods of extension to help the key staff in extension of fisheries programmes. The extension training should be provided after five years of service. The short term training should be given to the top level staff. It is also suggested that the staff should be sponsored for refresher courses, seminars and workshops.

\(^1\) See Figure-III of Chapter-III - Human Resources Development.
from time to time keeping in view the requirements. The short-term training courses should be life-long process.

2. It is also observed that there is no provision for training to non-technical staff who are 30 per cent in strength and constitute important echelons in hierarchical system. All the technical and non-technical proposals are prepared by these officials. The technical and administrative training would increase their efficiency and better understanding in disposal of cases. It is suggested that inservice training should be conducted for the various categories of the non-technical staff like Assistant, Accountant, Superintendent and Establishment Officer.

3. There is no systematic procedure in selection of staff for inservice training. Only willingness of a person is the main criteria. A case study was conducted during the present research to know the impact of training on the staff. Every trained personnel has accepted that training has increased his efficiency but no incentive was provided after getting the training. It is suggested that the trainings should be considered an integral part of service condition and should be made compulsory for higher promotions. The posting of the trained staff should also be done in the areas of fisheries importance to get maximum out of them for the development of fisheries.

4. All the Fisheries Training Institutes in the country are
situated in other States, far away from Haryana. Employees feel hesitant to go in for training at far off places. It is, therefore, suggested that a State Training Centre be established in Haryana for providing need-based training to the staff, fish farmers and fishermen. The medium of instructions should be simple and understandable keeping in view, the administrative capabilities of the persons.

5. There is no adequate system of the higher education for the staff in the department. The continuance of education to the middle level officers would lead to good performance in working. The higher education system would widen their mental horizon in decision making and working. It is suggested that open university system for fisheries education should be introduced to get the professional qualifications. The avenues for getting education through correspondence courses in fisheries should be open to all employees. The government should provide liberal grant of leaves for studies, attending seminars, conferences and should also reimburse a part of expenditure on professional books and periodicals.

Capture Fishery

It is observed that present identified water resources for the management of fishery in Haryana are either over estimated or under estimated. The correct estimation of the resources is essential for the proper development of fishery.
The identified water resources during the present studies are as under:

(a) Rivers : 1316 kilometres
(b) Drains : 2090.40 kilometres
(c) Canals : 16647.30 kilometres
(d) Reservoirs : 4590.50 hectares
(e) Micro-water sheds : 160 numbers

It is suggested that the survey of natural fishery resources should be done at the interval of every 10 years.

2. The study reveals that out of 12 districts, Ambala, Kurukshetra, Karnal, Sonepat, Gurgaon, Faridabad and Rohtak constitute more than 78 per cent of the total fish landing from the natural water resources. The Department should be made the special programmes for the management of fishery in these districts and other districts separately.

3. The present study reveals that production efficiency of natural lotic waters is only 26.3 per cent. The catch composition is dominated by major carp. More fishing pressures are made in monsoon season ranging from June to August as compared to other months. The study also reveals that some of the commercially important varieties like Mahaseer, Catla and Calabansu are depleting. Necessary conservational measures should be adopted. Ban should be imposed in Haryana on capturing the vanishing species for five years from natural
water bodies. The fish seed of these species should be
restocked in the natural water bodies.

4. It has been observed that with the increase of man power
for the fishing, the fish production increases. It reveals the
under-utilization of fishing gears efficiency. The fish
production can be increased by proper man power planning for
the operation of gears. The Department should conduct applied
research for optimizing the gears efficiency for different water
bodies.

5. The study reveals that there is only 9.6 per cent utili­
zation of reservoir resources. The proper stocking of fish seed
has direct bearing on the production of fish. The stocking
rate of fish seed is not properly managed due to which only 1/6
of the required production is obtained. The recovery is also
very low in the reservoirs as 12.5 number of fish seed forms
one kilogram of fish. The suggested stocking rates for the
reservoirs are as under:

(a) Large reservoirs (1000-5000 hectare) - 500 fry per hectare
    per year
(b) Medium reservoirs (100-1000 hectare) - 1000 fry per
    hectare per year
(c) Minor reservoirs (10-100 hectare) - 2000 fry per
    hectare per year
(d) Small reservoirs (below 10 hectare) - 10,000 fry per
    hectare per year
6. The study reveals that species of different varieties of fish seed are not stocked in proper ratio. The deep waters always have less natural food for fish at the bottom. At present, the stocking is done with more of bottom feeders as compared to other species in the State. It is suggested that existing stocking policy should be recast. The reservoirs having more than 5 meter depth should stocked with 50 per cent surface feeders, 40 per cent column feeders and 10 per cent bottom feeders. The reservoirs having less than 5 meter depth should have 40 per cent surface feeders, 30 per cent column feeder and 30 per cent bottom feeders.

7. The present study reveals that there is a dual management over the many natural water bodies. With the development of agriculture in Haryana State, a net work of irrigation canals have been constructed. The provision of fish passes and fish ladders are not made at head-works and spill ways. This restrict the migration of fish. There should be close coordination between Fisheries and Irrigation Departments for the optimal utilization of water resources.

8. The fishing rights of important reservoirs such as Karna Lake, Tiliyar Lake, Suraj Kund and Badkhal Bund have been transferred to Haryana Tourism Corporation by the Haryana Government, resulting in adverse affect on the recreational fishery. It is feared that the irrational tendency of the fish contractors would destroy the fisheries of these reservoirs. It
is suggested that the fishing rights of all these reservoirs should be transferred to Fisheries Department, Haryana, for proper management.

9. It is also observed that there is non-coordination between Wild Life Preservation Department and Fisheries Department on many issues. The Wild Life Preservation Department has declared Sultanpur Lake (Gurgaon) and Bhindawas Lake (Rohtak) as Bird Sanctuaries by banning fishing. Moreover, there are interferences in the fishing in natural waters on the pretext that fish like Mahaseer is also covered under Wild Life Act. All the water animals form the important food chain and have acute correlation with each other. The mismanagement of any aquatic species would have adverse affect on the development of fisheries. It is suggested that the management of whole aquatic eco-system including the development of all water animals should be the responsibility of the fisheries department, Haryana. In many countries such as United States of America, Canada etc. the water wild life including water amphibian, reptiles, birds, mammals and lowers animals are under the Fisheries Department for better management of water resources. Haryana is considered as one of the pioneer and marshal state of the country in agriculture sector, should adopt this pattern of aquatic life management for better future.

10. There are various issues over the utilization of water
resources which crosses the inter-State boundaries. Yamuna River and Agra Canal fisheries have suffered a lot due to conflict between Uttar Pradesh and Haryana States. It is suggested that a high level committee from the representatives of neighbouring States should be constituted to solve the inter-state problems.

11. After studying the present status of fisheries in Haryana a model has been designed\(^1\) for managing the fisheries in proper way for its future development. This model covers management of fisheries both at macro- and micro-levels. The model highlights that the fisheries in Haryana can be developed by the proper management of various sub-systems and activities such as supply of fisheries input and credits to fishermen. Proper managing the fisheries extension, education and research would promote the fisheries. The proper regulation and administration of fishery coupled with proper exploitation, processing and distribution systems of fish would encourage the fish production. All the components require proper management of the resources.

**Culture Fishery**

It is observed that in spite of good resources in Haryana, the level of production and productivity have not been

\(^1\) See Figure-X of Chapter-IV - Management of Capture Fishery.
adequate, leaving a large gap between the potential and actual yield. The maximum utilization of pond area under fish culture is found in Bhiwani while minimum in Sirsa districts. The utilization of available pond resources is above average in Sonepat, Rohtak, Faridabad, Bhiwani and Mohindergarh districts. On the basis of pond area utilization, all the districts should be grouped as good, average and poor. The districts of Rohtak, Sonepat, Faridabad and Bhiwani should be kept under the category of good having more than 30 per cent utilization. The districts of Ambala, Kurukshetra, Karnal, Gurgaon and Mohindergarh which are having utilization of 20 to 30 per cent should be put under the category of 'average' and districts under poor category are Jind, Hissar and Sirsa which have less than 20 per cent utilization. The efforts should be made as per need of the category. Separate developmental supports be planned and executed for different categories for better management of culture fishery resources development.

2. The owned ponds constitute 13.5 per cent by number and 8 per cent by area of the total pond water areas under culture. The production from owned ponds is 21.5 per cent more than the leased ponds. Government should encourage the private entrepreneurs for the construction of one hectare pond unit by giving 25 per cent subsidy on the purchase of land at ceiling rate of Rs. 30,000 per hectare.
3. Most of the impounded water units do not retain water throughout the year. In summer and post-winter days the farmers are forced to harvest juvenile uneconomic varieties belonging to different size-groups due to shortage of water. The water should be released at very nominal rate from the irrigation canals.

4. The ponds are given on lease by village panchayats for fish farming on an average period of 5 years in Haryana State. The present study reveals that the fish production is more in long leased ponds than short one. On an average the fish production in 10 years leased pond is 3.5 times higher than the 3 years leased pond. It is, therefore, suggested that the pond should at least be on 10 years lease for fish culture.

5. The present study reveals that average lease money of village pond is of Rs. 695 per hectare per year in the State. It varies according to place, size of pond, water source to pond and whims of local bodies who owned the ponds. The irrational leasing policy for fish pond in the State has a adverse affect on the development of fisheries. It is suggested that the fresh leasing policy should be constituted in the State. The new guidelines should include to make compulsory leasing of village ponds by panchayats to the fish farmers. The lease money should be unified all over the State at the rate of Rs. 700 per hectare per year with annual increase
of 5 per cent per year in Haryana State. The allotment of ponds should be made on the basis of lottery system among the local eligible rural people.

6. The present study reveals that the 'Land Utilization Efficiency' and 'Water Utilization Efficiency' at the fish seed farms in Haryana are 19.3 per cent and 17.2 per cent respectively less than the normal. The breeding efforts are 3.2 times less than the required. The response of fish to breeding is 13.7 per cent less than the normal. The ratio between Indian major carp and Common carp breeding pairs are 1:1.4 instead of 57:1. The average survival of spawn is 4.7 per cent less than the required. The per hectare fish seed production is 141.5 per cent less than the required. The average cost of production of fish seed is Rs.358 per 1000. All the fish seed farms are running in losses. The losses are more in case of small fish seed farms. It is suggested that only large fish seed farms (having more than 2.5 hectare water area which constitute 47 per cent of the total farms) should be selected for breeding-cum-rearing purposes while medium fish seed farms (water area between 1.26 to 2.50 hectare) and small fish seed farms (water area upto 1.25 hectare) should be taken for rearing purposes only. More concentration on the breeding should be laid at the large farms which should be equipped with modern breeding equipments. Only trained officers/officials should be posted
at the farms. Special allowances and bonus be given on the basis of performances.

7. It is observed that on an average 32.35 per cent fish seed is managed by various fish farmers from unknown sources. This uncertified fish seed generally does not have desirable fast growing fish varieties. The entry of uncertified fish seed should be banned in Haryana State. A Fish Seed Certifying Agency should be constituted in the State for the proper supply of the standard fish seed. The deficiency in fish seed is the phenomenon in the state. It is, therefore, the private entrepreneurs should be encouraged with liberal grant of subsidy and loan for the production of more fish seeds.

8. It has been found in the present study that the average stocking rate of fish seed in Haryana is 9530 per hectare which is 4.7 per cent less than the required. The stocking of fish seed is very irregular. The fish seed stocking is done as per norm in 23.9 per cent ponds whereas 51.7 per cent ponds are under stocked and 24.4 per cent are over stocked in the State. The stocking should be done as per norm of 10,000 fish seed per hectare per year to get the maximum production. The species composition of stocking of fish seed is very erratic. Against the stocking of six fast growing species in the pond, only four species are supplied. Silver carp and grass carp are not supplied to the farmers. The irregular species composition
is bound to have adverse affect on fish production. The quality and quantity of stocking material require great improvement in the State. The hatchery managers should be made responsible to check the stocking of fish seed quantity-wise and quality-wise from time to time and action should be taken against the defaulters.

9. The specification of fish seed is not standardized. The sizes of fish seed in Haryana are very different as that of other States and Institutions. Hence, the proposed standard specification of fish seed as a result of the study, has been given below:

(a) Spawn : 8 to 15 millimeter
(b) Fry : 16 to 50 millimeter
(c) Fingerling : 51 to 100 millimeter
(d) Advance fingerling : 101 to 300 millimeter
(e) Adult fish : Above 300 millimeter

10. The present study reveals that the Department of Fisheries is implementing various plan and non-plan schemes with 70 per cent total budget and 65 per cent staff are engaged in this programme, yet the culture fishery could only contribute more than 35.93 per cent to the total fish production. In spite of Government incentives for the production of culture fisheries, the average per hectare fish production could not cross the
average limit of 1902 kilogram per hectare per year which is 36.6 per cent less than the normal production. It was also found during the course of study that the cost in the input used in Haryana for fish culture is 15.6 per cent higher than the normal. The fishery technology is not being properly adopted by the fish farmers. The frequency use of input is 62.5 per cent each in case of lime and inorganic fertilizers while it is 100 per cent for other inputs. The use of lime is (+) 48 per cent, supplementary feed is (+) 8.6 per cent, raw cattle dung (-) 6.3 per cent, inorganic fertilizer (-) 21.8 per cent and fish seed (-) 4.7 per cent in the fish farming practices as compared to the normal dozes. The government should demonstrate the proper application of various fisheries input in proper way to have the optimum fish production. It is suggested that the Haryana Government should strengthen its T.V. Programme (Training and Visit programme) in big way by involving more and more field workers for proper dissemination of fishery technology in rural sectors.

Fish Marketing

It is observed that only 15 per cent of the total production is sold in Haryana. Government auctions the fishery rights of the notified waters to the fish contractors in the open auction with the condition that the fish contractor shall have a shop for sale in the area of his jurisdiction. More than
78 per cent of the fish production is caught from notified waters. It is also noticed that the fish contractors are basically either fish merchants of Delhi Fish Markets or financed by them. Although all of them have a shop in the area of jurisdiction yet tend to send the produce to the Delhi fish market for sale. It is suggested that there should be restriction on the out flow of fish from Haryana and fish auction system should be made compulsory at all the wholesale market at every district headquarter.

2. During the course of research the detailed study of the four fish markets was conducted. It reveals that the general condition of all the fish markets is dubious. There is no proper system of lighting, water, drainage and sanitation. The unhygienic and traditional methods are adopted for the managing the fish markets. It is, therefore, modernization of these fish markets are of urgently required. Government should take the initiative in the planning, construction and management of the fish markets. Government should monitor all the fish markets in Haryana. The financial assistance in the shape of subsidy and loan for the purchase of marketing equipment and for creation of infrastructure for modernization should be provided. The Government should also have a strict watch over the market as the monetised development does not mere only pumping money into the economy, but it entails a close check
over its optimal absorption. The Government should also create a post of market supervisor at each district headquarters for regularizing the function of fish markets in the State.

3. The sale procedure are unsystematic in fish markets. The fish put to auction in the markets are never cleared, gutted, or weighed. However, segregation of scaled and non-scaled fish is done in few fish markets. The weighing system through standardisation and grading of fish require proper management for better sale. It is suggested that powers should also be given to the Weight and Measure Inspectors to check the fish markets.

4. It is also observed that there are numerous market intermediaries. There is no record of the fish market intermediaries to make a proper channel of marketing. It is suggested that the compulsory licences should be issued to all the market intermediaries and renewal after 3 years be done only after assessment of their performance.

5. The case studies of the fish markets have been made in details and found that the profit gained by various market intermediaries are exorbitant. There is no authority to check the rates of commission charged at various stages. It is

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1. See Chapter-VI - Management of Fish Marketing for details.
suggested that at each district headquarter, a Fish Market Committee should be constituted and commission for each market intermediaries should be fixed.

6. The study reveals that a rise in trend of wholesale as well as retail prices of fish in markets, with the frequency of (+) 13 per cent and (+) 12.3 per cent respectively. The margin between wholesale and retail prices is 24.5 per cent. There is no fish price policy in the State. 'Fish Price Policy' should be framed in Haryana by considering the interests of consumers as well as producers. The policy must include the nature of consumer, their food habits; in flow and out flow of fish from the State; supporting price of fish to save the interest of producers etc.

7. The present study also reveals that there is no programme for the development and promotion of fish marketing in Haryana. The State should enhance the fish marketing activities like (i) exploratory areas for marketing of fish must be identified such as tourist complexes, messes of schools and colleges. Government should provide incentives to private traders for installation of stall for the sale of fish products at public places; (ii) food processing institution in Haryana should provide training to local people in fish recipes; (iii) fish merchants may be encouraged for the installation of ice-plants, net fabrication industries etc.;(iv) the horizontal, forward
and backward co-ordination of fish market intermediaries should be encouraged; (v) new products such as frozen fish keema, fish fillet, dressed fish, fish biscuits, fish bournvita, fish wafers etc. may be encouraged; (vi) integrated fish marketing such as sale of fish along with aquarium fish, eggs and meat should be promoted; and (vii) fish farmer's marketing societies should be constituted at district levels.

**Impact of Fisheries**

The average allocation of budget to fisheries compared to Agriculture and total plan budget of the Department is 1.798 and 0.120 per cent at State level whereas at national level the corresponding figure is 3.17 per cent and 0.369 per cent. It reveals that the financial support to the fisheries programmes in Haryana is less as compared to national plans. The fishery development should be made a part of state priority and integrated rural development. All the fisheries plans and developmental programmes should be financed on priority basis.

2. The present study reveals that there would be a good impact of fisheries on the rural development in coming future as the average cost of production of land based crop is increasing as compared to the water based. The average food grain production from one hectare land area in Haryana is 1656 kilogram per hectare per year at cost of production of Rs.4.35 per
kilogram. The net income by raising agriculture crops in one hectare land is Rs.2423.25 per year. Whereas the average annual fish production is 1902 kilogram per hectare water. The cost of production of one kilogram fish is Rs.3.45 and income per hectare is Rs.5046.70. Thus the average production per hectare water bodies is 14.9 per cent more than the land based crops in Haryana. The average cost of production in raising 1 kilogram of fish is 26 per cent less than raising one kilogram of foodgrains. The income to the farmer in raising fish in one hectare water area is 108.5 per cent more than raising of crop in one hectare land. Thus the Government should pay more emphasis on the expansion of fish farming for strengthening the rural economy. The Government should also encourage the active participation of the community in adopting the fish farming in common waters.

3. The average growth rate of fish production is 65.3 per cent which is much higher than any other agri-based food. The average annual growth rate of foodgrain (cereals) is 13.5 per cent, oil seeds - 43.9 per cent, forest production - 3.5 per cent, milk - 37.2 per cent, egg - 2.4 per cent in Haryana State. The average contribution of fisheries to the state income is only 0.095 per cent. Although at present, this contribution of fisheries to State income is not much, yet shows an upward trend. The growth rate of fishery's contribution to the State
income is 16.2 per cent as compared to 10.8 per cent of agriculture. Keeping in view, the present growth rate of income, it can easily be forecast that fisheries would be contributing about 1 per cent to the State income by 2000 A.D. Therefore, a long term prospective plan has to be developed by the State Government for the promotion of fisheries in rural areas.

4. It is observed during the present study that the person engaged in agriculture has reduced by 6 per cent during last one decade. The negative trend of employment in agriculture is towards increasing side. On the contrary the impact of the fisheries in creation of a class of fish farmers and generation of more employment opportunities is considerable. The average employment growth rate is 29 per cent comprising the 64 per cent growth rate of fish farmers, 12.2 per cent of fishing traders and 10.8 per cent in labour orientation. The government should undertake integrated fish farming in the rural sectors in association with duck, dairy, poultry, piggery etc. for generation of more employment opportunities in rural areas.

5. Fish is a highly nutritious protein rich food. The average per capita fish consumption in Haryana is only 80 gram per annum as against the 3.2 kilogram of India's level and 12.3 kilogram of World's level. The low consumption of fish in Haryana is mainly due to vegetarian habit of Haryanavis.
The Government should strengthen its extension programmes for the popularizing to inculcate fish taking habits among the rural masses to combat malnutrition.

6. The study reveals that socio-economic condition of the fish farmers is below the state average in Haryana. The literacy among the fish farmers is 24.2 per cent as against the State average of 36.14 per cent. The average per capita income of fish farmer is Rs.3185.10 per annum as against the State per capita income of Rs.3748 per annum. Thus in Haryana, the literacy and per capita income to the fish farmers are 11.94 per cent and 17.7 per cent less than the State average. Thus, there is imperative need for the consideration of deficiencies to raise the socio-economic conditions of fish farmers in Haryana State.