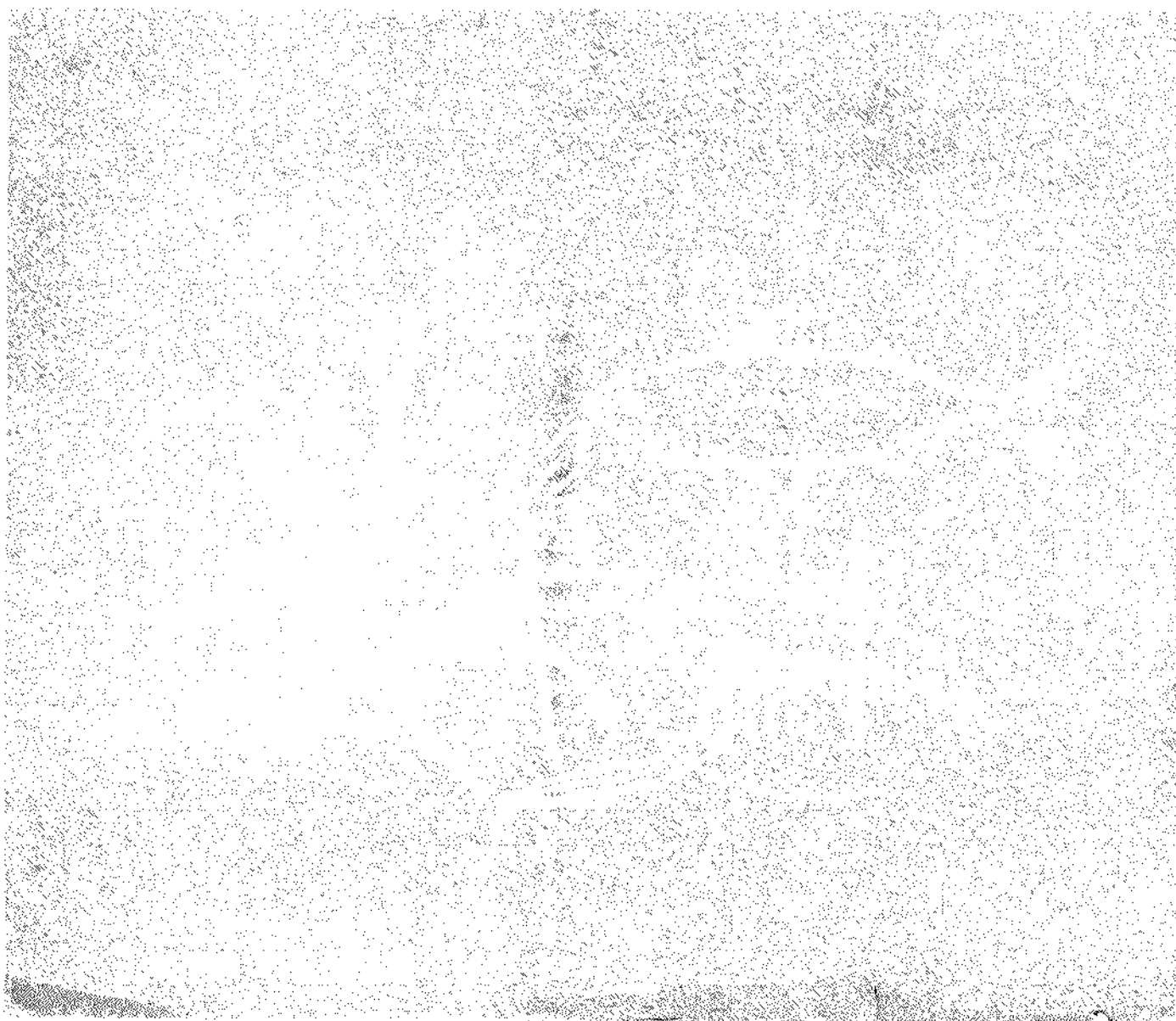


PROCEEDINGS OF THE SYMPOSIUM  
ON  
**LIVING RESOURCES**  
*of*  
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## INFRASTRUCTURE FOR FISHING INDUSTRY

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### ABSTRACT

With regard to the development of fisheries and effective utilisation of the fishery resources, such as provision of facilities for berthing and servicing of fishing vessels, handling of catches, an efficient infrastructure is essential. These facilities are being provided by different agencies in different countries.

In most of the countries it is the responsibility of the Government to provide this basic structure. In developed countries such facilities were extended a long time back and it has become urgent that in the developing countries such facilities are provided as a service by the Government. Even though it is expensive, this service by the Government would be economical and advantageous in the long run for proper development and organisation of the fishing enterprise on an industrial basis.

THE total harvest of fish and shellfish (crustaceans and mollusks) from marine and inland waters exceeded 52 million metric tons in 1965. Estimated very roughly, the value of this catch—at the fisherman's level—was in the \$7,000 to \$8,000 million range.

2. The 12 leading fish-producing countries, each of which caught 1 million metric tons or more, accounted for nearly three-fourths of world production. Two of these countries, Peru and India, were developing countries; two—Mainland China and the USSR—centrally planned countries; and the remainder developed countries (Japan, United States, Norway, South Africa, South West Africa, Spain, Canada, Iceland, and the United Kingdom).

3. The bulk of the world catch of fish and shellfish is taken from marine waters. The share provided by inland waters was 13 per cent in 1965.

4. At least a dozen countries have fisheries catches exceeding 1 million metric tons. Peru's production in 1965 was approximately 7.5 million metric tons and the year before had reached a record total of 9.1 million metric tons and in 1967 over 10 million tons. Japan and Mainland China also have fisheries crops above 5 million metric tons, and the USSR's production is rapidly approaching this level. Following these countries are the United States, Norway, South Africa, South West Africa, Spain, India, Canada, Iceland and the United Kingdom.

5. In a large number of countries the fisheries are capable of considerable expansion and such a development is highly desirable on general economic grounds in view of the potential contribution to national income from a national source, on nutritional ground because of the shortage of animal protein and on social grounds, in view of relatively large number of communities tied to fishing as an occupation. The opportunities for expansion are fairly well recognised and the possibilities for increasing the range and efficiency of marine operations and for obtaining higher yields from inland waters by stocking and culture are understood. Many Governments have formulated comprehensive and far reaching fishery policies, with the object of increasing fish production and consumption of fish products. The limitation due to poor communications, restricted marketing prejudice among consumers and isolated measures call for consolidation and coordination of developmental activities. This involves not only a balanced programme of development within the fishery industries themselves by simultaneous development of fishing, fish handling, processing, marketing and applied

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fishery research but also the coordination of those efforts with those being made in other fields like land and water use, transport, credit, food processing and marketing and nutrition. The main responsibility falls on the Government.

6. The general improvements in the economic activity, including the spread of industrialisation accompanied by urbanisation and higher per caput income is expected to increase the demand for fish products, while providing more facilities for distribution and marketing. The development of harbour facilities and communications have an important bearing on the growth of marine fisheries, although these cannot normally be financed nor operated exclusively by fishery undertakings, at least on a self-liquidating basis. Increased industrialisation, especially in regard to food and shipments, can increase the availability of skilled personnel, material, equipment and services required for modernisation of fishing and marketing practices.

7. In the fishery development, effective coordination at the planning level will bring important advantages. While the opportunities for development are manifold and require relatively modest investments, the developments have not kept pace and covered wider areas, mostly due to limited resources, lack of trained personnel in the fishery services and the present small economic importance of the fisheries and the overall economic structures within which these development programmes are confined. Even though the programmes may be justified by long term nutritional targets envisaging considerable increase in fish supplies, they are determined as to their size, mostly by immediate economic, political and social considerations.

8. The extreme dependence of the fisheries on other broader sectors of economic activity and development needs no emphasis and there can be few cases where the requirements of an expanding fishery industry will have any significant impact on overall economic planning at national level, especially in relation to industrialisation and urbanisation. Communications, like access roads, road and rail connections with arterial systems and carrier boats will have an important bearing on the location and size of the fishing centres, bearing in mind the constant need to centralise fish landings and distribution operations at some stage, where certain essential facilities can be provided economically. Shore facilities in fishing harbours are determined in the case of small power boats by the size and location of fishing grounds, the range of the crafts employed, whereas in the case of larger vessels exploiting distant grounds, minimum harbour facilities and services are essential, besides arrangements for landing, handling and distribution. The development of maritime industries will influence the availability of qualified technical personnel for fishing vessels and their maintenance.

9. While developing agricultural programmes, it is necessary to consider how far inland fisheries are treated as an integral part of rural economy and to what extent they may be effected or developed as a result of new schemes for utilisation of water resources and creation of new inland water areas by irrigation and power projects. In the majority of cases, the inland fishermen form part of the agricultural population.

10. It is necessary to ensure that fishery development programmes are specific and realistic based on a sound appraisal of economic opportunities for expansion and to recognise the relationship between fisheries and other economic activities at all stages to promote coordination of all activities.

11. Fishing industry has to be considered a little different from agriculture or mining industry in relation to resources and their utilisation. Agriculture is intensive and deals with many varieties of crops of different nature to be handled in a known area and the progress of growing crops can be watched regularly and adequate precautionary measures taken, if required, on known sources of the type of standing crops. In the case of mineral resources, the production (mining) after the estimation of the resources will be a question of tapping the known and fixed mineral resources,

But the harvesting of the fishery resources, based on the methods of estimation, capture and availability of different varieties of fish is of a different nature, as the resources are mostly moving and invisible; but the nature of organisation will have to be different from those of handling types of immovable resources. The raw materials, viz., the aquatic animals like fish, shell fish, shrimps, etc., though caught in different types of waters have to be brought to the few selected centres, either on the coast (fishing harbours) or on the seas (factory ships) for handling and utilising them in different ways. Fishery resources are to be treated as intensive in relation to economic handling of resources, though the resources themselves are to be gathered in wide areas, but limited to selected varieties. Such an organisation has to face very many situations and problems and they relate to the development of suitable designs of primary producing units, training of personnel in the handling of such types of units, different methods of handling, processing, distribution and marketing of catches and development of suitable extension and field services and facilities for maintenance and servicing of the production and processing units.

12. Governments foster programmes for assisting increase in production and marketing financial assistance and provision of credit facilities in research, education, training and extension'

13. Fishery industries in common with other sectors of the economy have been strongly influenced by the considerable and widespread change in government policies and led to extensive intervention. The governmental responsibilities can be grouped into:

- (i) Those which meet the Government's fundamental and normal responsibility for supervision, regulations and related services in the interests of the industry and the public, such as education, training, health, power, water, labour, transport, safety, etc.;
- (ii) Those which are undertaken in the special interest of the fishery industry, which would not be undertaken normally by the industry, such as, investigation of the fishery resources and international coordination, conservation and management of natural resources, international negotiation of fishery rights, trade agreements, tariff quotas, etc.; and
- (iii) Those which may or may not be without the capacity of the fishery industry depending on the level of development and nature of the problem, such as technical and financial assistance, services like training and extension.

14. Based on the Government responsibilities and the policy of the Government, the objectives of Government fishery policies will be:

- (i) to raise the nutritional level;
- (ii) to increase fish production and to contribute to additional requirements of food;
- (iii) to undertake a factual and objective assessment of marine and inland resources and indicate the availability of fish stocks and resources;
- (iv) to assess the efficiency of the existing units of production and improve them and make them available to the primary producers in time and at reasonable cost;
- (v) to provide facilities for finance and credit for proper organisation and effective marketing;
- (vi) to safeguard the stocks by regulating the exploitation and managing the resources, both nationally and internationally;
- (vii) to safeguard and improve the social status and welfare of the fishermen; and
- (viii) to create employment in the industry itself and its ancillary industries.

15. It may be noted that in the highly advanced fishing countries considerable development by Government and their action on the field communications, power and water supply, harbour

development, vocational training, etc., took place before the development of modern fishing industries and thus the stage was set for rapid introduction of technological and organisational advances. The activities of International Fishery Commissions and Councils and other arrangements for international consultations have had significant effects upon fishery policies and programmes with regard to co-operative researches and management of resources. Trade agreements including tariffs, quotas and export premiums and preferential rates of foreign exchange have contributed significantly to the development of fishing industry. Such activities would be normally the responsibilities of the Governments. The Governments in the highly developed fishing countries in Europe, North America and Japan have not only contributed to such activities but they are increasing their activities and assistance and are expected to increase further with the development of fishery industries. This factor should be taken into account while formulating fishery development programmes and in the organisation of Government fishery services.

16. The continuation of assistance in various forms and especially financial assistance by governments to fishery industries is operating in countries have highly developed economics. In the developing countries, such measures are absolutely essential for the development of fishery industries and the governmental responsibilities can be expected to increase over a long period of time. The wide range of activities which governments have undertaken are:

- (i) Fishery researches on:
  - (a) biology and natural resources;
  - (b) boat design and constructions;
  - (c) gear design and fishing methods;
  - (d) fish processing; and
  - (e) economics;
- (ii) Intelligence and statistics:
- (iii) Improvement of fishing operations by:
  - (a) financial assistance in the form of low interest loans and grants, guarantees, bank loans, subsidised interest rates on bank loans, accelerated depreciation, fiscal concessions on fuel, gear and other requisites, and Government contributions of share capital in fishery enterprises;
  - (b) extension;
  - (c) vocational training; and
  - (d) construction of fishing harbour and port terminal facilities;
- (iv) Fish processing;
- (v) Fish marketing by:
  - (a) establishment and administration of wholesale markets;
  - (b) public control or supervision of auction sales;
  - (c) transport;
  - (d) price guarantee and support; and
  - (e) promotion of fish consumption;
- (vi) Fishery co-operatives.

17. Centralisation of facilities for the development of fisheries is important as it provides for essential services, such as berthing of boats, handling of fish, supplying fishing requisites and maintenance and repairs of fishing boats. Facilities like fishing harbours, slipways, workshops, fish transport and markets, supply of ice, etc., should be considered as services exclusively for the benefit of the fishing industry or a service in the general public interest, which might be paid for wholly or in part from general revenues. Central facilities help to achieve greater efficiency in handling, selling, processing and distribution of fish and fish products in bulk. Thus it involves in the provision of harbour facilities to accommodate mechanised fishing vessels, both large and small. It will also involve in some cases provision of wholesale markets. Location of such central facilities will depend on geographical and physical aspects, economic factors, fishing areas, marketing bases and the availability of land. The type and the number of vessels, arrivals of fishing boats, types of fish and their disposal, methods of marketing and the kinds of users determine the type and the magnitude of the facilities required in fishing ports or terminals. The landing quays, mode of unloading, sorting and weighing facilities, auction hall, ice plant and cold storage and processing facilities, internal and external transport, type of fish containers, water and power, fuel and other supplies and services and amenities influence the layout of all these services and facilities in a fishing port. Further, arrangements for landing of fish and organisation of sales will have to be effectively co-ordinated by the Port, Municipal and Government authorities.

18. Harbour and port facilities are planned, constructed and administered by the State or local Government or by some other public body; this is done by the State in the developing countries. Port terminals and to a lesser extent the wholesale fish markets constitute social capital, the main function of which is to service the common interest of economic development. Such facilities for the public benefit normally do not bear profit directly from the enterprise, but are always organised as the basis of economic development and the people's welfare.

19. The normal arrangement is that the land in port areas and primary facilities such as landing facilities, auction halls, slipway and repair facilities are provided by the State or public bodies administering the wholesale fish markets. Certain secondary facilities like ice plants, cold storage, processing, supplies like fuel, oil, water, etc., are often provided by co-operatives, corporations or private industries under contract with market authorities.

20. Establishment of fishing harbours is an essential prerequisite for the development, organisation and expansion of power fishing and proper handling of the catches. Fishing harbours would have to be self-sufficient entities with approach roads, fresh water-supply, power supply, jetties, wharfs, slipways, dry docks, workshops, etc. Concentrated fish landings in the fishing harbours would facilitate the growth of the connected industries like ice and cold storage, freezing, canning, net-making, fish meal production, etc.

21. In developing countries, where the provision of harbour facilities is very important at this stage of development of power fishing, fishing ports are constructed by the Government and it has also been found essential to provide facilities for repairs of fishing vessels by establishing dry docks, slipways and workshops in the port itself and also facilities for fuel, ice and storage. The dry-docking and slipways should be considered as service in the early stages and the charges must be reasonable, till the port gets the full complement of fishing vessels expected to operate from the base. Besides providing facilities for major repairs, there must also be service stations which in the early stages should be operated by the State, co-operative or corporations.

22. In India, the provision of adequate landing and berthing facilities was given a high priority, when the mechanisation of fishing craft was taken about ten years ago and a survey of important centres was conducted with the assistance of F.A.O. experts. More than 60 centres were selected and general layout and plans were drawn for about 30 centres by 1966. The development of fishing port is in an advanced stage of completion in seven ports, is in different stages of progress in twenty centres and surveys and tests are being conducted in thirty centres.

23. In major ports the technical consultants will undertake the tests and trials and the construction programme will be taken up by the port. But in the intermediate and minor ports, the State Port Departments and Marine Division of the Public Works Department will conduct the surveys and take up construction after the designs are approved by the Fishery Departments, who provide the funds. (The Fishery Departments have a small cell dealing with the fishing ports.) The layout plans and reservations and allotment of sites for Ice Factory, packing halls, processing plants, etc., are made by the Port Department, solely on the advice of the Fishery Departments. The administration and maintenance of the port will normally be the responsibility of the Port Department, but the fishing aspects will be directed by the Fishery Departments. Special facilities for dry docks, slipways and workshop will also be provided at such fishing ports.

24. The National Harbour Board at its meeting in October 1964, recommended that the major port and State port authorities should give necessary assistance to the Ministry of Food and Agriculture by undertaking surveys, model tests, investigations, preparation of estimates and also take up the construction of fishing harbours, after the sites are selected in consultation with the Ministry of Food and Agriculture and the Ministry of Food and Agriculture would provide the necessary funds. In pursuance of this recommendation the matter was taken up with the Major Port authorities of Bombay, Marmagoa, Cochin, Madras, Calcutta and the Ministry of Transport for Tuticorin, Mangalore and Paradip harbours. The selection of sites at Bombay, Marmagoa, Cochin, Madras and Haldia has been made and the model tests are in progress. The sites are being examined at Mangalore, Tuticorin and Paradip.

25. During the next five years, it is proposed to take up construction of fishing harbours at the major ports of Bombay, Goa, Cochin, Mangalore, Tuticorin, Madras, Paradip, and Haldia as it is expected that the investigation and model tests will be completed in 1966. The investigations and surveys for construction of fishing ports at Madhwad, Malpe, Collachel, Vodelrevu and Fraserganj are proposed to be completed during the next year and complete construction in three or four years.

26. The major port trusts and the port authorities administered by the Ministry of Transport, Government of India, have already undertaken trials and tests and investigations, and some of them are working out plans and estimates for construction. [The ports of Bombay, Haldia (Calcutta) and Madras will be in a position to indicate the plans and estimates early in 1966. The plans and estimates for Paradip and Tuticorin will also be ready in six months' time.]

28. In Ceylon, the Muttuwal project near Colombo was developed by the State Government and it provides harbour facilities, ice and cold storage plants and a freezing plant (12 tons) and storage (500 tons). Ceylon Government are also constructing a fishery harbour at Galle.

29. In Pakistan, the fishing harbour at Karachi was completed in October 1959 with market building, auction hall, ice and cold storage plant with a capacity of 40 tons ice and 60 tons storage and for freezing and rail and road transport facilities. Similar facilities are being developed in Chittagong in East Pakistan.

30. In Thailand, the fishing harbour provides for auction halls, fish marketing organisation, fish boiling plant, ice plant (80 tons), cold storages (1,120 tons), road and water transport and other amenities. Fish marketing organisation administers the sales and services on behalf of the Ministry of Agriculture.

31. The fish terminal in Hong Kong provides facilities for wholesale markets operated by the Hong Kong Fish Marketing Organisations, block and stall, etc., cold storage (115 tons), communication and a quay 170 meters long. The fish marketing organisation administers the terminal on behalf of the Hong Kong Government.



32. In Indonesia, a major base is to be built in Tandjungprick near Djakarta by an agreement with a Japanese firm for harbouring fishing vessels and constructing freezing, housing and communication facilities at the base and provide medical aid facilities and homes for Japanese fishermen. Special radio stations will be built to control and direct fishing fleets. The investment will be by the Japanese agency from out of the Economic Co-operative Fund established by Japan in 1960. It is proposed to have a secondary port at Tjirebom.

33. The fishing port at Takoradi in Ghana was set up as a pilot scheme with F.A.O. advice and assistance in May, 1960. This is operated by the Ghana Fishing Corporation, financed by the Central Government. It is built for an annual turnover of 6800 tons. It provides for a market building, ice plant, ice storage (10 tons), cold storage (45 cu.m.) and certain amenities.

34. While indicating the programme of development of services in fishing terminal in some of the developing countries, it will be useful to refer to such facilities in some of the developed countries.

35. The Fish Terminal at Tokyo, handling above 1,600 tons of fish a day is administered by Tokyo Metropolitan Government. It provides auction halls (16,000 cu.m.) selling areas (24,000 cu.m.), Ice Plant (100 tons), refrigeration capacity of 2,000 tons, fresh fish storage (3,790 sq.m.), dried and salted fish storage (1,500 tons), boiling room, rail sidings and amenities. It has a quay wall of 550 meters to accommodate vessels of sizes 100 to 3,000 tons.

36. The fish terminal of Boston is owned by the State and leased to Boston Fish Market Corporation for managing the market and New England Fish Exchange conducts the auctions. It handles about 175 to 200 tons a day. The landing quay is 360 meters long and 90 meters wide. It provides a market hall, stores ice plant (3,500 tons), cold storage space (1,180 cu.m.), deep freeze storage (34,560 cu.m.), with supplies and repair shops and transport and amenities.

37. Grimsby in England handles about 700 to 1,000 tons of fish a day. It is administered by the British Transport Dock Section of the British Transport Commission. Grimsby Fishing Vessel Owners' Association engages shore labour and Grimsby Exchange Ltd. provides supplies and services. It provides market halls, stands, ice plant (1,000 tons), cold storage (100,000 tons), landing equipment, road and rail transport, and supplies and services. There is also a boat building yard.

38. In Esbjerg in Denmark, the fishing harbour was built by the State and administered by the Department of Hydraulic Engineering. The marketing is done by the Co-operative Danish Fish Marketing Association. It handles 40 to 50 tons of fish a day. It has an auction hall (3,400 sq.m. and 200 tons), store houses, ice plants (600 tons), frozen storage plants (9,000 tons), filleting plants, canning plants, and fish meal plants. The length of the quay is 2,900 m. Special unloading facilities for discharging 225 tons per hour are provided. Road and rail facilities are available. The harbour has a modern slipway and repair services are extended by private firms.

39. In Gothenberg, Sweden, the fishing port is administered by Fishing Port Office subject to Gothenberg Harbour Board. It handles about 250 tons per day, landed by about 300 vessels, ranging in size from 40 to 140 gross tonnage and 100 coastal vessels and has a quay of 1,160 meters. It provides auction halls (5,200 sq.m.), packing rooms (3,400 sq.m.) accommodation for rooms, containers and office, ice and cold storage plants, road and rail facilities.

40. The Government of Belgium built a fish terminal in 1952 and handed it over to the Municipality without charge and it manages the port and market. The port handles about 200 vessels; the average daily landing is about 150 tons. It has a market hall (6,720 sq.m.) rooms for traders, two slipways, two docks, repair shops, etc. Rail and road transport is provided,

41. In Gdynia in Poland, the fish terminal is owned by the State and administered by the Fishing and Service Enterprise (ARKA). It is also responsible for the management of all harbour facilities, unloading and handling of fish and operation of ice and cold storage plants and fish meal plants. ARKA bears all expenditure on construction and receives all charges and dues and is in-charge of all transactions. This port handles about 200 to 300 tons a day and is the base for about 200 fishing vessels. It provides for marketing halls (12,500 sq.m.), ice plant (75 tons), cold storage and freezing plant (90 tons), fish meal plant (45 tons) and rail and road transport. The length of the quay is 380 meters and that of jetties 2,150 meters. There is a repair yard for cutters.

42. In Philippines, the fisheries project of the Emergency Employment Administration is establishing 17 fish wharves, 13 ice plants, 5 fish canning and processing plants in different centres.

43. With regard to the development of fisheries and effective utilisation of the fishery resources, it is essential that an efficient infrastructure for providing facilities for berthing and servicing of fishing vessels, handling of catches, processing of the fish landings, distribution and marketing of the catches. These facilities are being provided by different agencies in different countries. But it is the responsibility of the Government in most of the countries to provide this basic structure. In developed countries such facilities were extended a long time back and it has become urgent that in the developing countries such facilities are provided as a service by the Government. Even though, it is expensive, it would be economical and advantageous in the long run for proper development and organisation of the fishing enterprise on an industrial basis.