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NATIONAL SYMPOSIUM ON RESEARCH AND DEVELOPMENT IN MARINE FISHERIES

MANDAPAM CAMP

16-18 September 1987

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A SUGGESTED PLAN FOR DEVELOPMENT OF MARINE FISHERIES SECTOR OF ANDHRA PRADESH

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ABSTRACT

A suggested plan for the development of marine fisheries sector of Andhra Pradesh is presented here. The condition of the state fisheries shows stagnation of overall productivity of the waters. Andhra Pradesh contributed on an average 1.47 lakh tonnes, forming around 9% of the total fish catches of India (in 1984). The following are major areas to be considered for proper planning and development. Several of the stocks are being fished in a narrow coastal belt and there is thus concern on the depletion of these resources; secondly, there is the threat of increasing incursion of foreign fishing vessels; thirdly, the increasingly fast degradation of coastal waters by multiple users on the one hand and multiplication of traditional users on the other; lastly, the potential of aquaculture is yet to be fully assessed.

The plan hence recommends four major but broad thrusts for the overall development which includes management and conservation of marine fisheries; prevention of pollution and degradation of wetlands as pertaining to fish habitats: strengthening the commercial fishing industry, particularly of the 200 miles EEZ; and aquaculture as an additional technology.

The implementation of the plan is to be vested with the State Department with collaboration from Research Institutes and Universities and agencies such as Rural Development, Irrigation and Power, Environment and pollution control Board. The implementation of action plans depends on information available. It also needs a management regime or Task Force. Legislation and organisational changes will be needed.

The management and development of these four thrust areas are detailed further with recommendations in each area of action.

INTRODUCTION

The suggested Plan for development of coastal/marine fisheries sector of Andhra Pradesh is a comprehensive outline of major thrusts in which the State's marine/coastal fisheries resources are to be managed and best utilized for the well-being of the rural fisheries sector.

A target date for achieving goal can be set up ten years from now viz., the year 1996. Similarly a few major thrusts or goals or development can be planned for, instead of a diffuse and far-much-spread out target.

The condition of the State's fisheries, the increasing demands on the prawn fisheries should be viewed with some concern. The main points of concern are as follows:

1. Many of the fish stocks, especially prawns, are being fished in a narrow coastal zone and there is thus concern for depletion or threatened depletion of these stocks.

2. There is a constant and rapid incursion of foreign fishing vessels off the coasts without proper agreement or joint ventures with our country which is also a major factor in the depletion of important resources. Monitoring of catches of these vessels is necessary to guard our resources.

3. Increasingly fast degradation of estuarine, coastal marine environment threatens the coastal marine fisheries.

4. Potential of aquaculture is to be studied on an area by area basis for evaluating economics of alternate employment to rural fishermen as well as its environmental impact in the coastal zone. Based on the above review four major thrusts in the development of Marine Fisheries Sector as an overall programme of rural development are envisaged in the plan as follows :

1. Management and conservation of marine fisheries.

2. Sterngthening the commercial fishing industry within reasonable limits and imposing ceilings on boats, nets and catches. Permits to foreign vessels, phased exploitation of the 200 miles EEZ. Marketing of product meeting the consumer demands of the state as well as National and International exports. The prevention of pollution and degradation of wetlands as pertaining to fish habitats viz., mainly conservation.

3. Aquaculture as an alternative technology

in the context of an integrated rural development to be developed by State Department of Fisheries.

The implementation of the plan rests with the State Department of Fisheries, A.P. requiring coordination of state and Central Government and other agencies such as Universities, rural development agencies, water pollution control board and water resources and irrigation and ecology and environment sector authorities. Implementation also requires understanding of the needs for such priorities, and support by way of funding.

In each thrust of action, further progress will depend on the state of information available for the next course of action. A few of the areas in which implementation of action has already begun are: the establishment of coast guard at Visakhapatanam for marine security, the establishment of a few fishing harbours (at Visakhapatnam, Kakinada, Nizampatnam and Bhavanampadu); voluntary cuts on trawler operations (at Visakhapatanam harbour ?) and the preventive actions taken by the State Board for prevention and Control of water pollution etc., to control release of effluents and, issuing guidelines on the siting or location of industries vis-a-vis their effluent releases and effect on human beings.

For each plan of action however, a management regime needed to be established as also a monitoring body (a task force). Legislation and organisational changes will be needed along with interaction with other bodies connected with coastal zone and marine zone. This has to be worked out in detail where necessary with short-term research and inventory type projects.

THE STATUS OF THE ANDHRA PRADESH FISHERIES: BACKGROUND

With a coastaline of 970 km, Andhra Pradesh is the largest maritime state in peninsular India. It contributes around 1.3 lakh tonnes (average of 1970 - 1980) of fish and shell fish to the national grid, forming around 9% of the total catches of India. The contribution of marine exports (sea food) is around 6% of which contribution from prawn alone is around 5%.

Several new management (technological) skills have been developed and introduced in the state such as :

i) Beach landing mechanised craft fitted with in-board engine and capable of easy surf crossing.

ii) Four new fishing habours to give berthing facilities for 100-300 small mechanised boats and large trawlers.

iii) A boat building yard at Kakinada.

iv) Brackishwater aquaculture.

While these measures for management of fisheries have been developed, the State has not made any progress in regard to the controls on fishing activity such as regulation of fishing effort or curbing free access to fishing areas. No doubt it is a national problem and a National Fisheries Law has to be promulgated. Albeit the same, the State has a responsibility towards its fisheries resources protection which is also dwindling due to other user patterns such as land use and water use, cutting down of managroves, dredging and mining in near-shore waters and so on. Perhaps meaningful control has been difficult and at times altogether absent.

The Condition of stocks

The capability of Andhra Pradesh coastline to yield catch has stagnated around 1.3 lakh tonnes in 1980. New innovations in craft and distant area fishing from the coastline seems to have indicated possibilities of greater yields (Anon, 1978, Narayanappa *et al.*, 1968).

Our knowledge of the marine ecosystem and changes occurring due to man-made interferences area by area, are limited, The continued increase in fishing effort might in the long terms introduce changes in ecological relationships and have serious, unpredictable consequences.

On many fishing grounds, a variety of species exist in the same area, at the same time. Trawls catch a mixture of species in addition to their principal target species. The incidental catches of fish which are "unwanted" and thrown back indiscriminately causes serious ecological changes and also undue changes in the pray-predator relationships. The recent "concentration" of all fishing effort on prawns alone, is one of such examples.

Fish Habitat Degradation

Physical encroachments and effects of effluent releases, be it from industry or agriculture and navigation are serious handicaps that must be viewed with concern. Information of impact on these changes is lacking and must forthwith form a part and parcel of programmes for impact studies.

The establishment of industries, fertilizer factories on shore lines, of ecologically sensitive areas such as the Kakinada Bay where thousands of

fishermen make their livelihood, must be viewed with concern and the Department of Fisheries must push forward its claim for obtaining impact studies before such siting is permitted (Rajyalakshmi, 1987; Sivaji Rao, 1987). Similar studies are needed and interaction with River Valley Development Boards about scientifically based quantum release of water to estuarine areas to prevent undue changes in the environment. The increasing salinity caused by reduced flows are known to have a serious impact on shell-fish environments and prawn/fish nursery areas.

The Commercial Fishing Industry

The commercial fishing industry of AP is large in view of its vast coastline, big lagoons such as Collair and Pulicat, and a number of reserviors, rivers and tanks. About 3 lakh fishermen make their livelihood on this besides middlemen employed in marketing, processing and export industry. More than 80% of the fishing craft is individually owned (unless middle-men controlled due to non-payment of loans taken) and more than 80% are small craft. Even in the processing industry the trend is similar. With one or two exceptions the processing plants are small - unit operations.

Following the trends in the All India Landings (in a range of 12-14 lakh tonnes in 1975-1982) the landings of Andhra Pradesh also showed fluctuations (in a range of 0.8-1.56 lakh tonnes). The prawn production continued to contribute around 4.80 to 6.67% during this period except during 1982 when it went upto 8.97% (CMFRI, 1983).

In the same period the increase in effort (both fishermen population as well as their craft and gear) has doubled. This trend indicates possibility of further rise in effort. Further, the efficiency of craft and gear has improved by new innovations in techonology, as shown earlier.

Fish and Fish-food supply

As per present estimates the Andhra Pradesh yield of fish, prawns and others has already attained the maximum sustainable yield (whether it has attained or crossed the economically sustainable yield does not seem to have been estimated). If haversting of unconventional species of squids, cephalopods and other crustaceans is increased (and potential of these are to be estimated by exploratory survey in offshore and depth zones), then there is a possibility of increase in yield and diversification of yields and markets. The present stagnation in yield suggests that the harvest should be reduced to insure against ecological damage and other long-term adverse effects.

THE FUTURE PROSPECTS

Two studies are urgently needed, if they have not been already undertaken when the World Bank assistance has been sought for construction of the fishing harbours of the State. They are:

i) The Economic value of the marine fisheries resources to the state: (a) at the present fishing level, (b) by management techonology, such as surf boats, mechanised boats capture of new species and (c) by the exploitation of 200 miles economic zone (either by own operations or by foreign vessel lease or chartering).

ii) Economic forecast of the industry say, for the next decade.

Both studies can be allotted to State Economics Bureau (or other Institutes) and a report be obtained.

Some assumptions that can be made in this regard are that the capture fisheries produce is going to substantially increase from other sectors.

In the processing industry side, the gains would rise more than marginally considering the international trends in prawn export trade and introduction of other finfish into the processing industry. We can use these base-line reference points to plan for the future prospects. To sum up, unless proper habitat improvements are made, controls set on efforts and yields, diversification in marketed product is done, the prospects of greater yields are not seen.

The nature of changes that are required to be made to improve the present trends or to prevent deterioration are given below.

Thrust Area 1

Free access of fishing boats/trawlers to some shallow areas such as, for example, Kakinada Bay may lead to undesirable economic consequences and depletion of fisheries by overfishing. Excessive capital and labour are attracted to free access. The inability to curb free entry into coastal fisheries might result in overexploitation, overcapitalization and conflicts between different users (Rajyalakshmi *et al.*, 1986).

The overall depletion of degradation of resources can be curbed only by comprehensive management. An authority for this purpose must

be created. This body requires information on available stocks and the factors affecting them. National Fisheries Research Institutes have acquired considerable statistical data over a number of years and these data can be made use of by the management authority.

Thrust Area 2

The degradation and decline in the fish habitats must be stopped forthwith by resorting and enhancing and establishing protected area or sancturies in some. Full implementation of existing legislation is necessary. New legislations must be passed where necessary in this regard so that they can provide legal basis to limit habitat losses and degradation. The present effort to limit the lossess face constraints because of the lack of proper consideration to fisheries needs in the planning such as controls or consultations when changes are made on land and water uses, permitting industrial establishments and operations in shore areas. More studies are to be emphasized on habitat losses, particularly of mangroves. To offset this loss restoration programmes can be combined with aforestation programmes of the DRDA and IRRP and Forests Departments i.e. planting of mangrove seedlings in addition to casuarina in certain estuarine areas.

Taking Kakinada Bay as an example of a site specific changes can be seen that mangroves are being removed for aquaculture and industry. Industries such as fertilizer companies are permitted to be sited on the Bay shoreline. These will have critical effects upon fish stocks of the Bay. The conservation measures are essential here.

The relevancy of the research programmes should be through (i) identification of high-priority research needs: (ii) periodic inventory of habitat areas to determine losses and (iii) monitoring the effect of decisions alre dy implemented in some fisheries habitats.

RECOMMENDATIONS

Area 1: Improved management and conservation of marine fisheries

To improve the management of fish stocks, basically policies, plan and institutional managements are needed. They require:

- that all interested parties are brought in to form a forum to advise on the needs for management.

- As much scientific knowledge as possible on the stocks (i.e., the resource) their habits and ecological relationships.

- Limit entry to any fishing areas based on the above information first educating the fishermen on the biological and economic aspects (for example, the State Department can limit the number of trawlers operating in a given area and also limit the area of operation). Funding for proper surveillance to assure compliance with management programmes.

- Develop necessary legislative authority. Manage stocks for optimum utilization i.e., (i) for some stocks it may be better to prohibit fishing for a short while to rebuild a stock. (ii) or to prevent capture of other incidental species while catching prawns.

- Information booklets be brought out on specific areas such as Kakinada Bay (East Godavari Dist) to point out the fisheries potential and need for conservation.

Strengthening may be done through improved technology base on one hand and improved marketing system on the other.

Most of this action lies in management area. For instance improving the resources by way of restoration programmes, continued availability of stocks, alternative technology such as aquaculture, and improved craft, gear and processing technology and if possible, limit entry to fishing.

National utilization of resources is the prime objective. Whether joint Government-industry or privately managed programmes can be taken up (if not already done) wherein government will provide the needed technology other inputs and financial support. This can best apply to offshore fishing which, at present is given to foreign vessels.

Another method is to think in terms of comprehensive catch-to market systems (i.e. integrating capture, processing and marketing) whereby middlemen are eliminated.

Area 2: Management of fish habitats

It is to be reemphasized that protection of fish habitats prevents deterioration, degradation of these habitats and results in restoration and enhancement of areas; declaring sanctuaries/protected areas without detriment to other compatible uses of the area. In this programme, the State Board for Prevention and Control of Water pollution and Forest and Environment Depts. must coordinate their activities with Fisheries and National environmental policy acts must be

brought in.

Restoration work can include replanting of mangrove seedling; enhancement by way of preventing effluent releases and stocking of juveniles and so on.

- Environmental impact statement by all industries must include impact on fish habitats and losses thereby.

- Educate public through extensive activities, TV and radio information etc. Make public also party to these conservation programmes.

- Funding to undertake these activities must be provided for, separately.

- Quick dissemination of information (by research, survey etc.) to serve particular needs.

- A Coastal Zone Management Legislation is needed.

Land use districts can be zoned in the basis of following categories: 1. Urban, 2. Agricultural, 3. Conservation and 4. Rural. Departures from this are to be allowed only by permit system. Indentification of hurdles is very much essential here and universities, fisheries organisations can undertake quick short-term studies in this regard whatever the earlier failures may be.

In this context an integrated approach to development of coastal fisheries to minimise the trawler (industrial) versus small-scale fisheries conflicts and at the same time protect the resources must be developed by involving both the groups in the decision making process.

Area 3: Aquaculture

Competing uses of the coastal areas, and taking into account the fact that fishing at times is a part time occupation, this sector should be part and parcel of an integrated rural development plan. Aquaculture helps to add income to the family beside providing occupation and food and helps to divert pressure from the fast depleting coastal fisheries.

Therefore, it will be a strategy to increase production and or divert attention from the capture to culture fisheries to prevent stress on some species.

The output from aquaculture (fresh and brackishwater) in Andhra Pradesh has been tremendously on the rise in the current decade and might be accounting for about 0.1 lakh tonnes, roughly 10% of total Andhra Pradesh production. The state can expect to further increase this production to 40% in the near future in view of the rising costs of Agricultural production and a good demand at Howrah market for freshwater fish and international market for the shrimp.

In Andhra Pradesh aquaculture of major carps began a century ago but it is in the current decade that the seed production has multiplied to supply almost the entire need of the aquaculture industry of the state. This is both in public and private sectors. The seed production, however, has not become a feasible technology in regard to the brackishwater fish and prawns. Hence, brackishwater aquaculture industry is lagging far behind. Private or public aquaculture has not yet touched oysters, clams and catfish and no expansion has taken place in regard to the giant freshwater prawn, *Macrobrachium resenbergii*.

There is quite a good scope for increasing fish production in Andhra Pradesh by developing/expanding hatcheries and also encouraging farming of shell-fish such as molluscs in the inshore areas such as bays/creeks.

For some species such as the major and exotic carps the technologies of seed production and farming are well known and production per unit area can be readily increased to meet the demand. For other species, particularly in brackishwater species, available technology must be further augmented vis., for shrimp, molluscs,crabs, lobsters and marine fishes (mullets, *Chanos,Lates* etc.).

The important advantage of aquaculture in Andhra Pradesh is the availability of water resources in many coastal areas thus avoiding competitions with other uses. Production records from private industries demonstrate the success of major and exotic carp culture and provide also a basis for estimating their potential for expansion. The carp production has increased from about 10 tonnes in 1970 to about 1000 tonnes in 1980. With adequate markets and prices, it can be expected to be doubled during the next half a decade.

Although all the trends point out to the expansion of aquaculture, there is no sign of diversification on the part of the private industry in regard to the species to be cultured. For instance, viable technology is available for freshwater prawn farming so also is a ready shrimp market. But it has not taken off yet although its commercial viability has been proved in countries such as Hawaii. Adequate quantities of clean freshwater is needed. Similarly is the need for unpolluted brackishwater in the coastal zone. But competition for water does exist and these problems

i.e. zoning, waste disposal/control and, licensing must first be attended to.

Many Government organisations, both central and state are involved to some degree in development of aquaculture. Each is independent of the other without an overall plan. No attempt has been made to make a unified effort to guide and coordinate these multifarious efforts.

Since it is proved that aquaculture is a tool for augmenting the state supply of aquatic food (protein source) and offers opportunity for making use of hitherto un-or underutilized resources such as the brakishwaters, a state wide policy is needed to organise this as an industry and also to protect the costal zone.

The objectives of a specific plan and policy statement in aquaculture development would be:

- To maintain or increase fish production using a broad spectrum of species. To provide scientific, technical, legal and institutional base needed for the development of aquaculture. To facilitate easy flow of or dissemination of research results by way of extension activities.

- A state level body would engage in activities providing leadership, joint planning and coordination of programmes with all parties including international agencies concerned in aquaculture development (viz., the State Government, the academic body, the private sector etc.).

- Research and development to provide biological information and development of aquaculture of certain species shall be done.

- Other institutional hindrances to progress of aquaculture would be tackled in co-operation with other groups such as economics, legal and social ones.

Starting a State Fisheries Institute for Education and Training of scientific/technical personnel, an Institute is very much the need of the day, not simply to develop graduates and postgradutes in fisheries science but training of fisheries managers, scientists with multidiciplinary approach to the development of the coastal and marine zone to preserve, protect, and enhance the same for fisheries, for maintaining the aesthestic values of the shore line, for pure water resources. These trained personnel in different disciplines are needed under extended jurisdiction to meet the needs of the new threats to environment.

A college of comprehensive fisheries including Marine Affairs may then be started immediately anywhere along the coastal areas of the state, staffed by teachers possessing experience in multidisciplinary aspects of aquatic living resources.

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