SOME CONSIDERATIONS OF FISHERIES DEVELOPMENT PROBLEMS IN THE PACIFIC ISLANDS AREA

by

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INTRODUCTION

Since the termination of World War II in 1945, a substantial amount of effort has been directed toward the development of fishery resources of waters surrounding the thousands of islands in the Pacific (commonly identified as Oceania). Various development projects have been sponsored by the island governments and territories, international agencies, e.g. Food and Agriculture Organization of the United Nations (FAO), South Pacific Commission (SPC), private funding agencies, and private enterprises. References to recent successes have centered around the development of the Pacific-wide fisheries for subsurface tunas and billfishes (Johnson, 1959) and more recently the development of fisheries for skipjack tuna, Katsuwonus pelamis, in the western Pacific, principally the Palau Islands region (Uchida, 1970), Papua New Guinea (Kearney, 1973), and the extensive southern water Japanese skipjack tuna fishery (Tohoku Regional Fisheries Research Laboratory, n.d.). Attempts to develop new coastal fisheries or to expand existing fisheries of the neritic-pelagial resources have met with varying success. One of the remarkable successes has been that of the fishery for round scad, Decapterus spp., in the Philippines, a fishery which increased from an annual catch of 19.0 thousand metric tons in 1956 to 206.8 thousand metric tons in 1967 (Shomura et al., 1971).

There have been failures in fisheries development programs; however, these are more difficult to identify since failures generally are not publicized nor well documented. The scope of these failures ranges from small projects designed to aid subsistence-type fisheries to developmental projects involving substantial capital. An example of the latter is the attempt by private enterprise in the 1940's to develop a tuna fishery in American Samoa. A cannery was constructed with the objective of obtaining an adequate supply of surface schooling tuna from Samoan waters. For several reasons, the principal one perhaps being the lack of an adequate supply of baitfish, the expected catch of tuna did not materialize and the project failed. Interestingly, the cannery was put into use a decade later utilizing subsurface tunas caught by Japanese longline vessels (Van Campen, 1954).

In the following sections, I will comment on a number of areas which need to be considered in undertaking a fisheries development program. The discussion is far from comprehensive and should be viewed as providing some of the ingredients for a total systems package. Many of my comments are simplistic and obvious, but in view of the shortcomings of many fishery development projects, past and present, it may be useful to make these comments.

GOVERNMENT POLICY

A positive fisheries policy by a government is essential if a fisheries development program is to succeed. This is especially critical in the Pacific islands area where development programs usually commence from a starting base beset with potential difficulties, e.g. lack of qualified help, problems in logistics, and absence of proper infrastructure.

In developing a fisheries policy and a subsequent program, the government is initially dependent upon advice obtained internally from its staff or externally from experts and consultants enlisted from elsewhere. Ideally, the government needs an initial overview of the total fisheries picture, including the assessment of naturally occurring fishery resources, and evaluation of aquacultural possibilities, marketing potential, required infrastructure for fishery development, and a "first cut" economic analysis. In essence, a systems analysis approach such as described for fishery management by Rothschild (1971) is required for the development of a sound fishery policy and program. In describing a systems approach, Rothschild (1971) states "The central theme in systems analysis involves using the anlysis to ask the right question by cycling iteratively through (1) defining objectives, (2) designing alternative systems to achieve these objectives, (3) evaluating the alternatives in terms of costs and effectiveness, (4) questioning the objectives and other assumptions underlying the analysis, (5) using this examination to open new alternatives, and (6) establishing new objectives. Once the new objectives are established, the cycle is re-entered at step (1)...." Successful planning should result in program priorities being established on the basis of knowledge of the fishery resources available, and development should be in line with the objectives of the government, e.g. increasing domestic consumption of fish and fishery products, establishing a more favorable foreign exchange by developing export markets, or increasing job opportunities.

It is unfortunate that in some areas, decisions on program support have been based on recommendations made by experts in specialized fields without examining alternatives to achieve the primary objectives. Within the context of the specialized fields, e.g. aquaculture, turtle farming, outer reef fishing, or bottom trawling, the priorities and recommendations expoused by these specialists may be sound; however, without reference to the country's objectives some poor decisions have been made and low priority programs have been funded at the expense of needed programs. Considering the small budgets usually associated with fisheries departments, it is essential that the decision makers address the question of "<u>are you doing the right thing or doing the thing right</u>?"

RESOURCE PROBLEMS

In the development and management of fishery resources, Gulland (1971a) noted that policy makers need three sets of figures: the best current estimates of the potential sustained yield from the stock, the present catch, and plans for increase in catch. For much of the area under consideration (principally the volcanic and coral islands of Oceania) these figures are virtually lacking. Even in Hawaii where the state government has a routine system of collecting commercial catch statistics, the reported catch is considered to be an underestimate of the true landings; this is principally because the recreational catch, which is estimated to be substantial, goes unreported.

Gulland (1971b) in a review of the fish resources of the ocean provided rough estimates of the potential yield of fishery resources (excluding tunas and billfishes) around the volcanic and coral islands of the western central Pacific (included are Nanpo Shoto group, Trust Territory of the Pacific Islands, Gilbert Islands, Ellice Islands, Solomon Islands, and the islands southeast of Papua New Guinea). For this area, Gulland estimated the yield to be around 43,500 tons and suggested that a three to fivefold increase of this minimum figure was not unrealistic as representing the true potential yield. Compared to the potential yield estimates of other underutilized resources, e.g. 2 million tons estimated for the California anchovy, Engraulis mordax, (Gulland, 1971b), the resources of the island waters do not suggest having the base necessary to sustain large scale fisheries. This does not, however, include the skipjack tuna resource, which is reported to be a large underutilized resource in the Pacific (Matsumoto, 1974). Murphy (1973) stated that "...a Pacific Islands fisheries program is not likely to contribute greatly to the world's fish supply."

Gulland (1971a) and Murphy (1973) stress the need for stock assessment estimates for rational development and management of the resources. While gross estimates of potential yields have been attempted for the Pacific island areas, these are "educated" guesses, at best. Although indications all suggest that the fishery resources of the coastal waters of the Pacific islands are only large enough to support fisheries for domestic needs, and at best a modest export industry, e.g. spiny lobsters, stock assessments are needed for proper management purposes. Murphy (1973) noted that one of the basic problems hindering stock assessments in the tropics is our inability to age tropical fish. Since publication of his paper, however, there has been a breakthrough in this problem area; recent studies provide evidence that fish otoliths bear markings representing daily growth increments. Current studies on the Hawaiian anchovy, Stolephorus purpureus, skipjack tuna, and goatfish, Mulloidichthys samoensis, in Hawaii are substantiating the validity of this aging technique (Paul Struhsaker, Southwest Fisheries Center, National Marine Fisheries Service, NOAA, Honolulu, HI 96812, pers. comm.)

Stock assessment studies of tropical fishery resources are also needed to clarify the turnover rates of production. One of the prevailing views is that tropical waters do not have a high standing crop of biological entities, vis à vis waters of higher latitudes; however, it is believed that a presumed faster growth rate, earlier maturation, and shorter life span provides for a rapid turnover rate in tropical waters and thus a high potential annual yield. As an example, the life span of the California anchovy and Japanese anchovy, Engraulis japonicus, is measured in terms of several years; the Hawaiian anchovy, on the other hand, has a reported life span of about 6 months (Paul Struhsaker, pers. comm.).

One of the principal deterrents in the development of fisheries for large scale local market operations or export fisheries in the Pacific islands areas is the large number of fish species encountered. The fish fauna is basically of Indo-Pacific origin and highly varied. In Hawaii, the fish fauna is reported to number 682 species (Robert T. B. Iversen, Southwest Region, National Marine Fisheries Service, NOAA, Honolulu, HI 96812, pers. comm.); a considerable number of these species appear in the fresh fish markets. For most large-scale

fisheries the industry is generally geared to a few species, e.g. Peruvian anchovy, Norwegian herring, Alaska pollock, tunas and salmon. In a number of fisheries where many species are taken in addition to the principal species sought, e.g. shrimp trawl fisheries, the fish taken as byproduct are considered of nuisance value and are often discarded. The reasons are basically economic in nature with the cost of sorting, handling and marketing not commensurate with the potential earnings. Another complicating factor is that the catches made by the types of gear used in the coastal waters of the Pacific islands, e.g. traps, gill nets, and handlines, cover a wide range of fish size.

The widespread distribution of the fishing grounds also retards further development of existing fisheries or the establishment of new fisheries. Except for the islands in the far western Pacific, e.g. Philippines and Indonesia, where the fishing grounds are extensive and geographically concentrated, islands of the Pacific have narrow shelves; thus the habitat for a given species or group of species is limited in size and usually strung out along island chains extending over great distances. In the Hawaiian archipelago, the grounds between 0 and 100 fathoms are estimated to be 20,800 km^2 in area; however, these grounds are distributed over a horizontal distance of 1,660 nautical miles.

Finally, in the resource problem area is the presence of ciguatoxin in some reef fishes. The lack of a rapid method of detecting ciguatoxin in fishes has forced fishermen to discard those species noted to have a history of toxicity. In some developing fisheries this amounts to a considerable percentage of the catch. In American Samoa a viable handline fishery was started in 1972. In recent years the annual landed catch has totaled around 136.1 thousand kg; an approximate 27.2 to 45.4 thousand kg of fish have been discarded because of potential problems (Stanley N. Swerdloff, Office of Marine Resources, Government of American Samoa, Pago Pago, American Samoa 96920, pers. comm.). This discard represents a substantial economic loss to the fishermen.

PEOPLE PROBLEMS

Basically the people problems in fisheries development involve the difficulty of placing the right people in the right places at the right time. The failure of some fisheries development programs can be directly traced to the disruption of the time phases of the program because of personnel problems, e.g. the lack of qualified mechanics at the start of a developing fishery is crucial to success of the fishery, since mechanical difficulties result in reduced fishing time; a reduction that fishermen in a developing fishery can ill afford.

In some development programs which involve on-site training of local talent, staffing is often inadequate. The failure of some development programs can be attributed to this lack of "critical mass." Presently there are a number of programs being carried out in the central and western Pacific Ocean to develop skipjack tuna fisheries, e.g. in American Samoa, Western Samoa, Trust Territory of the Pacific Islands and Fiji. Considering the complexity of a pole-and-line fishery, a fishery which involves fishing for baitfish, fishing for tuna, and operating and maintaining relatively large vessels, most of the programs appear to be undermanned in terms of qualified personnel.

In many areas of the Pacific Ocean a common complaint expressed is that many of the island people do not have extensive fishing traditions and thus cannot be counted upon to take an active role in the producer (fishing) end of the industry. While this may be true for some of the more arduous types of fishing, e.g. longline fishing with its long hours of work and long periods away from home port, many of the coastal types of fishing represent viable vocational options to the peoples of the Pacific islands.

In reviewing the shortcomings of past attempts to provide local input into developing fisheries, several points should be considered. First is that the social and economic structures of many areas are not as highly time-oriented as in many of the western cultures. In an industry where each member of a fishing crew is closely dependent upon the other, the tardiness or absence of one man can cause serious problems. Motivation is also a vital consideration. The economic level in many of the areas is such that economic motivation--the desire to accumulate capital (cash)--may be lacking. Until the economy progresses from basically subsistence to a cash economy, the motivational problem will probably continue to exist. The socio-economic aspects of fishery development in the Pacific island areas have not received adequate attention.

Similar to the problem of the geographically widespread resources noted in an earlier section, the companion problem of the widespread distribution of people and facilities also handicaps development of fisheries in the Pacific islands area. Recently there have been some attempts to overcome this problem by setting up a series of holding facilities on scattered islands and sending mother ships to collect the catch at intervals. Success of this method of development will depend on the economics of the system.

DISCUSSION

Despite the multitude of problems associated with developing fisheries in the Pacific islands area, the case is not a hopeless one. In fact, from a resource utilization standpoint it is essential that fisheries development work continue in this area. As the populations increase and the island territories and governments expand their economies, the trend towards urbanization will continue. Thus, while many of the areas are currently able to meet their protein needs through subsistence fishing, the demand for expanded domestic fishing and for the development of high-seas fisheries is bound to increase in the coming years. Needed are sound fisheries objectives by governments which are consonant with the available fishery resources within their region. Alternatives need to be examined, infrastructure problem areas need to be anticipated, and socio-economic aspects need to be considered. In essence there is a need for a total systems analysis package.

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