

SOCIAL AND ECONOMIC ASPECTS OF SMALL-SCALE FISHERIES
DEVELOPMENT: A CASE STUDY FROM MALAYSIA

by

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Abstract

Natural, technological, and human resources interact systematically and it is argued that development strategies for small-scale fisheries must take this into consideration. Two general approaches to development are discussed. The first, a production-oriented approach frequently depending on capital-intensive technical innovations, threatens to produce new or exacerbate existing inequalities among fishermen, with potentially disruptive social consequences. The second type of approach is to increase the efficiency with which the existing catch is handled, processed, and marketed. It is argued that the benefits of this frequently more labor-intensive approach are more likely to reach a greater proportion of small-scale fishermen and their families.

Regardless of which development approach is adopted, social and economic relationships within fishing communities will be affected. Case study materials are provided to illustrate this point. In the community studied, the building of a road led to new marketing relationships and more equitable distribution of boat and gear ownership.

Although the benefits of development in this case were broadly distributed, there were certain conditions in this locality which made this so, and there were certain individuals and groups who were unable to adapt. These circumstances may be understood in structural terms, and a number of variables are suggested for such a socio-economic structural analysis.

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1. THE SYSTEMATIC NATURE OF CHANGE

The economic and environmental adaptation^{1/} of fishing represents a complex interaction between natural, technological, and human resources. This interaction is systematic in nature: change in any one aspect will affect other aspects of the system. Development efforts designed to improve the standards of living enjoyed by small-scale fishermen must take into account the existing natural resources, the technologies used to exploit these resources, and the socio-economic and cultural contexts in which fishing takes place.

It is easily recognized that technological innovations (e.g., more efficient gears) have a direct impact upon existing marine resources. However, the social consequences of technological or other innovations are less clearly understood. It is necessary to broaden the focus of small-scale fisheries development beyond issues of production (i.e., the inter-relationship between natural and technological resources). Any small-scale fisheries development programme will affect not only individual fishermen but a wide range of relationships in which individual fishermen are involved both within and beyond their home communities. When designing a programme of small-scale fisheries development it is important to determine what effect these programmes are likely to have upon communities of fishermen and to identify the likely beneficiaries of such programmes.

2. PRODUCTION-ORIENTED VERSUS POST CATCH EFFICIENCY DEVELOPMENT STRATEGIES

Strategies of small-scale fisheries development can be divided essentially into two types: those that focus upon issues of production; and those that focus on issues of efficient handling, processing, and marketing of existing production. The production-oriented strategy concentrates upon the design of increasingly efficient but typically more capital-intensive boats and gears. This approach is politically attractive: administrators and politicians can point to new fishing units as evidence of their efforts on behalf of small-scale fishermen.

Two important factors limit the effectiveness of this development strategy. Only a limited number of fishermen are likely to benefit from government subsidy and loan schemes due to financial and administrative limitations of these programmes. Secondly, the marine resources exploited by small-scale fishermen are limited and in some cases are over-fished. Introducing more efficient gears under these circumstances may provide short-term benefits to those fortunate enough to be the recipients of government subsidy or loan schemes or those able to finance their own investment in the new production technology. Yet, as fishing becomes more capital-intensive, the owners of smaller boats and less efficient gears will be pushed closer to the margin of subsistence. Meanwhile, to meet increased

^{1/} As used here, the concept of adaptation refers to the dynamic relationship between human, plant, and animal populations in their particular geographical and environmental settings.

costs of operation and depreciation and to assure an adequate return to investments, the increasing incomes earned by owners of such capital-intensive fishing units will diverge from the more static incomes earned by regular crewmen. In short, development strategies for small-scale fishermen which focus upon production-oriented and capital-intensive technological innovations must be examined carefully from two perspectives: that of long-term effects on existing marine resources; and that of the possibility and consequences of introducing social and economic inequalities into communities of small-scale fishermen.

The second strategy for small-scale fisheries development -- increasing the efficiency of handling, processing, and marketing fishermen's catch -- is less spectacular than production-oriented strategies. In the context of declining landings by small-scale fishermen, however, this may be a more realistic development strategy than one based on ever-increasing yields from coastal waters (Smith, 1979; FAO, 1980). Moreover, the benefits of innovations leading to greater post-catch efficiency are likely to be more equally distributed throughout communities of small-scale fishermen and hence prove to be less disruptive than strategies which depend on more efficient production-oriented technological innovations. The actual distribution of benefits from either general category of development strategy is likely to depend upon the relative dependence upon capital and labor. Efficiency in fishing generally correlates with capital intensity. Within the context of small-scale fishing villages, handling, processing, and marketing of fish tend to be labor-intensive rather than capital-intensive. The technologies are relatively simple and inexpensive. Increased efficiency in these matters is likely to ripple throughout the community in the form of higher prices for fishermen and/or increased local employment.

In the case study which follows, the effects of more efficient marketing are traced within a specific community of Malay fishermen in Malaysia. What began as a simple project -- the construction of a road -- quickly led to more efficient marketing and to important changes in boat and gear ownership within the community. The case study illustrates the potential complexity of a simple development project and underscores the importance of understanding the social and economic implications of strategies of change. The case study presented here is ideal in both major senses of the word: it dramatically illustrates the systematic nature of change; and it represents an ideal in terms of equitable distribution of the benefits of development.

3. THE COMMUNITY OF MANGKOK

Mangkok, a community of Malay fishermen situated along a sandy cape on the East Coast of Peninsular Malaysia (see map), is composed of 121 households with a population of approximately 550. Three-quarters (93) of these households have at least one active fisherman. Virtually every other household in the community is involved either directly or indirectly in the fishing economy as boat owners, fresh fish buyers, dry

fish processors, or as elderly dependents supported by their economically-active sons and daughters. The people of Mangkok also engage in a number of other secondary economic activities including rice farming, petty trading copra processing and mat and basket weaving. These pursuits provide important sources of income, especially during periods of poor fishing. However, the most important source of income for the majority of households, and certainly for the community as a whole, is fishing.

In common with other East Coast fishing communities, geographical isolation has been a major obstacle to Mangkok's economic development. The East Coast is sparsely populated relative to the West Coast, where Malaysia's major urban centers are located. The expense and risk involved in shipping fresh iced fish several hundred kilometers to these important markets depresses the prices offered even at such relatively developed major East Coast landing centers as Kuala Trengganu and Kuala Besut.^{1/} For many communities and the majority of fishermen on the East Coast, however, lack of adequate roads and the scattered nature of the communities present major obstacles to marketing development.^{2/} Unable to obtain regular supplies of ice or transport the catch quickly, there is no option to salting and drying most of the catch. This results in lower prices and incomes for the fishermen.

Though geographically isolated, Mangkok's location has certain advantages compared to other East Coast fishing communities. Mangkok is situated on the Setiu River, which provides the only protected anchorage between Kuala Besut and Kuala Trengganu, a distance of over 100 kilometers. There are a number of fishing communities congregated around the mouth of this river.^{3/} A substantial volume of fish is landed in the area, a high proportion of which are large and commercially valuable species such as Spanish Mackerel and Wolf-Herring.^{4/}

^{1/} Kuala Trengganu is over 600 kilometers from Kuala Lumpur and Kuala Besut is over 700 kilometers from that capital.

^{2/} See Lim Chong Keat (1976).

^{3/} The East Coast is extremely vulnerable to the high winds and seas of the Northeast monsoon. For the most part, the only safe anchorages are found where major rivers meet the sea. Only shallow drafted boats can find shelter in such rivers due to the presence of shifting sand bars across the kuala or river mouth. A number of breakwaters are currently under construction along the East Coast to provide shelter for deep-drafted fishing boats capable of operating from shore.

^{4/} During the peak fishing season of January through May of 1978 a total of M\$87,000 (approximately US\$40,000) of fish was landed at Mangkok. Almost M\$70,000 of this total was landed between January 24 and March 15. More complete data on fish marketing and the seasonality of fishing can be found in Bailey (1980), pp. 135-218.

Before the early 1970's only bicycles and small motorcycles could enter the Mangkok area, and even these had to travel along sandy paths which were strewn with coconut fronds to provide some semblance of traction. Only a limited volume of fresh fish was carried out of Mangkok by small-scale vendors using such conveyances and their market was limited to a radius of five to ten miles from Mangkok itself. Unable to send the catch quickly overland to urban markets, most of the local catch had to be salted and dried.

4. THE ECONOMY OF DRY FISH PROCESSING

In Mangkok, three separate households dominated fish drying and indeed the local economy. The husbands and wives in these three households, in each case locally-born men and women between forty and sixty years of age, jointly managed their enterprises. Typically the husbands would be primarily responsible for buying fish from the fishermen and selling the finished product. Their wives were responsible for overseeing the processing itself, which was done primarily by women.

To be successful, these dried fish processors required constant sources of materials without which a steady labor supply and a good return to their investment in equipment would have been impossible. In an effort to guarantee this regular supply of fish, these three households invested in fishing boats and gears. During the late 1960's they owned at least half of the approximately thirty boats operated by fishermen from Mangkok. Fishermen operating boats owned by these processors automatically sold their catch to the owner, who set the price. Those fishermen who owned their own boats could sell their catch to the processors, salt and dry the fish themselves, or sell to the small-scale fish vendors serving the immediate hinterland. For independent fishermen, however, drying their own fish was not a viable alternative due to certain fixed costs, uncertainty of an individual boat's catch, and lack of regular marketing outlets. The small-scale vendors provided important outlets only during periods of relatively poor fishing. When the catch was substantial they could not handle the quantity of fish landed in Mangkok and the bulk of the catch had to be sold to the local dry fish processors.^{1/}

5. TRANSFORMATION OF THE LOCAL ECONOMY

Marketing Fresh Iced Fish

In the early 1970's the economy of Mangkok was transformed by the building of a bridge across the Setiu River connecting Penarek to the main East Coast highway at Kg. Buluh and the laying of a three-kilometer long dirt road along the sandy cape out to Mangkok (see map). Once this road

^{1/} See Bailey (1980) pp. 202-218, for a more detailed discussion of the economics of dried fish processing.

to Mangkok was completed, small pick-up trucks were able to reach the village. With an effective road link to Kuala Trengganu (eighty kilometers away) and the major urban centers on the West Coast, it became possible to export fresh iced fish from Mangkok. Prices immediately increased beyond the levels which processors of dried fish were able to offer 1/, and their business declined rapidly. An open and competitive auction was instituted for fresh fish marketing in Mangkok. The processors lost not only their automatic right to buy the fish from their own boats, but also their role as primary purchasers of the catch from other fishermen's boats. In their place, a half dozen locally-born men in their twenties and thirties have come to dominate the marketing of fresh fish in Mangkok.

The physical and managerial demands of fresh fish marketing are quite different from those of marketing dried fish and the dried fish processors simply were unable to adapt. Though processing and marketing dried fish entailed a number of risks and uncertainties and required considerable managerial responsibilities, the dried fish processors were ill-prepared for the new regimen of fresh fish marketing. Processors of dried fish needed only rudimentary record keeping skills and could conclude virtually all their transactions in the security of their own home village. The marketing of fresh fish however, requires the establishment of trade relationships with other middlemen either in Kuala Trengganu or in the major urban centers of Singapore, Johore Baru, or Kuala Lumpur. Record keeping is required at multiple stages and requires a level of literacy which few rural Malays born before World War II possess. Daily records of purchases from fishermen and sales to urban buyers have to be balanced against each other. This is done every few weeks; accounting for one hundred purchases or more from as many as forty different boats requires careful record keeping. 2/ Record keeping problems are compounded by the fact that buyers purchase fish by lot but sell on the basis of weight to urban middlemen.

Functionally non-literate and reluctant to establish a new range of business relationships where literacy is essential, the older dried fish processors also are disadvantaged by their very age as the marketing of fresh iced fish is physically exhausting work. During the peak fishing season (January through March), the fish buyers in Mangkok often have to work eighteen hours a day. They will need to be at the marketing place by six a.m. at the latest. Occasionally boats will begin coming in as early as two a.m. and continuing until seven or eight a.m. As each boat comes in the buyers must wade out to the boat, climb aboard, make a number of swift calculations, decide whether or not to buy, and then move on, often at a run, to the next of as many as forty boats a day. In between purchases the buyers must oversee the packing of fish and crushed ice into crates and the loading of the crates onto the pick-up trucks. Between nine and ten in the morning the pick-up trucks are ready to leave for Kuala Trengganu, approximately one and one-half hours away by road.

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- 1/ Local informants report that the price of Spotted Spanish Mackerel, the single most important species caught by Mangkok's fishermen both in terms of quantity and price, increased from M\$0.70 to M\$1.00 per kati (0.6 kg) soon after the advent of fresh fish marketing. In 1970 M\$3.00 was worth approximately US\$1.00; in January 1980 the rate of exchange was M\$2.15 to US\$1.00.
- 2/ Most fishing occurs during an 18 to 20 night fishing period (kelam) during the darker phases of the moon. Accounts usually are settled at the end of a kelam.

The sale of fish to the dealers in Kuala Trengganu typically takes little time. Each of Mangkok's buyers has established a relationship with one or another of the dealers in Kuala Trengganu, who offer the same prices. As they share information with each other, there is no need for each buyer from Mangkok to check the prices offered by the dealers on a daily basis. Once the fish buyers of Mangkok have delivered their fish they will buy ice for the next day's purchases.

It is at this point that the buyers often extend their working day and their costs. There is an ice factory at the fish marketing center in Kuala Trengganu, but during peak fishing seasons there is a serious shortage of ice. The buyers often wait for hours to buy ice and sometimes in desperation drive almost 150 kilometers north to Kuala Besut, hoping to buy ice there. There also is a shortage of ice at that landing, however, and because they cannot place an order by telephone for the ice they require, they usually face a long wait there as well and may have to return empty-handed to Kuala Trengganu. Without ice they would not be able to purchase fish on the morrow, and if there is no ice immediately available then they must wait. Often it is after midnight when Mangkok's fish buyers finally reach home with their precious cargo of ice.

Though it was difficult for these older dried fish processors to adapt themselves to the new marketing pattern, one of them tried. Unlike the marketing of dried fish, which could be accomplished from his home village, marketing of fresh iced fish required this man to travel to Kuala Trengganu daily, deal with buyers (usually Chinese) on their own turf, accept payment by check, and open and maintain bank accounts. He found the experience both physically and financially exhausting. To move the fresh fish quickly it was necessary to purchase a small van and hire a driver. Functionally non-literate, this buyer was unable to keep accurate records of his transactions and expenses. He also found the long days were too much of a strain on his constitution. Exhausted and discouraged, he sold the van and stopped marketing fresh fish.

Effect on Distribution of Boat and Gear Ownership

The marketing possibilities provided by the new road to Mangkok not only led to the displacement of the dry fish processors as primary purchasers of the fishermen's catch, but to a gradual change in the distribution of boat and gear ownership in the Mangkok area as well.

In seeking an assured source of raw materials, the various processors of dried fish had come to own half of the approximately thirty boats operated by residents of Mangkok. When an auction system was introduced for fresh fish marketing, however, they lost exclusive access to the catch. As owners, these processors received increased incomes due to the general

rise in prices,^{1/} but their profitable trade in dried fish itself dried up. The rationale for maintaining a small fleet of fishing boats to supply fish for processing no longer existed. As a result, almost all of the boats and nets previously owned by the dry fish processors have been sold, mostly to fishermen. The result is a much more equitable pattern of ownership.

With their increased incomes due to higher prices, many fishermen were able to buy used boats and nets. Though a new ten meter long boat with a six horsepower diesel engine and equipped with a new drift net might cost M\$10,000, a used boat and net could be obtained for M\$2,000 or less. By carefully mending an old net and repairing the hull and engine, a fisherman could coax several more years of life out of this equipment. The increased earnings from the boat and net shares would enable a fisherman gradually to replace old sections of the netting with new, and perhaps to buy a new or at least a newer boat. There is an active market in second-hand boats and nets, with more established fishermen often selling their old equipment to younger men and using the proceeds of the sale (plus personal savings and/or loans) to obtain newer equipment for themselves.

The active market in used boats and nets, plus open access to the fishing grounds, allows most fishermen who so choose to own the means of their production. As the fishermen of Mangkok increasingly have sought to purchase their own equipment it has become more difficult for the owners of boats to attract and maintain crews. The owner of several fishing units can earn a reasonably good income from the boat and net shares alone, but only if he or she can find captains and crews. Inactive boats depreciate in value more rapidly than active boats, and during the period of field research (1978) there always were at least two seaworthy boats left inactive due to lack of a captain and crew.

6. CONCLUSIONS

The case discussed above illustrated the systematic nature of socio-economic relationships in Mangkok. This was clearly shown by tracing the impact of a new road facility upon the handling, processing, and marketing of the fishermen's catch, which in turn led to a redistribution of boat and gear ownership throughout the community. These changes can be explained in simple functional terms. The concentration of boat and gear ownership served to assure a regular supply of fish for processing. When this no longer was necessary due to the introduction of fresh

^{1/} The shares earned by the owner(s) of a boat and drift net (the most common gear in Mangkok) is calculated as follows. After subtracting operating expenses from the gross receipts, the first twenty percent is set aside for the owner of the boat. The remaining eighty percent is divided three ways, one share (26.6 percent) going to the owner of the net, and the remaining shares divided equally among the crewmen. From both the boat and net shares a deduction of twenty percent is made in favor of the boat captain as recompense for his responsibility for maintaining the boat and net, selling the catch, collecting the proceeds from the various buyers, and distributing them to the crew and owners.

fish marketing, such concentrated ownership was no longer essential -- indeed, it posed certain risks. It was equally easy to explain the differing functional (e.g., managerial and physical) requirements of marketing dried fish and fresh iced fish, and the predictable effect of these requirements.

Sharing the Benefits of Development

Underlying these simple facts, however, are two related points. First, it is obvious that the benefits provided by the new road construction (and the ensuing changes) were broadly shared within the community. Fishermen obtained higher prices for their catch and were able to translate their higher incomes into more equitable distribution of boat and gear ownership. Equitable distribution was positively affected by the relatively large volume of fish landed in the Mangkok area, which provided adequate opportunity for effective competition between buyers.

A second point illustrated by this case study is that even in a situation where the benefits of development programmes are broadly distributed, some groups or individuals will still be unable to adapt to technological or other innovations. The obvious examples in this case are the dried fish processors. It also is worth noting that Mangkok's women, who had provided most of the labor for dry fish processing, would have been put out of work but for a contemporaneous (but otherwise unrelated) occurrence -- the growth of the trawler industry off the East Coast. Several trawlers now regularly off-load trash fish for processing at Mangkok so that the community's women -- and of course those who pay them, i.e., the dry fish processors -- have not become completely unemployed. 1/

Opportunistic Development

The road to Mangkok is a good example of an opportunistic development - an area of considerable but unfulfilled potential which experienced rapid development when a single and easily solveable constraint was identified and eliminated. It is important to add, however, that once a particular constraint is eliminated other constraints are likely to surface or become more pressing; for example, in the case of Mangkok once the new road allowed for marketing of fresh iced fish the inadequacy of the ice supply in northern Trengganu became a problem. Due to physical isolation, many fishing villages face similar constraints and could benefit from road construction and other infrastructural development which increase the efficiency in handling, processing, and marketing of the fishermen's catch.

1/ The impact of development programmes on the division of labor between men and women often is ignored, but the potential for social disruption following a major alteration of pre-existing divisions of labor is significant. The economic roles of Malay women on the East Coast were studied by Raymond Firth (1966), who found that the role of women in fish marketing in Perupok had been taken over by men between 1939 and his re-study in 1966. Other studies of importance on this issue include Rosemary Firth (1966), Thomas M. Fraser, Jr. (1960) and Bailey (1980).

Identifying and carrying out such opportunistic development projects may lead to important advancements in specific locations. The importance of recognizing and analyzing local conditions cannot be over-emphasized in the design of small-scale fisheries development programmes. Small-scale fishermen operate different boats and gears with varying degrees of capital- or labor-intensity, each having different patterns of ownership, different patterns of distribution of the catch, and different marketing arrangements. It is difficult therefore, to apply a single programme for developing small-scale fisheries.

The development planner need not throw up his hands in the face of such socio-economic minutia, however. While the ideal would be for a detailed socio-economic study to be conducted in every community, this obviously is an impractical goal. However, it is possible to identify a limited set of structural variables to assist those planning small-scale fisheries development programmes which will not create or exacerbate existing economic inequalities. These variables are presented below in the form of simple hypotheses of high probable validity. The first hypothesis focuses on the general issue of the relative degree of capital- or labor-intensiveness required by a particular innovation or development. Hypotheses two through five deal more specifically with issues of competition and marketing but could easily be adapted to other types of development programmes as well.

1. Where as a factor of production capital is more scarce than labor, the more capital-intensive the technology adopted, the more likely the benefits of increased efficiency in production will be limited to those who contribute or control capital resources.
2. The larger the volume of fish landed at a specific locality, the larger the number of buyers who will take part in the market. (N.B.: It is likely this will prove to be a null hypothesis if only a limited number of capital-intensive fishing units are landing fish at a particular locality, in which case it is likely that the boat owners will market the fish directly or through an agent.)
3. The larger the number of buyers active in a market the less likely that price fixing or other forms of collusion between buyers will occur.
4. The more open and competitive the marketing of fish the more likely are fishermen to receive the benefits of improved efficiency in marketing.
5. Conversely, in the absence of effective competition, improved efficiency in marketing cannot be expected to be passed along to fishermen.

These hypotheses indicate that development planners interested in identifying possible sites for opportunistic development projects should concentrate their attention upon communities where a relatively large number of fishermen are operating but where a particular constraint inhibits post-catch efficiency. Particular care should be given to ensuring effective competition in marketing or other related post-catch activities.

Development strategies designed to improve post-catch efficiency are more likely to benefit a wider number of small-scale fishermen than strategies more narrowly aimed at increasing production. Production, of course, cannot be disregarded, as it provides the material basis of life as we know it. But we must also be concerned with the distribution of production and the efficiency with which production from a limited natural resource is handled, processed, and marketed. If we do otherwise we risk both squandering an important natural resource and disrupting human communities. The human resources within fishing communities need to be given equally as careful consideration as the natural marine resources when devising small-scale fisheries development programmes. These two resource bases -- the human and the natural -- are necessarily in interaction and need to be recognized and treated as such.

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MAP OF NORTH TRENGGANU COASTLINE

