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Cooperatives: Their Effectiveness and Limitations for Small-Scale Fisheries Development

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COOPERATIVES: THEIR EFFECTIVENESS AND LIMITATIONS FOR SMALL-SCALE FISHERIES DEVELOPMENT

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ABSTRACT

Increased experience in fisheries cooperatives of developing countries has called into question a long-held presumption about their desirability and feasibility. In this context, this study attempts to reformulate the cooperative approach for small-scale fisheries in a realistic policy framework. First, past failures of fisheries cooperatives are analyzed from three different angles: the uniqueness of the fishing industry, systems intrinsic to the cooperative, and development policy. Second, various possibilities of building viable cooperatives are explored by introducing two key concepts: the strategic option and the operational option. On the one hand, the strategic option implies that it is imperative to integrate cooperative policy with overall fisheries development strategies in each country. With this regard, seven schematic fisheries development models are derived from agricultural as well as fisheries development experiences. On the other hand, the operational option indicates the range of policy choices with which to identify the most suitable cooperative format to locality-specific conditions. The author suggests that fisheries cooperatives in developing countries be restructured free from obsession with ready-made cooperative models. Finally, emphasis is placed on the need for interdisciplinary and international cooperation to broaden the scope of fisheries cooperative studies in the future.

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INTRODUCTION

The goal of this study is to explore a realistic approach for organizing viable cooperatives in the small-scale fisheries (SSF) sector of developing countries. Fisheries cooperatives have long been regarded as an indispensable means to modernizing the socio-economic sphere of SSF, and development assistance agencies and national governments have made considerable attempts to introduce them in peasant fishermen's communities. Yet the results have largely been disappointing. Although there are cases of successful cooperative development, such as in Korea, much evidence clearly indicates that past cooperative approaches need to be critically re-examined --including the fundamental question of whether cooperatives are really desirable and feasible for SSF. Efforts conceptualizing fisheries cooperative problems and thereby providing development strategies for future cooperatives remain insufficient, both quantitatively and qualitatively, but experience from all corners of the developing world indicates what Pollnac (1982) has called the "massive failure" of fisheries cooperatives. What makes it more difficult to deal with the cooperatives problem is that the findings and suggested solutions in empirical studies tend to be piecemeal and sometimes even contradictory (Obern et al., 1981; Johnston et al., 1982, p. 169). As a combined result of inadequate theoretical perspectives and confusing empiricism, a pessimistic feeling has

come to prevail among practioners about the use of cooperatives. Today, the cooperative is so often exposed to both explicit criticism and implicit cynicism that the very attempt to revitalize the cooperative approach might be viewed as obsolete.

It seems to me, however, that the current pessimism, as well as the optimism which surrounded cooperative policy in the 1950's and 1960's, does not necessarily stand on firm theoretical ground, probably because it has gradually infiltrated to the circle of fisheries development professionals without provoking a notable debate among them. Furthermore, alternative organizational models to the cooperative have received neither sufficient elaboration nor experimentation. For instance, although Ben Yami's (1980) community fisheries center (CFC) concept represents a rare example of concrete proposals substituting for the narrowly defined cooperatives, it appears to have a long way to go before the ambiguities are eliminated and its operationality is well established. (We will further discuss this concept in Chapter I.)

In short, the complex situation is such that there is no longer much enthusiasm for the cooperative, but alternatives are not readily available; and everybody admits that cooperative-like organizations, if not exactly the cooperative, are certainly needed for SSF. It may be said that the fisheries cooperative issue is at a conceptual deadlock. It is probably beyond any single person's capability to break this deadlock,

and even if that is possible, it may very well be one's life-work.

Bearing in mind the immense difficulties of the issue, we can positively state that the first step must be to establish an analytic framework from which we can better understand the structure of the issue. Specifically, we have to start with an appropriate analytic framework to examine the effectiveness and limitations of cooperatives in the unique setting of SSF development. Without such a framework, the cooperative problem will remain an ugly entanglement of mistakes, constraints, and failures. Chapter I will therefore concentrate on this task; it will attempt to derive an analytic framework by spotlighting problems of fisheries cooperatives from three different angles--namely, the uniqueness of the fishing industry, systems intrinsic to the cooperative, and development policy. My intention is not to restate negative evaluations of the past cooperative experience, but to specify the structure of the failures in terms of the origins of the problems.

Chapter II, composed of four sections, will be the most essential part of this thesis. The chapter will present basic models for building cooperatives focusing on the strategic functions of cooperatives in the broader picture of fisheries development strategy. Agricultural experience suggests that cooperatives must be designed in such a way that they are consistent with the overall strategy of development, so the chapter will include a discussion of the following questions:

What kind of strategic options does SSF development have both at present and in the future? How can cooperatives be consistent with and promote such development strategies? What potential pitfalls can we predict while cooperatives are being remodeled to perform these strategic functions?

Chapter III addresses another concern in designing cooperatives--that is, the finely detailed models are ironically often impractical in light of human, financial, and other types of constraints prevailing in developing countries. On the one hand, the models should be simple enough to allow policymakers and local participants to comprehend the basic objectives of cooperatives and the key processes by which to achieve them. (This is exactly the context in which we will develop our discussion in Chapter II.) On the other hand, the models should be flexible enough to enable cooperatives to continuously adjust to locality-specific conditions. In order to cope with these seemingly contradictory requirements, we will consider what I would like to call "operational options" (not strategic options as in Chapter II). I believe we can derive considerable flexibility in cooperatives--not only in the planning stage, but also in the implementation process--from various combinations of their forms and organizational principles. For example, a cooperative can be set up as a community organization or, alternatively, as a strictly occupational guild of fishermen, and there are a great many intermediary forms between these two. Analogously, while strategic

options constitute the infrastructure in building cooperative models, operational options discussed in this chapter somewhat resemble a superstructure based on the infrastructure.

The same chapter will also summarize the discussion and make a few suggestions for the future role of fisheries co-operative studies. Any social issues are inherently open-ended since the issues themselves develop over time, and their structure quite often undergoes qualitative transformations. For a student of the fisheries cooperative (which is a typical social issue) to claim that his study is conclusive is undoubtedly self-defeating. In fact, my research is far from discovering a solution to the problems of the fishing cooperative; on the contrary, I would be more than satisfied if I could help instigate more active discussions about cooperatives in the context of fisheries development.

The development of fisheries cooperatives is demanding but challenging, both in theory and in practice. For the time being, it is naive to believe that we can get rid of the painstaking process of continuous reexamination and redesign of the models and approaches. Therefore, I will conclude this thesis with a request that, in the future of fisheries cooperative development, cooperative efforts be made between policy planners and academicians; between economists, sociologists, and fisheries technologists; between Westerners and Easterners; and between peoples from developed countries and developing countries.

CHAPTER I

UNDERSTANDING THE PROBLEMS OF FISHERIES COOPERATIVE DEVELOPMENT

BACKGROUND

Looking back on past trends of fisheries development, we can easily recognize that SSF has been given more emphasis since the 1970's. Although large-scale or commercial fisheries (LSF) have traditionally enjoyed and still enjoy mainstream status as a subject of development projects in terms of financial turnover, the idea that SSF should be given a much higher priority has gained consensus in both development assistance agencies and academia (World Bank, 1982; Pollnac, 1984). Moreover, governments of developing countries are beginning to see the adverse effects of leaving SSF behind in favor of spectacular LSF projects, which have often turned out to be too ambitious and ultimately unproductive. Indonesia's recent decision to ban trawl fisheries in its substantial waters to protect the interest of small-scale fishermen dramatizes the reversed undercurrent in priorities between SSF and LSF (Sardjono, 1980). Two naive assumptions widely held in the early stages of LSF development were that increased employment

opportunities would, in the long run, benefit small-scale fishermen, and that the demonstration effects of modern LSF technology would induce technical improvements in SSF and thus pull it into the development process as well (Panayotou, 1980). Although there are some factors that make it difficult to judge the validity of such assumptions, reports from developing countries not only frequently disprove them, but also attribute to LSF development a considerable share of responsiblity for the ever-deepening plight of SSF. Highly productive commercial fishing boats have pushed less productive SSF out of the economic margin and damaged coastal fishing grounds traditionally utilized by SSF (Panayotou, 1980; Alexander, 1975). Besides the direct threats from LSF, the processes of industrialization and urbanization in many coastal areas of developing countries have worked against SSF by causing ecological damage to their fishing grounds. In addition, one of the most serious problems has stemmed from within SSF: excessive fishing efforts resulting from overpopulation began to dissipate even a meager economic return from SSF (Lawson, 1977). Over-fishing is a real risk in a number of countries--marginal production per capita notwithstanding. As Troadec (1983) has noted, Southeast Asia and the Indian subcontinent are the most notorious, but similar concerns over SSF over-fishing have been raised throughout the world.

Such critical issues concerning SSF have necessitated a revision of policy priorities in favor of SSF and have helped

people to realize its long overlooked merits. For instance, SSF relatively easily provides landless farmers and other rural poor with employment opportunities, at least for the time being. When it is clearly predicted that the agricultural sector of low-income countries must continue to supply most of the new jobs in the coming years (Loup, 1980), these countries seem to have few alternatives but to expect SSF to share the burden, no matter how irrational such a policy is from an SSF standpoint if SSF is already saturated. Lawson (1977) has stressed that the collapse of SSF would have devastating effects in conjunction with problems of urban/rural migration. Furthermore, SSF is less capital-demanding and less dependent upon foreign technology and imported materials than LSF is. Fuel prices increased drastically in the energy crises of the 1970's, and the subsequent deterioration of the balance-of-payments in non-oil-producing developing countries made economic conditions less favorable to LSF and therefore relatively favorable to SSF. Finally, the legal constraints of 200-mile EEZs, as a result of the U.N. Law of the Sea Convention, have practically terminated the growth potential of LSF in countries with narrow EEZs and those already having fleets disproportionately large to the size of their EEZs.

A tendency in the theater of development theory also contributed to the new emphasis on SSF. Basic Human Needs (BHN), a relatively new concept of development which gained recognition in the 1970s, helped shift the focal point from

LSF to SSF by arguing for a straightforward upgrading of the standard of living at the grass-roots level. Although a thorough investigation of BHN is beyond the scope of this paper, the rationale behind the concept can be summarized as follows (Ruttan, 1984):

- The basic needs for the rural poor measured in nutrition, elementary education, health care, and such can be met with relatively low levels of per capita income.
- Expenditures directed at achieving the BHN are, contrary to purely consumption-oriented appearances, high payoff investments for long-term development.

Among successful examples of the first premise is the highly publicized Sri Lankan case, where "its life expectancy is one and a half times, its literacy rate nearly three times, its infant mortality rate one-quarter" the figures for countries with a similar income level (Loup, 1980, p. 136). For the second premise, Taiwan's successful efforts to establish a mass educational system of high quality can be taken as an example of the high payoff investments which later led to remarkable economic growth (Lele, 1981a).

As usual for development theories drifting "fad to fad" over several years, BHN is no longer the mainstay among development specialists. The BHN approach was criticized for its excessive focus on consumption--in other words, for its neglect of income-generating components--for problems surrounding selection among different needs, and for naive assumptions

on the administrative and political capabilities of Third World countries (Loup, 1980, p. 127-138). However, although I am unaware of any studies which purposefully discuss the implications of BHN to fisheries development, the impact of BHN upon the direction of fisheries development could have been substantial. Unlike agricultural development, for which rural community development was the central theme as early as the 1950's, the focus of fisheries development has been largely confined to the technical field. About this conspicuous technical inclination--I prefer to call it technical bias--Emmerson wrote the following:

> The most serious and widespread weakness in artisinal marine fisheries development is a preoccupation with means to the neglect of ends . . .. Narrow questions (how to introduce a new boat, motor, or net) have tended to absorb attention that should have been spent on broader ones (why the volume of fish production should be enlarged at all) (1980, p. 1).

The technical bias characterizing the basic orientation of past fisheries development had a direct link with the LSF bias since LSF could readily accept modern technology introduced from developed countries without much bothering about social considerations. A convenient assumption frequently attached to LSF development was that technical feasibility was synonymous with social desirability. As a result, SSF was hidden behind the growing shadow of LSF, and even when development efforts were targeted to SSF, the range of activities usually extended no further than the improvement of fishing technique

and gear. However, as the focus of rural development theory gradually shifted from capital-intensive, production-oriented "projects" to administrative, people-oriented "programs" (Korten, 1980)--typically in BHN approach--its influence upon fisheries was felt, so that SSF instead of LSF, and fishermen instead of fish, began attracting attention. In summary, a reappreciation of SSF can be said to have originated in the retreat from an overemphasis on LSF and the influence of changing development theories, notably BHN.

The growing consensus on the importance of SSF has not proceeded further, however. Instead there remains a frustrating stagnation in professional circles centering around the critical point of whether we can realistically expect self-sustained socio-economic as well as technological development in SSF. Of the few substantial studies undertaken in the field of SSF, most remain introductory and tend to pose a lot of questions without providing answers. Of course, some lessons have been learned through three decades of experience: e.g., the direct introduction of advanced technology or purely economic cost-benefit analysis is in most instances useless and in some instances even disastrous; long-held views that middlemen are parasites exploiting poor fishermen, or that peasant fishermen are stubbornly conservative, are too simplistic and do not reflect reality; therefore, prior to the implementation of projects (or programs), the structure of fishermen's communities and their needs should be carefully examined.

Indeed, an awareness of these lessons is the minimum requirement for well-intentioned SSF projects, although these lessons alone doubtlessly fall far short of delineating a strategy for SSF development. In other words, there is a growing consensus about some "don'ts," but little is agreed upon about the "do's" except for very careful planning.

The vacillating expectations toward fisheries cooperatives exemplify such a theoretical black hole. Needless to say, the fisheries cooperative is primarily an economic institution which enables fishermen to deal collectively with problems whose magnitude is often far beyond their individual capacities.[1] Probably no one would disagree that the cooperative is as pivotal an element in SSF development as appropriate technology, infrastructure, and resource management. In fact, there are some benefits which fishermen could not obtain without being united; a modern processing plant whose efficiency is based on economies of scale, bargaining power against monopolistic buyers, market information for which everyone's honest reporting is a key, effective resource management, and political muscle in local politics are all examples of benefits available only to organized fishermen. Not only can an individual not attain these, but also as is notable in resource management, the pursuit of these benefits by one individual may very well damage collective benefits and therefore the individual's benefits in the long run. In addition to valid theory, the fisheries cooperative is further justified by the

fact that it is a well-established reality in many developed countries.

But if fisheries cooperatives are justified, why have so many attempts to introduce cooperatives into developing countries ended in fiasco? Meynell writes:

> During the 1970s, disenchantment with fisheries cooperatives began to set in; they were difficult to organize, the fishermen did not want them and they almost invariably failed. "Fishermen's cooperatives did not work!" was the conclusion (1984, p. 17).

If there are benefits which are obtainable only through cooperatives, why have the cooperatives been difficult to organize? Did fishermen not want benefits?

In the following three sections, we will analyze the failed attempts at fisheries cooperatives from three different angles. Concisely stated, the problems of fisheries cooperative development can be conceptually categorized as stemming from fisheries, from the cooperative, or from development policy. The problems from fisheries imply that while the physical, economic, and socio-cultural uniqueness of fisheries presents some advantages, it more often imposes disadvantageous conditions in sustaining cooperatives in fishing communities. The problems from cooperative refer to endogenous problems of the cooperative, which is a particular business organization with both merits and flaws. Finally, the problems from development policy have come from improper policy frameworks under which cooperatives have been used. As mentioned earlier, an intensive investigation of the cooperative experience per se

is not the purpose of this study, but there is no question that such an examination would benefit a discussion on building cooperative models--the goal of this thesis.

PROBLEMS FROM FISHERIES

Whether they are agricultural, fisheries, or other kinds, the record of rural cooperatives in developing countries has been discouraging. It appears, however, that fisheries cooperatives belong to the least developed category of cooperatives; the general impression is that it is more difficult to organize fisheries cooperatives than agricultural or other rural-based cooperatives (Meynell, 1984). In addition to the social and physical constraints generally observable in rural societies, the characteristics pertaining to fishing activities seem to impose some extra conditions upon the operation of fisheries cooperatives, and most such conditions are negative from a cooperative's point of view--that is, they compound difficulties more often than alleviate them. The history of fisheries cooperatives in developed countries invariably indicates that fishermen were latecomers in the national cooperative movement. In Norway, the first attempt to form an agricultural cooperative was made immediately after the Industrial Revolution began monetizing the rural economy, but it was nearly a hundred years later (i.e., in the 1930's) that fisheries cooperatives came into existence (Grimley, 1950). In the United States, modern agricultural cooperatives mushroomed

in the early decades of the twentieth century (Woodworth, 1984). An old book entitled Cooperatives in New England (by Ford) reported a remarkable success in cooperative creameries as early as 1913, as well as a surging momentum throughout New England for modern cooperatives based on the long cooperative experience of the Granges. Yet the founding of the Point Judith Fishermen's Cooperative Association, which is "one of the most successful [fisheries cooperatives] in the United States" (Gersuny et al., 1974) was as recent as 1947, notwithstanding the fact that fishing is as old an occupation as farming in New England. In Japan, it was only during and after the Great Depression that fisheries cooperatives began to undertake economic activities to a noteworthy extent, as an almost desperate response to the impoverishment of their members. By contrast, Japanese agricultural cooperatives (or more precisely, regional cooperatives with predominantly farmer members in rural areas) had already attained the organizational strength of full-fledged cooperatives by 1929 (Kase, 1981; Yamamoto, 1980).

Let us turn our attention to fisheries cooperatives in developing countries, taking an example from Thailand. In 1983 there were 909 agricultural cooperatives with a population/member ratio of 19%, but there were only 20 fisheries cooperatives with a population/member ratio estimated at 5 to 7% (JICA, 1984; Panayston, 1980). The inferiority of fisheries cooperatives to agricultural cooperatives is not confined to

the quantitative index; some studies note that the range and quality of services are not comparable either (JICA, 1984; Miyake, 1984).

These national experiences of both developed and developing countries support the generalization that the fishing industry offers a less favorable environment for cooperative development, but it is not sufficiently clear why this is so. The following discussion attempts to identify major factors which could create unfavorable conditions and, in the worst scenario, terminate cooperatives.

(1) Fisheries as local food producers

Today, more and more fisheries in the Third World are being enmeshed into global marketing networks, and the domestic markets also seem to be expanding as communications and transportation improve. However, in many parts of the world SSF still largely remain local suppliers of fish to the immediate hinterland markets, rural or urban. The perishability of fish, low productivity, and the difficulty of planned production have long deprived this industry of a higher return which the broader markets could give.

The history of agricultural cooperatives shows that cash-crop farming oriented primarily toward export markets accepted cooperatives much more smoothly than did local food-crop farming. The uniformity of cash-crop produce and the rather simple distribution channels helped cooperatives to attain economies of scale from collective marketing and larger

processing plants. The successful agricultural cooperatives in Africa have concentrated on export crops such as coffee and cotton (Lele, 1981a; Young et al., 1981, p. 28).

The direct intervention of colonialism in transforming indigenous fishing into an export industry was rare, but ironically, the absence of the colonialist intervention is one of the reasons why fisheries are difficult to organize into cooperatives. Nonetheless, the increasing importance of international commodities like shrimp in Third World fisheries seems to be altering the picture in favor of cooperatives. An interesting example of successful cooperatives is found in Belize, where mainly lobster and shrimp are harvested, both for an export market (Meynell, 1984).

(2) Risks and uncertainties

Besides the physical dangers of working at sea, fisheries are surrounded by some economic risks and uncertainties. The difficulties of planned production are often a consequence of the fact that the biological reproduction of fish resources is subject to changeable ocean environment and that the activities of fishermen are considerably restrained by climatic conditions. The open-access nature of fisheries (to be discussed in depth below) is also perceived as resulting in high risk because the entry of new vessels into established fisheries, without any restriction, could jeopardize both a prior investment and a resource (Rothschild, 1983). The remoteness of fishing operations from land-based control is also considered

a serious uncertainty for the land-based management category into which cooperatives fall (Pollnac, 1982, p. 71). Furthermore, due to rapid exhaustion, frequent loss, and little versatility, fishing boats and gear have a poor mortgage value; thus providing loans and credit to fishermen is not as safe as providing them to farmers who have land. Fisheries cooperatives have to shoulder the burden of such extra risks and uncertainties, which are not commonly found in other industrial sectors.

(3) Common property (open access)

It is well known that fisheries resources are considered common property from which anyone wishing to do so can obtain benefits. It is also known that this common property factor is a culprit which invariably leads to overfishing and, consequently, to the dissipation of economic receipts unless fishing efforts are artificially restricted. Anderson wrote:

> The observed fact that many fishermen eke out a scanty living may be attributable, then, to the open-access nature of the fishery, combined with the fact that initial high returns may be followed by hesitant and dilatory adjustments in population and entry or departure (1977, p. 54).

In order to counter the crisis of an overcrowded fishing population pushing up fishing efforts to an excessive level, some urge the institutionalization of limited entry. In fact, limited entry based on cooperatives was the historical origin of the highly developed Japanese fisheries cooperatives. However, it is well known in Japan that the counterproductive

mechanism of common property has sometimes undermined the proper use of coastal resources inside the cooperative-based limited entry (Shima et al., 1983). Unlike agriculture, where farms are usually owned individually, the sea is basically no one's and fish move all around. These facts make the development of fisheries cooperatives even more difficult if limited entry is not a solution compatible with traditional practice and economic reality in a fishery, or if limited entry cannot break the strong mechanism of common property.

(4) Mobility

Fisheries are characterized by a high geographical mobility; fishermen move up and down coasts in search of fish. In West Africa, fishing tribes move their dwellings seasonally, like nomads. Fishing communities in Southern Hokkaido were historically formed by fishermen seasonally migrating from central Japan to follow schools of herring. Even now, it is not uncommon that a fishing boat from Kyushu (an island in southern Japan) moves up to the coast of Hokkaido, chasing squid and other migratory species. The geographical mobility of fishing apparently imposes a very difficult problem upon the formation and day-to-day operation of fisheries cooperatives. The problem is circumvented in Japan by remitting landing proceeds to a particular cooperative through a nationwide network of fisheries cooperatives. However, it is unrealistic to expect developing countries to duplicate such a system in the near future. Another aspect of mobility concerns inter-

occupationality. Subsistence fisheries in developing countries embrace a large number of the rural poor, who engage from time to time in farming, petty trading, manual labor, and whatever employment can provide them with a day-to-day livelihood. The short production cycle of fishing--each operation completed within a day or two--makes it easier for the rural poor to gain "a little extra food or cash immediately, or to fill a gap in another task" (Firth, 1966, p. 2). Such people are apparently not compatible with a cooperative's organizational principle, which is based on a very cohesive membership.

(5) Historical stage of development

Since this subject will be explored in greater detail in the next chapter, I will present only two points here to facilitate further discussion.

First, the major technological innovation in fisheries has been mechanical in nature--for example, the stern trawl, power-block, and fish-finder. In SSF, too, the mechanization of fishing boats has been the most significant technological breakthrough in the last two decades; the widespread use of outboard engines is nothing but mechanically oriented innovation. On the other hand, in the same period, the greatest impact of modern science upon peasant agriculture has not been mechanization. Instead, it was brought about by the technical package of the Green Revolution, which is biological and chemical in nature (Hayami et al., 1971, p. 44). In India, agricultural cooperatives developed remarkably among farmers who

successfully adopted the Green Revolution technology. The results of the Green Revolution infer that an inadequate development of biological and chemical innovations may adversely affect the future of cooperatives in SSF.

Second, the research base for SSF development, including aquaculture, is still in its infancy compared with that of agriculture in terms of investment, manpower, international cooperation, and political attention. Research efforts in both the natural and social sciences and administrative experience in SSF have lagged behind agricultural counterparts; this constitutes another disadvantage for fisheries cooperatives.

(6) Socio-cultural uniqueness

Socio-cultural factors are one of the most interesting as well as difficult to generalize areas in assessing the uniqueness of fisheries vis-a-vis agriculture. Pollnac (1982, p. 68) introduces many sociological studies which report the low social status and even segregation of fishermen in rural societies. Poggie (1980) suggests that the psychological trait of independence widely observed among fishermen is a factor contributing to the lack of success of fisheries cooperatives. However, there are also some contradictory observations and literature. As far as Japan is concerned, I doubt that fishermen face social prejudice or that fishermen are particularly independent people. It is interesting to note that a policy objective intensely supported by Japan's post-war fisheries administration was to break down "a nest of rural fascism"

based on feudalistic community cohesion and to create rational, independent fishermen (Hisamune, 1984). Furthermore, Grimley concludes the following about Norwegian fishermen: "The collective mentality would be stronger among the fishermen than among the farmers who have always been known for their extreme individualism" (1950, p. 129).

My limited knowledge on socio-cultural factors does not allow me to pursue the discussion any further, but it may be safe to conclude that there is a considerable possibility that the socio-cultural or psychological uniqueness of fishermen, perhaps negatively, affects the outcome of the cooperative movement.

We have focused on the negative consequences for cooperative development of factors unique to fisheries. However, admittedly, these same factors may stimulate fishermen to make greater efforts toward cooperatives. For instance, the common property nature of resources may promote voluntary regulatory organizations among fishermen. The spontaneous development of regulatory agreements to control individual gain for the sake of common interest is not uncommon. Orbach (1978) notes that a cooperative club was formed among local fishermen in the Bay of Fundy to allocate fishing rights in a self-policing manner. A famous custom of Maine lobster fishermen in maintaining individual fishing territories also exemplifies spontaneous cooperation. Such efforts may provide a very strong

foundation for more formal cooperatives. Moreover, because fishing does not produce as large a variety of necessities as traditional peasant farming does, there is little doubt that the more specialized are coastal communities for fishing, the more strongly they would be bound to the outside market economy (Firth, 1966; Platteau, 1984). This feature of fisheries may constitute a favorable condition for modern cooperatives, for which a strong trade link with the outside world is the necessary prerequisite. However, positive effects stemming from the peculiarity of fisheries by and large tend to be outnumbered by the inherent detrimental factors of fisheries. The reason for the worldwide phenomenon that fisheries cooperatives are slow to develop, if they develop at all, in comparison with other rural cooperatives, lies in these unique characteristics of the fishing industry which are often unwittingly ignored by development planners.

PROBLEMS FROM COOPERATIVES

Since the days even before the Rochdale pioneers, the history of the cooperative records an accumulation of self-sacrificing endeavors by bright-eyed cooperative activists. Among those dedicating themselves to the cause of self-help and cooperation were socialist-leaning intellectuals, self-taught grass-roots leaders, social workers with deep religious beliefs, and progressive officials. The philosophy of the cooperative has a universal appeal for its idealism and

populism. I believe the following are three important philosophical principles of the cooperative: (a) the cooperative eliminates capitalist exploitation of people by people by giving only limited rewards to capital and by aiming at providing services to members rather than gaining profits; (b) the cooperative promotes grass-roots democracy by allocating equal opportunities to its participants for decision-making on cooperative management (typically, the one man, one vote principle); (c) the cooperative does not in itself adopt violent or revolutionary means to attain goals.[2] However, such an idealistic posture does not guarantee the cooperative's viability; the cooperative needs adequate profits, competitiveness, and even an aggressive investment plan--everything required by ordinary corporations.

Unless the cooperative provides clear-cut economic benefits, or at least prospects for future benefits, it cannot keep attracting ordinary members who join the cooperative not because they are advocates of the cause of the cooperative, but mainly because they see better economic opportunities in it. In a word, this is what is called the dualism of the cooperative--it is at the same time a people's association and a business enterprise (Dooren, 1982a, p. 31). Problems of cooperatives actually often stem from this dualism: if cooperatives emphasize efficient management in order to maximize economic benefits, the difference between them and private corporations becomes increasingly murky--like many credit

unions in developed nations--but if they are run with naive idealism, they often find themselves losing in real-world business competition--like British consumers' cooperatives. My personal communication with young cooperative employees in Japan indicates they are considerably frustrated by political- and social-issue-minded management (consumers' coop) and by the lack of keen management sense (fisheries credit coop federation). Yet some "cooperativists" warn that the growing "managementalist" tendency could be a part of the problem rather than a part of the solution for the future of Japanese fisheries cooperatives.

In developing countries, the ambiguity of the cooperative concept stemming from this dualism makes it very difficult for uneducated rural people to understand the cooperative. Cooperative education is always stressed, but cooperative objectives, mechanism, spirit, and terminology are apt to be too foreign to the realities of rural lives in these countries. Studies in peasant societies show it is not uncommon that peasants regard cooperatives as a channel to receive unconditional gifts from their paternal governments (Firth, 1966, p. 317; Takigawa et al., 1973). Alternatively, they may perceive government assistance as a reasonable reward for their attending what they may think "useless" cooperative seminars and patiently listening to officers' admonitory speeches. It is the opinion of the author that the dual role of the cooperative should bear a part of the responsibility for this sort

of misunderstanding.

Though dualism is an interesting issue, I probably should not indulge in this subject because major problems of rural cooperatives in the developing world seem to have a different origin and structure. Problems inherent to cooperatives in SSF are, in a sense, much deeper; they cast a serious question on the feasibility of fisheries cooperatives from the very beginning. For a long time economic domination by middlemen in peasant fishermen societies had been generally believed to be an impediment to SSF development. Thus it was natural that the displacement of exploitative middlemen by egalitarian cooperatives was eagerly sought. While the necessity of cooperatives was widely assumed, it was not proved. Now, however, extensive literature presents counterevidence against this assumption (Alexander, 1975; Pollnac, 1981, 1982; Lele, 1981a, 1981b; Platteau, 1984; Blain, 1984). This section attempts to identify problems for which the mechanism of the cooperative itself is responsible.

In order to do so, let us consider the local middlemen's role compared with a cooperative's role in marginally productive SSF. Contrary to a simplistic presumption that modern organizations are more efficient than indigenous ones, the cost-efficiency of cooperatives is not always superior to that of middlemen. First of all, cooperatives usually need offices and staff, for paperwork is an inevitable component of a modern business. In addition, despite the very high

opportunity costs of modern management skills in peasant societies, cooperatives cannot be run without trained (and honest) managers. These indispensable inputs to cooperatives render their operation extremely expensive. Local middlemen, on the other hand, perform multiple functions with none of these costs. Apart from buying, processing, transporting, and selling, they lend money for both production and consumption, invest capital, bring back news from cities, convey messages between fishermen, and maybe arrange marriages for fishermen's children. Some of these functions are of vital importance in societies where communications media are underdeveloped and unreliable.

Let us now look at the other side of the coin--i.e., income-generating ability. The primary weapon of cooperatives is, of course, the reduction of intermediary margins, achieved by drawing fishermen into a single economic unit. If benefits from this practice more than compensate for the high fixed costs, cooperatives will, in the long run, be viable from the management point of view. Unfortunately, the reality is that the size of individual transactions in SSF is so small that handling costs tend to eat up the profits of the collective action. Furthermore, unfamiliarity with local conditions and ideological egalitarianism become another handicap for the business efficiency of cooperatives. Describing state-sponsored cooperative loans intended to free Malayan fishermen from the hands of middlemen, Firth wrote: "This system also

has met with difficulties, one reason being that the state was often obliged to take the brunt of the losses made by the less efficient fishermen" (1966, p. 26). Local middlemen are undoubtedly more efficient creditors because they can avoid this sort of risk through their detailed knowledge of the skill and trustworthiness of individual fishermen with whom they have an acquaintance of long standing. They further understand area-specific constraints as well as general characteristics of fishing better than government officials, hired managers, and foreign advisors (Meynell, 1984). Alexander (1975) points out that due to middlemen's swift arrangements of loans and flexibility in loan repayments, Sri Lankan fishermen regard the credit facilities provided by local middlemen as superior to those offered by government agencies. Although strictly speaking cooperatives are not government agencies, in many countries the same types of inefficiency and inflexibility plague cooperative management. Lele (1981a) suggests that the replacement of a traditional market structure by a cooperative or a public-sector organization often only exacerbates inefficiency, particularly if the cooperative operates in a monopolistic situation.

As for organizational rigidity, we can find two different causes. First, government assistance, no matter how well-intended it may be, has a tendency to make cooperatives bureaucratic. Second, the cooperative has an inherent mechanism toward inflexible management. Cooperative managers are not

independent businessmen (unlike local middlemen), but are hired (or appointed) and accountable to member fishermen (or to the government). Naturally, this makes them security-seekers who resent irregularity rather than flexible risk-takers. Fish trading, for instance, is not a steady, secure business. It is volatile and speculative in nature, reflecting the ceaselessly changing supply and demand in the market. The security-seekers are the most ill-adapted to this business. Managers are also reluctant to take discriminatory actions against members even if it is reasonable to do so from a business standpoint.

Clearly, inefficiency, high operational as well as fixed costs, and inflexibility are all negative factors plaguing cooperatives but not local middlemen. Admittedly, other modern business organizations have the same problems, and the larger the organizations are, the more serious these problems will be. However, large organizations have three advantages that more than compensate for these drawbacks: one is economies of scale, another is market intelligence (and to some extent market intervention), and the third is R & D capability. Unfortunately, many fisheries cooperatives lack the means to incorporate these advantages. Cooperatives cannot enjoy economies of scale because of comparatively high handling costs. They are almost invariably inferior to local middlemen in gathering information and predicting the market unless they are able to expand their market area substantially.

Nor are cooperatives effectively involved in R & D. As long as fierce competition is maintained among middlemen by small and scattered production and a strong entry pressure to petty trading, fisheries cooperatives have limited room to thrive in SSF.

In summary, the cooperative as a unique organization with a dual nature--a people's association and a business enterprise--has greatly contributed to alleviating poverty and social injustice. However, its two aspects are not always harmonious. From the economic point of view, it is often slow; from the social point of view, economic considerations tend to overwhelm the social ones. Also, the dual nature is not easy to comprehend. These problems are tough to deal with, but the major problems of cooperatives in SSF seem to lie deeper. In general, cooperatives are not only comparatively costly, inefficient, and inflexible vis-a-vis local middlemen, but they also lack the means to take advantage of modern economic organization. Here, a word of caution about our conclusion may be necessary; the above conclusion does not imply that fisheries cooperatives are always inferior to private merchants. Many successful fisheries cooperatives in developed countries indicate the contrary. It should be remembered that the entire discussion in this section has been based on an assumption that SSF are marginally productive.

PROBLEMS FROM DEVELOPMENT POLICY

In this section, I would like to examine problems caused by the policy frameworks under which cooperatives have been used. I have a strong feeling that problems of this category have been more responsible for the dismal outcome of a number of past cooperative projects than the previously discussed two kinds of problems have been. In other words, fisheries cooperatives have been misused rather than useless. Discussing development policy is not an easy job because few systematic analyses on this issue have as yet been done in the field of fisheries. This may reflect the fact that community-oriented SSF development per se has rarely been given a high priority in the wide spectrum of national development programs. Though there have been a number of attempts to build fisheries cooperatives, particularly in the 1950's and 1960's, the "golden age" of the cooperative, they seem to have lacked a genuine integration with overall fisheries development perspectives. Bearing in mind that more systematic research efforts are needed in this field, let us present the general features found in past cooperative policies, regardless of country-specific differences.

(1) "The demand of modern society"

Cooperatives were often simply a convenient means for national governments and development agencies to channel funds to fishermen when they found it technically impractical to deal directly with huge numbers of individual fishermen. They

expected cooperatives to administer part of the loan procedure, supervise fishermen to use the loans properly, and ensure repayment from the fishermen. Borrowing Meynell's (1984) words, these cooperatives were set up for "the demand of modern society" rather than for "the needs of the developing communities." They were designed to be "debt cooperatives" from their very inception, though not surprisingly most of them could not satisfactorily function even in the role of debt cooperative (Takigama et al., 1973). Strictly speaking, this implies that the primary problem was an absence of elaborated policy frameworks rather than defects in them. Meynell satirically writes:

> Fisheries cooperatives were set up and used as a channel for funds in order to reach artisanal fishermen. But during the same time, fisheries personnel were preoccupied with understanding the biology of fish and defining MSY; the fishermen and their organization were hardly considered at all (1984, p. 17).

If Meynell's remark sounds too harsh, I would put it in this way: The governments and agencies took the feasibility and desirability of cooperatives so much for granted that they did not doubt the wisdom of instructing fishermen to join government-initiated cooperatives as a condition of receiving subsidies and loans.[3]

(2) The bandaid approach and bureaucratic rivalry

With few exceptions, the context in which fisheries cooperatives were used was fisheries development, not rural development including a fisheries component. Even if the

policies could be consistent within a fishing industry, attention was scarcely paid to the regional economy of which fishing was a part. Such indifference to the regional economy rendered the cooperative development policy a typical case of what Gow and Vansant (1983) called a "bandaid approach," meaning that a village would be picked for a development project with little consideration to regional socio-economic integration. The bandaid approach in cooperative development significantly reduced the chances of fisheries cooperatives being encouraged along with other rural cooperatives in the same region. For example, where the fisheries population was a little too sparse to be organized efficiently into a cooperative, it tended to be left out of the administrative scope. However, it might have been possible to incorporate those fishermen as a subgroup to an agricultural cooperative until the fishermen's experience and consciousness had grown to such an extent that an independent fisheries cooperative was intensely desired and viable. It is well known that agricultural community development has been frequently paralized by confrontations among various government agencies (Holdcroft, 1978). In fisheries, which are usually administered exclusively by fisheries agencies, inter-agency confrontation may not have been extreme, yet undoubtedly inadequate coordination between fisheries agencies and other agencies and the narrow perspective of fisheries agencies were due to the lack of regional integration in cooperative development.

(3) Superficial participation

It has been widely agreed that "perhaps the most important implication of a rural development strategy based on co-operativism is that pertaining to the degree of participation of the rural masses in the control of events directly affecting their lives" (Hope, 1983, p. 27). This is the very reason why we chose the cooperative as an institutional backbone of rural development despite the problems we have discussed thus far. Some researchers have suggested that unless people-oriented participatory programs are properly incorporated, production-oriented technical projects alone cannot achieve their own ends. According to Korten (1980), a Philippines' irrigation agency learned the importance of helping farmers form effective associations for operating and maintaining its irrigation facilities when many completed systems fell rapidly into disuse due to the lack of cooperation among and with farmers. Despite the fact that grass-roots democratic participation has been admired in political rhetoric, the participation of peasant fishermen in cooperatives has remained no more than superficial. In this respect, while some community development programs in agriculture have attempted to encourage local initiatives--for instance, matching grants brought by the village-level worker under the so-called self-help concept (Holdcroft, 1978), fisheries cooperatives were pegged for more direct "top-down" initiatives. The community fisheries center (CFC) proposed by Ben Yami (1980) is very attractive for its

technical pragmatism. Nonetheless, I believe the CFC is vulnerable to similar criticism with regard to popular participation; it is unrealistic to think that private enterprises and parastatals, which are allowed to constitute CFCs, could enhance the peasant fishermen's socio-political autonomy as well as economic capabilities without at the same time deepening the community's dependence upon outside assistance. It seems to me that though the CFC is efficient in terms of providing services to local people, it is still unclear to what extent it could encourage and respond to bottom-up initiative-building.

(4) Technologist-led development

This aspect of SSF development policy overlaps in part with the three previously discussed aspects, but it may be worth examining separately for its clear contrast with agricultural development.

A consensus in recent literature on fisheries development is that in addition to technological and economic perspectives, sociological considerations are of vital importance for SSF development planning. In the history of SSF development, the influence of sociologists is unfortunately rather limited; Meynell (1984) notes the professionals involved in past fisheries cooperatives have been either fisheries technologists or management experts on particular aspects of cooperative business. In clear contrast, agricultural community development policy in the 1950's and 1960's developed under

the initiative of community development experts with social science rather than technical backgrounds. Although it is said that ideological conflicts between these experts and technical personnel were resolved in favor of the latter as the shortcomings of community development policy became clear, their influence has long remained as a counterbalance to technologist-led development and reappeared later in the mainstream of development theory, taking such forms as Integrated Rural Development (IRD) and BHN (Staatz et al., 1984, p. 21; Holdcroft, 1978). Fisheries development traditionally lacks such a strong influence of community experts. Needless to say, this has worked against the well thought-out integration of cooperatives with overall fisheries development policies.

(5) The blueprint approach

Not only in SSF, but also in many other fields, cooperatives have been frequently damaged by being treated as if they were a ready-made solution to organizational problems. Prior to project implementation, high-level policymakers would determine cooperatives' objectives, structure, functions, and scope of activities based on the stereotyped Rochdale model or East European socialist models (Verhagen, 1984, p. 5). At times, successful domestic pilot cooperatives, such as the Comilla project in Bangladesh and Etawah model in India, were adopted as formal national models (Rutten, 1984). When these preplanned cooperatives were imposed, the local people responded sluggishly. Fisheries cooperatives have been initiated

in the same way. A basic assumption in this approach is that solutions to the problems are known and that development projects are nothing but the application of the solutions. This is what development experts now call the "blueprint approach," in contrast with the "process approach" (Gow et al., 1983; Johnston et al., 1982; Korten, 1980). In the process approach, institutional development is promoted through "a gradual, evolutional process in which both project staff and potential beneficiaries are willing to try various alternatives, discard them when they prove unworkable, and try others" (Gow et al., 1983, p. 432). In other words, one should regard cooperatives (though not exclusively cooperatives) as a movement or a process rather than a preplannable system. We will take up this subject again in Chapter III.

In this section, we have examined frameworks of cooperative development policy focusing on (1) the opportunistic utilization of cooperatives for administrative requirements of national governments and development agencies, (2) a lack of regional coordination, which is attributable mainly to bureaucratic rivalry, (3) the superficial understanding about the importance of grass-roots participation, (4) defects of technologist-dominated development planning, and (5) the deficiency of the blueprint approach, in which preplanned cooperatives are imposed regardless of area-, time-, and people-specific conditions. The logic behind my early statement

that problems from development policy were the most responsible for the failure of fisheries cooperatives is that if we had formulated development policies more properly, many problems stemming "from fisheries" or "from cooperatives" could have been circumvented. From a policymaker's point of view, the history of the fisheries cooperative in many developed countries is nothing but a process of overcoming these difficulties by continuously rectifying the erroneous policies. Of course, a proper development policy does not rule out the option of not initiating cooperatives if local conditions are too adverse to do so. We cannot simply follow try-to-do-everything-for-everybody policies, since we have limited resources in time, money, talent, and enthusiasm (Johnston et al., 1982, p. 15). We have to know what we can do and what we cannot do. Rejecting both do-everything optimism and do-nothing pessimism, we have to concentrate our scarce resources on what we can do. The reformulation of policy frameworks is a prerequisite for moving in a new direction in fisheries cooperative development.

CHAPTER II

FISHERIES DEVELOPMENT MODELS AND STRATEGIC OPTIONS FOR COOPERATIVES

INTRODUCTION

The discussion in Chapter I suggests that we cannot afford any more haphazard attempts to organize fisheries co-operatives. Budgets are tight, moods are bad, and fishermen are disillusioned. Unless a clear-cut perspective is presented, the cooperative may become a taboo subject among fisheries development professionals. Yet, as discussed earlier, there are significant benefits which are difficult to obtain without cooperatives: economies of scale, effective resource management, market intelligence, social credentials, political power; thus it is difficult to imagine well-balanced SSF development without first considering them. In theory, a government would be able to substitute the following for cooperatives: strict fishing regulations, government-owned processing plants, a market intelligence agency, a campaign to improve the image of fishermen, an organized political group in a community. In practice, however, it is absolutely unwise to recommend that the governments of developing countries having very limited

administrative capabilities and minimal budgets should carry out these policies. There seems to be no practical alternative but to induce fishermen to strive for the above benefits through their own organizational initiatives.

How can we crystallize such an abstract, lofty norm into concrete policy guidelines? The purpose of this chapter is to address this task by specifying strategic options for co-operative development. These options imply that the integration of cooperative policy with overall fisheries development strategy must be the first step in the policy reformulation process. In other words, this is an attempt to uncover income-generating factors related directly to production, and to design cooperative policy with these factors as the foundation. The validity of such an attempt will be discussed in some detail later; here a brief background will be given.

The literature increasingly suggests that the active participation of the rural poor is strongly related to income enhancement through improved or innovative production (Korten, 1980; Hyden, as quoted by Obern, 1981; Johnston et al., 1982, p. 173). To be sure, there have been remarkable cases where people have been successfully mobilized by programs aimed at meeting social needs--cf., family planning, community centers (Korten, 1980)--or economic needs that are not linked to production--cf., the collective purchase of home necessities, the saving and credit (Verhagen, 1984, p. 99). However, it is extremely difficult to incorporate these needs into a

generalized framework of fisheries cooperative policy since a need felt most intensely varies greatly from time to time, from area to area, and from subgroup to subgroup. In addition, it is questionable whether fisheries cooperatives always can or should play a leading role to satisfy such needs. The following discussion, therefore, will be confined to the strategic options based solely on production-related, income-generating factors.

This chapter is organized as follows. In the first section, we will take a detour and look at the development experience of world agriculture for the purpose of extracting useful lessons for fisheries. Drawing on the agricultural experience, the second section will attempt to identify factors driving fisheries development and present schematic development models, treating capture fisheries and aquaculture separately. Finally, in the third section, we will reinterpret these models as strategic options for fisheries cooperatives and consider the basic roles of cooperatives in the framework of various strategic options.

In order not to puzzle readers, it may be worthwhile to make a few comments on the relevance of agriculture to fisheries development studies. In spite of the industry taxonomy that puts fisheries and agriculture into the same category--that of primary industries--due to their common feature of exploiting biological energy directly from nature, few comparisons have been made between the two industries' development

from a historical perspective. Agronomists seem to perceive fisheries as an intriguing but small subsector of agriculture, for which general theories of agriculture are more or less applicable. On the other hand, academics and administrators of fisheries tend to overemphasize the differences between the two.

However, we have at least three good reasons to do a comparative study, especially for the benefits of fisheries studies. First, fisheries, commercial or subsistence, in most instances exist side by side with agricultural elements predominant in rural societies. A traditional linkage of fishing activities with local agriculture is stronger than it appears at first glance in terms of capital accumulation, supply of labor, and market among other considerations. Admittedly, there are cases where this generalization does not apply; for instance, the commercialization of fisheries may function to render this tie increasingly ambiguous, or agriculture itself may not be substantial in special localities like polar regions and atolls. However, the fact that fisheries are a segment of the rural society mosaic is still a prevalent reality in both developed and developing countries. This viewpoint is particularly important for understanding SSF in developing countries. Firth recorded that Malayan fishing communities were, to a considerable degree, enmeshed in the surrounding agrarian society:

> [Fishermen] have their own technical subculture, with which landsmen, particularly

> urban dwellers, are almost totally unfamiliar. But this is only in the technological field; economically, politically, socially, and religiously they are part of a larger universe (1966, p. 9).

Although this observation is not always true, what peasant fishing societies share with neighboring agrarian societies probably far outweighs what they do not have in common. While agricultural policies might be able to neglect fisheries, policies on SSF must always be made in the larger framework of rural societies as we already discussed in the defects of the bandaid approach in Chapter I.

The second reason for comparing fisheries with agriculture is that aquaculture, by contrast to capture fisheries, is rapidly growing. Since aquaculture is "agriculturalized" fisheries, the socio-economic aspect of fisheries could become even closer to that of agriculture in the future. If we consider the tremendous prospects of aquaculture, it is unthinkable that the general trend of fisheries to "agriculturalization" will decline. Tilapia in Israel and Taiwan, channel catfish in the U.S., shrimp in Ecuador, shellfish and seaweed in Japan and China are all examples of the recent advances of aquaculture.

Third, although it is hard for me as a student of fisheries to admit this, my honest impression is that fisheries lag behind agriculture in terms of both development experience and theory. Since fisheries are not at the level of agriculture in terms of manpower, budget, or social attention, we

have to keep learning from agriculture--unless fisheries personnel are content to inhabit a forgotten enclave.

AGRICULTURAL EXPERIENCE

The history of world agriculture embraces so many debates and unknowns that it constitutes an independent academic discipline in itself. However, for our purposes, Vernon Ruttan, a leading theorist in international agricultural development, provides a concise and well-balanced description of its history in "How the World Feeds Itself" (1980). Ruttan characterizes agricultural development according to six models. Three of them, I believe, are of major significance: namely, the frontier model, the conservation model, and the induced innovation model (or Green Revolution model). Drawing mainly on this article, let us examine what these models mean and how they are related to one another.

(1) The Frontier Model

By scanning the history of production, we find that prior to the twentieth century, increasing agricultural production was almost universally a function of the geographic expansion of farmland. This is the frontier model, an apparent example of which is the opening up of the new continents. Villages in Europe, Asia, and Africa used to increase production vigorously in the same way, though at a much less dramatic pace, thereby making a gradual population increase possible. The intensification of land utilization occurred simultaneously, but the main portion of the increment came from the exploitation of new lands. Despite a general belief that Chinese agricultural history is an exception to this model, about half of Chinese production increases from the beginning

of the Ming dynasty in 1368 to the middle of this century were also realized by expanding the crop area (Lardy, 1984). As far as the Third World is concerned, the frontier model remained mainstream as late as the 1960s. The recent famine in Ethiopia shows this process is still going on to an ecologically intolerable level in rural Africa.

Generally speaking, the importance of the frontier model diminished in the Third World between 1960 and 1975, when the cultivated area increased at an annual rate of 0.7 percent while yields grew at a rate of 1.6 percent (Loup, 1980, p. 100). Enhanced productivity, achieved through the replacement of traditional practices with modern techniques, reduced the importance of the physical enlargement of farming areas. The change was due to the introduction of high-yield varieties of rice, wheat, and corn, and associated technical packages. The subsequent dynamic transformation of traditional farming was called the Green Revolution, which eventually spread over one third of the grain-cultivating areas in developing countries (Jennings, 1974).

(2) The Conservation Model

Economic history reveals that in the period preceding the Industrial Revolution agriculture in developed countries underwent a transition which appeared similar to that of the Green Revolution. Furthermore, there is evidence that increased productivity in the agricultural sector was a precondition for industrialization in Western Europe and Japan (Loup,

1980, p. 140). The intensification of land use was brought about by intensive cropping, an integrated crop-livestock husbandry system, and a consolidation of physical facilities such as drainage and irrigation. This model of development is called the conservation model. The conservation model is qualitatively different from the Green Revolution in that the refinement of farming techniques was achieved by the farmers themselves through a slow process of trial and error without much assistance from institutional innovations based on modern science. Reflecting such piecemeal and local accumulation of refinements, the conservation model is a self-contained system; consequently, the growth rates based on it were quite low in today's terms. In England and France agriculture achieved less than one percent annual growth--in contrast to the dramatic image that the term "Agricultural Revolution" suggests. In China, before the current capitalistic reforms, a development strategy adopted for agriculture was identical to the conservation model, and the ecologists' organic farming movement may be a new version of this model.

It has been widely recognized that neither the frontier nor the conservation model can be accepted any longer as a guiding doctrine for international agriculture. The physical limits to the availability of arable land, given the present technical level, are a constraint for the former model, and expected growth using the latter model would be disappointingly slow. Neither model would be able to match food production

with annual population growth, which is predicted to be more than 2 percent until the year 2000 in most developing countries (World Bank, 1983).

(3) The Induced Innovation Model

History shows that agriculture in developed countries gradually entered a new development stage based on the induced innovation model. Since the beginning of this century agricultural productivity has been markedly enhanced by the application of new scientific and technological innovations developed in research institutions and universities. High-yield strains, pesticides, chemical fertilizers, agri-machines, and scientific farm management are all the brain-children of institutionalized R & D--obviously not the refinements of artisanal farming techniques.

The Green Revolution was a process similar to the induced innovation model which took place several decades later in the developing world; in other words, the Green Revolution was a new version of the induced innovation model developed around laboratory-produced grain varieties called miracle rice and miracle wheat. Although the Green Revolution has now lost its impetus as areas readily suitable to adopt its technology have dwindled away, its consequences in Latin America and tropical Asia have been no less than spectacular; for instance, India, a country suffering from uncontrolled population growth, managed to attain self-sufficiency in grain production largely due to the Green Revolution (Elfring, 1983).

The dark side of the Green Revolution is also noted by many researchers, and it is one of the most intensely debated issues in agricultural development studies. In some cases, different groups of researchers reach very opposite conclusions after investigating the consequences of the Green Revolution in the same area, probably reflecting their different paradigms of "development" (e.g., Umehara, 1982 versus Hayami et al., 1983). However, despite some drawbacks, the Green Revolution has been successful in proving that a transition from a resource-based system of agriculture in developing countries to a science-based one is very possible. One lesson from the Green Revolution is clear: rural development programs must always contain at their core a strong production drive (or income-generating factors) in order to fight back the continuing marginalization of small rural producers. No matter how elegantly planned, development efforts lacking the income-generating factors may end up as just another international welfare program.

(4) The Biorevolution Model

Let us turn our attention to the future. What we can see in the immediate future is a new wave of the technical revolution. In addition to further advances in the traditional agricultural sciences, a new set of scientific breakthroughs is opening up an era of "biorevolution." Among the promising fields are genetic engineering and microbiology. The Green Revolution was based on R & D in traditional biology and

chemistry: e.g., cross-breeding and selective breeding. Not only were these processes time-consuming, but also the difficulties in exchanging genetic traits between different species were immense. Now, thanks to the developments of cellular and molecular engineering, scientists are rapidly improving techniques to execute plant crosses between genetically very different varieties and seriously talking about a hybrid of potatoes and beans and other unimaginable crop combinations (Kenney et al., 1984; O'Type et al., 1984). The development of biotechnology will in all likelihood have an unprecedented impact upon agriculture in developing countries, not to mention that of developed countries. Kenney and Buttel give an example:

> Genetic engineering may well be able to produce varieties of rice with greater salinetolerance or wheats tolerant to aluminum. The importance of these research topics is clear; for example, 60 million hectares of land in Southeast Asia are affected by high salinity. Much of Brazil's land is affected by severe aluminum toxicity problems (1985, p. 67).

Another possibility, though in the more distant future, is crops capable of fixing atmospheric nitrogen through symbiotic bacteria. (Thereby much less fertilizer is needed; Hardy et al., 1984). Moveover, biotechnology is expanding its application to animal husbandry, plant tissue culture, and other fields such as medical science. The potential impact of biotechnology is so large--in making agriculture more efficient and even in industrially displacing a part of agricultural

production--that some assert that the biorevolution is the only hope for increasing agricultural production in tandem with the ever-swelling world population (Elfring, 1983). Kenney and Buttel (1985) also suggest that agriculture in developing countries does not have the choice of ignoring biotechnology if it is to survive the fierce competition from developed countries' agriculture reinforced with biotechnology. Table 1 summarizes the main difference between the Green Revolution and biorevolution.

Table 1. The main difference between the Green Revolution and biorevolution.

Characteristics	Green Revolution	Biorevolution
Crops affected	Wheat, Rice, Maize	Potentially all crops, including vegetables, fruits, agroexport crops (e.g. oil palms, cocoa), and specialty crops (e.g. spices, scents)
Other products affected	None	Animal products, Pharmaceuticals, Processed food products, Energy
Areas affected	Some LDCs; some locations (i.e. if accompanied by irrigation, high quality land, transport availability, etc.)	All areas; all nations, all locations, including marginal lands (characterized by drought, salinity, Al toxicity, etc.)
Research skills required	Conventional plant breeding and parallel agricultural sciences	Molecular and cell biology expertise plus conventional plant breeding skills
Crops displaced	None (except the germplasm resources represented in traditional varieties and land races)	Potentially any

Source: Kenny et al. (1985) p. 70.

FISHERIES DEVELOPMENT MODELS

Now let us turn in this section to fisheries, our primary area of interest, to see if the models outlined above can be useful in conceptualizing the historical development of fisheries as well and if so, how.

(1) The Frontier Model in Capture Fisheries

Fishing activities had been confined for a long time to lakes, rivers, and narrow bands of coastal waters before progress in shipbuilding and propulsion mechanics made possible the geographic extension of fishing operations. With few exceptions--such as Nordic fishermen who voyaged as far as Newfoundland before Columbus--it was only after the nineteenth century that distant-water fisheries developed on a global scale through motorization. However, once it gained momentum, the drive to explore farther fishing grounds became irresistible and exponential. This was the inception of the modern fishing industry. The British spearheaded this move. Cunningham et al. describe it:

> Before 1840 fishing was mainly coastal. In 1891, trawling off Iceland by British vessels commenced. By 1905 trawlers had begun visiting the Barents Sea, and by 1914 fishing grounds extended from Bear Island, Spitzbergen and the White Sea in the north to the Moroccan coast in the south. The period between the World Wars witnessed a continuation of the process . . .. In retrospect it would appear that Hull made the "correct" decision, to judge by the fact that the profitability of distant-water fishing was nearly three times that of near and middle-water fishing (1985, p. 130).

In the Far East, the Japanese were undertaking the same process. When the Russian threat was eliminated as a consequence of the 1905 Russo-Japanese War, the Japanese vigorously began distant-water fishing in the untapped North Pacific resource. Since then the promotion of distant-water fisheries has become one of Japan's top national policy priorities. Further along in history, its fishing industry again showed remarkable growth after the ruin of World War II as a result of using the same strategy. Soon the Soviet Union and other East European nations joined the race and quickly became important fishing nations. Following these forerunners, some developing countries such as Korea, Taiwan, Thailand, and to a lesser extent Cuba and Ghana pursued more or less the same policy to develop their fisheries. This process continued until fishing fleets from these countries completely covered the world's oceans; here evidently the key to increasing production has been the spatial expansion of fishing grounds. In this context, no matter how mechanically sophisticated fishing hardware was, the basic structure of world fisheries remained similar to the frontier model of agriculture. Large trawlers, whale factory ships, and airplane-accommodated purse seiners were all symbols of prosperity in the heyday of the frontier model.

However, in the early 1970's the frontier model came to an unexpectedly early end; the biological limitation of resources and the geographical dead end became increasingly

clear. A sense of crisis and much dissatisfaction with the regime for world fisheries led coastal countries to extend their seaward jurisdictions even before a consensus was reached in the U.N. Conference on the Law of the Sea (UNCLOS III). Once the suspicion that the frontier model did not have a future became a reality, this model was quickly discarded as a fisheries development strategy--at least in theory. It is noteworthy, however, that some developing countries hastened to fill the vacuum created by the withdrawal of foreign fishing from their EEZs; this may be viewed as a remnant of the frontier model, particularly when optimistic expectations are associated with it. Nevertheless, it is unquestionable that the frontier model is no longer the leading development doctrine in either theory or practice.

(2) The Conservation Model in Capture Fisheries

What did we have after the frontier model disappeared from the stage? A world-wide chorus of Maximum Sustainable Yield (MSY) theory, of course; the conservation model emerged as a new faith. Instead of an expansion of fishing grounds, the conservation model urges that fishing efforts be optimized, economic losses minimized, and thereby production in a given area maximized. It was no longer a mere pedantry to talk about the tragedy of commons and dissipated rent; note how significantly the philosophy of the conservation model affected the process of shaping fisheries provisions in UNCLOS III. However, the realization of MSY (or MEY) through proper

fisheries management is very difficult, if not impossible, in practice. Inadequate scientific knowledge, limited research capability, inflexible administration, a lack of enforcement, and the indifference and even hostility of fishermen are obstacles which are individually troublesome enough to shatter fisheries management completely. In fact, many important fisheries, ranging from North Sea herring and Alaskan king crab to trawl fisheries in the Gulf of Thailand, collapsed at the very same time that MSY was prevalent among academics and administrators. The underlying problem is probably twofold: (a) The common property nature of fishery resources makes the conservation model extremely complex. In the agricultural conservation model an independent farmer solely and tangibly controls his production. By contrast, even state-of-the-art fishery research techniques cannot easily tell what is happening under water, and what is worse, any conservation efforts are constantly threatened by the so-called free riders. In this respect, many studies report a serious deterioration of public resources in the rural society of developing countries. Not only fisheries but also public land, where people used to graze cattle and obtain fuel wood and construction material, are now under too heavy a population pressure to allow a half-hearted conservation effort to be viable (Verhagen, 1984, p. 13; Barker, 1984). (b) Too short a time has elapsed for all the turmoil to have settled. In some places, the conservation model has been a time-honored practice. Without a sophisti-

cated theory, Japanese coastal fisheries have been managed fairly well with the conservation model under the village-based (later cooperative-based) limited entry regime. Of course it was not done overnight; a long history transmuted the conservation idea to consensus and the consensus to common sense. To the conservation model, time is a vital function.

If we could work out an effective measure to circumvent the common property nature of fisheries, it would not be unreasonable--albeit a seemingly discouraging picture of world fisheries management--to expect that the conservation model would yield a moderate gain over a long period of time through a "learning effect" of the people concerned.

(3) The Induced Innovation Model in Capture Fisheries

In some developed countries, institutional R & D is exploring new sources of development for fisheries and has actually started changing a commonly held image of fisheries. An area most frequently referred to is development of the cost-saving technology; instead of increasing production, this technology is aimed at shrinking the costs without reducing the catch. Particularly after the second oil crisis in 1978, research efforts were focused toward the development of fuel-efficient engines, light and durable hulls, less water-resistant nets, and even revived sails. Parallel to such mechanical innovations, biological innovations began affecting coastal fisheries in developed countries. The best example is probably Japanese culture-based fisheries, in which

artificially propagated fish seedlings are released into and grow in nature, and fishermen catch them in addition to the natural stock. At present for this purpose, Japan has fifty propagation centers which mass-produce seedlings like a factory, and their network covers a substantial portion of Japan's coastal area (Norin Tookei Kyokai, 1984). Developing countries too have urgent problems which need technologically innovative solutions. For instance, the trash fish by-catch taken along with a target species (particularly shrimp) and simply discarded at sea is estimated to amount to at least several million tons a year--in the midst of a protein shortage in the Third World (Ceres, No. 1, 1984). The development of a cheap preservation method on board could lead to total utilization of the by-catch for human consumption.

An intriguing feature of the induced innovation model for capture fisheries is that many innovations--either mechanical, biological, or chemical--can make little or no impact upon the long-term productivity of fisheries unless they are used in proper combination with the conservation model. In this sense, it is erroneous to regard the induced innovation model as a cure-all substitute for the poorly managed conservation model. Nevertheless, many successful cases of Japanese culture-based fisheries indicate that provided adequate conservation measures, the induced innovation model has a huge potential which the conventional conservation model will never be able to match.

(4) The Frontier Model in Aquaculture

Aquaculture has also gained much attention as a substitute for the frontier model of capture fisheries. However, it is not difficult to give examples of aquaculture development which in themselves are based on the frontier model. In Latin America, the future development of shrimp culture is in part dependent upon the available space of mangrove swamps; the expectation that Mexico will become the largest shrimp producer surpassing Ecuador is attributed to its huge unexploited swamp areas. Cunningham et al. (1984, p. 348) note that in Asia there are 130 million ha of swamp, tidal waters, lakes, and lagoons which might be suitable for aquaculture, while less than 3 million ha are currently being used. Although it is no more than fancy to assess the world aquaculture potential by simply multiplying unused areas by the present yield per unit, it is equally unlikely that aquaculture development will face spatial limitations in the near future.

(5) The Conservation Model In Aquaculture

An interesting feature that has commonly appeared in much aquaculture literature is an admiration of traditional Chinese pond culture, the underlying philosophy of which is exactly the same as the conservation model in agriculture. The Chinese developed carp culture into a complete energy-recycling system which allowed as many as six varieties of carp to occupy different ecological niches so that an entire

water column was utilized. In recent years, the introduction of a couple of species of tilapia has further increased the efficiency of the system (Zweig, 1984). Fish farming in China is also an integrated part of an agriculture-livestock husbandry complex; a well-known example is an organic combination between sericulture and aquaculture. Mulberry plants are grown on pond dikes, and mud from the pond bottom is used as fertilizer. Silkworms grow by feeding on leaves of the plant while their feces and pupae are returned to the pond as fertilizer and feed respectively (Zweig, 1984). Fish farmers in developing countries are advised to follow the Chinese system to intensify their production. Bardach et al. write:

> While Chinese carp culture in the People's Republic will continue to be vital to the peoples of Asia, the greatest contribution of the Chinese fish culturists may be not to their own people, but to the world, as the contingencies of population excess and protein shortage force us all to apply the principles of ecology as they did centuries ago (1972, p. 119).

Again, the conservation model seems to be the guiding theory for world aquaculture. But we must not forget that the remarkable efficiency of Chinese fish culture has been accomplished through farmers' trial and error over thousands of years. Their techniques are often locality-specific and should be called "experience-intensive," to distinguish them from "knowledge-intensive," science-based fish farming. Thus the problems transferring the Chinese farming technology to other areas of the world are numerous (Zweig, 1984).

(6) The Induced Innovation Model in Aquaculture

Japan provides the best example of the induced innovation model in aquaculture, which has had a revolutionary effect on its coastal fisheries during the past two decades. The steady accumulation of scientific knowledge about biology and oceanography has made possible the successive development of new aquaculture techniques, in particular in mariculture. Today mariculture has grown to account for more than one third of Japan's coastal fishery production (Norin Tokei Kyokai, 1984). Aquaculture has not only raised production in itself, but it has also helped break the vicious circle of low productivity stemming from over-population in capture fisheries. The author personally witnessed a dynamic change triggered by new techniques in scallop and kelp farming in a small town in Southern Hokkaido. Ex-capture fishermen, the poorest group in the town, began enjoying at least an average living standard soon after these techniques were introduced. Tilapia culture in Israel and Taiwan is another successful case in which institutionalized research efforts paid off. Tilapia farming is now firmly established as a commercial business in both countries, and amazing innovations continue (Pullin, 1984). A recent issue of Ceres reports that cross-breeding between Nile tilapia and albino Java tilapia has produced "extremely fast growing red varieties," and the commercial application of this technique has increased tilapia productivity "a hundred fold at once" (1984, No. 4, p. 7).

Probably no more examples are necessary to illustrate the magnitude of the on-going innovations in aquaculture. We have noted that the Green Revolution was nothing but a rapid transition from resource-based to science-based agriculture; by extension, the current development of science-based aquaculture must be named "the Blue Revolution." We see no reason to deny the strong likelihood that the induced innovation model will also have a substantial impact on aquaculture in developing countries in the near future. Milkfish culture in Southeast Asia and shrimp culture in Latin America already suffer from an absolute shortage of naturally spawned seeds, and the only solution will be to produce the seeds artificially in hatcheries (Weidner, 1985). International technical cooperation, as well as the establishment of national research capabilities, will be needed to address the problem. Since aquaculture generally has a much shorter history than agriculture does, there still remains much room for contributions from the frontier model and the conservation model, but the center of gravity is shifting from those models to the induced innovation model. The following demonstrates the potential this model can tap for aquaculture in developing countries. One of the controversial points in aquacultural development is whether it should or would orient to luxurious international commodities like shrimp, or whether local nutritional improvement should be given top priority. A recent study suggests that the polyculture of a kind of freshwater prawn

and a monosex tilapia hybrid is possible without reducing the stocking rate of tilapia, thus calling into question the presumption that the two objectives are mutually exclusive (Pullin, 1984).

(7) The Biorevolution Model in Aquaculture

The growth of the biorevolution model in agriculture will undoubtedly spill over into aquaculture because the techniques of biotechnology, such as recombinant DNA, are quite universal and versatile. Researchers are already able to create a rat-sized mouse by transferring a growth hormone gene from rats into mice (Kenney et al., 1984), so it may no longer be a wild fancy to imagine a "fresh-water lobster" or a "tropical salmon."

Biotechnology could not only accelerate improvements in productivity, but also remove various difficulties in domesticating wild species and in cultivating fish in a foreign environment. One of the immediate utilities of biotechnology is the development of a single cell protein from natural gas or human wastes that can be used as an artificial feed (Kenney et al., 1984). If single cell protein becomes available, it will reduce feed costs substantially and thus provide a new opportunity for farming many species which are presently uneconomical. Although to predict the future is bound to be risky, it may be safe to assert that aquaculture will gain a renewed impetus from this new breed of science. As for aquaculture in developing countries, what we must

address at the beginning of the biorevolution era is the need for long-term basic research because present tropical aquaculture research is generally too short-term and adaptive to advance in tandem with aquaculture R & D (Pullin et al., 1984).

To summarize, while in capture fisheries the frontier model has essentially been replaced by the conservation model in theory, we probably have a long way to go before we can create a social environment that allows the conservation model to work effectively. Even if this process is relatively smooth, it is unlikely that the conservation model alone will enable world fish production to keep up with population increases (Cunningham et al., 1985, p. 310). Fisheries statistics of the FAO have already begun to indicate the slow-growth nature inherent in the conservation model; after the explosive growth based on the frontier model in the 1950s and 1960s, world fish production increased by only 9 percent from 1970 through 1982--that is, less than 1 percent per annum. This fact coincides with the historical trend we discussed in the conservation model of agriculture. Aquaculture, on the other hand, has a much higher potential, for it can surpass the ceiling of natural productivity by means of modern science and technology. The on-going Blue Revolution will accelerate on a global scale as a strong research base is established nationally and internationally. Furthermore, the spillover from the agricultural biorevolution will provide a lot of new

opportunities for the future of aquaculture.

I expect that a combination of the existing three models plus the possibilities of the biorevolution model will generate tremendous energy for aquaculture development in coming years. I am not implying that capture fisheries are no longer important; clearly capture fisheries will continue to account for the predominant portion of world fish production. Therefore, it is hoped that not only will the induced innovation model be introduced into aquaculture to the maximum extent, but also that improved fisheries research and proper conservation efforts will help capture fisheries evolve to the stage of the induced innovation model.

STRATEGIC OPTIONS

In the foregoing two sections we have shown that the development models theorized in agriculture offer an adequate, if not perfect, analytic framework within which to consider fisheries development. We have also shown that eight different models can be identified, although for practical purposes there are seven models--i.e., the biorevolution model for capture fisheries can be excluded. Table 2 summarizes the models and factors driving development in these models.

Table 2. Factors driving development in fisheries development models.

	Capture Fisheries	Aquaculture
Frontier Model	Geographical expansion of fishing grounds	Geographical expansion of fish farming
Conservation Model	Attainment of MSY (or MEY) through proper resource management	Polyculture and integration with agriculture and other production activities
Induced Innovation	Development of cost-saving technology Culture-based fisheries Utilization of trash fish by-catch	Institutionalized R&D to develop science-based technical package
Biorevolution Model	Release of genetically engineered fish into natural environment(?)	New feed, new medicine, new genetically improved species

The purpose of this section is to examine how cooperative development can be reformulated in terms of the seven fisheries development models. An important--probably the most important--point for fisheries cooperative policy is (as discussed earlier) that it must be consistent with the overall strategy of fisheries development. It appears that in the past many developing countries made ill-fated attempts to implant stereotyped cooperatives which were suitable neither to the social environment nor to development objectives. By reinterpreting these seven models as the "strategic option" for fisheries cooperatives; by paying due regard to the various functions that different types of cooperatives can perform, we will be able to outline a course for cooperatives which will be fit for the broader framework of fisheries development. This section will also discuss potential pitfalls in the course of cooperative development based on each of the strategic options.

Before moving on into cooperative design, some premises for discussion should be noted here. (a) It is more realistic to suppose that a government simultaneously takes two or three strategic options; thus interactions between options necessitates further consideration. However, for the sake of simplicity, the following discussion largely assumes that a government chooses a single option for a given area. (b) Because it is impossible to presuppose all possible conditions to which actual cooperatives have to adapt, it must be understood that

the proposed cooperatives are broadly indicative and obviously need case-by-case adjustments. (Chapter III will, in part, answer this problem.) (c) It is not our intention in the following sections to discuss whether a certain strategic option in itself is appropriate for today's developing countries. This question goes beyond the scope of this study. Instead, we will discuss how and what kinds of cooperatives should be proposed based on a given strategic option. (d) Although the seven strategic options are supposed to provide a conceptualized framework of national fisheries development policy regardless of the development stages of nations, discussion will mainly focus on developing countries given the purpose of this paper.

1. Strategic Option 1: Develop capture fisheries based on the frontier model.

Most of the fisheries policies adopted by developing countries in the past fall into this category. Where the fishing industry was virtually non-existent or too primitive to exploit resources fully, development was nothing but the introduction of new technologies, particularly those for LSF; as long as unused resources existed, this policy could achieve remarkable production increases in some countries.[4] But today, geographical, biological, and legal limitations are so apparent that it is often questionable whether to recommend that developing countries plan quick LSF development. Even if

offshore resources clearly indicate that a modern fisheries sector should be expanded, a government must not make overly ambitious plans. On the contrary, it should take rather cautious steps; for instance, each year only a very limited number of licenses should be given to new vessels. Cooperatives should first be organized among emerging boat-owner groups. We can distinguish two areas to which such cooperatives would be able to contribute.

First, the cooperatives could function as autonomous regulatory organizations to maintain optimum fishing efforts. In order to make them viable, the government would probably have to force license recipients to join the cooperatives, and if a boat were repeatedly uncollaborative, the government would have to take strong measures, including revoking the license. Once the cooperatives began acquiring some degree of maturity, the government would have to consult them about matters related to the further issue of licenses. The merits of this sort of cooperative are that (a) licensed fishermen as a group become a strong block against excessive entries of new boats into a fishery, and (b) social pressure from members of the cooperative helps prevent an individual boat from violating regulations. Unless such a bottom-up power effectively counters the pressures of new entry and illegal fishing, any government regulations will likely remain nominal, no matter how beautifully they are written.

As the reader may have noticed, this regulatory function

of cooperatives is little different from that of cooperatives based on the conservation model. This stems from the fact that there are no fisheries left for which we can afford to neglect resource management, even though they are in relatively early stages of development. In this respect, it is not extreme to say that a pure frontier model is not an option for today's fisheries development.

The second area concerns resolving bottlenecks to the steady development of a modern fleet. As the number of boats and production increase, some constraints often appear in either production inputs or outputs because it is not always possible for every economic component surrounding fisheries to change at the same pace. For instance, traditional middlemen may not be able to expand the market consistently with swelling production; the lack of a modern insurance system may become a bottleneck to modern fleet expansion; the unstable supply of fuel and spare parts may hamper fishing activities. If the need to resolve such constraints is intensely felt by the member boats, the coperatives will have the chance to undertake an economic service. Here, two points have to be made clear. (a) To feel needs strongly is one thing, but to prefer to fulfill the needs through cooperation is another. One prerequisite to combining the needs with cooperative solutions is the group-consciousness created through members' experience in the cooperatives as both self-regulatory bodies and interest groups. (b) If the increase of fishing boats is

relatively slow, an indigenous economic structure may have enough time to adjust itself to new opportunities. Thus it is important to understand that it is not always necessary to replace existing private businesses by cooperatives. In this case, it is better for cooperative activity to be confined to the role of coordination--e.g., the operation of auctions rather than direct marketing activity.

Potential Pitfalls

As elaborated in Chapter I, it is now clear that the development of LSF does not necessarily dissolve the problems of SSF. Similarly, it is doubtful whether the successful development of cooperatives among LSF boats will have a diffusion effect over an SSF sector. Although it is legitimate to concentrate administrative efforts to help organize cooperatives in LSF when LSF are about to grow or are growing, we must be aware that they probably have little impact on the organization of peasant fishermen. On the contrary, there is a real risk that the political maneuverability which cooperatives of LSF boats come to obtain will be used to restrict the fishing of peasant fishermen.

2. Strategic Option 2: Develop aquaculture based on the frontier model

In this strategic option, proposed cooperatives will be similar to agricultural settlement cooperatives because aquaculture development takes place in areas like mangrove swamps

where little or no substantial economic activity preexists. For settlement projects, the initial production credits and living funds must be provided by the government until new settlers are able to harvest sufficient fish to support themselves. I am inclined to think that the government should directly implement the financial assistance without using cooperatives because cooperatives set up for this purpose tend to give settlers a wrong impression of what the cooperatives are all about. Alternatively, I believe cooperatives must be encouraged to engage in collective bargaining with merchants on the supply of production inputs and the sale of fish. This is one of the most viable plans if new settlers are strangers to each other and therefore have difficulties organizing cohesive cooperatives immediately, and if competition among local merchants is sluggish. A cooperative for collective bargaining does not require a neat office and a professional manager, though it needs leadership for coordination and perhaps periodic assistance by government officials. Furthermore, the development of collective bargaining power implies that settlers would be better prepared to make their voices effectively heard in public agencies by increasing their "claim-making power" (Verhagen, 1984, p. 25). More advanced models of a cooperative should be proposed, based on an accumulated experience of cooperation, when aquaculture systems shift to the conservation or induced innovation models.

Potential Pitfalls

A crisis in this type of cooperative is predictable: if the settlement projects thrive, more middlemen will be attracted to dealing with settlers and some settlers may wish to drop out of collective bargaining. In particular very successful settlers who can get better prices and, at the other extreme, depressed settlers who need money for their next meal may be tempted to thwart sales agreements. It is difficult to judge whether the settlers, including those who are dissatisfied with a particular sales agreement, will resolve this problem by strengthening their solidarity or by simply splitting away. The cooperatives will be able to survive to the extent that the settlers are conscious of the merits of cooperation. Even if collective bargaining is terminated, the cooperative would have a much greater opportunity of resurfacing when the settlers faced other common problems in the future.

3. Strategic Option 3: Develop capture fisheries based on the conservation model.

The purpose of cooperatives designed under this option is almost identical to that of cooperatives in Option 1--that is, autonomous fisheries management through socio-political clout to counter the increasing pressures of new entry and mutual supervision to enforce regulations. However, because this option is usually applied to fisheries which are already over-fished and have no geographical escape--a situation

manifested in many SSF--there are some aspects we have to consider differently from Option 1. First, while one role of cooperatives under Option 1 is to limit new entries, here cooperatives must help reduce the existing fishing efforts to an optimal level; obviously this job is much more difficult. Second when this option is applied to SSF it cannot expect much administrative help. Even if it is possible for a handful of fisheries agency officials of a developing country to supervise say 50 trawlers congregated in one or two ports, they are nearly powerless when faced with a multitude of small boats spreading along entire coasts.

Given the considerations noted above, cooperative development policy must induce fishermen to establish a higher level of control over their resources. Bailey (1981) suggests that peasant fishermen be helped to form community-based resource management organizations in order to enable them to cope with a threat posed by commercial trawlers. Although he seems to overlook another threat from within SSF, I basically support his proposal. In my opinion, the most effective policy would be to organize fishermen into community-based cooperatives and grant the cooperatives the exclusive right to determine the mode of utilizing their resources. In order to prevent an uncontrolled increase in the fishing population, these cooperatives must be allowed to limit their membership with the approval of the authorities. In the long run, a cooperative-based sea tenure system, as successfully implemented in Japan

and Korea, can be considered as a means of strengthening the cooperatives if the existing customs are not too hostile to such a system.

As for the economic activities of cooperatives, policy-makers must be patient enough for the bottom-up initiative to grow through fishermen's experience in collective resource management, and they must concentrate assistance toward co-operatives which have had a serious commitment to economic activities. In Japan, fishermen's organizations took about 25 years to start limited economic activities, and another 20 years were needed before they were authorized to fully engage in economic businesses (Yamamoto, 1980). A dogmatic idea that collective marketing or financial service is always the primary field of cooperative activities must be discarded in the peasant cooperative; although an option for economic activities should be kept open, administrative efforts in SSF must be focused on the consolidation of socio-political autonomy for peasant fishermen, notably over coastal resources.

Pitfalls

Unfortunately cooperation-building under this option is very difficult for the following reasons:

1. Unless fishermen's communities have a relatively egalitarian structure and the "share of poverty" is a commonly accepted norm, the rural elite may dominate cooperatives and distort the patterns of access to resources in their own favor (Obern et al., 1981). In a way similar to the

enclosure act, this would threaten weak segments of communities such as minorities, immigrant fishermen, and part-time fishermen.

2. If cooperatives with limited membership and sea tenure are incompatible with existing customs, this model may cause fierce intra- and inter-community conflicts.
3. The conservation model is often incapable of achieving an immediate production increase; subsequently the chance of upgrading these cooperatives to include economic activities is rather slim, at least for the time being.
4. This model of cooperatives is intended to reduce fishing efforts, but mounting population pressures in peasant societies may nullify such cooperatives in the long run. We must bear in mind that the successful development of the conservation model in Japan was achieved under specific conditions--i.e., rapid economic growth had successively drained an excess of the fishery population out of the villages. Strictly speaking, this is a problem of the conservation model itself rather than that of the cooperative based on the conservation model. The solution can be found only in the creation of jobs in some other ways (Penayotou, 1980), either inside or outside the fishing industry. If we must find new employment opportunities inside fisheries, other strategic options must always be combined with the conservation model.

4. Strategic Option 4: Develop aquaculture based on the conservation model.

It is interesting to note that, as far as mariculture is concerned, this strategic option is hardly adoptable. Due to the technical difficulties in cultivating fish in the sea, major maricultures have developed only recently on the basis of a rapid accumulation of scientific knowledge (instead of the time-tested know-how of fish farmers), and it is certain that researchers at modern laboratories will continue to play the role of innovators, notwithstanding the importance of fish farmers' experience in adapting such innovations to the local environment. However, for small-scale, traditional fresh-water cultures in ponds and lakes--particularly those characterized by extensive farming methods and resultant low productivity, practices like polyculture and aquaculture-agricultural integration has much to contribute. For this option the appropriate choice is a cooperative in which all the households in a community participate, for a differentiated treatment of aquaculturists and agriculturalists obviously makes little sense.

A unique example of cooperative development on the conservation model is the "cooperation for survival" approach advocated by Verhagen. Although in my opinion, the real value of the "cooperation for survival" model lies elsewhere--i.e., in the formulation of "action-research" methods to uncover the structure of the needs for cooperation--the major premise

of this approach is identical to the conservation model. Verhagen writes:

> Resources, however scarce, are seldom used in an optimal way. Security offers no guarantee against waste . . .. In both the Thai and Sri Lankan villages "micro projects" were identified (in such fields as improved water management, horticulture and others) which would require no, or very limited resource input from outside . . .. Mobilizing local resources, including locally available knowledge, should be acknowledged in theory and in practice, as a major function of cooperative action and organization (1984, p. 22).

He further notes several specific guidelines for a rural development program (1984, p. 16); among these are multiple and intercropping systems as opposed to a sole cropping system; subsistence production--in particular of the poor man's food crops--as opposed to one-sided promotion of production for markets; and conservation and rationalization of the use of public lands, waters, and forests. Based on these typical conservationist notions, he proposes to organize cooperatives as issue-oriented functional groups in order to enhance the capability of peasant farmers' self-defense. As he suggests, any individual rural community has a unique resource endowment in terms of both quality and quantity; thus there is no uniform application method of the conservation model. When this strategic option is chosen, the desirable activities of cooperatives must be worked out uniquely in an individual community. In this respect, it would be correct to say that the community-based, issue-oriented functional groups are probably

the only feasible concept for cooperative development based on the conservation model.

Potential Pitfalls

The cooperation for survival model is certainly a very attractive approach for academicians, but it is probably just the opposite for governments and development-assistance agencies. Because the needs and therefore the actual development programs vary greatly in time and place, cooperative development under this approach requires huge human resources--i.e., a large number of experienced researchers and qualified officials who must be knowledgeable, sympathetic to the poor, incorrupt, and competent enough to contrive programs to fulfill the needs. I would like to leave it to the reader to judge to what extent development agencies as well as developing country governments can meet this requirement. Another potential pitfall is that the needs of every community would not necessarily provide the chance for a cooperative, particularly if the collective benefits gained by meeting the needs did not clearly exceed the collective costs of doing so. Johnston et al. (1982, p. 171) point out the fallacy of assuming that the costs of participation for the rural poor are minimal; cooperatives require "substantial and continuing investments of time, energy, and personal freedom of action on the part of participants." There is much room for discussion on whether the cooperation for survival approach can counter the creeping disinclination for participation among rural people if the

approach fails to increase their well-being (their income levels in particular), due to either a poor availability of local resources or an inadequate research capability.

5. Strategic Option 5: Develop capture fisheries based on the induced innovation model.

Given the characteristics of the induced innovation model, this strategic option will not be available for many developing countries unless their fisheries research substantially improves. However, nowadays the inadequacy of national research capabilities can to some extent be compensated by international technical aid, so let us not rule out the possibility of building cooperatives under this option.

Table 2 includes three major fields in which future research may be able to offer impressive breakthroughs: culture-based fisheries, development of cost-saving technology, and utilization of trash fish by-catches. Since innovations related to the latter two will possibly be adopted with or without cooperatives (though cooperatives can hasten the process), let us concentrate on the first.

As I mentioned earlier, in Japan culture-based fisheries have already become a reality. The Sarufutu Fisheries Cooperative is one of the highly publicized "model cases." Sarufutu, a small village located in northern Hokkaido, used to enjoy a large scallop production, but later uncontrolled fishing shattered this production and fishermen became extremely

impoverished. During the 1960s, while Japan as a whole was achieving unprecedented prosperity, fishermen in this village scarcely shared the boom. Fishermen who could not afford to leave remained in the village. In the early 1970s, they decided to take the full gamble in order to convert to culture-based fisheries, staking as much as 10 percent of their future landings. They bought spats with borrowed money and released them in one of four evenly divided areas of their fishing zone. They did not even touch the area for the next four years, despite further reductions in income which resulted from having given up a quarter of their fishing grounds. The results of their patience were production beyond the fishermen's wildest expectations: it came to twenty times an average year's production. Since then production has kept growing. When I visited the village in 1983, per capita annual income of the scallop fishermen ranged between U.S. $200,000 and $400,000. However, the point here is not the fishermen's new wealth, but how they became rich. We can identify three important components in their success: (a) scientific management; (b) cooperative initiative; and (c) collectivization of production. The last is particularly interesting; the cooperative is no longer a federation of independent fishermen but works virtually as a single unit of production. The fishermen catch scallops under the terms of an elaborated production schedule and a daily norm decided jointly by the fishermen and the cooperative management. Only four boats are allowed to engage in the

fishery and all young fishermen have to spend several years working in the cooperative on pre-production activities such as seeding spat in the fishing ground before they can qualify for the crews of the scallop boats. The cooperative also establishes detailed rules on profit-sharing, according to which boat owners, crews, and young fishermen in pre-production activities receive their salaries.[5]

As the above case study clearly indicates, in order for fishermen to take full advantage of culture-based fisheries, the conventional role of fisheries cooperatives as supporters of independent producers may need to be replaced with a more active role in which cooperatives are production entities in themselves. For culture-based fisheries, pre- and post-production become both unavoidable and indispensable because the traditional concept of fishing--to catch fish--does not make sense without activities such as seeding and the extermination of natural enemies. Moreover, the stricter degree of fishing regulations necessitates the direct control of operations by cooperatives in place of mere coordination among competing fishermen. Briefly, a key to this strategic option lies in the organizational transformation from independent fishing activities to an organic whole made up of interdependent fishing activities through scientific control. The collectivization of production in the framework of a cooperative is one of the viable approaches in this direction.

Potential Pitfalls

Chinese and Tanzanian experiences in peasant collective farming demonstrate that collectivization has fatal defects stemming from disincentives and bureaucratic controls despite an ideological justification for it (Putterman, 1985). Although collective farming may be a better way to induce cooperatives when over-population in a community does not allow the distribution of sufficient farmland to individual farmers, it is widely accepted that collectivization is apt to cause inefficiency and resentment among peasants. There are two major differences between the Chinese and Tanzanian collectivization efforts and the successful Japanese examples described above. First, in the Japanese case collectivization was planned at the cooperative's initiative and with the fishermen's experience, not imposed by an external authority; thus they could avoid many potential contradictions between the collectivization plan and existing socio-cultural conditions. Second and more important, collectivization in Sarufutu offered potential benefits which were too great for the fishermen to ignore. By contrast, collectivization in China and Tanzania failed to provide attractive prospects, at least by peasant criteria. A veteran fisherman of the Sarufutu Cooperative jokingly told me it was not fun to work under somebody, but it is not likely that the fishermen will dissolve collective production and return to "exciting"--but apparently devastating--free competition. Finally, we should remember that collectivization in

Sarufutu was possible only with the help of the newly available technical package of culture-based fisheries. If developing countries cannot provide similar technical packages, to imitate the Sarufutu model could cause further deterioration of their SSF.

6. Strategic Option 6: Develop aquaculture based on the induced innovation model.

This option does not necessarily require total or partial collectivization of production, since an entire production process can be controlled by an individual aquaculturist. Cooperatives based on this option should instead consolidate collective marketing, purchasing, and financing as an umbrella organization for independent aquaculturists, as do ordinary agricultural cooperatives in developed countries. This is not to say that cooperatives are no longer required to coordinate member activities; indeed aquaculture is not free from the tragedy of common property. If everyone attempts to maximize individual profits by raising the per unit density of fish in an uncoordinated fashion, everyone will be worse off as a result of a deteriorating ecology and epidemics of fish disease. However, the coordination of member activities would be a relatively minor function of the cooperatives. The major significance of this strategic option lies in its promising potential in terms of productivity, planability, and marketability, which would enable cooperatives to fully exploit economies of

scale in marketing and processing. Similarly, a uniformity and predictability in the use of inputs--for instance, artificial feeds, medicine, or cage nets--would render the collective supply very viable. These are business fields in which modern cooperatives can display their maximum strength, and in this respect the standard Western cooperative can be implanted without much friction with local conditions.

Finally, it should be noted that this type of cooperative often has to acquire research capability--or at least an ability to respond quickly to technical innovations developed in public research institutions--to survive the fierce competition with producers in other areas. This adds a new imperative to cooperative management.

Potential Pitfalls

One pitfall for these cooperatives is the unavailability of competent managerial personnel; as science-based aquaculture itself, cooperative management under this option requires a high level of expertise and entrepreneurship. Unfortunately, unlike aquaculture techniques, there is no technical package available for managerial skill, nor can low-level government officials substitute for smart businessmen. We can predict that the human factor could be a real bottleneck for the cooperatives, taking into account the shortage of trained management professionals in developing countries. Another pitfall is that rational management often eventually collides with the humanistic aspect of cooperatives. (We discussed this problem

in Chapter I.) This is a universal dilemma of the cooperative.

7. Strategic Option 7: Develop aquaculture based on the biorevolution model.

For cooperative development, this option may not be much different from Option 6. However, an interesting possibility is the use of cooperatives as a part of public research activities. Specifically, cooperatives could be organized among aquaculturists enlisted to experiment with new biotechnology products. Cooperatives could supply new inputs from laboratories and foreign countries to members, mediate information between institutions and members, disseminate new technology to other aquaculturists, and gradually convert themselves into an economic organization for these pioneer aquaculturists. It is not known for certain how many years will elapse before biotechnology will start affecting primary industries in developing countries, positively or negatively. Some studies forecast that biotechnology will become a compelling reality for these countries by the end of this century; if so, it is unrealistic to ignore a new possibility for cooperatives. I omit the potential pitfalls for cooperatives in this option as I am not confident of offering a plausible discussion on this matter. However, I can say positively that technology can solve many problems but obviously not all; cooperative development calls upon a much wider spectrum of human efforts.

CHAPTER III

OPERATIONAL OPTIONS FOR COOPERATIVES AND CONCLUSIONS

OPERATIONAL OPTIONS

In Chapter II, we examined how cooperatives can be linked to the overall strategy of fisheries development. However, the seven strategic options we identified are no more than coarse sketches of policy outlines within which the organization and function of cooperatives have to be depicted in detail. Indeed, strategic options alone scarcely provide the necessary information to design actual fisheries cooperatives; for this reason operational options need to be explored. Unlike strategic options, operational options do not indicate the general directions in which cooperatives must proceed, but present various sets of options from which we can consciously choose the most appropriate policy in a given environment. If the first choice turns out to be inadequate in the process of designing and implementing the cooperative programs, we can correct the program by considering the second choice instead of jumping to the conclusion that "cooperatives do not work." This is an incorporation of the process approach (as opposed

to the blueprint approach) into cooperative development (ref. p. 36). The following example helps illustrate this frame of reference.

In Strategic Option 5 we noted that collectivization of the production process must strike the keynote of cooperative development, but this general guideline per se does not determine every aspect of proposed cooperatives. A free hand is left in judging such matters as the following: whether collectivization should be extended to a maximum extent by including even non-fisheries production activities of communities; conversely, whether it should keep as low a profile as possible by introducing only a loose production agreement among boat owners in a specific fishery; whether or not collectivization should be achieved through a government's coercive action; and whether new cooperatives should be organized solely for collectivization or whether multipurpose cooperatives should perform this function as a part of their activities. There are no universal answers to these questions, and therefore decisions must be made on a case-by-case basis according to the social, economic, and political conditions under which cooperatives exist. The best thing one can do is to be aware of the range of available options and be prepared to make fresh choices at each stage in the process of cooperative development.

We have to keep in mind two important aspects of operational options. First, operational options are not "this or that" choices; rather a number of choices constitute a continuum

between the two extremes and operational options in the real world can be likened to a sliding scale between "this" and "that." For instance, in the above example for collectivization, it is apparent that many intermediary options are available between maximum and minimum collectivizations. There are actually many partially collectivized fisheries cooperatives in Japan (Shima et al., 1983). To simplify our argument, however, this section will discuss operational options mostly in a dichotomous fashion. Second, the general independence of the operational option from the strategic option does not rule out the possibility that operational options are at times narrowed down by strategic options.

Let us begin by examining operational options in the following nine categories: size of cooperatives; membership; compulsory membership; scope of activities; collectivization of production; cooperation among cooperatives; traditional organizations; pre-cooperatives; and violent confrontation. It should be stressed that despite my preferences below for particular policy choices in a general context, no choices are absolutely superior to other choices without a consideration of locality-specific conditions.

Operational Option 1: Size of Cooperatives

The fact that cooperatives have to meet two different requirements--one on business profits and the other on human considerations--makes it very difficult to determine an

appropriate size for cooperatives in terms of membership. In general, the business rationality justifies larger organizations to take advantage of economies of scale, but a member's sense of participation diminishes in inverse proportion to organization size. An average American fisheries cooperative has about 100 members (NMFS, 1984). (The Point Judith Fishermen's Cooperative comprises about 200 fishermen.) In Japanese marine fisheries cooperatives, the average number of active members is estimated at around 100, though the registered number exceeds 200 (Kase, 1985). The number of fishermen affiliated with Korean fishing village societies (community-based subgroups of regional cooperatives) is also reported at about 100 (Eon-Soo, 1984). In Thailand, relatively successful cooperatives of trawlers comprise about 150 members (Miyake, 1984). These statistics seem to suggest that the reasonable number of members is in the range of 100 to 200. However, it should not be forgotten that optimal cooperative size is a dependent variable of per capita productivity, membership qualifications, the size of communities, and the level of managerial skill.

An important question associated with cooperative size is whether a geographical area covered by a cooperative should coincide with a traditional community. Of course, it would be ideal if the two were identical, particularly if a community traditionally exerts the exclusive fishing rights or is ethnically different from neighboring communities. But often

traditional communities are too small to give cooperatives adequate business opportunities. One of the possible solutions to this dilemma is suggested by the organizational structure of Korean fisheries cooperatives: splitting the dual character of the cooperatives into a community-based people's association and a regional federation of such organizations. The regional federation integrates many economic activities of the community organizations into a single business enterprise. Cooperatives based on this double-tier structure are probably very effective in keeping fishermen from feeling apathetic and powerless, problems which often undermine large, horizontally organized cooperatives (Johnston et al., 1982, p. 188).

Operational Option 2: Membership

A great variety in the types of membership in fisheries cooperatives can be classified into the following four categories in order of openness: (a) community residents; (b) fishermen and other fisheries-related people; (c) fishermen; (d) boat owners.

(a) Community residents

A cooperative composed of community residents is normally called a community cooperative or village cooperative. If the fishing population accounts for the predominant portion of residents in a community, there is little harm in admitting non-fishermen to a fisheries cooperative. Particularly if the cooperative is intended to gain socio-political power for the

community, the restriction of membership may reduce those excluded to the rank of second-class citizens. Some cooperative activities, such as the common purchase of home necessities and credit services, benefit non-fishermen as well. It was suggested earlier that fishermen may be better off by being included in agricultural cooperatives than being unorganized; the same is true for non-fishermen in a fisheries cooperative. Another merit of community resident membership is the possible mobilization of rural intellectuals into the cooperative movement. The Sarvodaya Sharamadana Movement, a culturally and spiritually oriented rural development effort in Sri Lanka, was effective because it recruited village monks as community development workers and used village temples as the center of activities (Korten, 1980). In the initial stages of cooperatives, village monks and schoolteachers, among the few educated members of a community, often play a very important role in enlightening villagers about cooperation. Finally, let us recall that Strategic Option 4 renders a distinction between fish farmers and other farmers almost meaningless; thus for cooperatives based on that option, all have to be included. (This is a typical case where strategic options restict operational options.)

(b) Fishermen and other fisheries-related people

Except for geographically isolated areas like small islands, coastal communities usually embrace a substantial agricultural population in addition to the fishing population.

In such communities, it is desirable to organize fishermen and farmers separately lest the difference of interests of the two groups paralyzes cooperatives. However, the question still remains of how to treat people who engage in fisheries-related activities such as fish trading, boat building, and fish processing.

The conventional wisdom is that cooperatives should not be fooled by the Trojan Horse; i.e., once middlemen are admitted into cooperatives, they will quickly dominate the cooperatives at the expense of the fishermen. Although this is a useful guideline in most instances, competition among middlemen, their social bonds with fishermen, and the expected function of the cooperatives should be taken into consideration. For the small-scale boat-builders and processors, cooperatives may open the doors a little wider, provided that other organizations such as occupational guilds and local commerce associations are not available to them.

(c) Fishermen

Fishermen membership is perhaps the most orthodox membership criterion of fisheries cooperatives, but various sets of subcategories included in the general concept of "fishermen" make the definition of actual membership complex. The subcategories include the following: part-time and full-time fishermen; SSF and LSF fishermen; resident and nomad fishermen; boat-owners, self-employed fishermen, and crews; capture fishermen and aquaculturists; sport fishermen, sport fishing

guides, and commercial fishermen; onshore, inshore and offshore fishermen; householder fishermen and semi-dependent fishermen. There is obviously no one right formula to define "fishermen membership"; it must be decided in each country, in each region, or even in each cooperative. For instance, the Japanese Fisheries Cooperative Law defines the qualifications for full membership in the marine fisheries cooperatives --a full member must engage in fisheries more than 90 days a year and at the same time must reside in the jurisdictional area of the cooperative. However, it is not uncommon that the actual membership criteria of individual cooperatives differ from the legal definition due to explicit "grandfather clauses" and the one-household, one-membership custom in most communities. It is always a controversial point as to who should be included in or excluded from cooperatives, but it seems to me that one thing is certain: an egalitarian ideology for cooperatives should not be overemphasized regardless of local realities.

(d) Boat-owners

Boat-owner membership is one of the extremely narrow definitions of "fishermen membership," and because of its anti-egalitarian appearance, boat-owner membership tends to be regarded as a degradation of the cooperative spirit. However, boat-owner membership and de facto boat-owner membership are a widespread phenomenon throughout the world. Especially in LSF, where the majority of boat crews do not have immediate

prospects of becoming boat-owners, boat-owner membership is a rather common type of membership. On the one hand, if a commercial fishing boat is assumed to constitute a single economic interest, it is logical to conclude that the participation of a boat-owner in a cooperative adequately represents the common interests of fishermen working on the boat. On the other hand, if we put the emphasis on the fundamental conflict of interests between owners and crews, the best form of organizational arrangement for crews is probably not the fisheries cooperative, but a fishermen's labor union. Meynell asks: "If the crew still receive a share of the catch which has to be marketed through the cooperative, then why should they not be [cooperative] members too?" (1984, p. 30). In the same context I would ask: Why should they bother being members? As long as there is a social consensus that boat-owners represent the comprehensive interests associated with their boats, boat-owner membership is one way to achieve cooperative objectives while minimizing organizational confusion resulting from the inclusion of crews.

Incidentally, differentiated membership is an intriguing arrangement closely associated with the membership problem. In Indonesia, there are two levels of membership--that is, full member and candidate member, according to the process of paying for equity capital (Meynell, 1984). The membership of Japanese fisheries cooperatives consists of proper members and associate

members; it is intended in essence to accommodate part-time fishermen in the latter category. In Norway, in order to ensure balanced representation, fisheries cooperatives have adopted a unique system in which boat-owners, representatives elected by crew members of each boat, and self-employed fishermen are classified into A-, B-, and C- members, respectively (Grimley, 1950, p. 134).

In conclusion, various types of membership plus the use of differentiated membership provide us a considerable range of freedom in searching for the most suitable membership arrangement for SSF cooperatives.

Operational Option 3: Compulsory Membership

The orthodox cooperative theories condemn a government's practice of compelling people to join cooperatives because it is a departure from the principles of cooperatives (Dooren, 1982a, p. 84). In other words, compulsory membership, either in law or in practice, is the very opposite of voluntary, open membership, in which the tradition of West European cooperatives has been built. The motivated, active participation of members is believed attainable only in democratic cooperatives which guarantee people not only the right to join, but also the right to secede from them. Another criticism against compulsory membership points to the business inefficiency resulting from the monopolistic tendencies of cooperatives based on compulsory membership. Lele notes that cotton processing

cooperatives in Uganda "were able to continue operating regardless of the services they provided, or the costs they incurred" (1981a, p. 60) because of the legalized absence of competition.

Nevertheless, the history of fisheries cooperatives in some developed countries attests to the fact that compulsory membership works very well under certain conditions. Let us give Norwegian and Japanese examples. In Norway, the fisheries cooperative movement gained great impetus in 1928, when the government decided to grant fisheries cooperatives the exclusive right to the first-hand sale of fish caught by both member and non-member fishermen. Although non-member fishermen had "freedom" to stay outside of the cooperatives, this government action forced them to participate in the cooperatives in a practical sense because being outside would not apparently be of any benefit to them. This was certainly a controversial policy from the view-point of cooperative principles. But we must emphasize the cautious, democratic process used in the government to reach the final decision. The decision was made only after a secret vote among the fishermen confirmed support from a majority of the fishermen for the compulsory sales arrangement (Grimley, 1950, p. 148). In Japan policymakers invented an artful legal device for fisheries cooperatives: one has to be a fisherman to belong to a cooperative, and at the same time only cooperative members can be fishermen. The cooperative is, therefore, an almost completely closed system. The consequence of this policy is that fisheries cooperatives

have included literally all the fishermen, and that fisheries have been protected from the incursion of outsiders. Surprisingly, until very recently this policy has never been subject to any substantial controversies, and even today some concern is expressed only for its implications to the environmental movement, not for its validity as a fisheries policy per se. This is because this virtually compulsory membership follows the traditional customs of some fishing communities. Compulsory membership is also found in some developing countries. In Mexico, shrimp is one of the species whose exploitation is legally reserved for fisheries cooperatives. Although Mexican fisheries cooperatives have been steeped in difficulties, their problems are not directly attributable to compulsory membership (McGoodwin, 1980; Szekely, 1983).

These national experiences undoubtedly indicate that compulsory membership has the possibility of being an effective operational option if it is used carefully and consistently with fishermen's opinions and customs. However, it could be disastrous if compulsory membership were imposed against the fishermen's will.

Operational Option 4: Scope of Activities (Single-Purpose versus Multipurpose Cooperatives)

Cooperative researchers have long been debating the comparative advantages of single-purpose and multipurpose cooperatives. Though we do not have enough space to review the

debates thoroughly, the major pros and cons can be summarized as follows (Dooren, 1982a, p. 77; Takigawa et al., 1973; Roy, 1981, p. 326):

Single-purpose cooperatives

Advantages

a. Single-purpose cooperatives are easy for managers to run and easy for members to comprehend.

b. Single-purpose cooperatives can extract the benefits of specialization by concentrating on special products like shrimp for overseas markets.

Disadvantages

a. In order to meet the multi-faceted needs of fishermen, various single-purpose cooperatives are required in a community.

b. Even if it is possible to set up several cooperatives in a community, the overlaps in their activities and excessive rivalry among them are detrimental to members.

Multipurpose cooperatives

Advantages

a. Mutually beneficial effects are expected from the different activities; e.g., cooperative marketing helps cooperatives collect a repayment of loans from fishermen.

b. The operation of several activities spreads

overhead costs and business risks.

c. Multipurpose cooperatives can effectively compete with multi-functional local middlemen.

Disadvantages

a. Higher management skill is required.

b. A distinction between profitable and unprofitable activities is difficult, particularly if internal financing is allowed between activities.

Apparently, we have no single, absolute criterion with which to prejudge the comparative desirability and feasibility of the the two types of cooperatives. In fact, while many European cooperatives (including fisheries cooperatives) have developed in the single-purpose form, rural cooperative movements in Japan and Korea have succeeded in building along multi-purpose lines.

Operational Option 5: Collectivization of Production (or Production Cooperatives)

We have already noted that once fisheries have reached the stage of the induced innovation model, collectivization of the production process becomes a viable as well as unavoidable policy for cooperatives. Does this imply that collectivization is not useful before that stage? As indicated in Chapter II, the collectivization of peasants is, in general, very difficult due to peasants' hostility toward the communalization of

their land, their apathy, disincentives, managerial incapability, and so forth. After studying the kibbutz (the typical commune-type production cooperative in Israel) for its applicability to developing countries, Kennes (1982) concludes that the establishment of a similar system in developing countries would be possible only if strong motivation based on religion or nationalism provided the special environment. Dooren (1982b) suggests three groups of people who could be exceptions to the failure-ridden production cooperative: they are particularly ideologically or politically motivated people, landless farmers and sharecroppers who have nothing to lose, and tribal peoples without a tradition of individual land-use. As far as agriculture in developing countries is concerned, the production cooperative is clearly an unpopular choice. The production cooperative in SSF is by no means free from the above problems. Yet, at the same time, it should be recognized that fisheries have a higher possibility than agriculture of maintaining successful production cooperatives for the following reasons: fisheries resources are generally indivisible (unlike farmland), and some coastal communities have traditionally prohibited the individual utilization of fish resources. Interestingly, Lesser (1974) reports that the only successful fisheries cooperative in Guatemala is a production cooperative based on the typical frontier model. The best policy is probably to take a very cautious stance toward collectivization but not to rule out its possibility as an operational option.

Operational Option 6: Cooperation among Cooperatives

Cooperation among cooperatives is one of the official requirements called for by the International Cooperative Alliance for all the cooperatives in the world. Beyond this being a moralistic slogan, two partly overlapping problems of cooperation need particular consideration in view of their practical relevance to SSF cooperatives.

The first problem concerns the vertical integration of primary cooperatives into second-tier organizations (usually at the regional level) and third-tier apex organizations. Are such umbrella organizations necessary for fisheries cooperatives in developing countries? A theory advocating such organizations argues that as the primary cooperative itself is intended to improve fishermen's socio-economic capabilities through cooperation among individual fishermen, they must be able to benefit more by extending coopertion to the regional and national levels. For example, no matter how much political clout is gained by fishermen in each cooperative, it will remain local and unable to influence national fisheries policy unless local powers are effectively combined at the national level. However, the practicality of this theory is not always guaranteed; a critical point is the cost-effectiveness of the upper-tier organizations, which primary cooperatives have to support if they fail to attain financial self-sufficiency. In many developing countries, behind a beautifully drawn organizational chart of a national cooperative network, there is a

good posibility that these organizations will end up as white elephants of a self-perpetuating cooperative bureaucracy. Again, we have no ready-made answer about the desirable degree of vertical integration of primary cooperatives. If we can say something for sure, it must be to quote an ex-president of the Point Judith Fishermen's Cooperative: "Rather than starting an association for its own sake, the fisheries cooperatives should first identify a specific function that such an association could perform" (Dykstra, quoted by URI Marine Advisory Service, 1972, p. 9).

The second problem is the promotion of cooperation between different kinds of cooperatives. In this regard, consumers' cooperatives can be an important business partner for fisheries cooperatives, especially when fisheries cooperatives have to develop a new market as a result of increased production or anti-cooperative sabotage by middlemen. There are actually some successful cases of cooperation between consumers' and fisheries cooperatives in developed countries, but in developing countries, where the consumer movement has as yet only a limited influence, such cooperation may provide no more than moderate prospects for fisheries cooperatives. Nonetheless, cooperation with other cooperatives is worth keeping in mind as a potential operational option for fisheries cooperative development.

Operational Option 7: Traditional Organizations

Rural communities probably with no exception have time-honored communal organizations for mutual assistance. Through such organizations, villagers exchange labor in production activities, maintain village facilities like bridges and temples, and perform religious rituals. Although the traditional organizations are different from the modern scope of activities and the organizational principles of cooperatives, they all share a spiritual backbone of self-help and cooperation. Some believe that modern cooperatives can and must be built smoothly on a foundation of traditional organizations, like grafting a tree (Roth and Cliffee; cited by Obern et al., 1981). Japanese fisheries cooperatives are the supporting evidence for this argument: modern cooperatives were initiated by formalizing a traditional community practice in resource management. Pollnac (1982, p. 88) summarizes several other cases of the successful formulation of fisheries cooperatives on the basis of traditional organizations. However, the literature increasingly suggests that such a policy lacks universal applicability and warns of a dangerous tendency toward the idealization of traditional organizations (Lele, 1981a; Obern et al., 1981). Hunter writes that the modern cooperative "involves different kinds of action, for different purposes, by people in different relationships with each other, from the kinds of action, purpose and relationship enshrined in traditional cooperative activity" (quoted by Johnston et al., 1982, p. 166).

With these contradictory theories, it seems useless to generalize policy in terms of traditional organizations. Until more studies lead to consensus among researchers, let us tentatively conclude that although the use of the traditional organization has been relegated to second place, we should not completely abandon this operational option.

Operational Option 8: Pre-cooperatives

The pre-cooperative is an issue firmly connected with, but not quite the same as, the issue of the traditional organization. Cooperative development experience since colonial rule suggests that the full-fledged "registered cooperative," a copy of the Western cooperative notion, is often too complicated and advanced to introduce into a peasant society. In fact, many developing countries have given up on the immediate creation of full-scale cooperatives and have instead begun promoting small, informal, training-oriented cooperative groups called pre-cooperatives or functional cooperatives. For instance, Thailand presently has 109 fishermen's groups in addition to 20 fisheries cooperatives. The Thai government thinks that fishermen's groups will foster cooperative consciousness and management knowledge among fishermen so that the groups will later progress to full-fledged cooperatives (Miyake, 1984). Similarly, the Philippines recomposed its cooperative plan in 1973, adopting pre-cooperatives called Samahang Nayon, which are initiatory organizations before the introduction of

full-fledged cooperatives. Samahang Nayons carry out technical training, cooperative education, savings promotion, and some business arrangements between members and merchants. When Samahang Nayons successfully complete these programs, ten of them will collectively set up one Area Marketing Cooperative (Miyake, 1984).

The pre-cooperative approach seems to be a realistic and useful operational option. Yet so far pre-cooperatives in both Thailand and the Philippines have not recorded any major achievements, nor are they always welcomed by fishermen. In Grenada the length of time required for the pre-cooperative stage has disillusioned fishermen and thus adversely affected cooperative development (Epple, cited by Pollnac, 1982, p. 91). The pre-cooperative is not an obvious panacea, but I believe it has had an impact upon policymakers obsessed with the European cooperative model, and it has a good chance of developing into the mainstream approach in the future.

Operational Option 9: Violent Confrontation

Let us here consider whether violent confrontation with the anti-cooperativism of vested interests is a permissible tactic for developing cooperatives. One fundamental criticism of the cooperative development program is that the cooperative alone cannot change the exploitative structure of a rural society unless cooperatives are consciously used as a weapon in class struggle and social change (Maslennikov, 1983, p. 43).

In this view, violent measures in the process of organizing cooperatives may be justified. Although I do not deny the inevitability of revolutionary social change or the so-called "peasant war" strategy in extremely oppressive political regimes, such a radical view is often irresponsible for the following reasons:

(a) The process of violent social change, contrary to the optimistic prospects of "progressive" ideologists, devastates the rural poor as well as the rich (look at Cambodia and Afghanistan).

(b) As symbolized by the decline of African socialism, an equitable distribution of wealth makes little difference to the rural poor when the size of the "pie" remains tiny.

(c) It is virtually impossible not only for Western development assistance agencies, but also for multilateral aid organizations and socialist countries to be involved in such a politically volatile issue without causing serious diplomatic trouble.

However, all this is not to say that cooperative development has nothing to do with coercive group pressures or even skirmishes against vested interests. Violent confrontation is a topic no one likes to discuss, but it is sometimes an unavoidable reality in the cooperative building process. Once violent reaction takes place or is imminent, cooperative workers as well as fishermen will find themselves forced to choose

a policy ranging from an outright physical confrontation to nonresistance. I endorse a limited degree of militancy against external sabotage, particularly if the opposition itself employs violent measures. Of course, violence is always vicious, but it is a wishful self-delusion to believe that cooperatives are free from hostility and violent challenge. As the history of the labor movement shows, the collective direct action of fishermen is occasionally a necessary self-defense for the cooperative movement.

CONCLUSIONS

In this paper, we have focused the discussion on two questions: why fisheries cooperatives have failed miserably in developing countries and how they can be restructured in the future. First, we analyzed numerous difficulties confronting past cooperative development efforts from three different angles: the particularity of the fishing industry, limitations of the cooperative, and fallacies in the policy framework. Second, since the first two angles are independent variables for policymakers--that is, policymakers cannot readily change either the nature of the fishing industry or the mechanisms inherent to the cooperative--it was proposed that the policy framework (which is the only variable we can control) be recomposed by introducing the concepts of the strategic option and operational option. The strategic option is derived from the logic that the development policy of the fisheries cooperative must be based on and consistent with the overall strategy of fisheries development. My impression is that past cooperatives were often based on strange policies--such as that fisheries policy as a whole is directed to LSF development, and cooperatives alone target SSF, or that cooperatives are designed as distributors of subsidy and loans for boats and gear when proper resource management is urgently needed. The introduction of the strategic option is intended to prevent a disparity between the fisheries development strategy and the

cooperative policy by designing the latter on the foundations of the former. The strategic option provides a useful starting point from which national policymakers, development workers, and the target fishermen groups interactively shape cooperatives through a trial-and-error process. In this second stage of cooperative development, the operational option becomes necessary for choosing the most suitable organizational format in given local conditions. If cooperatives are rigidly preplanned, contrary to the wide range of flexibility suggested by the operational option, the cooperatives have little chance of stimulating the active participation of fishermen. I believe that in the past many policymakers were preoccupied right from the start with a particular image of the cooperative--mostly a relatively large, full-fledged, multipurpose cooperative made up of independent full-time fishermen. In addition, they probably did not pay proper regard to traditional organizations and cooperation with other cooperatives. However, it is entirely possible to perceive of a small, traditional-organization-based pre-cooperative whose only activity is shipping of fish to consumers' cooperatives for the convenience of both full- and part-time fishermen. Between and beyond these two formats, it should be remembered, there is an unaccountable number of combinations of operational options, so it is nothing more than the narrowness of policymakers (not of fishermen, to whom policymakers often attribute failures) to jump to the conclusion that cooperatives are not feasible when

their preconceived cooperatives do not work. I am suggesting not that the operational option can provide easy how-to skills for cooperative development, but rather that our struggle with complex cooperative issues could be more productive if we were aware of the range of possible choices.

I expect two criticisms to the approach proposed in this paper. One is probably about "excessive" production-orientedness in setting a starting point for cooperative development on the strategic option (production-related, income-generating factors). The other one can be a lack of an analysis of "human factors" which brings real results from an elaborated plan. Although a thorough discussion of these criticisms exceeds the scope of this paper, let us briefly reply to both.

Admittedly, it is a legitimate argument that "economic growth" is not always interchangeable with a multi-dimensional notion of "development"; growth can hardly be called development if only a small segment of the population benefits from it. In fact, the dilemma of growth and equity has been and will continue to be a central issue in development theories. Unfortunately, no development theory has fully succeeded in reconciling the two imperatives. In the context of the growth-equity dilemma, the cooperative is generally considered to stand on the side of equity. The rural cooperative has been advocated for its egalitarianism as a remedy to socio-economic differentiation, which has been created by the infiltration of a monetized economy into the peasant society dividing the

"have's" and "have-nots." However, an overemphasis on the equitable distribution of income as the objective of cooperatives often leads to the equitable distribution of poverty. Without a strong ideology to justify cooperatives, therefore, not only do the most efficient fishermen look upon them with disfavor (Pollnac, 1981, p. 30), but also a majority of them respond only passively to cooperatives. "Participation" is a shining word, but participation is always expensive to those who participate; participants have to sacrifice time and energy, be responsible for joint decisions, and even dare have a distasteful argument with neighbors (Johnston et al., 1982, p. 172). Examples are omnipresent in our own daily lives: a student may not care at all about a student cooperative assembly, the notice for which he found in his mailbox; a family may not change picnic plans when the election of a community council turns out to be on the same day as the picnic. Why? The costs of participation for the would-be participants are disproportionately high when weighed against the benefits. However, the same student may attend the assembly if its agenda includes the closure of a cooperative book store where he frequently buys. The family may cancel its picnic plans if a relative of theirs is running for the council. Why? Because the increased benefits of participation now balance the costs. If these are realities in a society in which we live, why does the same rule not apply to peasant fishermen's participation in cooperatives? I have repeatedly noted that cooperative

development must be attempted on an infrastructure of production-related, income-generating factors because these factors, and only these factors in a general perspective, can enhance the benefits of participation for fishermen. We have identified several development models for capture fisheries and aquaculture. They are the engines for SSF development, and cooperatives must be the vehicles to accommodate such engines. Fisheries cooperatives cannot afford to be restricted to a direct anti-poverty program, particularly if in many developing countries fisheries, together with agriculture, ought to lead off national development.

So far I have intentionally avoided substantial discussion about the human factor, but this does not mean that it does not affect the outcome of cooperative development. On the contrary, the nature of cooperatives as people's associations makes the human factor considerably influential in determining the success or failure of cooperatives. Even in a hostile environment, those who have strong ideological, religious, or ethical motivations often manage to produce successful cooperatives, and vice versa. Besides social motivations, elements such as people's character, intelligence, skill, industry, and discipline bring about far different results with cooperatives in the same environment. The most significant manifestation of the human factor in rural cooperatives is the quality of local leadership. Although a growing body of literature suggests that traditional patron/client relationships once

ubiquitous between rural elites and peasants are in the process of breaking down (Korten, 1980; Verhagen, 1984, p. 14), this does not mean that rural elites are withdrawing from a dominant position in cooperatives. Some recommend that cooperative development policy bypass rural elites and build new leadership among peasants in order not to allow a "distortion" of the cooperatives by elites in their own favor (Young et al., 1981, p. 32). Some are skeptical about the practicality of such an approach in view of the little experience and knowledge that peasants have about modern organization and their inclination toward dependency. Historical evidence from many developed countries also shows that rural elites rather than small farmers played a crucial role in the early stages of rural cooperatives (Johnston et al., 1982, p. 167; Dooren, 1982a, p. 37). Johnston and Clark aptly summarize the sharp division of researchers' opinions over the leadership problem:

> Some analysts conclude that a major obstacle to greater participation by the poor is the existence of strong, antiegalitarian local elites; others conclude that effective participation requires strong, grass-roots leadership, which when present at all usually emerges from the rank of the elite (1982, p. 169).

In practice, a judgment of the egalitarianism (or anti-egalitarianism) of rural elite leadership is bound to the subjective value systems of individual researchers. I believe these are two sides of the same coin: the margin between "grass-roots leaders" who are authoritative caretakers of

communities and "local elites" who are authoritarian rulers of communities is much narrower than it appears at first glance. This is the background for my decision not to include human factors, especially leadership, among the operational options. Above all, the subtleties and subjectivity reflected in the human factor problem render a dichotomous discussion extremely misleading beyond the reasonable limits of simplification.

Finally, I would like to make a short comment about the future of fisheries cooperative studies. It has not been uncommon for me to hear quite polarized opinions about fisheries cooperatives in conversations with fisheries development experts and government officials from developing countries. Some have overly optimistic opinions about both the feasibility and desirability of fisheries cooperatives on the simple ground that the fishing industry in developed countries has such institutions. More often, however, they categorically express pessimistic views based on their experience. It seems to me that these polarized opinions are replicas of cooperative optimism in the 1950's and 1960's and cooperative pessimism since the 1970's. As we have discussed, the fisheries cooperative is neither a panacea nor a false medicine; it is just an ordinary medicine that is effective if the right patients take it in the right way. But such misunderstandings about cooperatives cannot simply be eliminated by one-way communications from cooperative specialists to other fisheries experts.

Reasons: (a) There are probably no more than 20 specialists actively working on international fisheries cooperative development throughout the world; (b) More important, as this study has suggested, the design of cooperatives in the future will need more and more technological information and interdisciplinary research. The problem of fisheries cooperatives cannot afford to be the back yard of a few specialists, so it is hoped that many other fisheries experts, such as technologists, biologists, and economists, will come to share the basic idea that the fisheries cooperative has both effectiveness and limitations.

The exchange of experiences and views between Westerners and Easterners is another important factor for future fisheries cooperative studies. Surprisingly, despite the fact that Japan has the most advanced fisheries cooperative system in terms of scale and sophistication of activities, Japan has never been involved in a fisheries cooperative development project in the developing world. More regrettably, information about Japanese fisheries cooperatives is scarcely available to the rest of the world. The academic standard of fisheries cooperative studies in Japan is by no means mediocre, but research is for the most part confined to the domestic field and thus has a limited international perspective. Language is obviously the largest obstacle to communication between Japanese specialists and their counterparts in other countries. Even within the constraints posed by language, however, far less Japanese

research is available in international circles than would seem justified. Japanese cooperative development, in a different historical path from that of the West, has significant implications for the cooperative problem in developing countries. This is also true for Korean cooperatives. I believe that a constant exchange of experiences between Western and Eastern specialists will help rectify a long-time so-called Western bias in international cooperative development. (It is important to stress that my suggestion is not that the Japanese cooperative model become a new dogma replacing the European model.)

A third channel of cooperative efforts, which is even more important than the previous two, should be developed between practioners in developing countries and specialists in developed countries. Even after three decades of fisheries cooperative development in developing countries, an overwhelming portion of literature is still written by Western specialists. Of the few papers from developing countries, most are official reports written by either officers of fisheries agencies or semi-governmental national cooperative organizations. These reports often contain stereotyped cooperative rhetoric, statements of national commitment, neat organizational charts, and questionable statistics, but little information about the realities of their cooperatives. This sometimes appears to be because the governments and cooperative organizations themselves do not have much information rather than

because they are making "face-saving" efforts. It is obvious, however, that national practioners can communicate with fishermen and understand local conditions much more effectively than foreign specialists. Fisheries cooperative studies need detailed information from the national practitioners. The one-way flow of information from developed countries to developing countries must be corrected by increasing feedback information and dialogue among people from every corner of the world.

The tasks ahead for fisheries cooperative studies are daunting, but there is no reason to doubt a reward for our struggles. As long as people keep on seeking conciliation between humanity and economic reality, opportunities for the cooperative will never cease to exist. A new cooperative realism can and should supercede the ungrounded optimism and pessimism of the past.

NOTES

[1]Over the years, a number of different definitions have been given of the cooperative (see, for example, Roy, 1981). In this paper, the concept of the cooperative includes both the official and semi-official forms of cooperative organization such as pre-cooperatives but excludes traditional community organizations (ref. Chapter III).

[2]Neither the Rochdale principles nor modern cooperative principles formalized by the International Cooperative Alliance make mention of means to develop cooperatives. But there has been implicit agreement among practitioners on the evolutional and peaceful process in building cooperatives. Except in case of self-defense, the cooperative movement does not employ violent means (ref. Chapter III, Operational Option 9).

[3]For a critical appraisal of past rural credit projects in developing countries see Adams et al., 1981.

[4]Lesser (1974) provides an intriguing Guatemalan example of SSF cooperative development based on the frontier model.

[5]For those who can read Japanese, the detailed information about Sarufutu Fisheries Cooperative is given by Shima, 1979, 1981.

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