

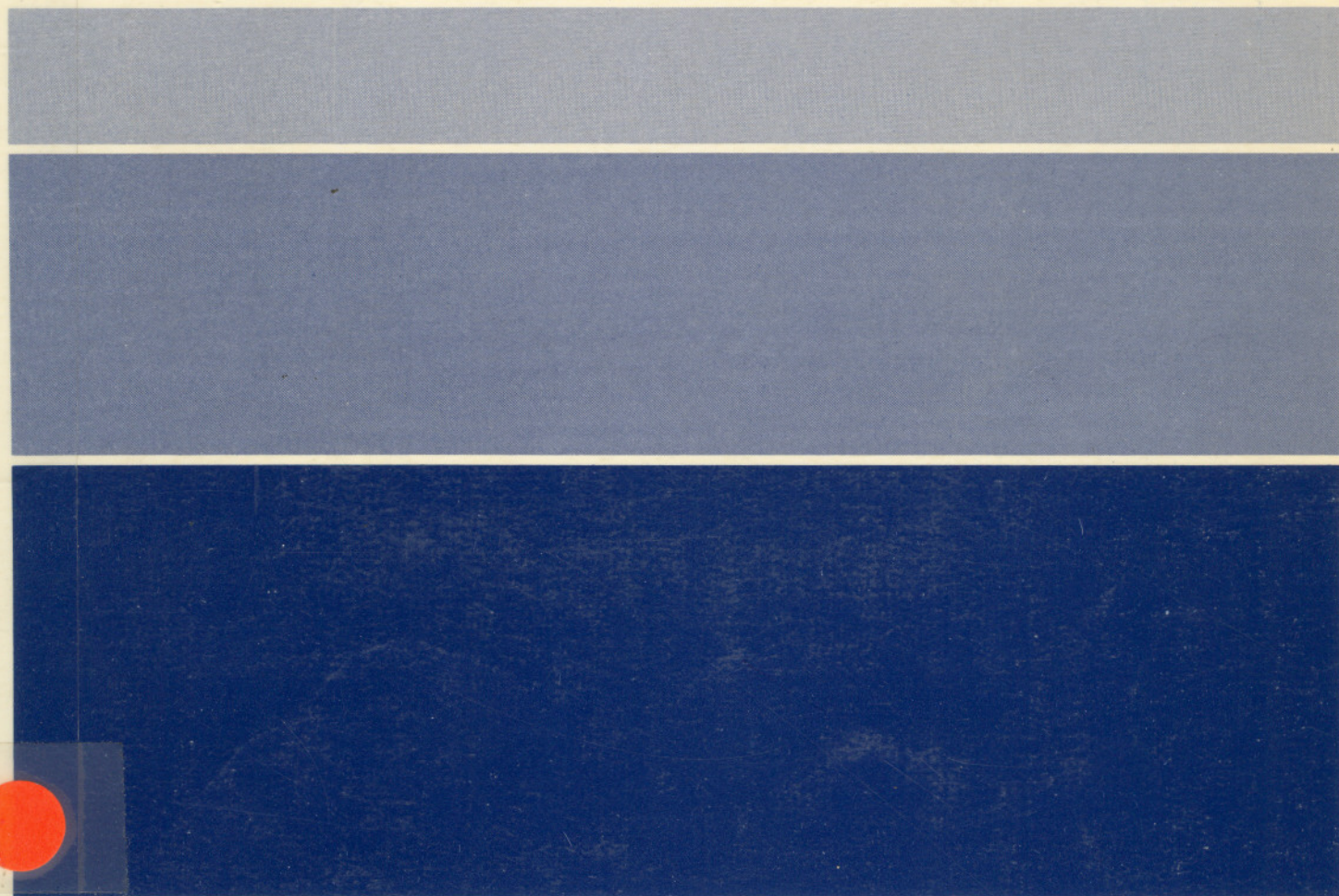
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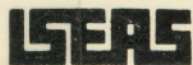
# LAW OF THE SEA

Problems of Conflict and Management  
of Fisheries in Southeast Asia

Francis T. Christy, Jr., Editor



INTERNATIONAL CENTER FOR LIVING AQUATIC RESOURCES MANAGEMENT



INSTITUTE OF SOUTHEAST-ASIAN STUDIES

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**Proceedings of the ICLARM/ISEAS Workshop on the Law  
of the Sea, held in Manila, Philippines  
on November 26-29, 1978**

**Edited by**

**Francis T. Christy, Jr.**

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# Opening Remarks

## Why a Law of the Sea Workshop?

JOHN C. MARR

*Director General*

*International Center for Living Aquatic  
Resources Management*

When the oceans beyond three-mile territorial seas were "high-seas," the fishery resources of the high seas were common property resources. In the absence of any legal basis for management measures, the high seas fisheries offered unlimited access or unlimited entry. They were open to all. The history of such fisheries all over the world has made it abundantly, even redundantly, clear that they are soon overcapitalized and overfished. The consequences of unlimited entry are economic and biological disaster.

In recent years law of the sea matters have been dynamically evolving, both within the Third United Nations Conference on the Law of the Sea and without. Regardless of the outcome of the UN Conference, it is clear that most, if not all, coastal states will claim a 200-mile zone of extended economic jurisdiction. One very exciting aspect of the extended economic zones with respect to fisheries is that with jurisdiction comes the possibility of management, of avoiding the previously inevitable economic and biological disasters. This prospect is particularly exciting in the South China Sea where the extended zones will meet in the center; there will be no more "high seas" in the South China Sea.

Because of such important changes in the law of the sea, in 1977 ICLARM began a study of the law of the sea developments and their probable effects on fishery development and management, with particular reference to Southeast Asia and the Southwest Pacific. This study was undertaken by Dr. Francis T. Christy, Jr., of Re-

sources for the Future, who joined ICLARM for 9 mo, during which period he travelled extensively within these two regions, contacted individuals concerned with these problems, and obtained information on the specific problems facing each country.

One result of Dr. Christy's odyssey was a comprehensive report which will be published by ICLARM. Another result was the decision to arrange this workshop itself. Early in the conceptual planning of the workshop, Dr. Christy and I had the good fortune to meet with Prof. Kernial Sandhu, Director of the Institute of Southeast Asian Studies (ISEAS). Arising from that meeting were more specific plans for the workshop, including joint sponsorship by ISEAS and ICLARM.

Two of the major problems in connection with the extended economic zone are allocation and implementation. Some fishes are migratory and move freely from the waters of one country to the waters of another without respect to political boundaries. How should such resources be allocated among the countries concerned? The best of fishery management plans is of no value if it cannot be effectively implemented. Two-hundred-mile zones can encompass vast areas and impose special problems of ensuring integrity in the use of the resources. These two general problems—allocation and implementation—were chosen for special consideration by the workshop. Background papers were prepared by five experts from the region and presented by them at the workshop. These are contained in the present report

of the workshop proceedings.

The participants in the workshop were drawn from the region, largely from foreign ministries, departments of fisheries, universities, and the private sector. However, and I would emphasize this, all were invited in their personal capacities. After the Opening Session, the workshop was closed. Thus, each participant was free to speak in his or her personal capacity without the constraints of formal institutional positions.

There were two major objectives of the workshop, first, to bring individuals together to stimulate interest in the subject matter of the workshop and, especially, to facilitate communication between these individuals and, through them, between and within governments, and among governments, the academic community, and the private sector. We hope that lines of communication strengthened or established at the workshop will be kept open in the future. Second, the workshop sought to identify specific problems, the alternatives open in the solution of such problems, and the consequences of following the various alternatives. While attainment of this objective was useful in the context of the workshop, we hope that the publication and distribution of the report of the workshop proceedings in Southeast Asia and elsewhere will make it of much wider use.

It should be made clear that the workshop was not an exercise to design an ISEAS/ICLARM program relating

to law of the sea matters. While the participants pointed out some ways in which ISEAS/ICLARM could continue to perform useful functions in this general area, program design was not an objective of the workshop.

A final word about the workshop. ISEAS and ICLARM only provided a forum in which the participants could meet informally and discuss problems of mutual concern. ISEAS and ICLARM were in no sense proposing solutions to such problems. Nor, indeed, could they have done so. Clearly, solutions to law of the sea problems are a matter of national concern and must be sought within and by each individual country.

As indicated, I believe that the changing law of the sea offers both challenges and opportunities in the development and management of marine fishery resources and marine fisheries, which account for 86% of the total world fishery production. These changes will also affect the quantity and distribution of fishery production. Thus, considerable attention will continue to be devoted to these matters by ICLARM. Future workshops may deal with regional problems or with subject matter problems. And, judging from past experience, requests for specific undertakings will continue to arise from individual governments and from regional bodies. Clearly, there are useful functions to be performed in these areas by international, nongovernmental organizations such as ICLARM.

## Keynote Address

JOSE D. INGLES

*Acting Foreign Minister  
Republic of the Philippines*

At the outset, allow me to congratulate the Institute of Southeast Asian Studies (ISEAS) and the International Center for Living Aquatic Resources Management (ICLARM) and their officials for organizing and sponsoring the workshop on "The Law of the Sea: Problems of Conflict and Management of Fisheries in Southeast Asia."

I share the view of the organizers that the workshop should focus on two of the many issues which the topic entails, namely: the necessity to reach agreements on the sharing and management of fishery stocks that swim through the waters of neighboring coastal states; and the problems of implementing and enforcing regulations and agreements which may be evolved by the states in the region.

There are a number of factors which may give rise to problems of conflict and management of fisheries and fishing activities in Southeast Asia. The most important problem appears to be biological, that is, the fact that pelagic fishes, which move from one area to another, abound in this part of the world.

The Southwest Pacific which merges into Southeast Asia, appears to be one of the few places in the world where tunas are not yet fully exploited. Since tunas provide the most important canned fish consumed in developed countries and at the same time constitute one of the most important exports of many developing countries of the region, their conservation and wise utilization can not be overemphasized.

Because migratory fish resources form part of the

patrimony of the States of Southeast Asia, any action by one state, for example, to deplete the stock, must of necessity affect the other states.

Even within the confines of each coastal state there are potential problems such as overfishing, the sophistication of fishing gear and equipment, the increase in the number of fishermen and fishing vessels, as well as conflicts between inshore and trawl fishermen, between offshore and deep sea fishermen, and between local and foreign fishermen.

Illegal fishing through the use of dynamite, poison, prohibited nets and constructions, and poaching by foreign fishermen pose problems of implementation of local laws and international agreements.

The widely-believed outcome of the fisheries question in the on-going Third UN Conference on the Law of the Sea—the establishment of a 200-mi economic zone providing coastal states with jurisdiction over its fish life—can be another source of conflict. The establishment of such zone will affect to a considerable degree the regime of exploitation and management of living resources of the sea. Even though the 200-mi zone would cover only some 35% of the oceans, they would include about 90% of the resources presently under commercial exploitation.

It has been pointed out that the drawing of boundaries in the South China Sea would give rise to controversy because of conflicting territorial claims to the Paracel and Spratly island groups. Possible overlapping economic zones between adjoining or opposite coastal

states, and questions of traditional as well as treaty fishing rights, will also be sources of conflict. Add to this the fact that there are semienlosed seas in Southeast Asia, for which special solutions to the problem of exploitation and conservation of living resources have to be found.

A fourth possible source of friction among member states of the Southeast Asian region insofar as management of fish resources is concerned will be the attitude which these states will take towards neighboring or distant fishing nations. Faced with the constriction of the high seas fishing areas and the drastic reduction of their catch, the leading deep sea fishing states have to make arrangements with the states which have assumed, or will assume, jurisdiction over their customary fishing grounds. The interest of those nations are now focused on Southeast Asia among other regions, trying either to sell their surplus vessels or to negotiate joint venture or bilateral arrangements with several countries in the region.

If one state in the region adopts more liberal regulations than other states, there might be little incentive for the other states to maintain their controls: there could be a mutually destructive competitive race to capture what could only be considered as intermediate benefits.

On the other hand a state in the region which might feel hemmed in by the exclusive economic zones may seek accommodation either with other states in the region or even outside the region.

Paradoxically, the provisions of the ICNT of the current Third United Nations Conference on the Law of the Sea may also give rise to conflict of fisheries management in Southeast Asia. For example, one of the hard core issues in the on-going conference on the Law of the Sea is the right of access of land-locked and geographically disadvantaged states to the exclusive economic zones of coastal states.

Article 61 grants coastal states the right to determine the allowable catch of the living resources in its economic zone. Article 62 obligates the coastal states to promote the objective of optimum utilization of living resources in the exclusive economic zone.

The determination of allowable catch, the capacity of coastal states to harvest the allowable catch, the question of access to be granted to other states in the exclusive economic zone, and other matters of conservation and management will give rise to problems needing regional arrangements.

The role of regional arrangements in this matter has already been recognized in Article 63 of the ICNT which provides that "where the same stock or stocks of associated species occur within the exclusive economic zones

of two or more coastal states, these states shall seek either directly or through subregional or regional organizations to agree upon the measures necessary to coordinate and ensure the conservation and development of such stocks" and "where the same stock or stocks of associated species occur both within the exclusive economic zone and in an area beyond and adjacent to the zone, the coastal state and the states fishing for such stocks in the adjacent area shall seek either directly or through appropriate subregional or regional organizations to agree upon the measures necessary for the conservation of these stocks in the adjacent area."

There are other peripheral issues which might give rise to conflict. For example, unless the archipelagic principle is approved at the Law of the Sea Conference, two archipelagic states in the region—Indonesia and the Philippines—might find it difficult to adhere to the final Convention. Despite differing approaches to the problem, the two states agree that the right of passage does not confer any right to fish in archipelagic waters.

Technical assistance, advisory services and scholarships granted by government institutions and nongovernmental organizations will go a long way towards the conservation of marine life and modernization of the fishing industry in Southeast Asia.

Regional seminars and symposiums are also important instruments for the exchange of experience as well as the dissemination of knowledge and techniques to insure scientific and progressive development of the fishing industry and the harmonization of national policies in the region.

A regional agreement setting forth principles for the management of fisheries in the Southeast Asian region may merit consideration. The fundamental objective of any agreement which may be established, I believe, should be the creation of adequate jurisdictional bases for the efficient and effective management of the fishing stocks in the region. This workshop could recommend ways by which adequate jurisdictional bases for management could be developed. It could, for example, set into proper perspective what areas are suitable for regional standards and what matters are better left to the national management entities.

A necessary corollary to this regional agreement on management of fisheries would be a regional specialized agency which may be established independently or developed from an existing organization. This workshop could suggest guidelines on the establishment of the agency: its functions, authority, and other related matters.

It should not be overlooked that any regional agreement for fishing management, or the establishment of a regional agency for that matter, can only be achieved



through a spirit of accommodation and compromise because of differing national interests and policies.

Obviously, each country will have its own view of the political, economic, or social benefits which will be derived from the institution of a fishery regime in the region, depending more upon national priorities than upon international considerations.

Perhaps the ASEAN member countries could take the lead in the establishment of a fishery regime since it is the only cohesive group so far in the region. ASEAN has the advantage of an existing framework and announced objectives of cooperation among others in the economic development field.

To my mind, an effective management system is one that meets several criteria. Firstly, the system must make all parties capable of significantly influencing the system. States must feel that they are better off by maintaining the management system than by doing without it.

Secondly, the management system should be flexible enough to accommodate changing conditions.

Thirdly, the system must be simple. It must not be so complex that the difficulties in establishing and negotiating arrangements, in acquiring information and adopting and enforcing regulations, far outweigh the benefits that can be obtained from the system.

Fourthly, it may be advisable that whatever regional management agreement is established in the region, it should incorporate provisions for dispute avoidance and dispute settlement.

The recommendations and suggestions from this work-

shop should prove of immense value to the policy making sectors of the governments in Southeast Asia. It may be a worthy objective of this workshop to attempt to find some congruence between those recommendations and suggestions and the individual national goals of the states in the region.

In arriving at your conclusions and recommendations you will necessarily have to distinguish between the ideal and the possible, between the theoretical and the practical. It may even be said that sometimes the best is the enemy of the good. So that a more modest approach at regional management might provide common ground for a consensus.

There is an urgent need for coordinated national and international action which can not await the conclusion of a new International Convention on the Law of the Sea. Indeed, such need will continue even after the adoption of such treaty.

The race to exploit the living resources of the world oceans to supplement land based agriculture in order to satisfy the food requirements of a burgeoning world must be rationalized and kept within bounds.

Conservation measures are necessary to renew dwindling stocks and to save valuable species from extinction. Needless to say, management and control are central to conservation.

I wish this workshop all success. Your pioneering efforts are a valuable contribution not only to the improvement of the human condition but also to the survival of man in this planet.

## ISEAS and the Law of the Sea

KERNIAL SANDHU

*Director*

*Institute of Southeast Asian Studies*

As some of you already know, the Institute of Southeast Asian Studies is an autonomous, nonprofit research center for scholars and other specialists concerned with modern Southeast Asia, particularly the multifaceted problems of development and modernization, and political and social change. The Institute is supported by annual grants from Singapore and other governments, as well as donations from international and other private organizations and individuals. It has neither students nor teaching functions, being purely a research body. In addition to support staff, the Institute has 20 to 25 academicians and other specialists working at the Institute at any one time. About half of these are Southeast Asians, including Burmese, Indonesians, Malaysians, Filipinos, Singaporeans, Thais, and Vietnamese, and others come from as far afield as Europe, Japan, and North America. Though from different disciplinary and national backgrounds, all these scholars share a common concern, that is, an interest in the problems of Southeast Asia. They function as a community of scholars and interact among themselves and with the public at large through a series of seminars and professional meetings. Their research findings are published through various outlets of the Institute and distributed all over the world. In other words, the Institute is no proverbial ivory tower. Its involvement in regional and international affairs is both direct and contemporary. In this light it was quite natural that we should get involved in a workshop focused on the Law of the Sea and problems of conflict and manage-

ment of fisheries in the region. Then, too, quite apart from its intrinsic merits, the topic falls within the Institute's ongoing research interests in the general area of the Law of the Sea and Maritime Resources.

Likewise, that the Institute should join forces with ICLARM in cosponsoring this Workshop would also seem only logical as the Institute is already, and increasingly so, working closely with other organizations and institutions, both within and outside the region, in facilitating such activities. Moreover, in this particular case, there was a real meeting of minds between the Institute and ICLARM as the subject of this Workshop—The Law of the Sea: Problems of Conflict and Management of Fisheries in Southeast Asia—spans the research and professional interests of both ICLARM and the Institute. Hence, our joint presence here today.

With regard to the Workshop itself, what we at the Institute, like ICLARM, are hoping might emerge from it are not so much commitments by countries or binding recommendations to them, but rather more precise identification and definition of the problems involved, and thence examination and analysis of alternative means for dealing with them, bearing in mind the various budgetary, political, and manpower constraints involved. It is our hope that before the end of this Workshop we would have made progress towards such objectives. Needless to say, what we do achieve in fact will depend very much on all of us, individually and collectively.

Thank you.

# Workshop Summary Report

FRANCIS T. CHRISTY, JR.

## Introduction

The changes that are taking place in the law of the sea are of considerable importance to most coastal states, both in their effect on the distribution of the sea's wealth in fisheries and in the increase in coastal state's responsibility for the management of the resources. Very few, if any, nations are adequately prepared to deal with these effects, and all need to improve their competence to deal with emerging issues. It was with this objective in mind that ICLARM and ISEAS joined in convening the Workshop on the Law of the Sea for Southeast Asian states.

In seeking to reach this objective, the workshop focused in general on only two of the many issues being raised by the changes in the law of the sea. It did so partly because of the desirability of having a relatively narrow focus for discussion and, in part, because of the recognition of the fundamental importance of the two issues—allocation and implementation. The issue of allocation is that of determining “who gets what” from the sea's resources. It is an issue that must be resolved if nations are to avoid a mutually destructive race for the common resources of the oceans. Implementation is of equal importance in that the best management plans and the most beneficial arrangements with foreign countries will be of no value if they cannot satisfactorily be put into effect.

The workshop recognized that the problems of allocation could only be dealt with in terms of the process,

not the product. It was not appropriate for the workshop to determine who “should” get what from the sea's wealth in fisheries or where the boundaries between neighboring or opposite coastal states should be drawn. These are matters for negotiation among the concerned states. The workshop, therefore, adopted a basic working assumption that all states in the region would extend their jurisdictions over fishery resources and would reach agreements as to the location of their boundaries. This assumption was adopted to facilitate discussion and avoid the problems of boundary and territorial disputes.

It was recognized, however, that the extension of jurisdiction would have disparate effects and that some states would lose while others would gain. Means for the amelioration of these effects are currently being discussed at the 3rd United Nations Conference on the Law of the Sea and it seemed appropriate that this aspect be considered by the workshop as a separate problem.

Thus, the discussion of the three separate working groups focused on three separate issues: the allocation of living resources, the effects of extensions of jurisdiction, and the problems of enforcement. A “discussion guide” was prepared for the use of each of the working groups, so that each group would consider all of the issues. The guide is presented below:

## Discussion Guide

1. Problems in allocation of living resources
  - a. Are bilateral, multilateral, or regional agree-

- ments necessary for allocation, research, prevention of waste, and enforcement?
- b. What are the advantages and disadvantages of bilateral, multilateral, and regional arrangements?
2. What does extension of national jurisdiction entail for Southeast Asian countries? What are the advantages and disadvantages of such actions?
  3. Problems of enforcement
    - a. How can enforcement capabilities of the states be strengthened?
    - b. What are the advantages and disadvantages of such measures?
    - c. What can be done to guarantee compliance by foreigners?
    - d. What are the advantages and disadvantages of such actions?

Throughout the discussions, the problems of information needs and research requirements were raised frequently. It is quite clear that knowledge of the fishery resources in the region is seriously deficient and that a considerable amount of research needs to be done. Even though research problems were not identified as an issue before the workshop, the discussion of the problems and their importance justifies separate treatment in the Summary. The Summary, therefore, is broken into four—one on information needs and the other three on the substantive issues raised in the “discussion guide.”

The Summary is drawn not only from the discussions, the background papers, and the working group reports, but also from the remarks presented by those participants who were asked to initiate the discussions. For each of the four subjects, there is a brief presentation of background information and a statement of the problems needing attention. This is followed by suggested approaches for resolution of some of the problems identified in the discussions. It should be emphasized that these are not recommendations for action, but suggestions as to the possible approaches that might be followed.

### Information Needs

It was generally agreed that there are major gaps in our knowledge about the fishery resources of the region. For the problems being considered by the workshop, information on three particular kinds of stocks needs to be greatly improved—(a) the scads and mackerels, (b) yellowfin and skipjack tunas, and (c) the demersal (bottom-living) stocks, particularly those occurring along present and likely future boundaries between the states. For each of these, more knowledge is needed about the status of the stocks, rates of growth, and the effects of fishing on the yields. In addition, for the first two kinds, information on migratory patterns is

crucial.

It is known that several stocks of scads, mackerels, and tunas migrate across state boundaries. Common stocks of scads and mackerels are believed to occur along the margins of the Gulf of Thailand and the eastern margins of the South China Sea. The tunas that are found in Philippine and Indonesian waters are thought to be from the same stocks that swim through the waters of Micronesia, Papua New Guinea, and farther east. However, there is very little precise knowledge about the migratory paths or about the location of the spawning areas of the stocks. In some cases, as noted in the background papers, overexploitation may already have occurred.

For such shared stocks that swim through the waters of two or more coastal states, agreements on allocation and management measures are absolutely necessary if the benefits to be derived from the resources are not to be dissipated. If any one state attempts to maximize the catch without regard to the interests of the other states, the stock will become depleted (fished beyond the point of maximum sustainable yield) and produce little or no benefits for any of the sharing states. The problems of allocation and management are further complicated if the stock is especially vulnerable or occurs only in its immature form when it is in the waters of one of the states. In this situation, excessive fishing by that state may seriously diminish the total yields that could be made available to all states.

It is clear that information on these various aspects is important for the decisions that must be made. But it is equally clear that there are considerable problems involved in obtaining the information. Some of those pointed out at the workshop are the costs of undertaking research on marine resources, the difficulties of getting accurate reports of quantity and location of catches, the low value placed by some administrators on the need for the information, and the lack of uniformity among the states in the collection of statistics.

There is little need to elaborate on the costs of marine research. The mobility of the species, the fact that they lie in an opaque medium, the difficulties of developing controlled environments, the necessity for using vessels, and many other factors mean that the costs of developing knowledge are considerably higher than the costs of research on land resources.

One of the best tools for management research is the records of quantities of catch, size of individuals, and location of catches and the amount of effort spent by the fishermen. But it was frequently noted throughout the workshop that such records are very difficult to obtain. Many of the catches are made by artisanal fishermen using small craft, fishing from small and

isolated villages, and landing a wide variety of species. In the Philippines, for example, it was pointed out that tunas, frequently immature fish, are taken largely by fishermen using vessels under 3 t and that their catches are not included in the commercial fishery records. It was also stated that in some countries a large but unknown amount of vessels are not licensed, so that the total amount of effort spent is not known.

An additional difficulty is the low value placed on the collection of the relevant data. It appears that in certain countries, those responsible for setting budgets for fisheries are often more concerned about development prospects than about management needs and that they therefore place a low priority on collection of such important data as catch per unit of effort.

Also, although efforts are being made to improve the situation, there is still a considerable lack of uniformity among the countries in the kinds of statistics collected. This creates particular difficulties for evaluating shared stocks of fish.

A somewhat separate but still important problem raised at the workshop relates to the fact that information has value and that the potential for misuse of information may inhibit its production. One of the issues being raised at the UN Conference on the Law of the Sea is whether coastal states should have the sole responsibility for determining the optimum yields of the stocks in their zones or whether this should be done jointly with neighboring concerned states or by an international organization of recognized competence. Some states fear that if the coastal state has the sole responsibility, it may tend to underestimate the optimum yield so as to reduce or eliminate any surpluses that might be made available to foreign fishermen. Other states, however, are concerned that foreigners or international organizations may not fully take account of the economic, social, and ecological factors that are important in determining optimum yields and that foreign participation in such research would be an infringement on the coastal state's sovereignty.

Not all of these problems in the production of information are readily resolvable, but some suggestions were made for steps that might help to alleviate some of the difficulties. It was suggested that cooperation on research on shared stocks among concerned states would be desirable. For example, the migratory patterns of scads, mackerels, and tunas can be determined by tagging of individual animals and recording the location of their recapture. Since tagging will take place in the zone of one state and capture might occur in the zone of another, cooperation is essential. As another example, it was pointed out that although marine research might have low priority in any one state, the aggregate interest of all states would justify joint research undertakings and that

the costs to the individual states could be reduced. Costs could be reduced by cooperation in the use of research vessels, training of research personnel, the development of research methodologies particularly suited to the region, and in many other ways. Although cooperative research efforts already exist in the region, it was thought that these could be supplemented and complemented by other approaches.

Although cooperative undertakings are desirable, it was recognized that the primary responsibility for the production of information lies with the individual states. In this regard, it was pointed out that decisions on management of fisheries and on arrangements with foreigners are being made, and must be made, in the absence of full information on the resources. Information will never be full and uncertainty will always exist. The importance of this fact is that research should relate directly to the decisions that have to be made. As noted in the workshop, one of the first and most important tasks is the clarification of the objectives to be sought from the use of fishery resources. Objectives are not always clearly stated by governments, and several different objectives may be in conflict with each other. Decision makers need to resolve the conflicts and then determine as precisely as possible the various elements of the decisions required to reach the objectives. On this basis, they can then determine the information that they need to make the decisions. This will permit a more efficient direction of research efforts and reduce the costs of research programs.

Improved collaboration among those responsible for agreements with foreign states, those responsible for fisheries management, and researchers is necessary to maximize the benefits that can be derived from the changes in the law of the sea. Indeed, it was the essence of the workshop to help stimulate such collaboration.

#### Allocation of Shared Stocks

The fact that many valued stocks of fish freely swim across national boundaries calls for a high degree of cooperation among the concerned states in the distribution of benefits. Fundamentally, the achievement of effective cooperation depends upon whether the states perceive that the benefits of cooperation in allocation are greater than the losses they might experience by proceeding unilaterally. It is thus important to improve the perceptions of the individual states with regard to the nature of the cooperation required, the benefits to be derived, and the costs (including the apparent infringement on sovereign rights) that might be incurred. The workshop touched on several of these aspects.

Some of the participants pointed out that one of the

basic problems was the lack of appreciation by some of the decision makers of the need for reaching agreements on the allocation of fishery benefits. This is due in part to the lack of clear-cut information on the status of the stocks and their migratory patterns. The present or potential damages of unilateral approaches have not been sufficiently well demonstrated to those concerned to stimulate them to take action. In some cases, damages may not yet have occurred, but in others it may be that the proof is not sufficiently convincing or has not been brought to the attention of those responsible for the decisions. The lack of communication among different agencies within governments is an impediment to the initiation of negotiations on the allocation of benefits from shared stocks.

Another problem raised at the workshop is that of resolving the numerous technical difficulties in the development of allocation systems. Various systems have been suggested. One would be the distribution of national quotas, i.e., shares of the total allowable catch that can be taken within any zone. Under this arrangement the fishermen of any one state would be able to fish anywhere in the region until they reach their state's quota. Another system would be that of zonal quotas in which the share acquired by a particular state is taken only within the zone of that state. Quotas could be made transferable so that a state could sell or lease rights to take its share or a portion of its share. This would approximate a system in which the benefits from the resources, rather than the yield from the resources, are distributed among the concerned states. There are various advantages and disadvantages to these different systems and a large number of complexities involved in implementing any one of them. Indeed, the problems associated with the development of viable systems for allocation of shared stocks still have to be resolved in most regions of the world. This is notably true for the tunas of the eastern tropical Pacific and for a variety of species in the North-east Atlantic.

Another problem that was raised is that of the possibility or likelihood that a stock may be particularly vulnerable in a certain zone or area within a zone. If the fishermen from a state or area within a state have access to a stock only when it is immature, their catches may reduce the harvests of bigger individuals in the zones of other states and could eventually lead to depletion of the stock. If these fishermen restrained their catches, the total yields for all fishermen might be higher. But the restraint would mean a sacrifice on the part of one of the states, a sacrifice that would be difficult to make.

It was pointed out that in the Philippines a large amount of the tunas that are caught are immature tunas taken by artisanal fishermen. Although all states sharing

the tuna stocks may be better off by preventing the artisanal catch of the immature tuna, such a measure would be difficult to enforce and would work especial hardship on a particular group of fishermen. Such inequities make it difficult to resolve the problems of allocation.

An additional problem of considerable concern to the workshop was that of determining how to extract the maximum net benefits from foreign fishermen wishing to have access to the stocks in coastal state waters. It was noted particularly in Indonesia that the past arrangements with foreign fishermen, in particular those from Japan, had not been entirely satisfactory, and that the costs associated with implementing the agreements had been high and the returns had been low. Part of the problem may be due to the negotiating strength of Japan. This strength is due not only to the importance of Japan to the economies of the coastal states in general but also to the fact that its interests in tuna can be met by a large number of coastal states throughout the Southwest Pacific region. Currently the Japanese are the only distant-water fishermen with a strong capability for taking skipjack tuna in the western Pacific. Since the skipjack are not yet fully utilized, the Japanese can move their vessels to the waters of the coastal states which charge the lowest fees for access. In the absence of a coordinated approach by the states sharing the tuna stocks, the Japanese may be able to use their position to play off one state against another and drive down the fees for access.

A coordinated approach, however, means that the concerned states will have to reach an agreement on allocation of the resources or resource benefits. Furthermore, the determination of the appropriate fees to charge will not be easy. Finally, it should be noted that an approach which seeks to maximize the net economic returns that can be extracted from foreigners may mean that the developing countries within the region may not be able to compete. This, however, may change as labor costs in Japan continue to increase and as the developing states improve their ability to fish for tuna.

These problems associated with the allocation of shared stocks of fish are not easy to resolve. Many of them are essentially problems of wealth distribution and, like those of boundary agreements, have to be worked out by negotiation among the concerned states. The workshop noted that the process of negotiation could be greatly facilitated if the states were able to adopt some general principles for allocation. This in turn would be facilitated by efforts on the part of the individual states to develop a clear set of the values and objectives they seek from the use of fishery resources. Unless they know, as precisely as possible, what they want to gain

from the allocation of the resources — whether they want economic revenues, employment opportunities, sources of protein, or export earnings — they will not be able to negotiate easily nor know what they will be willing to trade off to reach mutually beneficial agreements.

Generally, the workshop participants recognized and accepted the necessity for cooperation among states. They believed that the allocation process would be most successful if it proceeded slowly. It was believed that an institutionalized infrastructure was not a prerequisite for cooperation on allocation. Agreements might begin through bilateral negotiations, moving towards the eventually necessary multilateral mechanisms.

It was also pointed out that the most important criterion for allocation was that of acceptability. All states which can influence or affect the decisions should believe that they are better off by abiding by the decisions than by breaking them. Here, a clear understanding and accurate perception of the benefits being traded off would be extremely helpful.

In situations where one state may be required to make a sacrifice to achieve greater benefits for all concerned states, it was suggested that some means for compensating the losers would be desirable. For example, if the total yield from a stock can be greatly increased when the fishermen of one state refrain from catching the immature fish, the other states might join in providing some compensation to the fishermen that refrain from fishing. Through such means, all participating states would be better off.

There was some discussion of the different systems of allocation and a suggestion that zonal quotas had sufficient advantages to deserve careful consideration. It was also suggested that cooperation among sharing states with regard to negotiations of agreements with extra-regional states could be helpful in strengthening the position of the sharing states and maximizing the net benefits that could be extracted.

In general, although the workshop participants recognized the technical, social, and political difficulties associated with the allocation of shared stocks of fish, they felt that cooperation among the states was both feasible and desirable.

### **The Effects of Extended Jurisdiction**

The workshop discussed, to some extent, the problems relating to the extensions of jurisdiction in the region. Only a few of the states in Southeast Asia have thus far asserted claims for exclusive economic zones. It was believed that all states would eventually assert such claims and that the present areas of high seas would

disappear and fall under the jurisdiction of the various coastal states. It was recognized that there would be considerable disparity among the states in terms of their gains and losses. In particular, the states of Singapore and Thailand would lose because a large amount of their present fishing effort is spent in waters that will fall under the jurisdiction of other states.

The UN Conference on the Law of the Sea is currently discussing measures that might be taken to alleviate the hardships that might be incurred by states that gain little from the extensions of jurisdiction. At the workshop, much of the discussion focused on the concept of "traditional fishing rights" and how this concept should be defined. One view was that "traditional" referred to the fishermen and their vessels, rather than to states. Under this view, it was held that the same fishermen who had fished in the area that would become the exclusive zone of another coastal state might be granted some form of preferential access but that they must use the same vessels. It was suggested that this preferential access could not be transferred to other fishermen or other vessels.

This view was contested by several of the participants who argued that the right accrued to the state as a whole and that preferential access should be available to other fishermen as well as those who had actually fished. It was argued that restricting the right only to those who had actually fished would severely limit the right, both in terms of time as the fishermen die, and in terms of precluding modernization of fishing effort. It was suggested that the coastal state's interests would be adequately protected by defining preferential access in terms of quantity of fish that could be taken rather than in terms of traditional fishermen and vessels.

The workshop did not attempt to suggest how this controversy should be resolved. It was believed that the issues should be more properly discussed at the UN Conference or in negotiations between the concerned states.

A separate point about extensions of jurisdiction was also briefly discussed at the workshop. It was noted that some agreements with foreign countries and cooperative arrangements among the states of the region may depend to a certain extent upon how the boundaries of the exclusive zones are finally drawn. The absence of a final determination of boundaries may impede the reaching of such agreements and arrangements. It was suggested that this uncertainty might be alleviated in certain cases by reaching tentative agreements for special purposes.

### **The Problem of Enforcement**

The problems of enforcement were generally agreed to be particularly important to resolve, not only with

regard to the changes taking place in the law of the sea but also in terms of the present condition of limited jurisdiction. It was recognized that the problems and difficulties of enforcement diminish the net benefits that states receive from use of fishery resources within their present zones of jurisdiction and that net benefits from extended zones will also be diminished if the problems of enforcement cannot be satisfactorily resolved. These problems apply both to domestic and foreign fishermen and to the implementation of regulations and agreements as well as to illegal fishing or poaching by foreign vessels.

The workshop participants identified a wide variety of causes for the present ineffectiveness of enforcement. One of these is clearly the high costs of patrol craft that can conduct surveillance and make arrests. For several of the states, the water area within present jurisdictions is vast and much of it is isolated and far from land. For these states, investments in adequate patrol forces will be heavy.

But in addition to the high costs, there are other problems reducing the efficiency of enforcement systems. It was pointed out that one of these is the lack of coordination between those responsible for decisions on agreements and regulations and those responsible for the various phases of enforcement systems. This leads to the adoption of regulations that may not be readily enforceable or to agreements with foreigners that place excessive burdens on patrol forces or on the courts.

It was noted that there are several phases to an enforcement system. These include not only surveillance and arrest, but also trial, punishment, and reporting. These phases are each of such importance that an enforcement system is only as strong as the weakest of the phases. For example, if the courts are not adequate to hold trials expeditiously, the whole system of enforcement is jeopardized. One of the difficulties is that the various phases fall under different arms of government and that coordination of their activities is thereby impeded.

Another problem apparently common to many states in the region is the lack of coordination among the various agencies that have the authority for surveillance and arrest. In some cases, this authority is shared by police forces, customs agents, immigration agents, the coast guard, fisheries departments, navy, and other governmental departments. Even though there may be one central command for enforcement of fishery measures, there appear to be severe difficulties in getting the cooperation of the different departments and agencies. It was also mentioned that the authority for arrest was sometimes abused and that fishermen sometimes attempt to avoid regulations by bribing enforcement officials.

An additional difficulty expressed at the workshop

was the lack of awareness of the desirability of the measures being enforced. When the fishermen do not perceive that the regulation will work to their benefit, they will have little incentive to comply with the regulation. In situations where the regulation is designed to distribute benefits to one group of fishermen, such as artisanal fishermen, and away from another group, the latter group will experience losses and will be tempted to violate the regulation. But even if a regulation leads to greater benefits for all in the future, there may be some difficulty in convincing the fishermen of its desirability. This may be due to the imposition of a uniform regulation that may not be equally applicable in all areas or it may be due to a lack of credibility in the information demonstrating the need for the regulation. In any case, when fishermen do not benefit from or do not perceive the benefits from a regulatory measure, the costs and difficulties of enforcement become much greater.

In addition to the problems mentioned above which deal with enforcement within individual states, the workshop identified problems in achieving effective cooperation in enforcement among the states of the region. It was recognized that cooperation would be desirable for a number of reasons. When stocks are shared by several states, each state wants to be assured that other states are abiding by the allocation agreement. With extended zones of jurisdiction, cooperation in the surveillance of foreign fishing vessels that are in transit from one zone to another would clearly be beneficial.

Enforcement, however, is a highly sensitive area for all states and there are limits to the degree to which cooperation is feasible. States may find it difficult to permit other states to conduct surveillance operations within their zones, and yet some technique for ensuring credibility in reporting of catches appears to be necessary for effective agreements on the allocation of shared stocks.

The workshop participants suggested several ways to improve enforcement systems. One of these was the desirability for states to broaden their focus beyond the phases of surveillance and arrest and to include the phases of trial, punishment, and reporting. It was suggested that each phase should be improved commensurately with the others so that the whole system could be made more effective. Increased coordination among the various phases would also be desirable as well as increased coordination with those responsible for decisions on regulations and on agreements with foreigners. It was clear that states are already aware of the problems associated with diffused responsibilities for surveillance and arrest and of the need for better coordination among the various forces.

An important task that emerged from the workshop



discussions is increasing the awareness of the need for and value of enforcement systems. As noted above, the respect that fishermen have for enforcement is related directly to their understanding of the importance and value of the measures. It might also be mentioned that decision makers should also improve their awareness of the need for better enforcement systems. Enforcement is not an activity that is particularly rewarding to administrators. They would prefer to be known for the amount of resources they have developed or number of vessels they have built than for the number of arrests they have made. The fulfillment of their enforcement tasks would be made easier if there were greater understanding on the part of their superiors of the value of enforcement.

With regard to cooperation among states, it was suggested that uniformity in regulations and agreements with foreigners would be very helpful. For example, where it is desirable to have special lanes for the transit of foreign vessels, it is important that the lanes through one zone conform to the lanes through an adjacent zone. Uniformity in rules governing the stowage of fishing gear and in the kinds of gear or vessels that can be used would also mutually facilitate the tasks of enforcement by neighboring states.

For these and other reasons, it was suggested that increased contact among the enforcement officials of the different states in the region would be desirable. This might eventually lead to the adoption of joint surveillance techniques such as satellite systems and transponding devices. It could also do much to improve credibility in compliance with agreements on allocation of shared stocks.

### Summary

It is interesting to note that the three different work-

ing groups independently identified similar problems and suggestions for improvements. In particular, all groups emphasized the importance of fisheries management, believing that development prospects can be fully realized only if there is improved management of the resources and resource users. The stress on the need for dealing with the problems of depletion, waste, and conflict demonstrated a strong sense of responsibility for fisheries management and for the mutual regard of other states.

The participants agreed that this responsibility can best be exercised by improving the competence within their states to deal with the issues. They also agreed that many of the issues cannot be resolved except through multilateral agreements and that regional cooperation was both necessary and feasible. It was recognized that one impediment to cooperation was the present difficulty of communication between the centrally planned and market economies in the region. It was suggested that the ASEAN states should not proceed so rapidly that their actions become subject to misinterpretation, nor so slowly that the resources are wasted. It was considered possible for the ASEAN states to adopt tentative arrangements pending the resolution of the problems between the centrally planned and market economies.

It was stated that one of the values of the workshop was that it facilitated informal contacts between individuals from different countries and that such contacts were particularly helpful in furthering regional cooperation. Further efforts through additional workshops or other means were considered to be desirable in reaching the objective of mutually beneficial use of the fishery resources of the region.

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# The Allocation of Scads and Mackerels

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## Introduction

Among the pelagic fisheries in Southeast Asia, the scads (*Decapterus* spp.) and mackerels (*Rastrelliger* spp.) are the most productive. The combined catch of these species increased from 632,400 mt in 1971 to 879,974 mt in 1976, and accounted for 84% of the total world catches of scads and mackerels in 1976 (Tables 1 and 2). Although fisheries on these two resources have rapidly developed during the last decade, catches continue to grow in many areas and considerable increases can be expected in the future. However, since it is well known that scads and mackerels are widely distributed in the South China Sea region, a substantial proportion of these resources may be shared by more than one country in the region. Thus, the increased intention of the coastal states, off whose shores these stocks migrate, to invest more heavily in fishing effort will eventually lead to a mutually destructive race for the common resources, unless the states concerned are able to reach an agreement on the allocation of the yields from these resources.

The problems of international allocation and management raised by the generally mixed nature of the stocks and their variable pattern of exploitation and migration are just beginning to be appreciated. When a stock occurs in more than one area of national jurisdiction, negotiations and cooperation between the countries concerned are required to reach an agreement on the shares to be taken by each country. For the scad and mackerel resources which are of vital importance to the economy of the pelagic fisheries in the countries bordering the South China Sea region, no attempt has yet been made to devise allocation schemes in the area. I therefore appreciate

this opportunity to initiate discussion on the principles and problems in determining the allocation of catches of these resources among the countries concerned. It is hoped that this will be an initial step toward the rational exploitation of these resources as well as a means to conserve the stocks for mutual benefits of all concerned.

## Scad Resources and Fisheries

Scads are widely distributed in the South China Sea region as shown in Figure 1. At least four possible species were recognized in the area. In Philippine waters, *Decapterus macrosoma* (syn. *D. lajang*) and *D. russelli* are abundant while *D. kurroides* is very rare (Tiews et al. 1970; Ronquillo 1970). In the Gulf of Thailand round scad (*D. maruadsi*) is the most abundant, followed by *D. macrosoma*. *D. kurroides* seems to be very rare (Sukhavisdh 1978a). In Malaysian waters Russell's scad (*D. russelli*) appears to be most abundant whereas *D. macrosoma* and round scad are caught to a lesser extent (Chong 1973). In the Indonesian waters, at least two species, *D. macrosoma* and round scad, were reported (Anon. 1977). However, it appears that there have been some difficulties and confusion in distinguishing these species in the commercial catches in all countries (SCSP 1978). Most of the catches were therefore reported as combined catches of scads and thus added difficulties in the assessments of distribution and productivity by species in the region.

Knowledge of the biology and life history of scads is also incomplete. Little information on spawning behavior, early life history, growth, migration, food habits and other aspects of basic biology are available at present.

From the study on the round scad stocks in the Gulf of Thailand, Chullasorn and Yusukswad (1977) reported that round scad and *D. lajang* mature to a total length (TL) of 16 cm. There are two peaks of spawning, in February-March and in July-August. The spawning grounds appear to be in deep waters of the central part of the Gulf of Thailand (Fig. 2). Since age determination of *Decapterus* spp. is very difficult due to being tropical, Chullasorn and Yusukswad employed length frequency analysis and showed that the maximum length of round scad in the Gulf of Thailand is about 23 cm, with a growth coefficient of about 0.11.

It is apparent that scad is a slow-growing pelagic fish as compared to mackerel. Tiews et al. (1970) stated that scads in the Philippine waters grew to about 20 cm TL in their third year, but larger fish have scarcely been caught from the commercial fishing grounds. The record of some

fish longer than 30 cm caught in deeper waters, however, suggested that there might be mature stocks in some deeper areas which were virtually unexploited (SCSP 1978).

Owing to limited information available, it was not possible to identify with any degree of certainty the various stocks present in the region. However, the Workshop on the Biology and Resources of Mackerels (*Rastrelliger* spp.) and Round Scads (*Decapterus* spp.) in the South China Sea, organized by the FAO/UNDP South China Sea Fisheries Development and Coordinating Programme and held at Penang, Malaysia from November 7-11, 1977 identified eight local unit areas for preliminary stock analyses (Fig. 3). The results indicate that many stocks are fully exploited and expansion of exploitation is possible only in some areas (Table 3).

It is important to note that the development of the

Table 1. Scad (*Decapterus* spp.) catches by country, 1971-1976 (mt)<sup>a</sup>

	1971	1972	1973	1974	1975	1976
World catch	409,489	444,760	509,841	539,877	528,290	689,184
Southeast Asia	364,489	402,660	455,141	489,642	476,120	608,033
Hongkong	6,600	6,600	4,800	6,577	9,108	9,970
Indonesia	33,100	54,400	53,900	56,271	68,700	71,683
Malaysia <sup>b</sup>	7,300	12,200	14,100	20,448	16,111	16,411
Philippines	317,000	328,600	367,600	373,093	356,120	426,211
Singapore	0	200	100	84	73	54
Thailand <sup>c</sup>	489	660	14,741	33,169	26,008	83,524
Japan <sup>d</sup>	45,000	42,100	54,700	50,235	49,647	80,901
Others <sup>e</sup>	ND	ND	4,000	6,823	2,523	250

<sup>a</sup>From FAO (1977) Yearbook of Fishery Statistics, Vol. 42.

<sup>b</sup>Russell's scad (*D. russelli*) only.

<sup>c</sup>Revised data from Department of Fisheries, Thailand.

<sup>d</sup>Round scad (*D. maruadsi*) only.

<sup>e</sup>Mainly from Atlantic Ocean, ND = no data available.

Table 2. Mackerel (*Rastrelliger* spp.) catches by country, 1971-76 (mt)<sup>a</sup>

	1971	1972	1973	1974	1975	1976
World catch	474,400	306,900	301,100	281,018	297,194	357,515
Southeast Asia	264,200	180,300	223,500	221,595	230,867	271,941
Indonesia	65,300	62,200	56,400	65,427	70,985	74,262
Malaysia	39,000	17,600	31,500	25,109	20,918	19,059
Philippines	44,400	44,900	56,000	69,874	47,087	82,196
Singapore	100	100	100	85	74	31
Thailand	115,400	55,500	79,500	61,100	91,803	96,393
India <sup>b</sup>	204,600	121,200	69,900	41,100	49,604	69,731
Others <sup>c</sup>	5,600	5,400	7,700	18,323	16,723	15,843

<sup>a</sup>From FAO (1977) Yearbook of Fishery Statistics, Vol. 42.

<sup>b</sup>India mackerel (*R. kanargurta*) only.

<sup>c</sup>Mainly from the Northwestern Indian Ocean.

scad fishery in Thailand is quite spectacular, similar to the development of trawl fisheries during the mid-1960s. With the introduction of luring purse seining techniques in the early 1970s, the annual catches of scads increased from 489 mt in 1971 to 83,524 mt in 1976. Similar development was observed in Philippine waters when purse-seiners with light luring techniques successfully competed with bagnets which resulted in catches 10 times higher than those taken with traditional fishing gear in the Sulu and Visayan Seas. The disturbing fact is

that the vast majority of scads caught in these areas were reported as immature, except in the northern part of the region, and the spawning behavior of the fish is not well known. It is possible that mature scads spawn in the

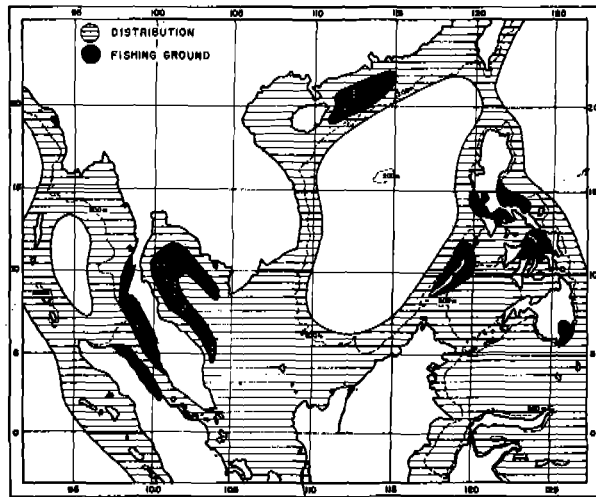


Fig. 1. Distribution and fishing ground of round scads, *Decap-terus* spp. in the South China Sea.

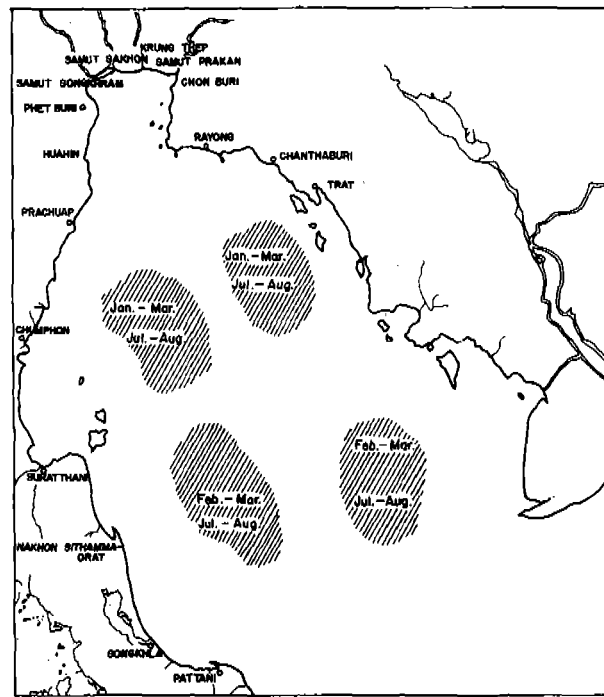


Fig. 2. Assumed spawning ground and spawning season of *Decap-terus* spp. in the Gulf of Thailand. (from Chullasorn et al. 1977).

Table 3. Current catches and potential yields in the scad fisheries in the South China Sea area (from SCSP 1978).

Area	Catch in 1000's mt		Estimated potential (mt) and status of exploitation
	1974	1975	
Gulf of Thailand	26.3	83.5	Probably over 100,000 Moderately exploited
Philippines and NE Sabah	373.1	356.1	Probably over 400,000 Moderately exploited
Northern shelf of South China Sea	2.4	3.4	Undetermined
E. coast of Peninsular Malaysia	13.2	10.7	Around 15,000 Moderately exploited
W. coast Kalimantan	0.7	0.9	Undetermined Slightly exploited
Andaman Sea-N. Malacca Strait	8.4	5.3	Undetermined Slightly exploited off Thai coast
Northern Sumatra	13.2	10.8	Around 14,000 Fully exploited
Sarawak-W. Sabah	0.5	0.5	Undetermined Slightly exploited
<b>Total</b>	<b>437.8</b>	<b>471.2</b>	<b>540,100<sup>a</sup></b>

<sup>a</sup>Estimated potential plus the average 1974/75 catches in the areas in which potential was not estimated.

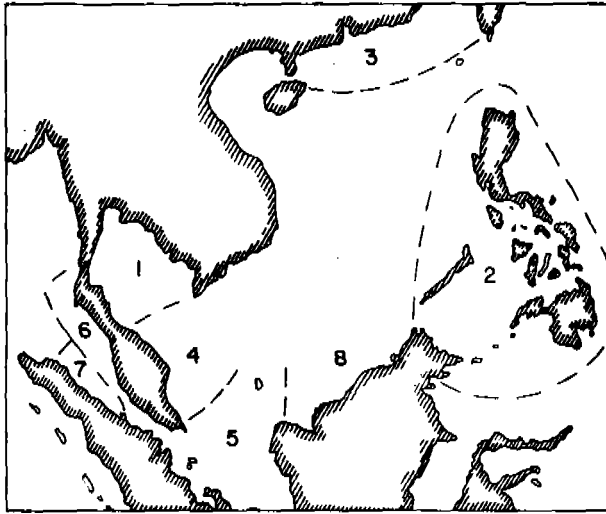


Fig. 3. Subdivision of the South China Sea in areas used by the workshop for assessment of the *Decapterus* resources. Area 1, Gulf of Thailand; Area 2, Philippines-NE Sabah; Area 3, Northern Shelf of the South China Sea; Area 4, E. Peninsular Malaysia; Area 5, W. Kalimantan; Area 6, Andaman Sea-Malacca Strait off Thailand and Malaysia; Area 7, Northern Sumatra; and Area 8, Sarawak-W. Sabah.

deeper waters along the edge of the shelf as suggested by the disappearance of mature scads in Philippine waters and by the spawning grounds in offshore waters of the Gulf of Thailand. In this case, mixing of stocks among the assumed local unit areas might occur and thus create problems in the allocation of catches in all areas concerned.

#### Mackerel Resources and Fisheries

Basic information on the biology, bionomics, and fisheries of mackerels (*Rastrelliger* spp.) have been presented by Jones and Rosa (1965), Hongkul (1974), and recently by SCSP (1978). Similar to the situation with scads, the information is far from complete. There are problems in species identification, catch statistics, and life history, as well as with assessments of the stocks of mackerels in the area. Nevertheless, the existing information as presented at the Penang Workshop (SCSP 1978) allows more insight into these resources than into those of scads.

Figure 4 illustrates the distribution and the main fishing grounds for mackerels in the South China Sea region. Although the distribution of each species was not clear due to the difficulties and confusion about the taxonomy and insufficient coverage of surveyed area, it was agreed that *Rastrelliger brachysoma* (syn. *R. neglectus*) seems to be the most abundant among the species along the coastal waters, while *R. kanagurta* and *R. saughni* appear to be open-sea forms that are also found throughout the area. In addition, two new species of *Rastrelliger* were

reported from the Andaman Sea (Sukhavisidh 1978b).

Only the mackerel stocks in the Gulf of Thailand have been intensively investigated since 1963. The results from these studies showed that mackerels (i.e., *R. neglectus*) mature at about 17.5 cm TL and spawning takes place over a fairly prolonged period, from February to September in areas along the western coast of the Gulf of Thailand. In these areas, the plankton was found to be abundant and there also appeared to be a high daily photosynthesis rate in the spawning season (Suwapepun and Suwanrumpha 1970; Lursinsap et al. 1970).

Tagging experiments conducted during 1960-1965 revealed a northward feeding migration of the young fish to the Inner Gulf of Thailand during April-August, and a southward spawning migration of the adult fish during December-January (Somjaiwong and Chullasorn 1974). It was supposed that fish along the eastern and western coast of the Gulf did not intermingle to a large extent although interchange of stocks along the eastern coast with those in Kampuchean and Vietnamese waters is expected. Similar patterns of migration were hypothesized for the mackerels along the Andaman Sea coast of Thailand. It is possible that mackerels that spawned off the west coast of Peninsular Malaysia might have a northward feeding migration to the Thai waters (Pathansali 1967). Some mackerels that were tagged and released off Langkawi Island and which were later caught in the Thai waters support this hypothesis. Similarly, the mackerels in the Mergui Archipelago may have a southward migration to the northern part of the Thai waters in the Andaman Sea. Similarities in the morphometric characteristics of mackerels from the

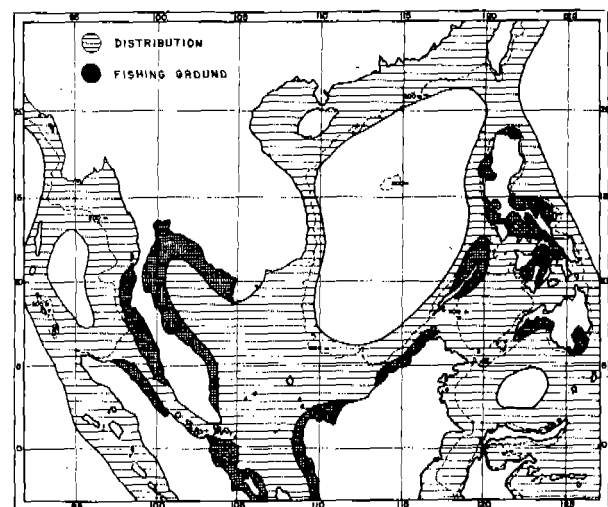


Fig. 4. Distribution and fishing ground of mackerels (*Rastrelliger* spp.) in the South China Sea.

Burmese and Thai waters in this area were reported (Druzhinin and Myint 1970)

Studies on the growth of mackerel have been carried out in several countries. Due to difficulties in age determination, these studies have been made mostly by investigating the seasonal change in length distribution. Hongskul (1974) employed this technique together with the tagging data to establish the growth function of mackerel in the Gulf of Thailand, with a high growth coefficient of 0.28 which enables the fish to grow to the commercial size within 7 mo after its birth. Malaysian scientists obtained similar results (SCSP 1978). On the other hand, Sujastani (1974) reported a lower growth coefficient for mackerels in the Indonesian waters. Nevertheless, the differences are not highly significant among the countries in the area.

The unit of the mackerel stocks in the area generally appeared to be very vague due to lack of information. To assess the status of the stocks, the Workshop on the Biology and Resources of Mackerels (SCSP 1978) proposed a subdivision of South China Sea area into eight local units (Fig. 5). The preliminary assessments based on the available data indicate that at least 60-70,000 mt of increased mackerel production can be expected from the region (Table 4). Many traditional fishing grounds for mackerels, however, showed signs of overexploitation, particularly in northern Malacca Strait, the western coast of Peninsular Malaysia, and the western coast of the Gulf of Thailand.

### Allocation of Catches

The previous discussion indicates that scad and mackerel in this region are shortlived with life spans of about 3 yr, fast-growing in their early stages and reaching commercial sizes within 1 yr. They also start spawning in their first year of life. Although no estimate of

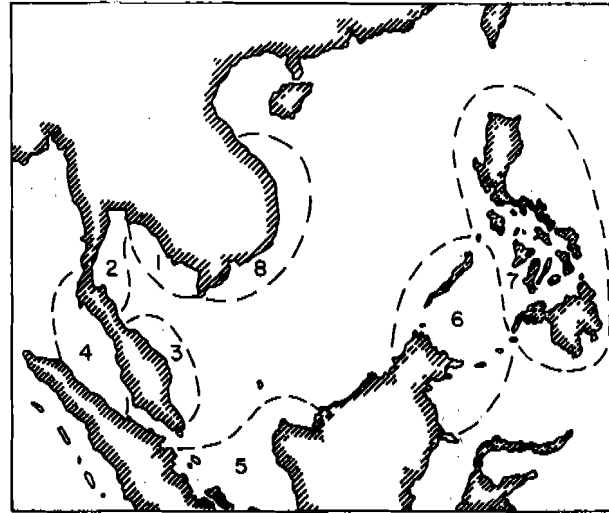


Fig. 5. Subdivision of the South China Sea in areas used by the workshop for assessment of the *Rastrelliger* resources. Area 1, E. Gulf of Thailand-Cambodia-W. Vietnam; Area 2, W. Gulf of Thailand; Area 3, E. Peninsular Malaysia; Area 4, Andaman Sea-NE Sumatra; Area 5, W. Kalimantan; Area 6, Brunei-Sabah-Palawan Island; Area 7, Luzon-Visayas; and Area 8, E. Vietnam.

Table 4. Current catches and potential yields in the mackerel fisheries in the South China Sea area (from SCSP 1978).

Area	Catch in 1000's mt		Estimated potential and status of exploitation
	1974	1975	
Gulf of Thailand (East)	2.3	2.8	Over 7,000 Moderately exploited
Gulf of Thailand (West)	21.1	19.0	35,000 Overexploited
E. coast Peninsular Malaysia	13.9	11.7	Probably 13,000 Nearly fully exploited
Andaman Sea-NE Sumatra	47.8	51.3	Around 98,000 Overexploited
West Kalimantan	15.0	17.8	Undetermined Slightly exploited
Brunei-Palawan Islands	23.9	17.8	Undetermined Fully exploited
Luzon-Visayas	46.0	29.3	Undetermined
E. Vietnam coast	ND	ND	Undetermined
<b>Total</b>	<b>170.0+</b>	<b>159.7+</b>	<b>228,000<sup>a</sup></b>

<sup>a</sup>Estimated potential plus the average 1974/75 catches in the areas in which potential was not estimated.

recruitment was ever made, it is apparent from the catch of these 0-group fish that variation in recruitment occurs in most areas. In fact, variation in mackerel catch was noted 100 yr ago (Day 1878). Natural fluctuation was often cited as the main cause for recruitment and thus stock size variation, although the effects of environmental perturbation on these stocks are not known. Murty (1969) once reported variations in pelagic fish catches due to variation in the pattern of surface mixed layers derived from the coastal drift currents. Murty and Edelman (MS, cited by Rao 1970) also suggested that certain low ranges of monsoon intensities are unfavorable for the pelagic fisheries since they found the surface waters depleted of dissolved oxygen during such periods.

The scad and mackerel fisheries have been major fisheries in the countries bordering the South China Sea for decades, particularly the mackerel fishery in Thailand and the scad fishery in the Philippines. With the introduction of modern purse-seining and trawling, these resources are now being exploited at increasing rates in all countries. Many "local" stocks already show signs of overexploitation, for example on the west coast of the Gulf of Thailand, the west coast of Peninsular Malaysia, and the northern Sumatra area for mackerels. Scads, stocks in the Gulf of Thailand and northern Sumatra are probably fully exploited, whereas those in the Philippines and the east coast of Peninsular Malaysia are moderately exploited with a trend toward heavier exploitation.

It is important to note that the identification of "unit stocks" as described above was based on existing information on the distribution of mackerels and scads as a whole. Although the terms "population" and "stock" do not have precise definitions and are commonly used in a variety of contexts, "population" generally refers to the fish of a particular species living in an area at any time. "Stock" however implies a greater degree of discreteness as demonstrated by genetic evidence, difference in spawning area and season, migratory routes, meristic and morphometric data, growth rate, year-class strength, and other individual or group characteristics (Brander 1978). Thus, a population inhabits one area like the South China Sea, but may consist of several stocks; and a stock may migrate or have part of its life history in more than one area and therefore be fished by more than one country. For the populations being studied, it is possible that the mixing of mackerels could occur in Areas 1, 2, and 3 in the Gulf of Thailand and in areas 6 and 7 in the Philippines (Fig. 5). The mackerel stock in Area 4, which is fished by Thailand, Malaysia, and Indonesia at present, may also mix with the Burmese mackerels from the Mergui Archipelago at their northern boundary in the Thai waters. Similar mixing of scads is

presumed for the fish from Areas 1 and 4, and from Areas 6 and 7 (Fig. 3).

Characteristics of pelagic stocks, such as shoaling behavior and migrations which lead to mixing of stocks, give particular difficulties as they are not indicated in the commercial catch data. The accurate estimation of allowable catch (TAC) requires that we be able to estimate the current exploitable population size with reasonable accuracy. The accuracy with which we can do this and with which we can assess objectives in the national fishery development programs will obviously be affected by our knowledge of migration and shoaling processes. Without it, however, there will always be room for disagreement in interpretation of stock assessment for management purposes. For example, Pope (1973), using simple simulation models, demonstrated that the stock-recruitment patterns varied significantly with the migration rates between the two stocks in the neighboring areas. When high rates of mixing are combined with unequal input error, then errors generated in the estimates of migration effects may obscure the population processes. The lack of a definite relationship between fishing mortality (greatly affected by loss and gain through migration) and fishing effort will preclude using fishing effort controls to achieve a  $F_{max}$  management scheme as desired.

For the national fisheries management programs, in view of the changing economic order of the ocean regime, a vital step is to control the amount removed, either explicitly (e.g., as catch quotas) or indirectly (e.g., closed seasons, license limitation). This has been recognized in the Law of the Sea discussions. The first two paragraphs of Article 61 of the Informal Composite Negotiating Text (ICNT) dealing with the Conservation of Living Resources read:

"1. The coastal state shall determine the allowable catch of the living resources in its exclusive economic zone.

2. The coastal state, taking into account the best scientific evidence available to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by overexploitation. As appropriate, the coastal state and relevant sub-regional, regional and global organizations shall cooperate to this end."

The problems that immediately arise are the principles that should be used in determining the allowable catch and the coordination of allowable catches from stocks occurring in the area of jurisdiction of two or more coastal states.

The approach to solve the first problem is undoubtedly related to the national objectives in fishery programs of a particular coastal state. In general, these objectives have been expressed in rather vague but inspiring phrases



such as "conservation and rational utilization" or "maintenance of optimum yield." The term "optimum yield" has recently become popular. This has the virtue of being obscure. Everyone is in favor of optimizing the yield. The only question is, whose optimum, in the face of a multitude of conflicting interests? In the case of whales, where there are different groups concerned with resource management having conflicting interests, the New Management Policy of the International Whaling Commission spells out precisely what level of catch should be allowed in accordance with the current state of the stock and the magnitude of the sustainable yield from it. This approach is useful for such a group. However, the rigid and precise formula for setting catch quotas leads to difficulties when there is a change in objectives or when it is not matched by equally precise and reliable knowledge of the stocks. The latter case becomes more serious when stock abundance changes considerably from year to year as in the case of mackerels, as mentioned earlier.

In any case, a country in any given situation must choose a balance between the various aspects of the fishery. Different criteria will result in different levels of fishing being considered optimum. For example, although it is well known that the level of effort giving the maximum sustainable yield (MSY) is higher than that giving net economic return (NEY), from the point of view of employment, a greater amount of fishing may be desirable if the fishery has already developed in order to reduce a surplus of fishermen who will need resettlement. It is therefore impossible to determine some unique level of fishing that will best provide the "optimum" under all conditions.

Given the objectives and principles, however, determination of the allowable catch requires scientific research which in turn requires adequate support and well planned programs extending over several years. A number of recommendations for the study of scads and mackerels in Southeast Asia were made by the Penang Workshop (SCSP 1978). The participating countries were requested to undertake such studies to ensure proper management of these resources in their jurisdiction as outlined in Articles 61 and 62 of the ICNT (UN 1978).

The problems on international allocation and control raised by the mixed nature of the stocks and their variable pattern of exploitation and migration are more complicated. Article 63 of the ICNT gives the following conditions:

"1. When the same stock or stocks of associated species occur within the exclusive economic zones of two or more coastal states, these states shall seek either directly or through appropriate subregional or regional organizations to agree upon the measures necessary to coordinate and ensure the conservation and development of such stock without prejudice to

other provisions of this Part of the present Convention.

2. Where the same stock or stocks of associated species occur both within the exclusive economic zone and in an area beyond and adjacent to the zone, the coastal state and the states fishing for such stocks in the adjacent area shall seek either directly or through appropriate subregional or regional organizations to agree upon the measures necessary for the conservation of these stocks in the adjacent area."

It is apparent that when a stock occurs in more than one area of national jurisdiction, negotiation between the countries concerned is required to reach an agreement on the shares to be taken by each country. In the past, the general method of allocating national "quotas" has involved some "horse trading" strategies but was based largely on "historical rights" with some extra-allowance for coastal states. Historical rights are generally calculated as some weighted average of the catch over a period of time. For example, in 1972 the International Commission for the Northwestern Atlantic Fisheries reacted very quickly to the available scientific data showing the weakening of the stock position of many commercial fisheries in the northwestern Atlantic. It obtained agreement among member states for quotas for certain fish stocks in certain areas, together with agreement on a formula as to how these quotas should be operated country by country. This 40-40-10-10 formula allocated 40% of overall catch to be allocated in proportion to catches made over the last 3 yr, 40% to catches over the last 10 yr, 10% preference for coastal states, and 10% for special needs (Scott 1973). At present, however, the new situation is quite different because property rights are at issue rather than just an allowed catch level for 1 yr. There are numerous objections to basing property rights simply on the distribution of catch over the past 10 yr, and in many cases the distribution corresponding to the new exclusive economic zones is not known (Brander 1978). However, since exploitation of a shared stock in one part of its area affects the whole stock, coastal states cannot regulate these stocks independently. There must be common arrangements for TACs and other conservation measures before allocation among the coastal states involved. The negotiations among the states concerned could take into account the joint interests of the countries other than fisheries. The fishery aspects could include matters of trade, technical assistance, and cooperation, etc., and the relative importance of fisheries in different national economies as well as the narrower fields of the fish themselves and their capture. Among the latter, obvious considerations would be the patterns of the fish in all stages of their life history and the proportions of the total catches taken by fishermen of each country or taken within each national jurisdiction. With such a range of possible factors for consideration, it is

unlikely that any single formula or principle can be used in determining allocation in all situations. Similarly, it is unlikely that the allocation of any given stock will remain constant.

In the initial years of any agreement, it is likely that allocation will be largely based on historical catches since this will require the least adjustment by individual countries. The argument that allocation, particularly in terms of property rights, should be based on average distribution of the biomass of a stock through its life history is a sound but rather difficult one to adopt because of lack of information.

For areas in which little is known about the distribution of the stocks, such as scads and mackerels discussed at present, it may be possible as a first step to base allocation on existing data and to adjust it as more information becomes available. No allocation should ever be regarded as final and, provided the institutional framework exists for making adjustments, this should not have adverse effects on the overall management of the stocks. When other factors become important, particularly if there are changes in the general pattern of fishing such as starting fishing on the feeding grounds for smaller fish, the allocation should be adjusted accordingly.

Once the coastal states have divided up the TAC of a particular stock among themselves, each should be free to allocate those rights (catch quota) among its own fishermen or to trade them off for reciprocal fishing rights, license fees, or other quid pro quo with third countries. In practice, this makes zone quotas almost inevitable for a shared stock. Historic rights may play some part in negotiations with third countries, but these will be phased out very rapidly unless there is some trade-off. This problem is leading to very rapid contraction of distant-water fishing fleets in the Northeast Atlantic (Brander 1978).

With these developments, the pattern of fishing will change much more rapidly and drastically than it otherwise would. The distribution of fishing may be altered by the introduction of zone quotas and thus result in lower yields because more young fish are being caught. The pattern of fishing by distant water fleets may in some circumstances lead to higher yields than can be obtained by local effort because they can move in to heavily harvest good year-classes close to their optimum size (Pope 1973). If the stocks in a particular area become depleted, then distant water fleets can move on to other areas to allow the stocks to recover. Local fleets with no alternative livelihood may have to go on fishing and further deplete the stocks. Thus, where such areas are small and there are marked seasonal movements of fish between jurisdictions, probably in the case of mackerels in the northern part of Malacca Strait and along the eastern coast of the Gulf of Thailand, there could be

advantages in the fishermen being able to follow the fish wherever they go, thus providing a more regular supply (Acmar 1978).

On the other hand, examples from cod fisheries in the northeastern Atlantic indicate that with total quota system, some stocks might be underexploited while others might be overfished. Gulland (1968) once suggested closed season schemes on the overfished stock to encourage fishing on the other. To compensate for a country's disadvantage in not being able to switch its effort from area to area, that country may have its share of the total quota assigned to a particular area or stock; in return for an agreement not to fish another stock, the country's vessels would not be bound by the closed season. In this respect, the closed season concept would apply only to distant water fleets while smaller vessels would be licensed to fish in only one area. This proposed scheme seems to provide enough flexibility to achieve considerably better management of several stocks than would be achieved by the total quota system or TACs.

Finally, the consequent problem of control will be a critical one in both international and national negotiations for allocation of shared resources. Each coastal state will want to ensure that the regulations are followed. Unless credible control measures such as uniform enforcement of mesh sizes, observance of bycatch regulations, and accurate and timely reporting of catch statistics are instituted by all countries concerned, there is little hope of avoiding zone quotas and further conflicts over shared stocks in most areas.

It is apparent that cooperation between countries is essential when stocks cross boundaries of national jurisdiction. The forms of cooperation depend upon the magnitude of the problems. In many cases, bilateral agreements for technical cooperation in fisheries, e.g., agreement between Thailand and Malaysia could provide a basis for both joint research and negotiations for exploitation and management of the shared stocks. For the intra- or interregional level, the existing organizations in the region should cooperate with the coastal states to ensure proper utilization of these resources, particularly those in the exclusive economic zones. As pointed recently by Bell (1977), the net benefit arising from the advent of extended national jurisdiction may be very small, taking into account the potentially enormous costs of effectively managing and enforcing a 200-mi limit and the benefits to the country which are likely to ensure. The only way to reduce costs is to raise the level of cooperation of both international and local industries.

In conclusion, I strongly believe that, without accurate information on the status of scad and mackerel stocks in this region and with the lack of management mechanism at the regional level, it is unlikely that the

coastal states in the area will be able to come to agreement on the TACs and the principle of allocation of these resources at present. Nevertheless, the need for cooperation and negotiation will become more apparent due to the effects of the extended jurisdiction in the region. As predicted by Valencia (1978) recently, the seriousness of the political implications might force a series of bilateral or multilateral agreements as these effects become increasingly obvious, and finally an establishment of an "umbrella" organization for the resolution of all fisheries/resources management problems in the region involving two or more countries.

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# The Allocation of Tuna Fisheries

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## Introduction

This paper discusses some facts about tuna fisheries in the Philippines in particular and in the Southwest Pacific in general, and some ideas on their allocation. It does not necessarily express the views of the Philippine Government but is written simply to provide sufficient information as basis for discussion in the "Workshop on the Law of the Sea: Problems of Conflict and Management of Fisheries in Southeast Asia."

Tunas are highly migratory species and are thus a common property resource which, under the common property characteristic of fishery resources, are available and accessible to everyone. They are, therefore, of interest not only to the Filipino people but also to the peoples of the rest of the world. The upward trend of the world tuna prices has spurred interest in tuna exploitation in the tropical western Pacific waters among the Southeast Asian countries, the distant Asian countries like Japan and Russia, and countries in the Southwestern Pacific especially Papua New Guinea and Australia.

The results of studies on tuna research and exploration more or less indicate that the tuna resource of the Philippines is part and parcel of the Western Pacific stocks. Such indication, although not fully confirmed, is strongly supported by the fact that the Philippines, being situated in the Southwest Pacific, is within the migratory path of these pelagic fishes which swim from the southern equatorial waters on their way to the North China Sea and the North Pacific Ocean.

In the latter part of the 1940s, after World War II, tuna research and exploration was given a high priority by the Philippine Fishery Program of the U.S. Fish and Wildlife Service as part of a policy to examine the possibility of expanding the existing tuna fishery of the coun-

try which was established by the Japanese before and during the war. Today, tuna research and development is again among the priorities, being one of the important fisheries research projects of the Philippine Government. It is thus interesting to note that tunas have assumed a position of major importance in Philippine fisheries research since a fishery development program was introduced in the country. With tuna research among the priorities for a long period of time, the Philippine tuna fishery might have been expected to have been developed by now. Yet, paradoxically, the fishery is still being developed in the country. It may be added that tuna research and exploration/development will always be a priority in Philippine fisheries.

## Occurrence and Distribution of Tuna and Tuna-like Fishes from Philippine Waters

There are 21 species of tuna and tuna-like fishes recorded to occur in Philippine waters (Herre 1953). Of these, five are the basis of the tuna fishery in the country. These are yellowfin (*Thunnus albacares*), skipjack (*Katsuwonus pelamis*), bigeye (*Thunnus obesus*), yaito or eastern little tuna (*Euthynnus yaito*), and frigate tuna (*Auxis thazard*). The first two species are the most important not only because they are most common but also because they command a high export value—being the species of tuna most suitable for canning—and they occur regularly in Philippine waters. The last three species are used only for local consumption, as they are neither suitable for export, nor as important and common as the yellowfin and skipjack.

Other tuna and tuna-like species not of equal importance as those already mentioned include *Euthynnus affinis* (black skipjack; also called eastern little tuna),

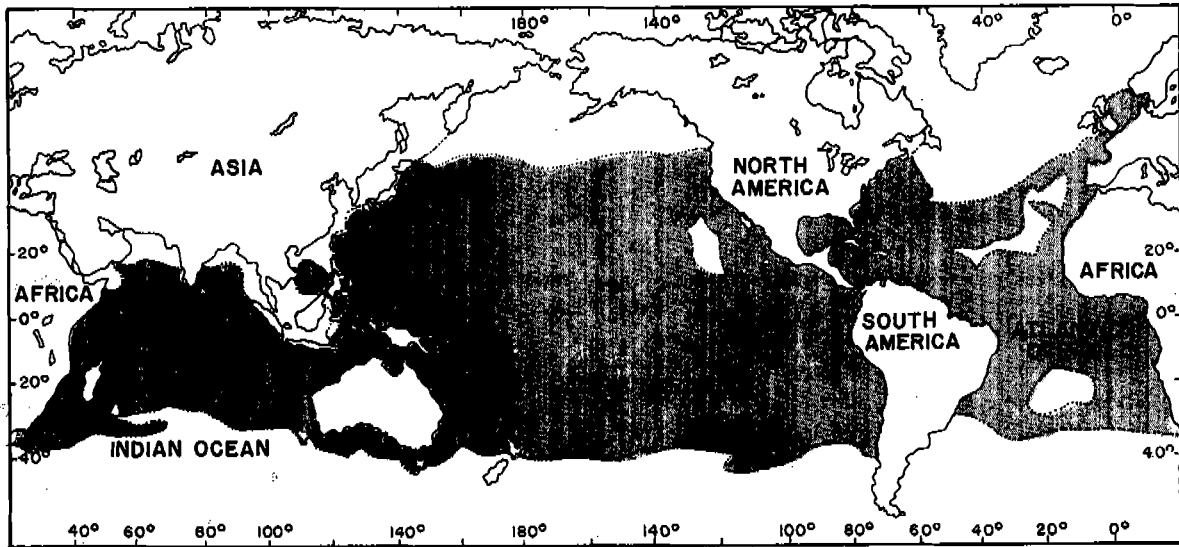


Fig. 1. Estimated range of tuna distribution (Saila and Norton 1974).

*Thunnus orientalis* (black tuna), *T. tonggol* (blackfin or scaly tuna), *T. alalunga* (albacore), *Auxis tapeinosoma* (frigate tuna), and *Gymnosarda nuda* (dog-toothed tuna).

Tunas are widely distributed throughout the Indo-Pacific Region as shown in Figure 1. Figure 2 shows the tuna spawning areas in the Philippines. Tunas occur in most months of the year in almost all fishing areas; more often, however, in the Sulu Sea and Celebes Sea, both considered the most productive tuna areas. According to Simpson and Chikuni (1976) the Moro Gulf and, to a lesser extent, the Sulu Sea appear to be the nursery areas for skipjack and yellowfin and both species move through the Sulu Sea where they spend about another year.

Larvae of tuna and tuna-like fishes have been recorded to be found in the archipelagic and territorial waters of the Philippines. Figure 3 shows the larval distribution of yellowfin, skipjack, yaito, and frigate tuna.

Schaefer and others (1963) maintain that the yellowfin tuna (*T. albacares*) occurs in all warm seas of the world except the Mediterranean. It occurs principally in the South Equatorial Current (Kamimura and Honma 1963). In the Philippines this species is caught throughout the year in many deep fishing grounds, especially by handline around Mindanao, Antique, off Damortis, and in deeper waters off Western Luzon. During the months of January and February, it is found in Davao Gulf, Sulu Sea, western Palawan waters, Celebes Sea, and in the waters north of Papua New Guinea. In March it is caught in the waters of Luzon and Mindoro Islands, east of Surigao, Moro Gulf, Celebes Sea, and in the northern

waters of New Guinea. In April the yellowfin is found in the eastern waters of the country, especially east of Surigao and Samar, and in most archipelagic waters. It is most abundant in the northern waters of Papua New Guinea. It reappears in Celebes Sea and in the waters northwest of Luzon in June, and is caught in commercial quantities during the month of July in eastern Visayan waters, southern Mindanao, Celebes Sea, and in the waters northeast of Papua New Guinea. During August and September yellowfin is caught in the southern and eastern Mindanao waters; it is reported to occur in the same area, as well as in Panay Gulf and Sulu Sea in October. In November and December this species can be found throughout the country's territorial waters especially in Moro Gulf, Sulu Sea, and Celebes Sea.

The skipjack tuna (*K. pelamis*) is also widely distributed, extending from the Trust Territories west through the Philippines and Indonesia. This species is found everywhere throughout this vast area, although it tends to congregate around the island groups where more food is presumably available. Within the Philippine territorial waters, it is found throughout the year in all fishing areas where yellowfin tuna occurs. Until recently, the skipjack tuna has been caught in lesser abundance than the yellowfin, although statistical records reveal that production of this species from the municipal fisheries is far greater than that of the yellowfin.

The bigeye tuna (*T. obesus*) is most abundant in the North Equatorial Current (Kamimura and Honma 1963).

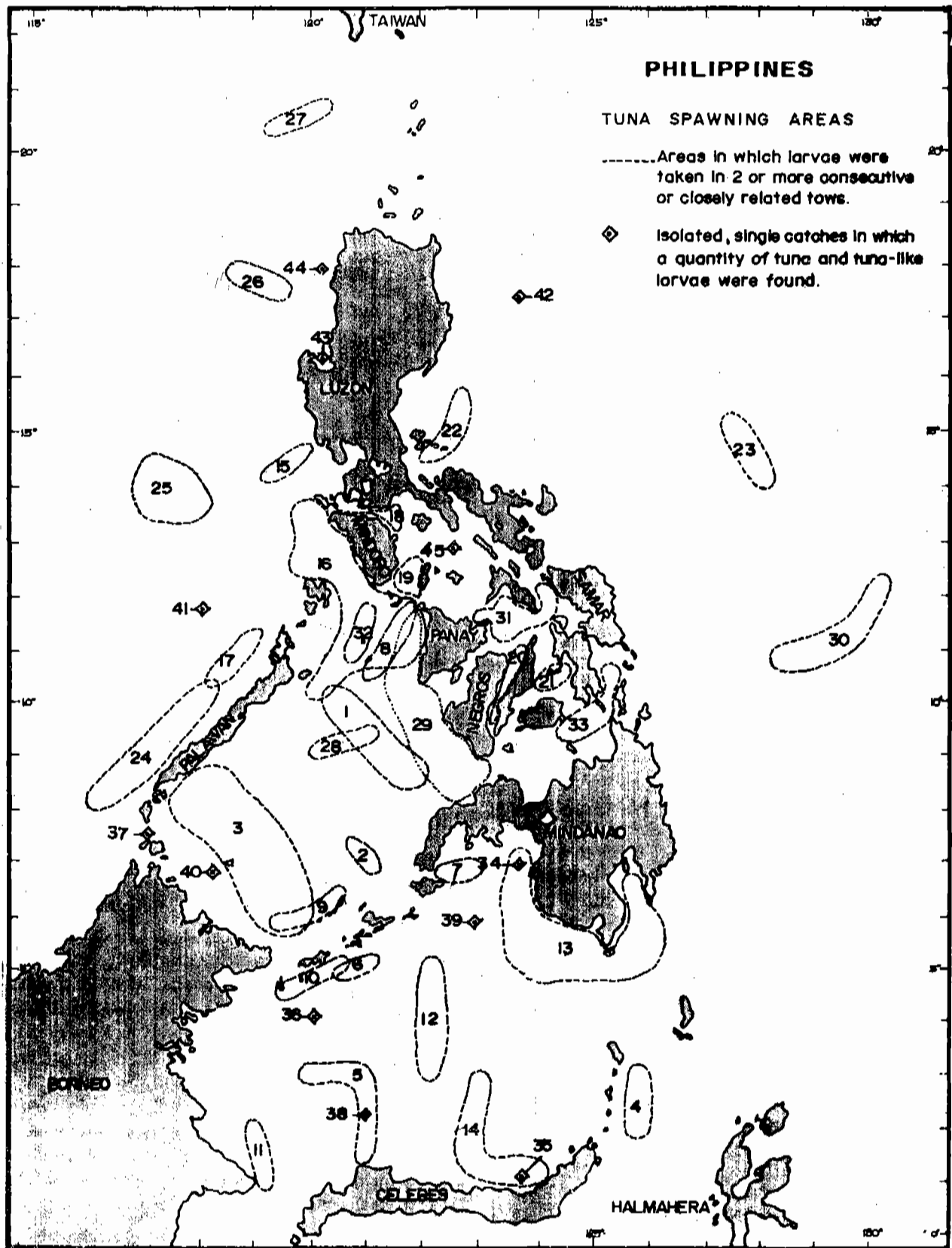


Fig. 2. Spawning areas of tuna and tunalike fishes in Philippine waters (Wade 1951).

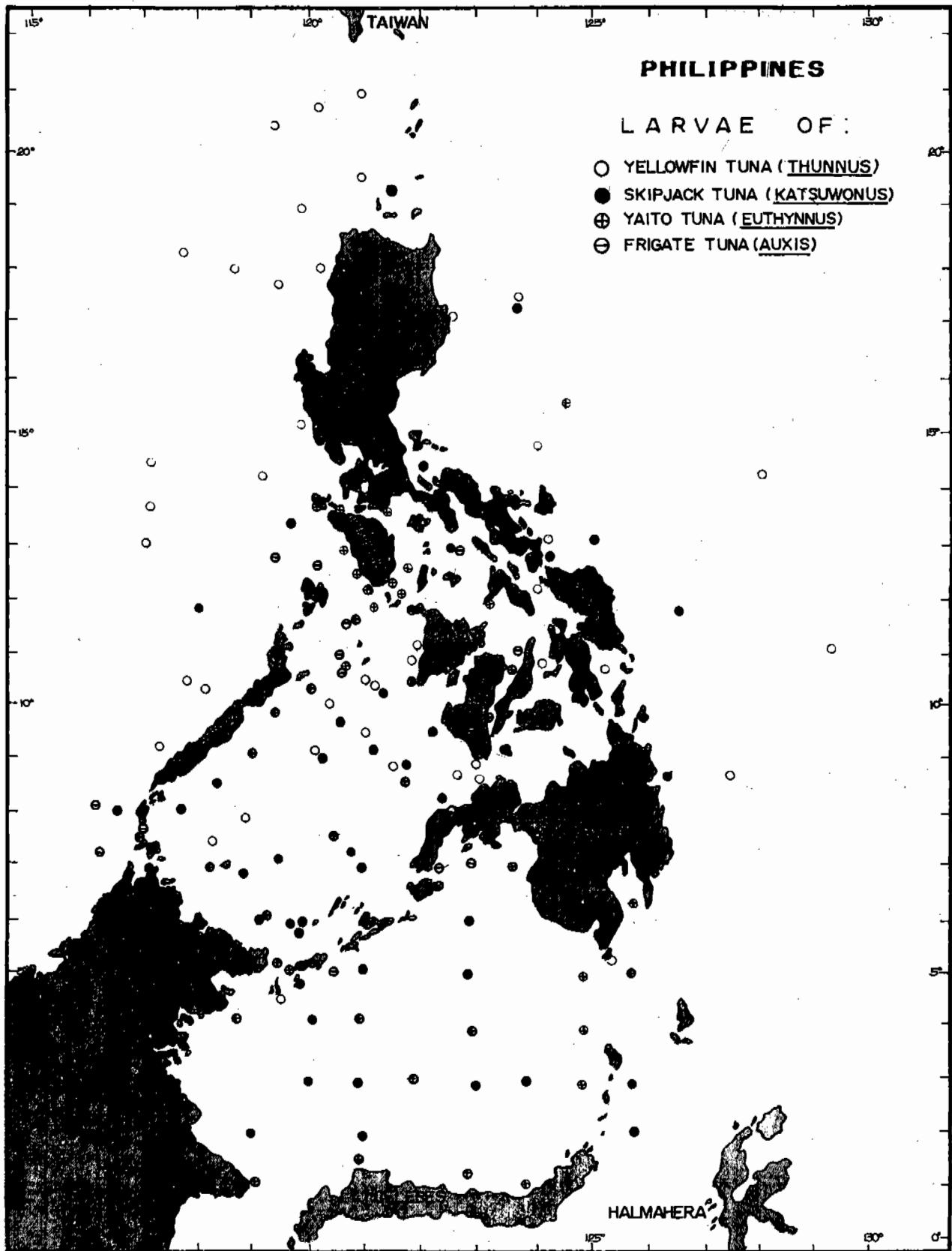


Fig. 3. Areas in Philippine waters from which larvae of yellowfin, skipjack, yaito, and frigate tuna were collected (Wade 1951).

It is often caught and identified with the yellowfin. It is rarely separated from the yellowfin, thus, bigeye catches, although small in quantity are often recorded as yellowfin catches. This species is found in many fishing areas throughout the Philippines.

The yaito or eastern little tuna (*E. yaito*) is distributed mainly in the Western Pacific, west of the Hawaiian Islands, through Indonesian waters. Its distribution extends from the middle of Japan through Taiwan, the coast of Vietnam and the Philippines, and as far as Australia (Kikawa et al. 1963). This species is caught in all fishing grounds of the Philippines especially during the northeast monsoon season (October to April).

Uchida (1963), citing Rosa (1950), states that the frigate tuna (*A. thazard*) is distributed widely in the Pacific Ocean as far north as the Sea of Japan and as far south as Tasmania. It is caught in commercial quantities in Philippine coastal waters, mostly in bays and gulfs, from October through May.

The rest of the 21 tuna and tuna-like species are rather restricted in range, and are not found abundantly in Philippine waters.

#### Tuna Life History

Tunas are heterosexual and fertilization takes place in the water.

As shown in Figures 2 and 3, tunas spawn throughout the Philippine waters the year round as reported by Wade (1950). Yaito or eastern little tuna seems to have a year-round spawning period in the Philippines; skipjack spawns throughout the year, with the peak occurring during April, May, June, and July; and yellowfin spawns over a considerable period with most intensive spawning during May, June, July, and August.

Larval stages of tuna have been taken from nearly all

tropical waters of the Pacific Ocean, including the Philippine waters from which tuna larvae were taken to determine the seasonal distribution of tuna species as shown in Figure 3 (Wade 1951). Tuna larvae, according to Schaefer and others (1963), are found scattered in the surface layer above the thermocline and they drift, in their earlier stages, with the ocean currents.

As to the feeding habits of tunas, Ronquillo (1953) shows that fishes belonging to 51 families mostly percomorphs and nonedible plectognaths, and larvae of stomatopods and squids comprise the food of yellowfin and skipjack. In another study based on the analysis of stomach contents of yellowfin, bigeye, and a few albacore tuna, it was reported that one-third of the food consists of fish, one-third mollusks especially squids, and one-third crustacean decapods.

#### Tuna Production and Size Composition

The country's fishing areas are grouped into regions, (Fig. 4) based primarily on the idea that fisheries management is easier done through regionalization. In addition, catches from the different fishing grounds within a particular region are no longer landed outside that region, thereby facilitating statistics collection.

Table 1 shows the total production of the first 10 fishing grounds based upon the 10-yr fisheries statistical records of commercial catches of yellowfin, skipjack, yaito, and frigate tuna. On the whole, Sulu Sea gives the highest yield.

Philippine fisheries statistics records also show that a total of 58,830 t of frozen tuna were exported from 1969 to 1977, and 495 t of canned tuna in 1975 through 1977 (Table 2).

Tuna production by the different countries included

Table 1. Total production of the Philippines' 10 leading tuna fishing grounds from 1966 to 1975. Data are from Fisheries Statistics of the Philippines, 1966-1975.

Fishing Ground	Yellowfin ( <i>Thunnus</i> )	Skipjack ( <i>Katsuwonus</i> )	Yaito Tuna ( <i>Euthynnus</i> )	Frigate Tuna ( <i>Auxis</i> )	Total
Sulu Sea (North & South)	17,934	1,490	28,346	60	47,830
Visayan Sea	7,178	3,700	15,696	441	27,015
Moro Gulf	6,929	2,945	4,331	406	14,611
Davao Gulf	1,213	62	9,575	2,107	12,957
Burias Pass	1,032	3	2,791	2,919	6,745
Macajalar Bay	5,617	10	—	0.7	5,627.7
Sarangani Bay	555	1,336	2,276	596	4,763
Malampaya Sound	350	6	4,157	—	4,513
Batangas Coast	367	123	3,327	—	3,817
Tayabas Bay	249	78	1,936	—	2,263
<b>Total</b>	<b>41,424</b>	<b>9,753</b>	<b>72,435</b>	<b>6,529.7</b>	<b>130,141.7</b>



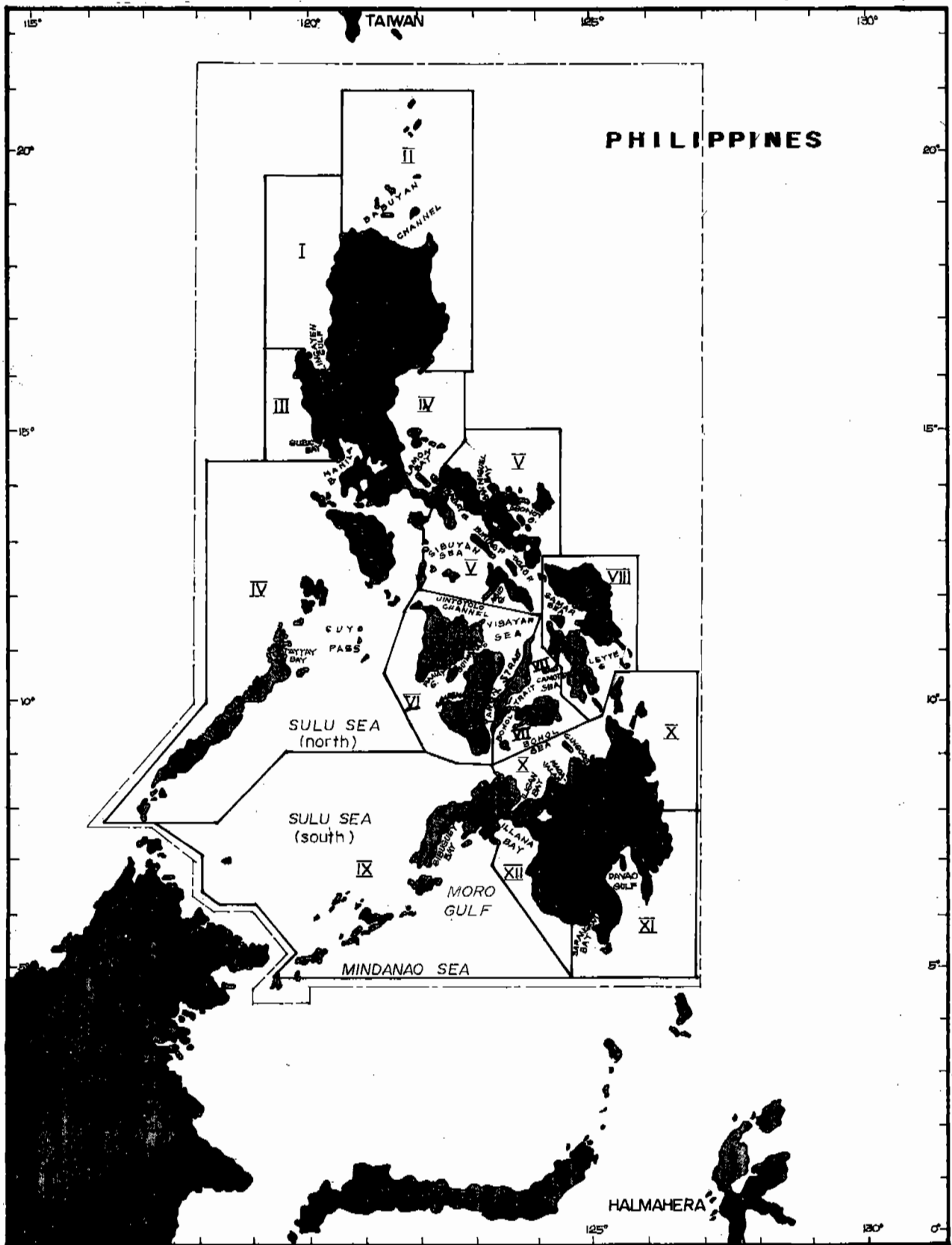


Fig. 4. Regions I to XII and the fishing areas under their jurisdiction. (Note: The fishing grounds indicated are only those with records of tuna catch within the period 1966-1975 as shown in Tables 1 to 5.)

in FAO statistical area No. 71, including the Philippines, from 1973 to 1976 is shown in Tables 3 to 5 for yellowfin, skipjack, and little tuna (*Euthynnus*), respectively. The tables suggest that tuna are caught mostly in the archipelagic and territorial waters of the Philippines, Indonesia, and Papua New Guinea. Table 3 shows that the aggregate yellowfin catch for the years 1973-1976 is much more than the total catch of yellowfin for 1966-1975. This is so because, although Table 1 shows catch data for a 10-yr period, the records include only the catch data from 10 fishing grounds and these data come only from the commercial fisheries. On the other hand, Table 3 includes catch data, both from the municipal and commercial fisheries, as estimated with a raising factor by FAO.

Figures 5 and 6 show the annual catches of yellowfin and skipjack, respectively, from 1965 to 1975. About 60,000 t of yellowfin were caught in 1975 alone (Fig. 5) (SCS/GEN/77/11). This is probably due to the fact that "... considerable quantities of the catch being sold at sea to carriers and unknown quantities to some foreign freezer boats in addition to the known catch bought by others. . ." may not have been included in the Philippine fisheries statistics. Although the catch of skipjack from the municipal fisheries is much greater than that of yellowfin, the total annual catches of both species suggest that yellowfin is more abundant than skipjack.

As to the size composition of tuna species caught in Philippine waters, Wade (1950) shows that skipjack tuna is caught at a size ranging from 340 mm to 650 mm (Fig. 7); yellowfin, at 350 mm to 830 mm (Fig. 8); and yaito tuna, at a size ranging from 280 mm to 670 mm (Fig. 9).

Figure 10 shows the length-frequency distribution of skipjack caught by troll line based on the *S.F. Baird* and *T.N. Gill* cruises from 1947 to 1949. The size distributions of the yaito tuna (Fig. 11) and that of skipjack show marked similarity, i.e., the range of length for skipjack is from 350 mm to 660 mm, while for yaito tuna, it is between 350 mm and 685 mm, indicating the similarity of the size of these fish available to the troll fishery.

In 1960 the *M/V Malasugui* of the Bureau of Fisheries made three longline fishing cruises in the southern waters of the Philippines. The greatest catches were made in Celebes Sea, Moro Gulf, and the waters near Basilan Island. During the first cruise (March to April), the yellowfins taken had an average weight of 39.04 kg and were heavier than the bigeyes (*T. obesus*) which averaged 28.83 kg.

Between 1975 and 1976, tuna fishing operations were conducted in Philippine waters by FAO chartered Canadian purse seine vessels *Royal Venture* and *Southward Ho*. In nine trips made by the *Royal Venture* and six by *Southward Ho*, 975 t of fish were caught, of which 742

Table 2. Philippine exports of tuna from 1969 to 1977. Data are from Fisheries Statistics of the Philippines, 1969-1977.

Year	Frozen tuna		Canned tuna	
	Quantity (mt)	Value (Peso)	Quantity (mt)	Value (Peso)
1969	842	1,286,651	—	—
1970	821	2,519,282	—	—
1971	2,770	8,719,364	—	—
1972	5,162	17,737,195	—	—
1973	8,545	30,119,823	—	—
1974	11,376	51,860,440	—	—
1975	8,120	36,616,195	122	1,535,271
1976	5,735	26,811,659	319	3,102,843
1977	15,619	85,366,513	54	623,396
Total	58,990		495	5,261,510

Table 3. Yellowfin tuna production in metric tons by different countries from 1973 to 1976 in FAO Region # 71. Data are from Year Book of Fishery Statistics, FAO, Vol. 42.

Country	Area	1973	1974	1975	1976
Fiji	71	0	12	11	74
Gilbert Island	71	0	25F	25	25F
Korea	71	—	—	259	3,664
Papua New Guinea	71	1,420	1,420	1,743	8,556
Philippines	71	14,900	25,271	21,830	29,568

Table 4. Skipjack production in metric tons by different countries from 1973 to 1976 in FAO Region # 71. Data are from Year Book of Fishery Statistics, FAO, Vol. 42.

Country	Area	1973	1974	1975	1976
Fiji	71	100	71	80	510
Gilbert Island	71	—	200F	200	200F
Indonesia	71	22,300	23,613	23,316	24,488
Papua New Guinea	71	28,500	40,350	15,884	24,379
Philippines	71	3,200	6,057	6,998	22,596
Singapore	71	0	0	0	4

Table 5. Little tuna production in metric tons by different countries from 1973 to 1976 in FAO Region # 71. Data are from Year Book of Fishery Statistics, FAO, Vol. 42.

Country	Area	1973	1974	1975	1976
Indonesia	71	31,600	38,507	39,625	41,616
Malaysia	71	4,600	7,427	8,486	6,293
Malaysia (Sarawak)	71	400	708	1,477	1,517
Papua New Guinea	71	250F	250	30	100
Philippines	71	24,000	11,315	12,013	9,447

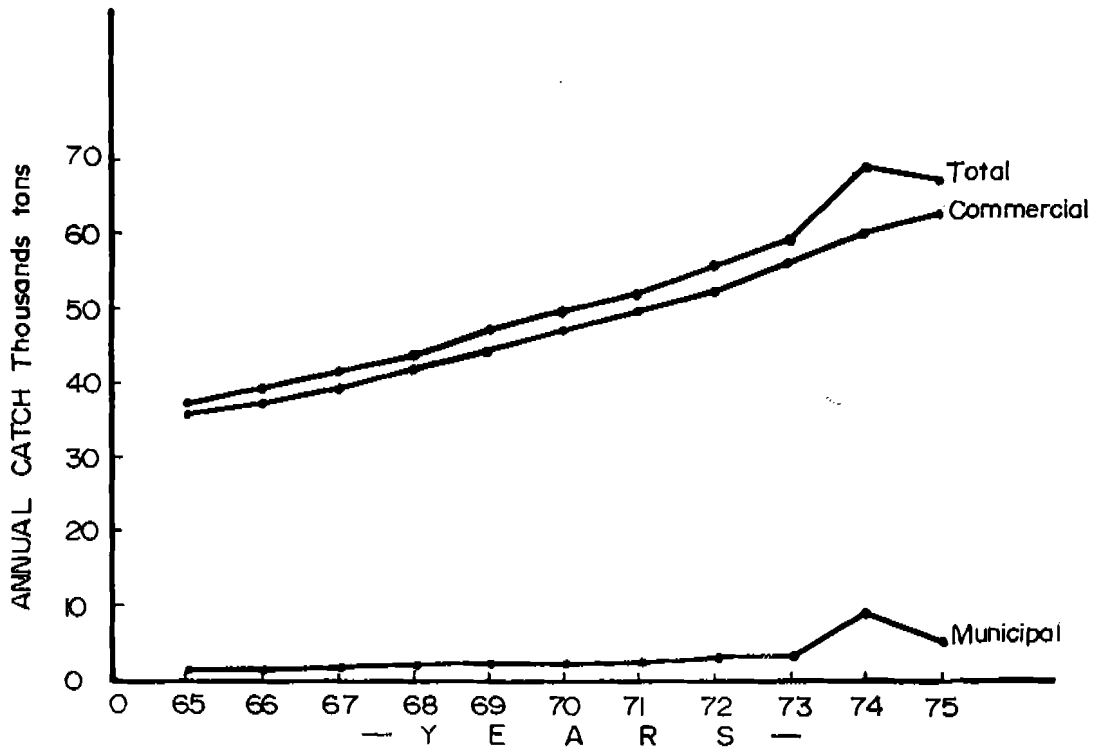


Fig. 5. Annual catch of yellowfin tuna, 1965-1975 (SCS/GEN/77/11).

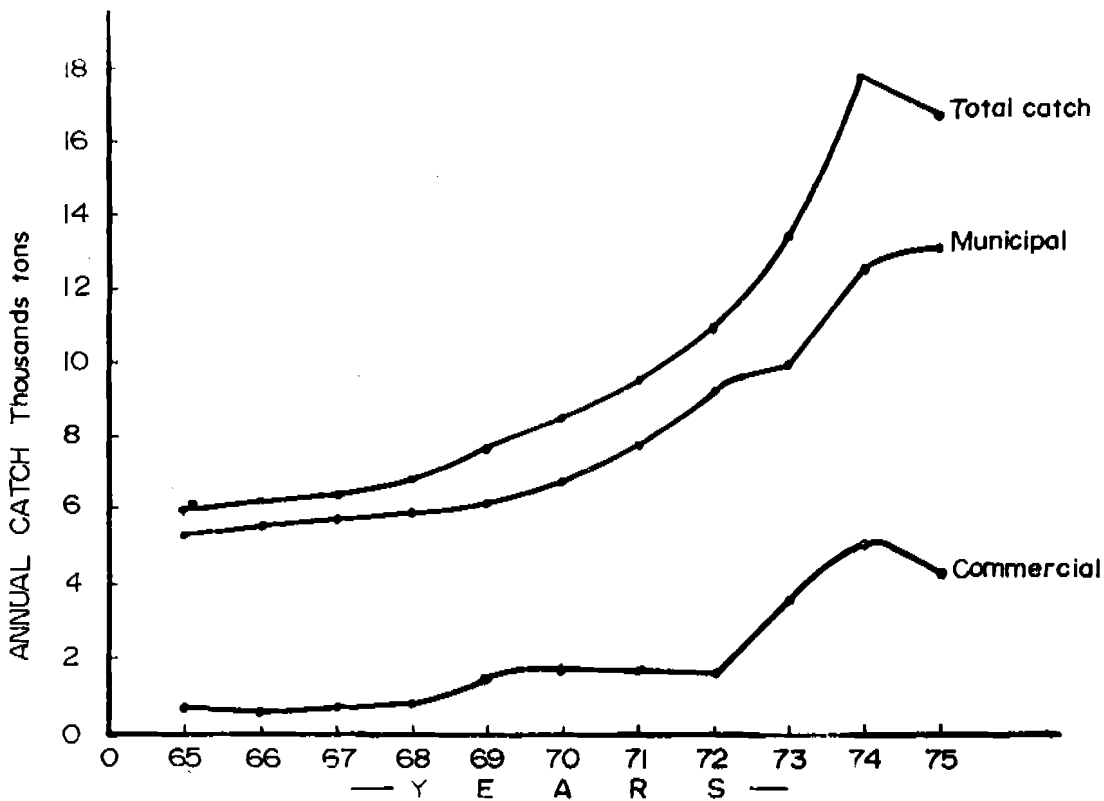


Fig. 6. Annual catch of skipjack tuna, 1965-1975 (SCS/GEN/77/11).

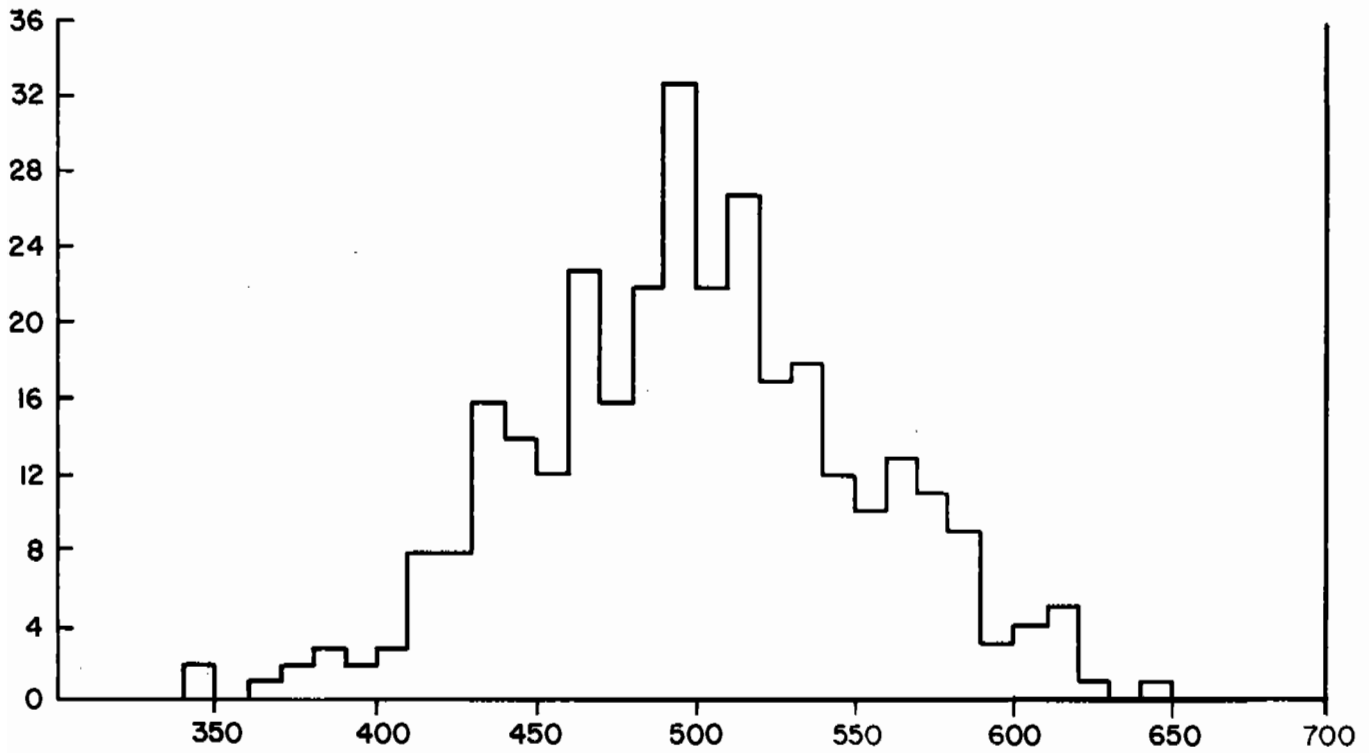


Fig. 7. Length-frequency distribution of skipjack (*K. pelamis*) taken in Philippine waters from October 1947 through November 1948 (Wade 1950).

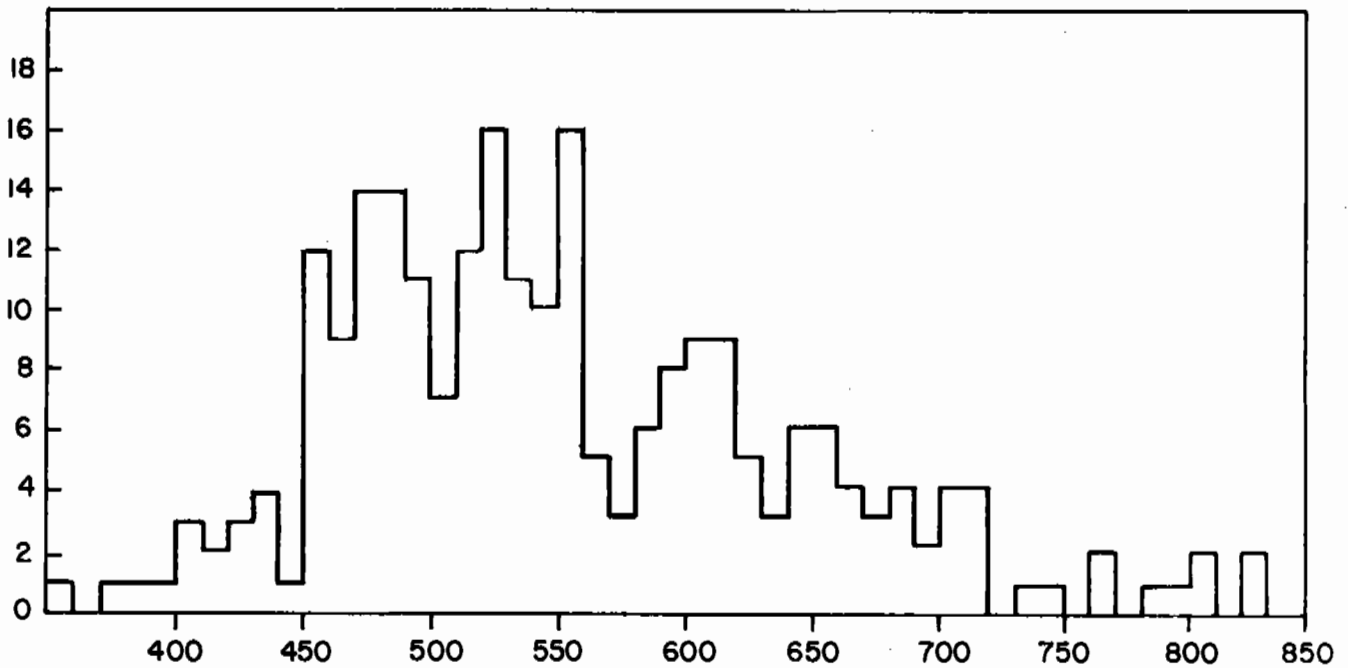


Fig. 8. Length-frequency distribution of yellowfin (*T. albacares*) taken in Philippine waters from October 1947 through November 1948 (Wade 1950).

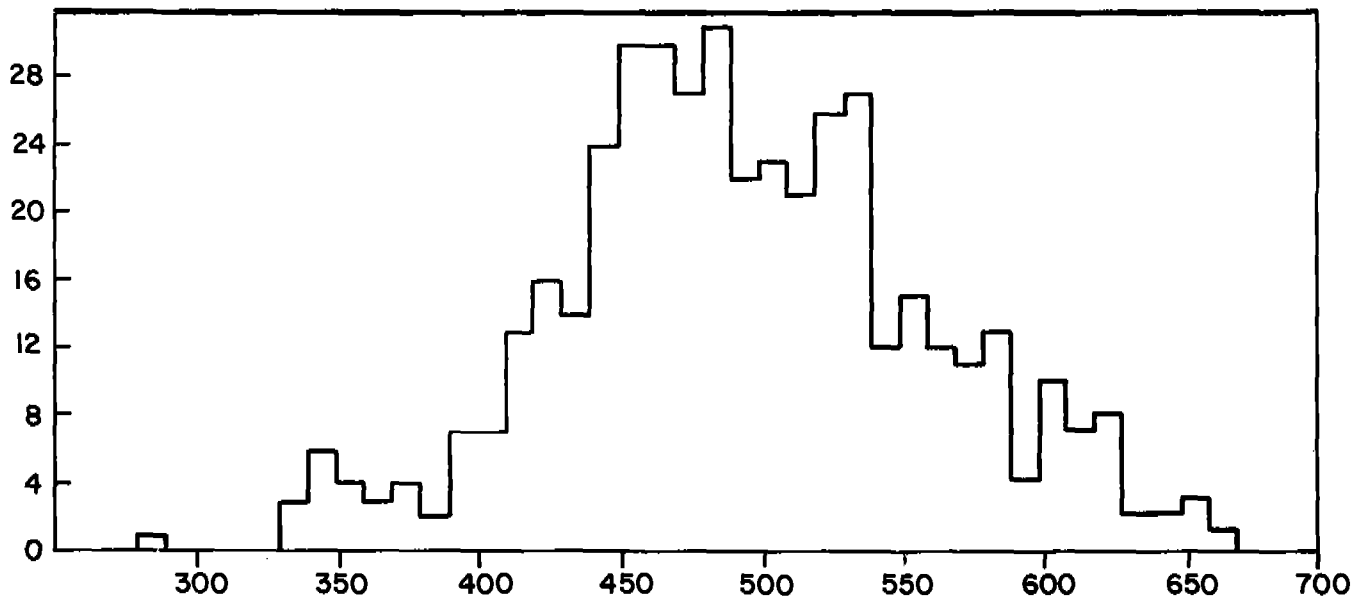


Fig. 9. Length-frequency distribution of *Euthynnus yaito* taken in Philippine waters from October 1947 through November 1948 (Wade 1950).

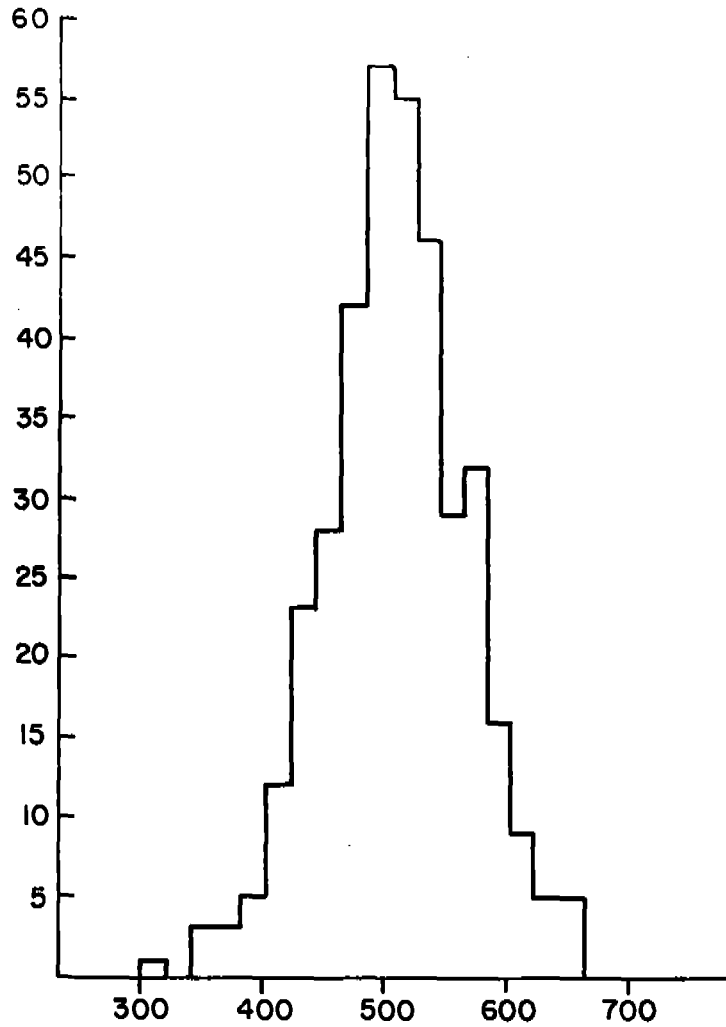


Fig. 10. Length-frequency distribution of skipjack (*Katsuwonus pelamis*) taken by trolling in Philippine waters by S.F. Baird and T.N. Gill, 1947-1949 (After Ronquillo 1963).

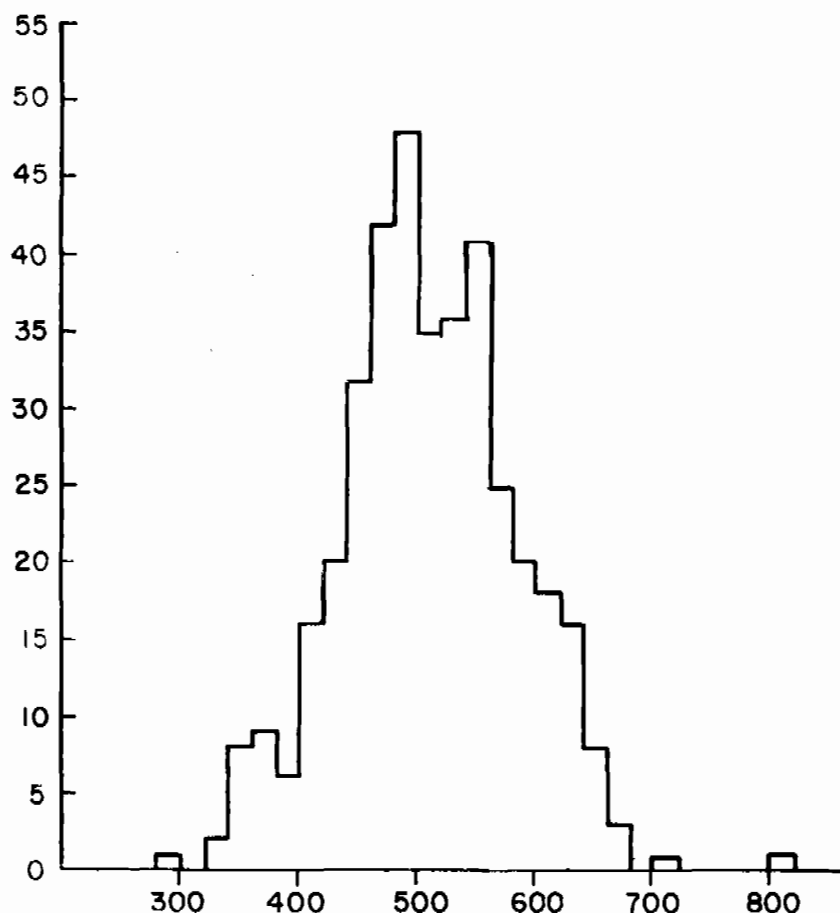


Fig. 11. Length-frequency distribution of *Euthynnus yaito* taken by trolling in Philippine waters by S.F. Baird and T.N. Gill, 1947-1949 (After Ronquillo 1963).

t were skipjack (*K. pelamis*) and 133 t were bigeye (*T. obesus*). The skipjacks caught in Moro Gulf were almost all 40 to 60 cm (Fig. 12). Between May and October, few smaller skipjacks ranging from 25 to 40 cm were caught. In Sulu Sea larger skipjacks (over 55 cm) were more abundant than in Moro Gulf.

Most of the yellowfins caught were 60 cm (4.5 kg), although a few of larger sizes up to 110 cm (27 kg) were caught during some of the trips. The percentage size composition of the yellowfin catch is shown in Figure 13 where the rather similar sizes are seen.

Albacore tuna (*Thunnus alalunga*) was caught in Moro Gulf only once when the catch of 5 t comprised about equal weights of this species and skipjack. Frigate tuna was often caught and occasionally in large quantities, but the sizes were smaller, ranging from 30 to 50 cm and from 0.5 to 2.4 kg (Simpson and Chikuni 1976).

In the southern waters of the Philippines, yellowfin tuna is caught at an average size ranging from 54 cm to

87 cm mean length, depending upon the time of the year (Table 6), while in the western side (near Palawan), the size ranges from 55 to 122 cm total length or from 3.5 to 10.5 kg (Table 7).

#### Tuna Fishing Methods

The main tuna fisheries of the world are carried out by means of longline, purse seine, and pole-and-line or live-bait fishing. Longline and pole-and-line were introduced in the Philippines before World War II, while purse seine came during the middle part of 1956.

The longline gear consists of exceedingly long lines with baited hooks which are suspended below the surface by means of buoys and lines. It is often used in deep waters and tends to catch the older, larger, nonschooling, subsurface swimming tunas.

The purse seine is a very long and deep sheet of netting with floats along one side and weights along the other. It

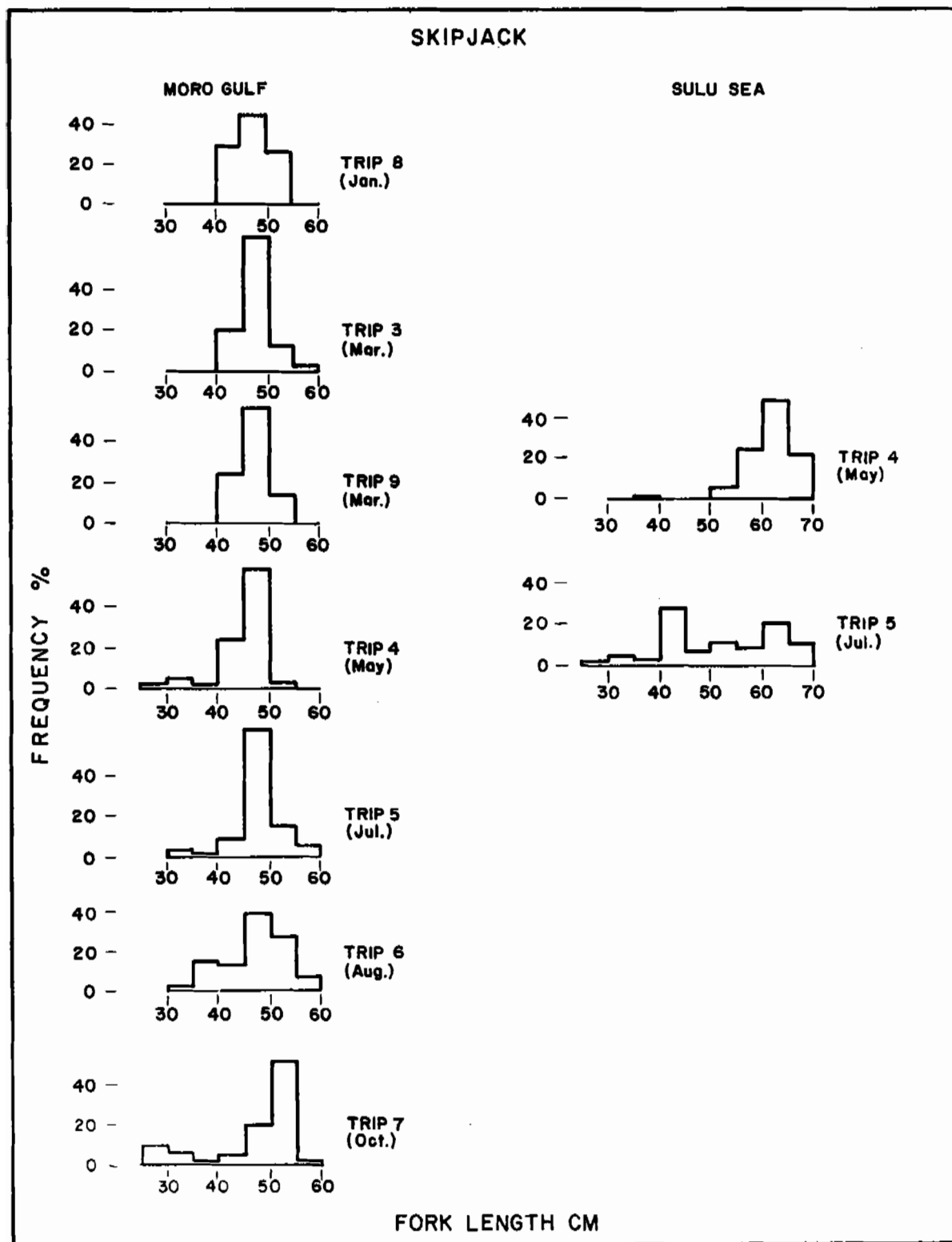


Fig. 12. Length composition of the skipjack, 1975-76 (*Royal Venture* and *Southward Ho*) (Simpson and Chikuni 1976).

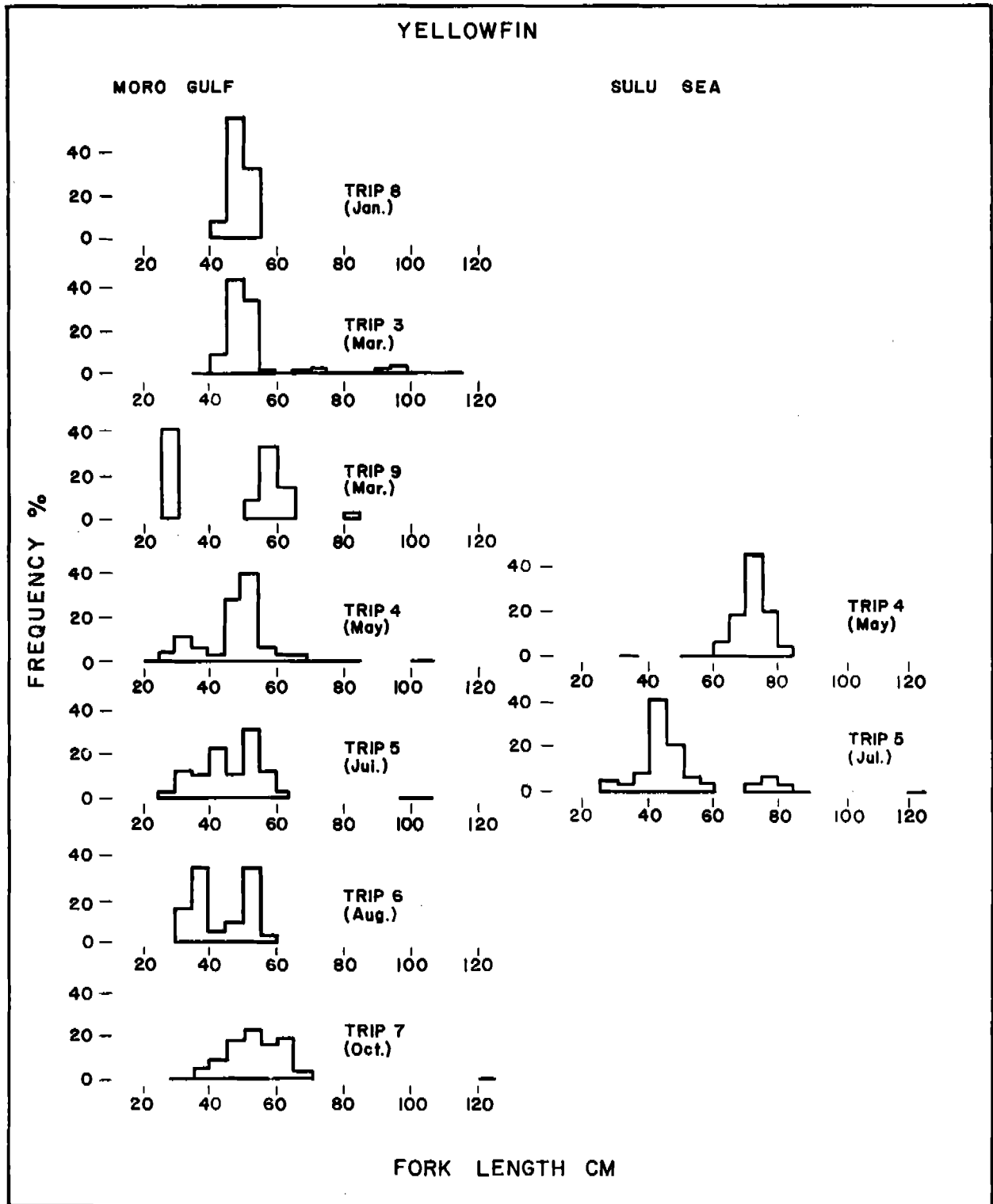


Fig. 13. Length composition of the catch of yellowfin tuna, 1975-76 (*Royal Venture* and *Southward Ho*) (Simpson and Chikuni 1976).



Table 6. Average size of yellowfin tuna in the southern part of the Philippines. Fish were measured at markets by Regional personnel.

Area	Date	Mean Length (cm)	No. of specimens measured
Bohol Sea	November 1977	75.7	21
	December	87.2	18
	February 1978	74.4	18
	March	64.25	20
	June	53.6	21
Surigao waters	December 1977	68.0	10
South Cotabato (assumed to come from Davao and Sarangani Gulfs)	June 1978	77.1	57

Table 7. Sizes of tuna caught in Pagasa Island, Western Palawan (South China Sea).

Date	Yellowfin		Bigeye		Eastern little tuna	
	Total Length (cm)	Total Weight (kg)	Total Length (cm)	Total Weight (kg)	Total Length (cm)	Total Weight (kg)
August 1976	80	9.5	80	7.5	35	1.0
	83	11.0			42	1.5
					46	2.0
					51	2.5
September	55	3.5	77	6.5	43	1.5
	57	3.5				
	58	3.5				
	61	4.0				
October	—	—	—	—	30	0.5
November	86	4.0	—	—	—	—
	122	10.5				
December	60	4.0	—	—	—	—
	63	4.0				

is set around schools of fish at the surface in such a way that the net hangs down from the surface in the form of a cylinder. The bottom of the cylinder is then "pursed" by a cable drawn through rings attached to the bottom of the net. Unlike the longline, the purse seine tends to catch the younger, smaller, schooling, surface-swimming tunas. Purse seine fishing in the Philippines, based on the California technique of fishing, is starting to develop successfully.

The pole-and-line gear consists of a bamboo pole and line, a leader, and a barbless hook to which a bait is attached. The number of pole-and-line gear carried by a fishing boat depends upon the number of fishermen. The pole-and-line method, also called live-bait fishing, involves locating a tuna school, chumming (or throwing overboard small live bait fishes) and spraying, and hooking. In the

Philippines, live-bait fishing has yet to be developed for lack of appropriate bait fishes.

Other fishing methods employed in catching tuna include the use of the different types of gear, such as troll, handline, ring net, Otoshi-ami, and fish corral which are used to catch tunas that frequent coastal waters. In the Philippines tunas are taken largely by smaller vessels (dugouts) in deep but close-to-shore waters at night with lights by handline and by troll fishing.

Tables 8 and 9 show the different types of gear and the percentages of yellowfin and skipjack tuna caught by these gear within the Sulu Sea-Bohol Sea-Moro Gulf area. (Before the creation of Region XII, sometime in the latter part of 1975, Moro Gulf was still part of Region XI. This explains why this fishing ground is included in these tables as part of Region XI instead of IX.) Handlines and experimental longlines are used in catching large yellowfins in the southern waters of the Philippines. In the waters near Basilan Island, deepwater traps are used to catch yellowfin during November to May, and skipjack throughout the year.

Generally, skipjack tuna fishing in the Philippines is carried out within the internal (archipelagic) waters by artisanal (sustenance) fishermen.

#### Tuna Fisheries in Other Countries

The Eastern Pacific fishery consists of young skipjacks which are probably part of the Central Pacific stocks, whereas the Japan-Papua New Guinea fisheries are probably supplied by one or more Western Pacific subpopulations.

Table 10 shows the annual catch of skipjack in the Pacific from 1970 to 1976 by different countries. In almost all the years, Japan had the highest catch.

The tuna fishery in Japan is carried out by longline and pole-and-line which are the main types of fishing gear used by Japanese fishermen to catch tuna, especially yellowfin and skipjack. Other types of gear, such as purse seines, set nets, and trolling jobs are also used to catch yellowfin, but only in waters closely adjacent to Japan.

The Japanese have developed the longline method which catches largely yellowfin and bigeye tuna so well that Japan has been known as the most important tuna-producing country in the West Pacific region. The Japanese tuna longline fishery produces about 3,200 mt annually from the South China Sea alone (Marr 1976). The fish come largely from the deepwater areas beyond the Sunda Shelf.

The Japanese pole-and-line, with live bait or jig as a lure is used for surface fishing in Japan coastal waters and the contiguous open-sea regions. This method catches largely skipjack, yellowfin, albacore, and small-sized

Table 8. Percentage of yellowfin tuna caught by different types of gear. Data are from SCS (1977).

Gear	Region/fishing ground					
	VI Antique	VII Negros	IX Sulu Sea	IX Tawi-Tawi	X Bohol Sea	XI Moro Gulf
Handline/longline	50	50	93	94	50	25
Purse seine	15	—	5	4	—	—
Ring net	—	35	—	—	40	50
Otoshi-ami	15	—	—	—	—	—
Fish corral	15	—	—	1	10	10
Pole-and-line	—	—	2	1	—	10
Others	3	5	—	—	—	5

Table 9. Percentage of skipjack caught by different types of gear. Data are from SCS (1977).

Gear	Region/fishing ground							
	IV Taytay	VI Antique	VII Negros	IX Sibuguey Bay	IX South-Sulu Sea	IX Tawi-Tawi & Basilan	X Bohol Sea	XI Moro Gulf
Handline/longline	—	50	—	40	—	15	20	30
Purse seine	100	15	10	—	—	—	—	—
Ring net	—	—	60	50	50	25	35	50
Otoshi-ami	—	10	—	—	—	—	—	—
Fish corral	—	20	15	—	30	60	15	10
Pole-and-line	—	—	—	—	10	—	20	10
Troll	—	—	5	—	10	—	10	—
Others	—	—	10	10	—	—	—	—

bigeye tuna.

According to a report by the Far Seas Fisheries Research Laboratory (1978), the Japanese annual yellowfin catch by longline in the Pacific Ocean used to be around 60,000 mt in the early 1960s. This amount markedly decreased and fluctuated between about 40,000-50,000 mt in recent years. In spite of this decrease, the total catch of yellowfin by longline has remained roughly constant, around 60,000 mt due to the increased catch by Korea and Taiwan.

The Pacific bigeye tuna has been harvested predominantly by longline principally by the Japanese whose bigeye catches, according to the preceding report, accounted for about 80% of the total bigeye catch in recent years.

Japan, Taiwan, and South Korea have been fishing by longline within the territorial waters of the Philippines, and, possibly, Indonesia. Japan is reportedly fishing for tuna under permit in Indonesian waters. Lately, joint ventures have been formed by Japanese firms in the Philippines, Papua New Guinea, and Indonesia.

In Papua New Guinea, the tuna fishery is carried out

by live bait and pole-line boats. The species commonly obtained by this method is skipjack. In 4 yr the live-bait fleet of this country has grown to 33 Okinawan vessels, with a 1973 catch estimated at 28,000 t (South Pacific Commission 1974).

Little tunas (*Euthynnus* and *Auxis*) are one of the important fishes of Indonesia in the Malacca Strait. The catch of little tunas amounted to 4,000 t in 1973 (Sujastani 1976). Skipjack is caught by Indonesian tuna fishing vessels only in the northernmost part of the Strait (Aceh), while eastern little tunas and frigate tunas are found in North Sumatra waters.

Approximately 2,000 t of skipjack are produced annually by French Polynesia. This catch is taken by the skipjack fleet consisting of about 100 small vessels.

The Solomon Islands have recently developed a joint venture skipjack fishery, with an estimated annual catch of 16,000 t.

Hawaii's skipjack fishery averages about 5,000 t per harvesting by approximately 15 live-bait boats.

American Samoa has no existing commercial skipjack fishery due to inadequate supply of bait.

### Some Problems on Tuna Allocation and Management

Tunas are wanderers of the sea and they migrate extensively. As such, they comprise a fishery in which there is unlimited entry. Because tunas are a worldwide marine resource which is the property of any nation, the question of "who should benefit from the fishery?" arises. The question per se is a great problem which generates several other problems of management and allocation of tuna catch. Unlimited entry into the fishery leads to great mobility of tuna fleets and increases the dangers of tuna depletion on a worldwide basis. As shown by Joseph (1973), the rapid growth of the world tuna fleet would soon (by 1984) be above that necessary to harvest the maximum sustainable yield (MSY) of all species even if the growth rate were to increase by only 3% annually, which was less than what was the annual worldwide increase. Unless immediate global management is done, there is great danger of declining yields and significant losses to the world community (Saila and Norton 1974).

The report of the first session of the Indo-Pacific Fisheries Council (IPFC) Working Party of Experts on Central and Western Pacific Skipjack stated, among other things, that a significant proportion of the total catch from the Philippines and Indonesia did not enter catch and effort statistics, although excellent progress was noted in both countries; that there were no detectable effects of effort on the skipjack fishery as it is not so widespread; and that the stocks were exploited at a low rate and the magnitude of potential annual yield could not as yet be determined.

The Inter-American Tropical Tuna Commission (IATTC) found management by overall catch quota to be a failure in the eastern Pacific and the Western Atlantic because it leads to excess capitalization. Joseph (1973) outlines the conditions of the tuna fishery in the eastern Pacific which have changed remarkably since 1966 when the fleet increased nearly three times and competition increased so sharply that the open season for yellowfin fishing decreased from about 10 mo to less than 3. De-

Table 10. Summary of catches (thousand tons) of skipjack in the Pacific. Numbers in parentheses are based on available statistics up to 1974, and estimation by the groups for 1975 and 1976. Data are from FAO (1978a).

Country	Year						
	1970	1971	1972	1973	1974	1975	1976
Papua New Guinea	2	17	12	27	40	15	26
Solomon Islands	0	5	8	6	10	7	17
Japan, southern waters	53	79	80	107	196	120	144
Palau	8	2	2	3	5	7	6
Philippines	0	1	21	27	17	(25)	29
Indonesia	—	—	20	22	(23)	24	(25)
<b>Total (Area 71)</b>	<b>63</b>	<b>104</b>	<b>143</b>	<b>192</b>	<b>291</b>	<b>198</b>	<b>247</b>
Japan home islands (Area 61)	151	99	156	201	128	133	149
China	1	1	1	2	(2)	(2)	(2)
<b>Total West Pacific (Areas 61,71)</b>	<b>215</b>	<b>204</b>	<b>300</b>	<b>395</b>	<b>421</b>	<b>333</b>	<b>398</b>
New Zealand (Area 81)	—	—	—	—	—	1	5
Tahiti	1	1	1	1	1	1	1
Hawaii (Area 77)	3	6	5	5	3	3	4
Eastern Pacific Ocean	56	105	33	45	79	116	130
<b>Total Areas (77, 81)</b>	<b>60</b>	<b>112</b>	<b>39</b>	<b>51</b>	<b>83</b>	<b>121</b>	<b>140</b>
<b>Total Pacific</b>	<b>175</b>	<b>316</b>	<b>339</b>	<b>446</b>	<b>504</b>	<b>454</b>	<b>538</b>

veloping nations then maintained that under management system, their tuna fisheries could not develop and there was a strong pressure for increased special allocations. This led to shift of flag vessels from nations with large fleets to nations with small fleets, and problems of implementation and enforcement by member nations.

Several other problems relating to allocation and management are encountered in the tuna fisheries in the Southeast Asian region. Among these problems, which may serve as stumbling-blocks in reaching cooperative arrangements with other countries in the region, are:

a) The absence of a tuna fishery in some member states of the IPFC in the region and, at the same time, the rapid development of the skipjack fishery in the West Pacific, as in Papua New Guinea, the Solomon Islands, and other states which are not members of the IPFC. The fishery is very important only in Indonesia and the Philippines and almost absent in some states bordering the South China Sea region. While a fishery body, i.e., the South Pacific Regional Organization was recently established in the West Pacific region by the South Pacific Forum at its 17th Session, it will take some time before activities on tuna management can be done in collaboration with Indonesia and the Philippines. There are provisions, however, for Southeast Asian countries to join this new international fishery body.

b) Tuna fisheries in the Philippines and possibly in Indonesia are well developed in the archipelagic (internal) waters. Skipjack and yellowfin are the most important species which form artisanal (sustenance) fisheries, although records show that the catch from municipal fisheries are few as they are often not included in the commercial catch record. Any management arrangements made in the region which may affect these fisheries, as for instance limiting their expansion, would probably find opposition from the local population.

c) Some distant-water fishing states do not respect the archipelagic and territorial waters of coastal states thereby violating the national laws of coastal states. This is indeed a deterrent to cooperative arrangements and, to some extent, these fishing states might claim historic fishing rights in the waters of coastal states which the latter claim as illegal.

d) At present, very little knowledge is available on the life history, migration, and stock identity of the tuna stocks in the Southeast Asian region. For instance, there are still gaps in the biology of eastern little tunas (*Euthynnus* spp.) and frigate tunas (*Auxis* spp.). It is possible that these tuna species comprise a much larger resource than is reflected in the catch records. Concerted efforts should be initiated by an international fishery body to determine the extent of these fisheries in each country and the possible extent of mixing of the stocks. Sufficient

knowledge on these aspects will undoubtedly serve as a basis on which cooperative arrangement could be formulated. Likewise, there is very limited information on stock assessment of the most important market species of tuna in the region. Some new information is available from nonmember states of the IPFC, such as Papua New Guinea.

e) It is a fact that the tuna stocks in the Philippines are scattered in small schools. This situation has brought about some overcapitalization and has caused some failure in the purse seine fishery. This is aggravated by the availability (as incentives were made readily available) of smaller secondhand fishing vessels from Japan which can readily be purchased.

f) There is very limited information available on catch-per-unit-effort and its relation to actual abundance and behavior which could be used to convince decision makers on how member states in the region may solve the problem of allocation. Catch and effort data are poorly collected in some tuna-producing countries in the region. In the Philippines especially, tunas are taken largely by sustenance fishermen using vessels of 3 t or less with catches not recorded in the commercial fishery statistics. As a whole, the importance of information on catch-per-unit-effort is still not very much appreciated by both tuna fishermen and fisheries officials.

g) As compared to other countries, there are very few fishery biologists who are undertaking research on the tuna resource in the region. This is true in spite of the fact that export of tunas, which are a good source of foreign exchange, has been increasing for some time.

There are other points of view which need to be considered to understand better the problems of tuna fisheries management in Southeast Asia. These can be stated in the form of questions the answers to which could be used as basis for management arrangements:

a) Is there an intermingling of tuna populations, particularly skipjack, among those in Papua New Guinea, Palau Island, Indonesia, and the Philippines?

b) Does the tuna breeding area, particularly that of skipjack, as reported in the Philippines, extend through Indonesia and Papua New Guinea?

c) How far north do tropical tuna populations (as those in the Philippines) migrate before they return to the tropics? While a tagging program is being undertaken in the West Pacific area (Papua New Guinea and Solomon Islands), should it be extended to Indonesia and the Philippines?

d) Are the northwestern Pacific populations related to those in the southern equatorial area?

e) Studies on blood relationships of skipjack and yellowfin in the Western Pacific are now being done in Australia. Should they be extended to include samples

from Indonesia and the Philippines?

f) Skipjack and yellowfin are taken when they are small (about 50 cm) by purse seine and fish traps operated close to shore in the Philippines and possibly elsewhere in Southeast Asia. Studies are needed to determine if catches of these species affect the overall fisheries in the area. As the fish are taken in internal waters, should international regulations, if ever set, affect these fisheries?

### **Alternative Management Arrangements**

According to Saila and Norton (1974), FAO in 1971 listed the objectives of tuna management in the Indo-Pacific region as set by the joint meeting of IPFC and IOFC (Indian Ocean Fisheries Council). These include: a) maintenance of tuna stocks at levels that provide high sustained yields; b) conservation measures that do not interfere with development of unexploited stocks; and c) measures which afford the opportunity for countries not yet participating in tuna fishing to build up their fishing industries. To make these objectives more rational, Saila and Norton added the following objectives: d) improved economic efficiency and e) appropriate distribution of the benefits. Both of them realize that the above objectives are in the long run necessary to prevent overfishing of the tuna resource.

It is probable that decision makers in Southeast Asia would act to attain the last-mentioned objective, specifically on the distribution of benefits to tuna-fishing nations in the region including nonfishing nations through whose waters the stocks swim. However, as no form of tuna management exists in Southeast Asia at the moment, member states of the IPFC may deem it wiser to take a wait-and-see attitude and allow such revolutionary arrangements to be initiated first in other regions where some schemes of management have been set up for some time and where depletion of tuna stocks is presently observed.

Several methods of limiting catch and effort and/or distributing benefits from the world tuna fisheries are also listed in Saila and Norton (1974). These include: a) overall catch quotas; b) national quotas; c) direct effort limitation; and d) licensing and taxation. Likewise, various institutional arrangements for carrying out these techniques have been advanced. Examples of these are: a) extended coastal jurisdiction on the economic zones of coastal states; b) regional coastal authorities; c) regional high sea commissions; and d) a global management agency. Emphasis is made of the fact that overcapitalization and economic waste are the major difficulties associated with the total catch quota; that without additional regulations, such as national catch quota or limitation on entry, the idea of total catch quota alone

does not answer the need for a sound worldwide tuna management program. It is possible that if total catch quotas were set up in the Western Pacific without national catch quotas, overcapitalization would set in quickly.

According to the same source, if catching rights could be allocated and be marketable, or at least transferable among nations, a shift of tuna harvesting to nations with lower capital cost could occur and thus improve economic efficiency. Saila and Norton (1974) believe that an adequate capacity among nations now actively fishing for tuna would soon be achieved and further addition to the world tuna fleet could not result in greater catches. Hence, effective management requires that there be provisions for developing nations to enter into tuna fisheries and thus, methods must be developed which will allow for transferring efforts from existing fishing nations to the new nations where tuna resources could be harvested more economically.

The IPFC should consider studies to determine what regulatory techniques would be most beneficial and acceptable to member states. The technique of setting up national quotas may be one that is acceptable. However, the total permissible yield, which should be divided among the relevant nations as their national quotas, has to be determined by the IPFC. These national quotas are not to be exceeded by participating nations and these may be set by species and/or area.

Saila and Norton (1974) further explain that national quotas could effectively maintain a high sustainable yield and at the same time prevent economically wasteful competition among states. However, it could not prevent intra-state competition; hence, restrictions by limited entry within each state should be made to prevent overexploitation of the resources within each member state. Important questions which are raised by this approach are listed in the same source. Among these are: a) how to initially distribute the quotas among nations; b) how to allow for new entrants to the fishery; and c) how to distribute the benefits among states other than those actively engaged in the fishery. The first two questions would take time to settle even with expert assistance from the IPFC. Moreover, the solution to the last question may elicit objections from among member states of the IPFC inasmuch as decision makers would doubt the rationality of such a decision as it is entirely new and unprecedented.

Decision makers of developing states in the region have first to see how the world community could benefit from allocations of benefits accruing from a worldwide fishery, for example, from the whale fishery which is at the moment availed of solely by Japanese and Russian nationals. Similar arrangements would probably not start in Southeast Asia, although they may start in the IATTC

area where some sort of allocation has been enforced since 1966 (Kask 1969).

Saila and Norton (1974) recommend that national quotas be made marketable so that quotas can become available to the most efficient or lowest cost producers. In this way, developed nations like Japan and the U.S.A. may consider selling their quotas to countries with lower labor costs. This can also solve the problem of how to allow for new entrants of coastal states of the region to the fishery.

On direct effort limitation, the same authors describe the method as less desirable than national quota techniques because so far, no clear definition of fishing effort has been made for tuna fishing. This is brought about especially by the different types of fishing methods used in the tuna fishery. Moreover, direct effort limitation tends to retard technological advances simply because, when any technological improvement is made to keep the effective effort at a given level, the management agency has to reduce the allowed effort with no real gain to the vessel owners. Christy (1973) provides a more detailed discussion associated with restriction on direct fishing.

Saila and Norton (1974) noted that the above techniques are not appropriate to yield adequate return for the tuna fishery revenue or rent which could be used for financing the management agency or for payments to coastal states for allowing fishing in their own jurisdictional waters. This can be corrected through 1) a license fee based on vessel size; 2) a license fee that allows landing of a certain amount of fish; and 3) a direct tax on landings. These forms of taxation could limit catch, because those unwilling to pay the tax would not dare enter into the fishery.

Mention is made by Saila and Norton (1974) of some very basic complex questions which need to be considered. Among these are: 1) Who issues and collects the fees (i.e., a central management agency, individual coastal states, or a combination of these)?; 2) How are the licenses to be allocated among fishing states?; and 3) Who will share in the revenue that is to be collected?

It is important that a regional management agency set up the rate of the fees and that the same be applied within and beyond national jurisdiction. This is reasonable, for if it were otherwise, each state might attempt to attract more and more effort by lowering its rate and be used by coastal states to generate short-term revenues rather than conserving the tuna stocks.

Saila and Norton (1974) expound one method of allocating licenses among fishing states as an alternative, i.e., to auction a limited number of licenses to the highest bidders. Through this method the individual or state, as

the case may be, who could make the greatest gain from holding the licenses would tend to bid the highest. The disadvantage of this approach is keeping out of the fishery certain nations that are just developing their fishery capabilities and thus may not be able to pay high prices for the licenses. However, one alternative might be to use the revenue generated to subsidize new fishing nations.

While recognizing that economic rent should really be collected for the world community rather than allowing an unmanaged tuna fishery, it is doubtful if decision makers and ultimately the IPFC member states could be convinced of sharing the benefits derived from the fishery with the whole region or the world as advocated.

In the meantime, the IPFC, through its appropriate bodies of experts should prepare a position paper on the state of the skipjack and yellowfin tuna resource in the Western Pacific, and on the trends and the possible alternative positions which may be taken to keep the tuna fisheries productive at a sustained level. The paper should be distributed widely to governments and fishermen alike so as to sell the idea that some concerted effort must be made to save the tuna resource. This program should be a continued one so that the production trend can be made regularly available to all concerned as soon as possible. The sooner the member states know of the conditions obtaining in these fisheries, the earlier the decision makers can act to change the status quo and save the tuna fisheries. It is hoped that distant-water fishing nations will participate actively in this exercise by submitting necessary catch data to the IPFC.

The extension of fishery jurisdiction would normally exclude the right of distant-water fishing nations to fish within the area of national jurisdiction. However, in view of the migratory habits of tunas, the draft article in the text of the Informal Composite Negotiating Text (ICNT) of the Law of the Sea Conference specifically provides that the conservation and optimum utilization of tuna species should be promoted in a cooperative manner through appropriate international organizations (see Art. 64, ICNT) throughout the region. This provision allows for the participation of distant-water fishing fleets in the harvesting of tuna resources in the exclusive economic zone along lines to be agreed upon by member states in the region. This calls for the establishment of a regional body that is more responsive to the needs not only of tuna fisheries but of other fisheries as well.

The tuna fishery in the Philippines and possibly that in Indonesia is found to be well developed in deep but close-to-shore waters, more correctly within the internal (archipelagic) waters of these states. This condition calls for different fishing arrangements. However, bigger purse seiners are being introduced into the region through

joint ventures to allow fishing farther offshore. Extension of jurisdiction may also give coastal states the necessary capital, vessels, and know-how which may be provided or generated by distant-water fishing nations for them to be allowed to continue their fishing activities within the coastal states' exclusive economic zones. Initially, the IPFC has to be the responsible international fishery body which can help direct activities along this line and provide the needed guidance.

Marr (1976) gives an excellent analysis on management mechanisms, stating the need for strong internal management of fisheries in a state to ensure international fishery management. Accordingly, alternative provisions for the necessary mechanism for the Southeast Asian region are also listed. In spite of the proliferation of international fishery bodies in Southeast Asia, it appears that all are inadequate to provide the necessary mechanism to save the fisheries resources, including the tunas, in the region from depletion.

The newly established South Pacific Regional Fisheries Organization in the Southwestern Pacific, with seat in the Solomon Islands may specifically deal with the tuna resource in the Western Pacific and is open to states in the Southeast Asian region. The Philippines and Indonesia are welcome to join this new international body to enhance the research and management of the tuna fisheries in the region. The establishment of this agency may be timely, for it is in a position to rationally manage the tuna fisheries in the Western Pacific before it is too late.

As recommended by Marr (1976), the establishment of a South China Sea Commission should be considered in the long-term, especially if funds could come from ASEAN and/or other international funding institutions. Nevertheless, it is timely that discussions be made now, even in such unprecedented alternative arrangements to influence decision makers of fishing nations before the tuna resource becomes depleted. Saila and Norton (1974) emphasize the importance of this so that all concerned should be cognizant of the constraints and implications of the regulatory techniques described above and should recognize that appropriate and widely acceptable regulations must be established to prevent the depletion of tuna stocks and worldwide economic waste in the tuna fisheries.

The IPFC should consider seriously, for example, the combination of a national quota along with a tax system and allowance for transfer of quotas which, according to Saila and Norton (1974) appear to meet all the objectives of the IPFC together with its recommended objectives.

With the recent development in the 3rd U.N. Conference on the Law of the Sea to the regime of the 200-mi exclusive economic zone, coastal states will soon declare extended jurisdiction over these areas, thereby forcing

distant fishing nations to seek bilateral arrangements to enable them to fish within the more productive economic zones of coastal states. This could lead to more efforts by distant fishing fleets and aggravate the further entrance of developing states into the tuna fishery. There are several countries in Southeast Asia which have joint ventures with Japanese nationals, e.g., the Philippines. There are other distant-water fishing nations which seek joint ventures with Filipino fishing concerns and possibly this is true in other countries in Southeast Asia. Definitely such arrangements should be set up before any alternative management arrangements for the tuna fisheries are established in the region.

Marr (1976) lists the alternatives in dealing with the management of fisheries and fishery resources in the South China Sea. These are: 1) continuation of the status quo; 2) extension of fishery jurisdiction; and 3) provision of a management mechanism. How would the tuna fisheries fit into these schemes?

Preserving the status quo means that the present trends would be allowed to develop in the tuna fisheries of each country as in Papua New Guinea, Indonesia, the Philippines, Micronesia, Taiwan, the Solomons, etc. In due course, there will be overcapitalization of the fisheries and in no time, biological overfishing of the resources. In the long run, there will be increasing confrontation between countries in order to get more of the limited resources. These conditions surely would be destructive to the resources and the fishing states and would lead to negotiation of arrangements among the countries participating in the fisheries. However, although studies show that the yellowfin tuna resource can be fully utilized in the Western Pacific, more studies are needed to convince the decision makers in Southeast Asia that such is the case in Indonesia and in the Philippines.

One Japanese study shows that the skipjack resource can also be fully utilized in the Western Pacific, but a more recent report indicates that there is, in general, no detectable effect of the fishery upon the catch rate, and until effort becomes more widespread, a clear relationship will not be observed (IPFC 1978). This report expresses the need for continued monitoring of the tuna catches, and that catch-per-unit-effort data are needed in the region. All states in the region with developing tuna fisheries should realize these problems and, together, their experts should determine more accurately the production trends, at least in the yellowfin and skipjack catches.

However, the time needed to put such a body into full operation prevents more active management studies which are now badly needed to keep the tuna fisheries in Southeast Asia at optimal utilization and properly managed. Hence, it is probably advantageous for Indo-

nesia and the Philippines to join the South Pacific Regional Fisheries Organization to enable them to actively undertake management and research work

needed for the conservation of the tuna fisheries in the region.

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# Sharing of Access Among Neighboring States<sup>1</sup>

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## Introduction

The question of sharing of access among neighboring states or, in other words, access to the living resources of the sea, has, in recent years, raised international issues of great concern to the world community and has often been the cause of international disputes due to unilateral claims made by a number of coastal states for extended maritime jurisdiction. This article discusses legal problems of access as a result of the new developing trend on the Law of the Sea, with particular emphasis on the Southeast Asian region.

This article is written in my personal capacity and the views expressed herein do not necessarily reflect the official views of any particular Government.

## The Exclusive Economic Zone

In the early 1970s, coastal states started claiming the zone, sometimes known as "fishery zone," by unilaterally extending their natural jurisdiction to a maximum limit of 200 nautical miles from their relevant baselines for the main purpose of exploring and exploiting living and nonliving marine resources and preserving marine environment in the zone while still recognizing the freedom of other states to navigate and overfly the zone. So far, about 60 coastal states have claimed the zone, among them India, Sri Lanka, Bangladesh, Burma, Kampuchea, and Vietnam. This new concept of Exclusive Economic Zone developed after it became clear that the excessive

claim made by some coastal states, particularly Latin America, for complete sovereignty over their 200-nautical-mile territorial seas did not gain wide acceptance and support from the world community.

## Effects of Exclusive Economic Zone

As stated above, the Exclusive Economic Zone concept is mainly designed to maintain the sovereign rights of coastal states to explore and exploit living resources in the zone. As far as nonliving resources are concerned, this concept does not give additional rights to coastal states since they can at least equally claim these rights by invoking Article 1 of the 1958 Geneva Convention on Continental Shelf. Article 1 stipulates that:

"For the purpose of these articles, the term 'continental shelf' is used as referring:

(a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas;

(b) to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands.

Article 2. The coastal states exercise over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources."

Today's advanced technology makes the provision of this Article obsolete. Considered as one of the lacunae of the four 1958 Geneva Conventions on the Law of the Sea, this provision needs to be amended.

As regards living marine resources, it is obvious that the establishment of the 200-nautical-mile Exclusive Economic Zone by coastal states adversely affects the interests of other states, particularly those whose na-

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tionals have habitually fished in the zone. In the case of Thailand, a distant fishing nation in this region, the fishing industry is being seriously affected. It is estimated that Thailand is likely to lose about 600,000 mt of catch annually, representing around 40% of her total annual catch. Arrests of Thai fishermen as well as seizures of Thai fishing boats made by the neighboring authorities have also been reported; on certain occasions the use of force in the arrests have resulted in deaths. Such incidents have happened elsewhere and have sometimes impaired friendly relations among states.

#### **Legal Validity of the Exclusive Economic Zone**

The existing international law does not provide coastal states sovereign right over the water column beyond 12 nautical miles. It is true that the 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone does not specify the exact breadth of the territorial sea; however, Article 24 on Contiguous Zone does provide that "2. Contiguous Zone may not extend beyond twelve miles from the baseline from which the breadth of the territorial sea is measured."

Based on the above provision, it appears that the territorial sea, together with the contiguous zone may not extend beyond 12 mi from the baseline. This interpretation is consistent with international practice. Therefore, to subject part of the high seas, which is beyond the 12-mi limit from the baseline, to the sovereign right of coastal states is contrary to prevailing norms of the sea.

On the other hand, it may be argued that the existing four 1958 Geneva Conventions on the Law of the Sea to which a few states are members are considered obsolete by a majority of states. It is equally true that in accordance with Article 38 of the Statute of the International Court of Justice, international custom, as evidence of a general practice, can be accepted as international law. But as to what extent State practices can be taken as having developed into international customary law is a legal question that remains to be determined. During the Seventh Session of the Third UN Conference on the Law of the Sea held in Geneva from March 28 to May 19, 1978, many delegates contested the legal validity of the Exclusive Economic Zone. In their view this practice had not yet crystallized into international customary law. It may be further pointed out that in the North Sea Continental Shelf cases—the Federal Republic of Germany vs. Denmark and the Federal Republic of Germany vs. the Netherlands—the International Court of Justice ruled in its judgment of February 20, 1969, par. 69 that:

"In the light of these various considerations, the Court reaches the conclusion that the Geneva Convention did not embody or crystallize any pre-existing or emergent rule of customary law, according to

which the delimitation of continental shelf areas between adjacent areas must, unless the Parties otherwise agree, be carried out on an equidistance-special circumstances basis. A rule was of course embodied in Article 6 of the Convention, but as purely conventional rule. Whether it has since acquired a broader basis remains to be seen: qua conventional rule however, as has already been concluded, it is not opposable to the Federal Republic."

In 1972 the conflict between the United Kingdom and Iceland over fishing incidents caused by Iceland's extension of fishery jurisdiction was finally brought before the International Court of Justice. The Court, in its judgment of July 25, 1954, pars. 67 and 68 ruled that:

"67. The provisions of the Icelandic Regulations of 14 July 1972 and the manner of their implementation disregard the fishing rights of the applicant. Iceland's unilateral action thus constitutes an infringement of the principle enshrined in Article 2 of the 1958 Geneva Convention on the High Seas which requires that all states, including coastal states, in exercising their freedom of fishing, pay reasonable regard to the interests of other states. It also disregards the rights of the applicant as they result from the Exchange of Notes of 1961. The applicant is therefore justified in asking the Court to give all necessary protection to its own rights, while at the same time agreeing to recognize Iceland's preferential position. Accordingly, the Court is bound to conclude that the Icelandic regulations of 14 July 1972 establishing a zone of exclusive fisheries jurisdiction extending to 50 nautical miles from baselines around the coast of Iceland, are not opposable to the United Kingdom, and the latter is under no obligation to accept the unilateral termination by Iceland of United Kingdom fishery rights in the area.

68. The findings stated by the Court in the preceding paragraphs suffice to provide a basis for the decision of the present case, namely, that Iceland's extension of its exclusive fishery jurisdiction beyond 12 miles is not opposable to the United Kingdom; that Iceland may on the other hand claim preferential rights in the distribution of fishery resources in question, and that the principle of reasonable regards for the interests of other states enshrined in Article 2 of the Geneva Convention on the high seas of 1958 requires Iceland and the United Kingdom to have due regard to each other's interests, and to the interests of other states, in those resources."

In the light of this judgment, the Court, while recognizing the right of coastal states to extend their fishery jurisdiction beyond 12 nautical miles, at the same time expressly ruled that the established or historic rights of other states must be duly respected. This judgment may be regarded as a basis for excessive claims of fishery jurisdiction; consequently, the Exclusive Economic Zone concept will finally be generally accepted as part of the new regime of the Law of the Sea.

### The Third UN Conference on the Law of the Sea and the Question of Access to Living Marine Resources

In 1970 the UN General Assembly, realizing the need to revise the four 1958 Geneva Conventions on the Law of the Sea, convened the third UN Conference on the Law of the Sea. Prior to its first session in 1973, the Third UN Conference on the Law of the Sea had created in 1967 an ad hoc committee to discuss questions concerning the peaceful use of seabed and ocean floor beyond the limits of national jurisdiction. The seventh session of the conference was resumed in New York from August 21 to September 15, 1978. To sum up, the world community has taken up this extremely important issue on the law of the sea for 11 yr now.

#### INFORMAL COMPOSITE NEGOTIATING TEXT (ICNT)

After the Sixth Session in New York, May 23 to July 15, 1977, the President, together with the chairman of the three Main Committees, entrusted with the responsibility of preparing a new negotiating text for the future session of the Conference, introduced another negotiating text called Informal Composite Negotiating Text (ICNT). This negotiating text is the third of its kind. The first two are the Single Negotiating Text and the Revised Single Negotiating Text.

The ICNT, like its predecessors, is informal and has served as a basis for negotiations without affecting the rights of any delegation to make amendments to the Text.

#### LEGAL STATUS OF THE EXCLUSIVE ECONOMIC ZONE

The legal status of the Exclusive Economic Zone is one of the main issues the Conference had to settle. During the Seventh Session of the Conference, it appeared to be generally accepted that the Exclusive Economic Zone is a *sui generis* zone which is subject to a specific legal regime and it is, therefore, not part of the high seas or the territorial sea.

#### RIGHT OF ACCESS TO THE LIVING MARINE RESOURCES IN THE EXCLUSIVE ECONOMIC ZONE OF OTHER COASTAL STATES

One of the seven hard core issues given priority by the Seventh Session of the Conference to arrive at a compromise formula was the right of access, particularly by the landlocked and geographically disadvantaged states, to the living marine resources in the Exclusive Economic Zone of other coastal states.

On the rights of landlocked states Article 69<sup>2</sup> of the

ICNT reads:

"1. Land-locked states shall have the right to participate in the exploitation of the living resources of the exclusive economic zones of adjoining coastal states on an equitable basis, taking into account the relevant economic and geographical circumstances of all states concerned. The terms and conditions of such participation shall be determined by the states concerned through bilateral, sub-regional or regional agreements. Developed and land-locked states shall, however, be entitled to exercise their rights only within the exclusive economic zones of adjoining developed coastal states.

2. This article is subject to the provisions of articles 61 and 62.

3. The paragraph is without prejudice to arrangements agreed upon in the region where the coastal states may grant to land-locked states of the same region equal or preferential rights for the exploitation of the living resources in the exclusive economic zones."

Article 70 concerns the right of the so-called geographically disadvantaged states, but it does not explicitly use the term "geographically disadvantaged state." The article stipulates that:

"1. Developing coastal states which are situated in a sub-region or region whose geographical peculiarities make such state particularly dependent for the satisfaction of the nutritional needs of their populations upon the exploitation of the living resources in the exclusive economic zone of their own shall have the right to participate, on an equitable basis, in the exploitation of living resources in the exclusive economic zones of other states in a sub-region or region.

2. The terms and conditions of such participation shall be determined by the states concerned through bilateral, sub-regional or regional agreements, taking into account the relevant economic and geographical circumstances of all states concerned, including the need to avoid effects detrimental to the fishing communities or to the fishing industries of the states in whose zones the right of participation is exercised.

3. This article is subject to the provisions of articles 61 and 62.

These two articles of the ICNT are subject to articles 61 and 62 relating to the conservation and utilization of living resources which read in part as follows:

"Article 61. Conservation of living resources.

1. The coastal state shall determine the allowable catch of the living resources in its exclusive economic zone.

2. The coastal state, taking into account the best scientific evidence available to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation. As appropriate, the coastal state and relevant sub-regional, regional and global organizations shall cooperate to this end.

Article 62. Utilization of the living resources.

1. The coastal state shall promote the objective of optimum utilization of the living resources in the ex-

<sup>2</sup>Documents A/CONF.62/WP.10 and add. 1.

clusive economic zone without prejudice to article 61.

2. The coastal state shall determine its capacity to harvest the living resources of the exclusive economic zone. Where the coastal state does not have the capacity to harvest the entire allowable catch, it shall, through agreements or other arrangements and pursuant to the terms, conditions and regulations referred to in par. 4, give other states access to the surplus of the allowable catch.

3. In giving access to other states to its exclusive economic zone under this article, the coastal state shall take into account all relevant factors, including, inter alia, the significance of the living resources of the area to the economy of the coastal state concerned and its other national interests, the provisions of articles 69 and 70, the requirements of developing countries in the sub-region or region in harvesting part of the surplus and the need to minimize economic dislocation in states whose nationals have habitually fished in the zone or which have made substantial efforts in research and identification of stocks."

These provisions of the ICNT were not acceptable to the group of landlocked and geographically disadvantaged states. At the Seventh Session of the Conference, a negotiating group was formed to take up the matter. The chairman of the group, after having taken into account the views expressed by both the group of landlocked and geographically disadvantaged states and the group of coastal states, proposed a series of texts for the revision of articles 62 (par. 2), 69, and 70 of the ICNT, the last version<sup>3</sup> of which reads as follows:

"Article 62. par. 2.

The coastal state shall determine its capacity to harvest the living resources of the exclusive economic zone. Where the coastal state does not have the capacity to harvest the entire allowable catch, it shall, through agreements or other arrangements and pursuant to the terms, conditions and regulations referred to in par. 4, give other states access to the surplus of the allowable catch having particular regard to the provisions of articles 69 and 70, especially in relation to the developing states mentioned therein.

Article 69. Right of land-locked states.

1. Land-locked states shall have the right to participate, on an equitable basis, in the exploitation of an appropriate part of the surplus of the living resources of the exclusive economic zone of coastal states of the same sub-region or region, taking into account the relevant economic and geographical circumstances of all the states concerned and in conformity with the provisions of this article and of articles 61 and 62.

2. The terms and modalities of such participation shall be established by the states concerned through bilateral, sub-regional or regional agreements taking into account inter alia:

(a) the need to avoid effects detrimental to fishing communities or fishing industries of the coastal states;

(b) the extent to which the land-locked state,

in accordance with the provisions of this article, is participating or is entitled to participate under existing bilateral, sub-regional or regional agreements in the exploitation of living resources of the exclusive economic zones of other coastal states;

(c) the extent to which other land-locked states and states with special geographical characteristics are participating in the exploitation of the living resources of the exclusive economic zone of the coastal state and the consequent need to avoid a particular burden for any single coastal state or a part of it;

(d) the nutritional needs of the populations of the respective states.

3. When the harvesting capacity of a coastal state approaches a point which would enable it to harvest the entire allowable catch of the living resources in its exclusive economic zone, the coastal state and other states concerned shall cooperate in the establishment of equitable arrangements on bilateral, sub-regional or regional basis to allow for participation of developing land-locked states of the same sub-region or region in the exploitation of the living resources of the exclusive economic zones of coastal states of the sub-region or region, as may be appropriate in the circumstances and on terms satisfactory to all parties. In the implementation of this provision the factors mentioned in par. 2 shall also be taken into account.

4. Developed land-locked states shall, under the provisions of this article, be entitled to participate in the exploitation of living resources only in the exclusive economic zone of developed coastal states of the same sub-region or region, having regard to the extent to which the coastal state in giving access to other states to the living resources of its economic zone has taken into account the need to minimize detrimental effects on fishing communities and economic dislocation in states whose nationals have habitually fished in the zone.

5. The above provisions are without prejudice to arrangements agreed upon in sub-regions or regions where the coastal states may grant to land-locked states of the same sub-region or region equal or preferential rights for the exploitation of the living resources in the exclusive economic zone.

Article 70. Rights of states with special geographical characteristics.

1. States with special geographical characteristics shall have the right to participate, on an equitable basis, in the exploitation of an appropriate part of the surplus of the living resources of the exclusive economic zones of coastal states of the same sub-region or region, taking into account the relevant economic and geographical circumstances of all the states concerned and in conformity with the provisions of this article and of articles 61 and 62.

2. For the purposes of the present Convention, 'states with special geographical characteristics' means coastal states, including states bordering enclosed and semi-enclosed seas, whose geographical situation makes them dependent upon the exploitation of the living resources of the exclusive economic zone of other states in the sub-region or region, for adequate supply of fish for the nutritional purposes of their

<sup>3</sup>NG 4/9/Rev. 2, 15 May 1978.

populations or part thereof, and coastal states which can claim no exclusive economic zone of their own.

3. (Identical with article 69 par. 2 except the words 'land-locked states' are replaced by 'states with special characteristics' where it is mentioned only of land-locked states.)

4. (Identical with article 69 par. 3 except the words 'land-locked states' are replaced by 'states with special characteristics' and the words 'par. 2' in the last sentence are changed to 'par. 3').

5. (Identical with article 69 par. 4 except the words 'developed land-locked states' are replaced by 'developed states with special geographical characteristics'.)

6. (Identical with article 69 par. 5 except the words 'land-locked states' are replaced by 'states with special geographical characteristics'.)

The proposed text for the revision of articles 62 par. 2, 69, and 70 of the ICNT by the chairman of the negotiating group was viewed by the group of landlocked and geographically disadvantaged states as an improvement, although they still found the proposal unacceptable to them and to the group of coastal states. Below are the main problems that remained to be resolved:

**Right of access:** The landlocked and geographically disadvantaged states asserted that it was their right of access to the living resources of the Exclusive Economic Zone. This they asserted on the premise that the Exclusive Economic Zone was part of the high seas and therefore accessible to all states. They added that if coastal states were to be granted exclusive resource rights and jurisdiction over a 200-nautical-mile Exclusive Economic Zone, the existing rights of other states therein should be respected.

The coastal states agreed to grant access to the surplus of the living resources in their Exclusive Economic Zone to the landlocked and geographically disadvantaged states as well as to other states, on condition that such grant of access could not be claimed by other states as a right.

**Determination of allowable catch:** The coastal states reserved their right to determine their allowable catch as well as their capacity to harvest the living resources within the Exclusive Economic Zone. Where the coastal states did not have the capacity to harvest the entire allowable catch, they may, through agreements or arrangements, grant other states access to the appropriate part of the surplus of the allowable catch.

The landlocked and geographically disadvantaged states naturally contested this right of the coastal states. In their view, coastal states should not have the sole discretion to determine the allowable catch and their capacity to harvest. They feared that if this were the case, there might be no surplus left for them. The landlocked and geographically disadvantaged states further insisted that the determination of the allowable catch

should be carried out jointly by states concerned or by an international body of recognized competence. Another area of concern voiced by the group was that the coastal states might, through arrangements with other advanced fishing states, increase their capacity to harvest the total allowable catch, thus leaving no surplus for other states. To cope with this possibility, the chairman of the Negotiating Group suggested that when the harvesting capacity of coastal states reached a point which would enable them to harvest the allowable catch, the coastal states and other states concerned should cooperate in working out equitable arrangements.

**Definition of geographically disadvantaged states:** Another difficulty in reaching a consensus was the definition of the "geographically disadvantaged states." The definition suggested by the chairman of the Negotiating Group, as mentioned above, was not entirely satisfactory to the group of geographically disadvantaged states. Furthermore, the use of the term "geographically disadvantaged states" was not endorsed by the group of coastal states. The group of coastal states preferred to use the term "states with special characteristics." The disapproval of the term "geographically disadvantaged states" arose from the fact that the definition of states falling under this category could not be based solely on a geographical criterion. Other criteria, especially economic and biological aspects and the varied needs and interests of other states had to be taken into account since a state which claims a smaller area of Exclusive Economic Zone does not necessarily put it in a disadvantageous position, economically speaking, because such a limited area may be extremely rich in living and nonliving marine resources.

**Preferential fishing rights of landlocked and geographically disadvantaged states over other states:** The group of landlocked and geographically disadvantaged states insisted that their right to fish in the exclusive economic zone of the coastal states should be on a preferential basis vis-a-vis other states, including states whose nationals have habitually fished in the zone. I cannot concur with this view for the very reason that it is not justifiable to accord preferential right to the landlocked and geographically disadvantaged states, which have not engaged in fishing activities, over states whose nationals have habitually fished in the zone. On the question of fishing, states seriously affected by the declaration of the Exclusive Economic Zone are those which have already engaged in fishing activities but which do not belong to the class of landlocked or geographically disadvantaged states which have so far nothing to do with fishing. Conversely, the landlocked and geographically disadvantaged states can be qualified as states whose nationals have habitually fished in the Exclusive Economic Zone if it corresponds to the fact. In my opinion both the landlocked and geographically

disadvantaged states and the states whose nationals have habitually fished in the exclusive economic zone should share equal right of access to the zone. However, the ICNT and the paper introduced by the chairman of the Negotiating Group on this subject (NG.4/9/Rev. 2 above) tend to give preference to the group of landlocked and geographically disadvantaged states over other states. It may be said that the two texts reflect the majority view of the Conference but it cannot be denied that the group of landlocked and geographically disadvantaged states comprising 53 states or about one-third of the states participating in the Conference have a vital role in decision-making. This is because the adoption of the new Sea Law Convention requires a two-thirds majority vote; therefore, the voice of this group of states carries significant weight.

*Settlement of disputes:* At the Seventh Session, the matter referred to the Negotiating Group by the Plenary under item 5 was: "The question of the settlement of disputes relating to the exercise of the sovereign rights of coastal states in the exclusive economic zone." There were two opposing views, those who wanted the rights guaranteed them by the Convention to be safeguarded by compulsory adjudication procedures and those who felt that since the coastal states had sovereign rights over the Exclusive Economic Zone, in the exercise of these rights, they should not be forced to participate in any form of compulsory settlement of disputes unless otherwise agreed upon. The group of coastal states further contended that to subject the sovereign right of coastal states to compulsory settlement of disputes would lead to abuse of the legal process and would unduly impede their exercise of sovereign rights.

At the end of the Seventh Session, the concept of compulsory recourse to conciliation procedure, which is not binding upon the parties to the disputes, emerged as a possible compromise. The final formula put forward by the chairman of the Negotiating Group 5 received widespread and substantial support. According to the compromise formula, three categories of disputes relating to fisheries may be submitted to a conciliation procedure when it is alleged that:

1. a coastal state has manifestly failed to comply with its obligations to ensure, through proper conservation and management measures, the safety of all living resources in the exclusive economic zone;

2. a coastal state has arbitrarily refused to determine, upon the request of another state, the allowable catch and its capacity to harvest the living resources with respect to stocks which are of interest to other states;

3. a coastal state has arbitrarily refused to allocate to any state, under the provisions of articles 62, 69, and 70 and under the terms and conditions established by the coastal state consistent with the present Convention,

whole or part of the surplus it has declared to exist.

#### BILATERAL ARRANGEMENTS

With or without a new comprehensive Convention on the Law of the Sea, the question of access to the living resources can be settled only through bilateral or regional agreements between states concerned as provided for in the ICNT. The new Sea Law Convention can only lay down general conditions for the conclusion of such agreements. Pending entry into force of the Convention, fishing states affected by the proclamations of the Exclusive Economic Zone have already concluded agreements for access to marine fishery resources with other coastal states. Thus far, quite a number of such agreements exist.

In return for the allocation of fishery resources, in general, either foreign states or foreign fishermen have to pay the coastal states granting access. Payments may be in the form of license fees, royalties, taxes, joint-ventures, etc. They also have to comply with the terms and conditions with regard to conservation and management measures imposed by the coastal states. In some cases, benefits to be accorded to the states granting access include the training of fishermen and the transfer of technology in fisheries. In the case of Japan and New Zealand, the success of the negotiation was largely due to Japan's commitment to increase import of meat and dairy products from New Zealand in exchange for the right to fish in New Zealand's waters through payment of license fees.<sup>4</sup>

The joint-venture type of access is a highly complex one because it involves additional legislative and administrative measures existing in the state where joint-venture companies are incorporated. Consequently, the joint-venture system has sometimes proved ineffective and economically unprofitable.

There exist at present very few fishery agreements in Southeast Asia. Recently an agreement on fisheries cooperation between Thailand and Bangladesh was signed and had been in effect since July 5, 1978. The objective of this agreement is to conduct technical cooperation and joint-venture in the field of fisheries. Under the agreement, authorized joint-venture companies set up jointly by Thai and Bangladesh partners in accordance with the laws and regulations of Bangladesh and the agreement between the two countries in the ratio of 49:51, respectively, may exploit living resources in the Bay of Bengal within the Exclusive Economic Zone as well as territorial waters declared by Bangladesh. It should be noted that the fishing grounds permitted under this Agreement include the territorial waters of Bangladesh since it is the only country which has adopted

<sup>4</sup>Evening Post, 1 July 1978.

the unique 10-fathom-depth straight baseline concept by invoking the geographical peculiarities of the Bay of Bengal. For this reason the distances of the declared Bangladesh straight baselines from which the breadth of the territorial sea is measured are generally greater than 12 nautical miles from the nearest coastlines. The Agreement also provides for the setting up of joint-Ministerial and Technical Committees for the purpose of implementing the Agreement. Meetings were held in Bangkok last August 1978 and both parties agreed to start fishing operations in October 1978 following the establishment of joint-venture companies.<sup>5</sup>

To minimize economic dislocation caused by the creation of the Exclusive Economic Zone, leading fishing nations have intensified their efforts to develop aquaculture within the waters under their jurisdiction. Japan and Thailand, for example, the 1st and the 10th ranking fishing nations, respectively, in volume of catches,<sup>6</sup> have launched various projects to this effect. According to the article entitled "Declaration of EEZ's Temporarily Squeezes Japan's Fish Supply,"<sup>7</sup> to improve coastal fishing grounds, \$740 million has been invested by Japan in constructing artificial spawning and feeding beds and beaches. Aquaculture development has similarly received a large boost in the form of plans for 17 additional fish farming centers by 1980, bringing the total to 27 (excluding salmon hatcheries). Salmon husbandry, deemed the most promising of all aquaculture ventures for Japan, will receive special attention.<sup>8</sup> Thailand has likewise concentrated on marine, brackishwater as well as fresh water aquaculture, and to this end various fish farming centers are now actively conducting their activities.<sup>8</sup> In addition, in order to solve fishery problems which it now faces, the Government of Thailand has set up a high level inter-ministerial committee for the purpose of formulating and implementing fishery policies.

#### REGIONAL AND INTERNATIONAL COOPERATION

By extending maritime jurisdiction, coastal states will, in principle, benefit more from the sea. But the extension of jurisdiction itself will not solve fishery problems. This is due to the natural characteristic of fish to migrate from place to place. There is virtually no boundary for fish.

Another area of possible conflict concerns the question

of maritime boundaries. Unlike a land boundary, a maritime boundary is generally not visible and can be a cause for fishing conflict. The extension of maritime jurisdiction by coastal states has further created additional fishing problems particularly in cases where each of opposite coastal states cannot claim the maximum 200-nautical-mile Exclusive Economic Zone limit. As a result of the extension of jurisdiction, in Southeast Asia as well as in other parts of the world, there exist overlapping maritime areas claimed by more than one state. Under international law, maritime boundary delimitations between adjacent or opposite states concerned have to be effective through agreements; unilateral claims cannot prejudice the rights of other states.

Unlike nonliving natural resources, living natural resources are renewable. Life cycles of fish are relatively short. They should be properly exploited to avoid economic waste. However, natural living marine resources can be depleted if they are not rationally exploited; conservation and management measures are important factors for increasing their productivity.

It should be further pointed out that in this region, there are stocks of fish called "shared stocks" which occur within the national boundaries of two or more states. There are also highly migratory species like tunas. These stocks are interdependent in the sense that harvesting a stock in an area may have adverse effects on the yield of the same stock in another. In this case, states concerned should cooperate in conserving and developing these stocks. Regional or international organizations may also render assistance in this regard.

In view of the fact that fishery problems are transnational issues, regional and international cooperation is needed. To deal effectively with these problems, regional and international organizations can greatly contribute to this effect through fishery research, identification of stocks, and assessment of maximum sustainable yield.

With regard to the maximum sustainable yield in this region, according to the workshop held in Penang, in November 1977, the areas with largest potential yields are:

East coast Peninsular Malaysia	440,000 t
Indonesia-South China Sea	470,000 t
Natura Islands	260,000 t
off Sarawak	330,000 t
off Sabah	110,000 t
off Mekong mouth-Central Sunda Shelf	500,000 t

It was further estimated that out of the potential yield of 3,300,000 t from the demersal resources in the Sunda Shelf, only about 1,000,000 t are presently harvested. In the Gulf of Thailand, it was reported that "With the exception of *Rastrelliger* spp. (mackerel), which may now be yielding maximum catches, the pelagic resources of

<sup>5</sup>The Nation Review, Bangkok, 28 August 1978.

<sup>6</sup>Nominal catches by Japan and Thailand arranged by 1976 catch size were 10,619,917 and 1,640,396 metric tons respectively (1976 FAO Yearbook of Fishery Statistics, p. 11).

<sup>7</sup>ICLARM Newsletter, Vol. I, No. 1, July 1978, p. 6.

<sup>8</sup>See report on "ICLARM Staff Visits Thailand," ICLARM Newsletter, Vol. I, No. 1, July 1978, p. 4.

the Gulf are less heavily exploited than those of demersal fish."<sup>9</sup>

As mentioned before, there is a surplus of fish in this region. It will be a waste if these resources are not properly exploited for the common benefit of the states concerned. Cooperation among states concerned is therefore required for the rational exploitation of these resources. In this connection, I fully endorse the view of Dr. Francis T. Christy, Jr., an internationally recognized authority on fisheries, who recently stated that, "... the states would have to be convinced that the potential economic gains from cooperation would be greater than the gains in nationalistic pride, etc., that they could receive by attempting to exercise their claimed jurisdiction."<sup>10</sup>

Regional organizations with close cooperation among their members should facilitate cooperation in the field of fisheries. The Association of Southeast Asian Nations (ASEAN), for example, has formulated projects for fish-

eries cooperation.<sup>11</sup>

### Conclusion

The traditional legal regime on the Law of the Sea is seriously being challenged and is undergoing significant change. With regard to fisheries, the question of access to natural living resources of the sea is one of the main issues of great interest to all states. Marine fishery resources constitute the main source of animal protein for human consumption, provide job opportunities, and generate revenues for a great number of states. Fishery problems are transnational issues. Regional and international cooperation should be promoted to deal effectively with these problems for the common benefit of states concerned. It is gratifying to note that various regional and international organizations have so far exerted efforts to help solve these vital issues.

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<sup>9</sup>South China Sea Fisheries Development and Coordinating Programme, Vol. 2, Fishery Country Profiles, SCS/Dev/76/11 App. 1, p. 90.

<sup>10</sup>Dr. Francis T. Christy, Jr. In Press. Fisheries management and the law of the sea in Southeast Asia and the Southwest Pacific. ICLARM Studies and Reviews. International Center for Living Aquatic Resources Management, Manila.

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<sup>11</sup>Report of the ASEAN Fisheries Experts Meeting for the ASEAN-CANADA Dialogue, 24-26 January 1978, Singapore.



# Implementation of Agreements with Foreigners

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## Introduction

The topic assigned to me is "The Implementation of Agreements with Foreigners." I cannot discuss the implementation of various agreements concluded among other Southeast Asian countries as I am ill-equipped for the subject. I will instead confine my observations to the implementation of fisheries agreements entered into by Indonesia with other countries in waters within its national jurisdiction. The opinions expressed in this paper, however, are totally personal, and do not necessarily reflect the opinions of the Indonesian Government.

Before one can discuss the various agreements concluded between Indonesia and other countries, one first has to understand Indonesia's varied national positions on the matter, as they will determine or affect the agreement itself. Secondly, for the purposes of the present discussion, the term "agreement" shall include not only agreements officially concluded, but also other arrangements that have existed for some time between Indonesia and other countries.

## Indonesian Positions

From the point of view of Indonesia, all fisheries resources within Indonesian archipelagic waters and territorial seas fall within its national jurisdiction. These resources include those of sedentary species found in the Indonesian continental shelf or those of pelagic or demersal species found in the area which would become Indonesia's exclusive economic zone. This position is well known to everyone. Therefore, I merely have to refer to the Indonesian Declaration of December 13

1957, announcing the Indonesian archipelagic state concept and the 12-mi territorial sea, both later enacted into Law No. 4/1960. In 1961 Indonesia also ratified the Geneva Continental Shelf Convention of 1958, thus acquiring sovereign rights over the sedentary species of all living resources within its continental shelf.

The essence of the archipelagic state concept is the recognition of the right of an archipelagic state like Indonesia to draw straight archipelagic baselines connecting the outermost points of the outermost islands of the archipelago, thus enclosing the whole archipelago into a single entity. The territorial sea, the contiguous zone, the exclusive economic zone, and the continental shelf of the archipelagic state shall be measured outward from these baselines. The waters within these baselines are archipelagic waters, over which the archipelagic state exercises territorial sovereignty. This sovereignty covers the waters, the airspace above the waters, the seabed and subsoil, and all other resources contained therein.<sup>2</sup> Derived from this basic concept, especially from the concept of sovereignty over all the natural resources contained in the archipelagic waters, the archipelagic state exercises sovereignty over all the fisheries resources within its archipelagic waters. Thus, any exploration or exploitation of these resources, in accordance with Article 33 of Indonesia's 1945 Constitution, can only be undertaken for the benefit of the Indonesian people, either by their own organizations or through some kind of arrangements with foreign organizations. Any agreement concluded with foreign countries on this matter will have to take into account this basic position.

<sup>1</sup>Indonesian Representative to the Second Committee of the Third UN Conference on the Law of the Sea.

<sup>2</sup>Through the years the Indonesian archipelagic state concept has found its way into the ICNT. For detailed regime of the archipelagic state concept which I hope will be incorporated in the next LOS Convention, see Articles 46-54 of the ICNT.

Since the whole archipelagic waters now belong to the archipelagic state of Indonesia, all national legislation with respect to fisheries in its waters can now be applicable to the Indonesian archipelagic waters and territorial seas. This legislation is either of recent origin or dates back to the colonial era. Some of the old legislation now applicable to the archipelagic waters of Indonesia is worth mentioning.

First, there is the Pearl and Coral Collecting Act of 1916<sup>3</sup> which regulates pearl, anemone, and coral collecting within 3 mi from the coasts. Exclusive and traditional rights for such activities are guaranteed local fishermen anywhere in the sea where depth is less than 9 m at low tide. Such rights cannot be transferred to others except as provided for in the Act.

Second, there is the Fisheries Act of 1920<sup>4</sup> which prohibits the use of poison, toxins, and explosives in fishing, except for authorized scientific purposes.

Third, there is the Coastal Fisheries Act of 1927.<sup>5</sup> The rules enunciated in this Act relate to fishing in the Indonesian territorial seas, then fixed at 3 mi from low tide along the coasts. The Act stipulates that only vessels flying the Indonesian flag and manned by a crew of Indonesian nationals (unless granted special permission by the Minister of Agriculture) shall be allowed to fish in Indonesian waters. All fishing activities in the Indonesian waters shall respect and take into account the traditional fishing rights of the indigenous coastal population as well as the specific rights of local governments to regulate fishing along the coastlines under their respective jurisdiction. This Act has been amended several times, the latest having been in 1960 when both the Indonesian archipelagic state principles and the 12-mi territorial sea were enacted into Law No. 4.

Fourth, the Whaling Act of 1927<sup>6</sup> regulates whaling within 3 mi of Indonesian coasts. The Act states that whaling within 3 mi of the coasts (now within Indonesian archipelagic waters and the 12-mi territorial sea) is allowed only under special permission from the President of the Republic, except whaling activities traditionally conducted by the indigenous coastal population. The Act further regulates all other details related to whaling.

Fifth, the Territorial Sea and Maritime Circle Act of 1939<sup>7</sup> regulates Indonesian territorial sea (3 mi from the coasts at low tide or from straight baselines where there are bays, river mouths or estuaries less than 6 mi wide; or where there are island fringes along the coasts, or where

there is a strait less than 6 mi wide and both of its coasts belong to Indonesia). The Act also establishes Indonesian maritime circles along specific areas within Indonesian coastlines. Fishing activities are prohibited within the maritime circles, except by the Indonesian indigenous population or by those with special permission from the Naval Chief of Staff. The Act also establishes strict guidance for the Naval Chief of Staff in granting the permission to fish within the maritime circles. Presidential Decree No. 103, issued May 27, 1963 provides for the conversion of all Indonesian waters into a single maritime circle. This Decree strengthens the power of the Naval Chief of Staff to enforce all fisheries legislation in all Indonesian waters.

Violators of all or any of the Acts cited above are either fined or jailed.

Some of the recent regulations on fishing in the Indonesian archipelagic waters and territorial seas contain provisions on the use of equipment and the use of trawlers in specified areas as well as provisions on the maximum use of fishery resources.

Decision Nos. 561/1973 and 40/1974, both by the Minister of Agriculture<sup>8</sup> also obligate all enterprises engaged in shrimp fishing to make use of all the bycatch. In 1975 the same Minister issued a decision<sup>9</sup> setting up guidelines on the proper conservation and management of the fishery resources. This decision regulates seasonal or areal closure of certain fishing grounds to one, some, or all fish species, as well as the kind, size, and number of vessels; the size of nets and all other fishing equipment; and the quota for each catch. Decision No. 02/1975<sup>10</sup> prohibits trawling in waters less than 10 m deep around the coasts of Irian Jaya (see Chart in the Annex). Shrimp catching through the use of pair trawl, as well as cod ends having a mesh size of less than 3.0 cm (stretched mesh) is also prohibited. The Director General of Fisheries is authorized to determine every year beginning April 1 the number of vessels allowed to operate after the stock of fish or shrimp in the area has been assessed. Decision No. 123/1975<sup>11</sup> prohibits the fishing of *Rastrelliger*, *Decapterus*, *Caranx*, *Sardinella*, and other similar pelagic species by purse seines less than 2 in on the wing side and less than 1 in in the bag. Violation of this rule can mean a revocation of the fishing permit.

<sup>8</sup>See Decision Nos. 561/KPTS/UM/11/1973 dated November 7, 1973 and 40/KPTS/UM/2/1974 dated February 1, 1974.

<sup>9</sup>See Decision No. 01/KPTS/UM/1/1975 dated January 2, 1975.

<sup>10</sup>See Decision No. 02/KPTS/UM/1/1975 dated January 2, 1975.

<sup>11</sup>See Decision No. 123/KPTS/UM/3/1975 dated March 31, 1975.

<sup>3</sup>State Gazette 1916 No. 157 dated January 29, 1916.

<sup>4</sup>State Gazette 1920 No. 396 dated May 26, 1920.

<sup>5</sup>State Gazette 1927 No. 144.

<sup>6</sup>State Gazette 1927 No. 145 dated April 29, 1927.

<sup>7</sup>State Gazette 1939 No. 442.

One of the more important decisions made by the Minister of Agriculture is Decision No. 607/1976.<sup>12</sup> It provides for the division of parts of Indonesian coastlines into four belts (Fig. 1) namely:

1. **First Fishing Belt**, namely, coastal waters up to 3 mi from the low-water mark along the coasts. Here, inboard motorized fishing vessels above 5 gt or above 10 hp, all kinds of trawls (beam trawl, otter trawl, and pair (bull) trawl), purse seines and the like, encircling gill nets and drift gill nets, or nets more than 120 m long are prohibited.

2. **Second Fishing Belt**, namely, waters 4 mi wide measured from the First Fishing Belt. In this belt, inboard motorized fishing vessels above 25 gt or above 50 hp, bottom trawls (with otterboard) with head rope length over 12 m, mid-water trawls or pelagic trawls as well as pair (bull) trawls, or nets over 300 m long are prohibited. Fishing vessels owned by State Fishing Enterprise are exempted from the prohibitions stipulated for the Second Fishing Belt.<sup>13</sup>

3. **Third Fishing Belt**, namely, waters 5 mi wide measured from the Second Fishing Belt. Inboard motorized fishing vessels above 100 gt or above 200 hp, mid-water trawls (otterboard) more than 20 m head rope, length, pair (bull) trawls as well as nets over 600 m long are prohibited in this belt.

4. **Fourth Fishing Belt**, namely, waters outside the Third Fishing Belt. Here, all vessels and legitimate equipment may be used except pair (bull) trawls which may only be used in the Indian Ocean.

The regulation also stipulates that except for some specified exceptions, all nets having mesh sizes of less than 25 mm and purse seines for tuna having mesh sizes of less than 60 mm are prohibited in all the four belts. In addition, the use of beam trawls, otter trawls, and pair (bull) trawls for pelagic and demersal fishing is prohibited in both the Strait of Madura and the Strait of Bali.

All fishing permits must specify the belt where the vessel is allowed to fish. Violations of this regulation may result in the revocation of the fishing permit. The Director General of Fisheries is authorized to strictly enforce this decision.

To further regulate the use of trawls, the Minister of Agriculture issued Decision No. 609/1976.<sup>14</sup> This divides demersal fishing within Indonesian waters into four zones (see Chart in the Annex). Each trawler can operate only in the zone assigned to it and it must bear

a sign with a color indicating its zone of operation. The four zones are: Zone A in the Indian Ocean; Zone B in the Strait of Malacca and South China Sea; Zone C in the Strait of Karimata, Java Sea, and the Strait of Makassar; and Zone D in the Eastern Part of Indonesia.

The Director General of Fisheries<sup>15</sup> announced that the decisions of the Minister of Agriculture (Decision Nos. 607, 608, and 609 1976) entered into force on July 1, 1978. Since then, 634 trawlers have been arrested in all parts of Indonesia for violating the rules. This represents about 3% of all fishing vessels (about 21,000 vessels) operating in Indonesian waters.

All of the above-mentioned rules and regulations are necessary to conserve all living resources and to protect them from being depleted especially those that are important for the consumption and the economy of small local fishermen as well as other resources that are important primarily for the world market. Fisheries along the Strait of Malacca, the Java Sea, the Strait of Bali, and the Strait of Makassar can be classified as within the meaning of the first category, while tuna fishing in the Banda Sea and shrimp exploitation in the Arafura Sea can be classified as within the second category. This fact is particularly important since the livelihood of an important sector of the Indonesian coastal population, numbering over one million fishermen, largely depends on fisheries of the first category. The second category is equally important because of its potential to provide sources for foreign exchange which can be beneficial to the economic development of the country.

It is then clear that all foreign vessels operating under whatever arrangements in Indonesian waters must strictly observe the above-mentioned rules and regulations.

#### Agreements with Foreign Countries

When one discusses agreements concluded by Indonesia with other foreign countries, various situations arise:

1. Arrangement concluded with Japan for the exploitation of tuna in the Banda Sea;

2. Agreement, in principle, with South Korea toward cooperative efforts in matters concerning fisheries;

3. Arrangement negotiated between Indonesia and its neighbors, specifically Singapore and Thailand, allowing adjacent neighboring states of Indonesia to continue their traditional fishing rights within specified areas of the Indonesian archipelagic waters;

4. Agreement to be made with regard to the right of access by the landlocked and geographically disadvantaged states to the surplus living resources in areas that

<sup>12</sup>See Decision No. 607/KPTS/UM/9/1976 dated September 30, 1976.

<sup>13</sup>See Decision No. 608/KPTS/UM/9/1976 dated September 30, 1976.

<sup>14</sup>See Decision No. 609/KPTS/UM/9/1976 dated September 30, 1976.

<sup>15</sup>See Decision No. H.11/1/4/4/78 dated May 15, 1978.

are to become part of Indonesia's exclusive economic zone; and

5. Arrangement made with other neighboring states, particularly Australia, allowing Indonesian traditional fishermen to continue fishing in areas within the Australian exclusive fishing zone, namely within 12 mi from the Australian baselines.

#### Arrangement with Japan

The Japanese Government claimed that their fishermen had traditionally fished in far-distant waters of Indonesia, including the Banda Sea area. This claim certainly ran counter to the Indonesian assertion of archipelagic principles since 1957. The determination of Indonesia to enforce its archipelagic principles has brought about problems affecting its relations with Japanese fishing interests, especially in the Banda Sea area.

Protests made by Japan in 1957 and in 1960 failed to placate Indonesia to relinquish its archipelagic principles. Indonesia continued to enforce these principles vis-a-vis the Japanese boats fishing illegally in the area. Various fishing vessels were either arrested, brought to court, or fined or sentenced for violating Indonesian laws.

Various efforts by the two countries to resolve the matter finally succeeded when both parties signed the "Interim Arrangement" in July 27, 1968. This interim arrangement, concluded between the Government of the Republic of Indonesia and the Representatives of the National Federation of Fisheries Cooperatives of Japan and the Federation of Japanese Tuna Fishermen Cooperative Associations, regulated tuna fishing by Japanese fishermen who are members of the two associations "in the waters between the Indonesian islands." The area covered by the arrangement was the Banda Sea which is within the archipelagic waters of Indonesia, with coordinates 124°E 2°S, 129°E 2°S, 132°E 3°S, 132°E 8°S, 124°E 8°S, and 124°E 2°S, all specified in the Interim Arrangement. The Japanese undertook not to operate in areas other than that specified in the Arrangement.

Article I of the Arrangement granted certain Japanese vessels permission to call at the port of Ambon where they would be provided facilities for tuna fishing in the area. Before being able to fish in the Banda Sea area, however, the fishing vessels were to be issued certificates from the Indonesian Embassy in Tokyo. The call at the Indonesian port was to be made at the end of each fishing activity for purposes of verification by the local naval authority. Applications for permission and facilities had to be secured by the Associations on behalf of their members, specifying therein the names of the vessels, the

names of the owners, and the vessel's registration number as well as its tonnage. Additional requirements such as a crew list and a photograph of the vessel were also imposed.

Japanese fishing vessels granted permission and certificate were also required to bear specific markings on both sides of the vessels' bridge, the details of which were specified in the Arrangement.

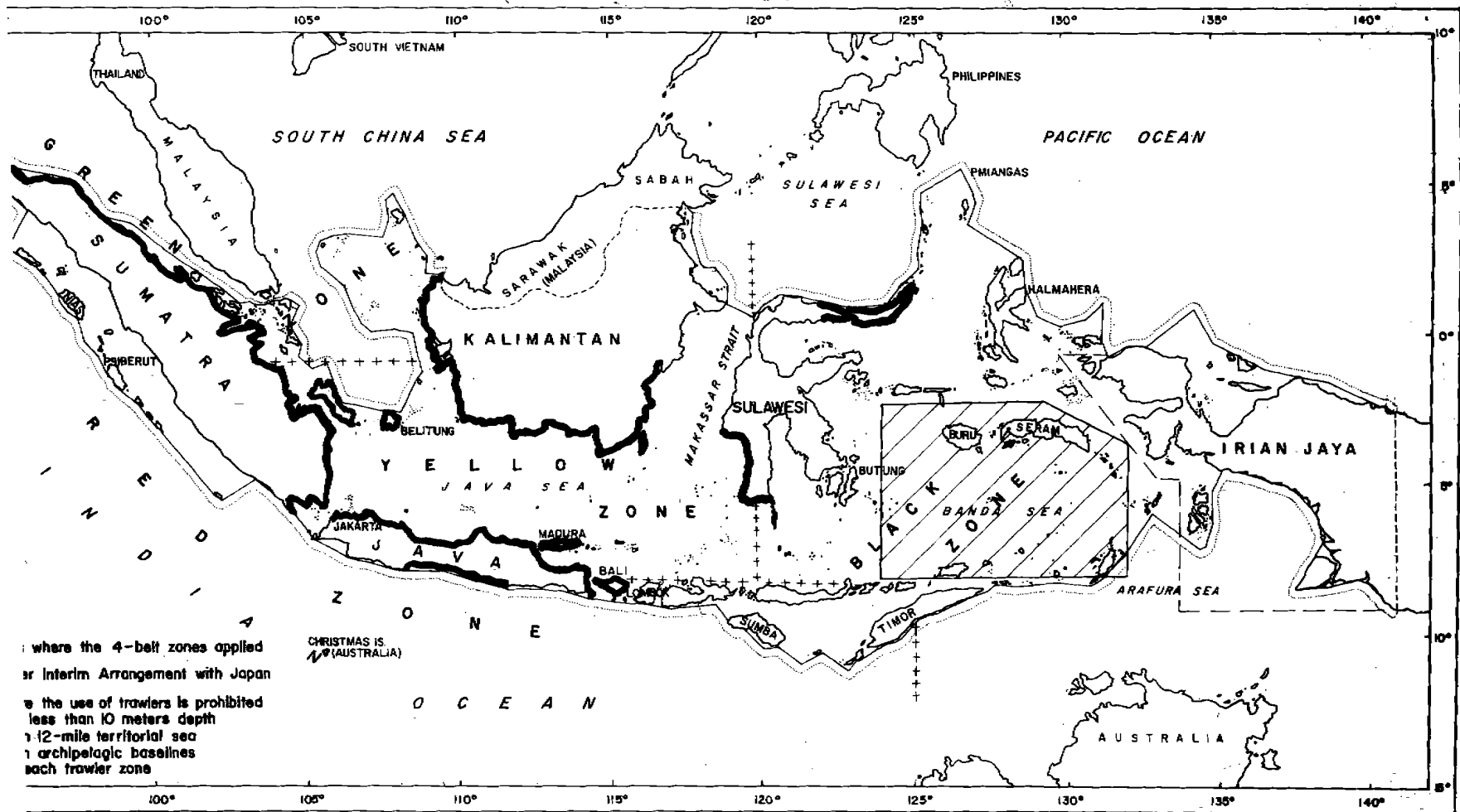
To be able to fish in the specific area, fishing vessels had to pay a certain fee, depending on the class of the vessel used. For a class A vessel, namely, a vessel of 40 t class of less than 70 gt, the fee was fixed at US\$300 per vessel per year, while for a class B vessel, namely, a vessel of 100-t class of not less than 70 gt, but not larger than 300 gt, the fee was fixed at US\$390 per vessel per year, payable in yen through the Indonesian Embassy in Tokyo.

To protect local Indonesian fishermen, Japanese fishing vessels were not allowed to operate within the limit of 30 mi from the island of Ambon, and from other areas to be mutually agreed upon. Likewise, Japanese fishing vessels were not allowed the use of mother ships or transporting vessels. Each vessel was to be on its own, and fishing was limited to the longline method.

The number of vessels allowed to operate under this Arrangement was limited to a maximum of 250, not more than one-third of which should consist of 100-t class vessels of not less than 70 gt but not larger than 300 t. Within this category, however, 13 vessels of approximately 200 gt but not exceeding 300 t were allowed. The rest would be vessels of 40-t class not larger than 70 gt. The maximum catch of the whole Japanese operation under this Arrangement was limited to not more than 15,000 t/yr. The Arrangement took effect on its signing on July 6, 1968 and was to be in force for only 1 yr.

The form and the contents of this Arrangement were peculiar. First, it was negotiated between the representatives of the Indonesian and the Japanese Governments but it was signed between the Government of Indonesia and the National Federation of Fisheries Cooperatives of Japan and the Federation of Japanese Tuna Fishermen Cooperative Association, both private organizations. It seemed that while the Japanese Government was eager to protect the interests of its fishermen, it was nevertheless reluctant to conclude an official agreement with the Government of Indonesia. Perhaps Japan feared that such a bilateral agreement might be interpreted from the legal point of view as its indirect but de facto or de jure recognition of the Indonesian archipelagic concept.

Secondly, the arrangement regulated Japanese fishing activities "in the waters between Indonesian islands." From the very start, the Indonesian Government disagreed on this formulation and preferred the phrase to simply read "in the Indonesian waters." The implication



g belts of the Indonesian coastlines.

was clear: the Indonesian Government wanted clear, legal Japanese recognition of its archipelagic concept, while the Japanese side insisted on maintaining some semblance of legal nonrecognition through the formulation.

Thirdly, the Japanese side was willing to pay for access to the tuna fisheries in the Banda Sea. Although Indonesia considered the amount paid as very little or meaningless, it nevertheless viewed the payment as an act which constituted Japan's recognition of its archipelagic concept. The Japanese side, of course, simply viewed the payment as a fee to enter an Indonesian port since the Japanese fishing vessels operating in the Indonesian archipelagic waters had to report the results of their operations to the predetermined Indonesian port.

Fourthly, the arrangement was valid only for a limited time—1 yr. Thus, it had to be renewed every time; and each time, the discussions would center on the need for such an arrangement and on the points previously mentioned. Basically, Indonesia did not consider the arrangement beneficial to her and therefore wanted to modify the terms to better suit her needs. Yet, the Japanese side considered the arrangement extremely important primarily because it involved activities and the economic life of a certain sector of Japanese electorates; thus, it was politically significant for any Japanese Government in power. Each time the negotiation bogged down, political pressure would be applied on Indonesia. As a result the arrangement was renewed five times and replaced by a new arrangement in 1975. Between 1968 and 1975 the arrangement generated less than US\$10 million for the Indonesian Government, namely, US\$147,640 in license fees, US\$1,929,186 in the form of aids (grant), and US\$7,856,285 in the form of credit for project aids.

By 1975 the Indonesian Government had become very reluctant to continue with the arrangement. However, it had to continue giving special consideration to this peculiar Japanese interest because the Japanese Government considered the solution of the issue essential for their position on the matter of archipelagic states in the Law of the Sea Conference. Before Prime Minister Tanaka could agree to express sympathetic views vis-a-vis the archipelagic principles when he visited Indonesia in 1974, the Indonesian approval to continue the arrangement in the archipelagic waters had to be secured first.

By September 26, 1975 the validity of the Interim Arrangement had expired. Again, new negotiations were made. Both sides decided against a sixth renewal of the Interim Arrangement. Instead, a new arrangement was made, this time between an Indonesian State Fishing

Enterprise, the Perikanan Samodra Besar (PSB)<sup>16</sup> and the same Japanese Fishing Associations mentioned earlier. The new arrangement embodied provisions for tuna fishing cooperation on the basis of a profit sharing arrangement. The new arrangement also required the Associations to prepare and transmit to the PSB a sailing plan for tuna fishing for each contract year. The plan is to be carried out after due acknowledgment from the PSB "which will be given expeditiously" (Article II of the Contract). The area of operations under the new arrangement remained the same, e.g., "the waters between the Indonesian archipelagic islands," as provided for in the Interim Arrangement. In the Interim Arrangement, Japanese fishing vessels were not allowed to operate within the limits of 30 mi from the island of Ambon, but unlike the Interim Arrangement, the Japanese vessels were not allowed to operate within 15 mi from other specified groups of islands, such as the Geser, Gorong, and Banda Neira groups. The restriction that Japanese vessels should engage mainly in tuna fishing and only by longline method remained. The maximum catch was now reduced to 8,000 t/yr and the number of longline vessels to be used was fixed at a maximum of 100, consisting of vessels less than 80-gt class (class A) and 80 gt or more but less than 300-gt class (class B) vessels. The maximum number of class B vessels was limited to 33. Likewise, Japanese vessels operating under the Contract were required to bear markings, the details of which were indicated in the Contract. The vessels were not also allowed the use of mother ships or transporting vessels.

One new provision in the Contract was the profit sharing arrangement. Under the Contract the Associations were to relinquish to the PSB 40% of the profit accrued from their operations. The detailed formula for the calculation of the profit was to be decided by both the Associations and the PSB. The Associations were to bear all operating expenses incurred in the operations of the vessels as well as transmit to the PSB reports on the operations and their results, including a profit and loss statement. On the other hand, the PSB was to take administrative steps to obtain necessary documents to facilitate operations and assist the Associations in obtaining the necessary port entry permit. The Japanese vessels operating under the Contract were also required to carry certificates issued by the Indonesian Embassy in Tokyo.

The Contract was to take effect on October 17, 1975

<sup>16</sup>The PSB was established under the Government Regulation No. 12, 1969, Government Regulation No. 16, 1972, and the Articles of Association No. 37 of May 12, 1972 and domiciled in Jakarta on the basis of the Minister of Agriculture's Decision No. 350/KPTS/UM/8/1975 of 20 August 1975.

and was to be valid for 3 yr beginning from the date the Interim Arrangement expired.

Again, the implementation of the Contract during the last 3 yr was not encouraging to Indonesia. The profit from the operations was calculated only at 2.5%. Since PSB's share of the profit was calculated at 40%, the PSB gained only 40% out of the 2.5%, namely, about 1% of the total gross proceeds. The amount received by the PSB was not even enough to cover administrative costs, such as telegrams, verifications, etc. Furthermore, the number of Japanese vessels reporting under the Contract was less than the maximum allowable number. While 100 vessels per year were allowed to operate under the Contract, only 23 reported for verification in 1975-1976, 35 in 1976-1977 while 77 applied between September 1977 and June 1978. Between September 1977 and April 1978, only 35 vessels reported for verification and checking at Ambon.

Various problems also arose under the Contract arrangement. The Indonesian Department of Finance claimed that since the Japanese Fisheries Association and the Japanese crews operating under the Contract gained their incomes in Indonesia, they should be levied taxes under Indonesian Law. Naturally, the Associations and the crews refused to pay tax on the ground that they have already been taxed in Japan. The problem was solved only through a "dispensation" granted by the Indonesian Department of Finance, a situation which was hardly agreeable. Secondly, Japanese vessels were granted bunkering facilities upon entry at Ambon for verification. The irregular entry of these vessels created problems for the Pertamina State Oil and Gas Company, which had to make arrangements for the purpose from Jakarta.

During the 3-yr period of the Contract, aside from the negligible 1% profit sharing, the Indonesian side also obtained one training vessel along with equipment valued at US\$1.8 million as grants and another repair shop for the PSB valued at US\$200,000.

Since the Contract is valid only for 3 yr, ending September 27, 1978, both sides are once again faced with the ever-perplexing problem of renewing the Contract. It is not yet clear how the arrangement will be made, if at all, in the coming years.

Strict enforcement of the arrangement with Japan presented many problems. Firstly, the area covered by the arrangement was relatively large making it difficult for Indonesia's law enforcement agencies to supervise. Secondly, other vessels, including fishing vessels also used the area as a transit route between the Indian and the Pacific Oceans, thus making it difficult for law enforcement agencies to distinguish vessels covered by the arrangement from those that were merely passing through.

Thirdly, the enforcement of the arrangement required an improvement in the efficiency of various enforcement agencies in terms of personnel, equipment, methods, as well as coordination. Fourthly, even if the enforcement activities at sea worked smoothly, the process of judicial solution through courts would still be monumental. A vessel apprehended at sea for violating the arrangement of Indonesian rules and regulations on fishing had to be brought to the court which could be 100 mi away from the site of apprehension. A few weeks or even months could pass before the case was finally settled. Financial damage to both the vessel and the Indonesian Government (which had to feed the crew during the waiting period) could be enormous.

To avoid this situation, since the early 1970s the Indonesian Government issued the "peaceful fine system" under which a vessel alleged to have violated Indonesian fishing laws and regulations may be allowed to leave Indonesian waters immediately upon paying specified amounts as fines to the Indonesian Government through the law enforcement authority that apprehended it at sea. The idea was to avoid lengthy and costly judicial procedures for the benefit of both the vessel and the Indonesian Government. Unfortunately, this attempt also met with many difficulties, and abuse of enforcement powers was discovered later on. As a result the system was abrogated.

On the other hand, vessels which fished illegally in Indonesian waters were also much to blame for the difficulties encountered in enforcing the arrangement. Some of these vessels would rather bribe the corrupt government officials rather than stand trial, which in any case would surely cost them more time and money.

Various licenses have also been given by the Indonesian Government to various Japanese companies to fish through joint venture agreements with Indonesian private fishing companies. Dating back to earlier years, such licenses were used in Arafura Sea for shrimp and others. This type of operation was a simple joint venture agreement within the context of Indonesian Foreign Investment Law. Like all joint venture investment agreements, they were all under Indonesian laws and therefore did not create the same problems.

#### **Fisheries Arrangement with the Republic of Korea**

South Korea is one of the countries in Asia which have been developing far-distant fishing capabilities. It is therefore logical for the Government of South Korea to consider possible fisheries cooperation with Indonesia, and vice versa. Officials of both countries first met in Seoul, in July 1972 to discuss the possibilities of establishing fisheries joint ventures in Indonesia. South Korea

agreed to encourage participation of Korean companies in such joint ventures while Indonesia expressed its readiness to support such activities, including trial fishing. Both parties also agreed to promote fisheries technical cooperation through exchange of scientists and technical and scientific data, and in the field of education. South Korea further expressed its willingness to export fishing vessels on a credit basis while Indonesia agreed to explore the possibility of importing fishing vessels from the Republic of South Korea.

A second meeting was held in Jakarta in September 1972. The Korean fishing company agreed that as a first step toward the establishment of fisheries joint ventures in Indonesia under Indonesian law, it would "in the very near future" send three tuna vessels and two stern trawlers to "Indonesian waters" to perform trial operations in cooperation with Indonesian private companies for a period of 6 mo. Both sides agreed on the immediate implementation of the trial operation. Also discussed in the meeting were the realization of technical cooperation arrangement between the two countries, the possibility of conducting a joint survey in Indonesia and its adjacent waters, and the possibility of importing fishing vessels from the Republic of Korea.

A third meeting took place in Seoul in May 1974. In this meeting it was agreed that the Republic of Korea would share its fishing experiences and techniques with Indonesia to develop the latter's coastal and distant-water fisheries. Both countries also agreed to further strengthen existing technical cooperation; to cooperate in research and survey of marine resources in the waters of Indonesia; to encourage joint ventures between private enterprises of each country in the field of tuna longline, skip-jack pole-and-lining, and shrimp trawling; and to arrange through private sectors the exportation of fishing vessels from the Republic of Korea to Indonesia.

In practice, there has not been extensive fisheries cooperation between Indonesia and South Korea and there has not been any joint venture agreement concluded between private enterprises of each country. The question of enforcement of the Indonesian-South Korean cooperation was therefore not very prominent. The issues of South Korean vessels were primarily those of transitting Indonesian archipelagic waters and how to prevent them from fishing while in transit. The issue was not so much that of enforcing agreements with other countries but of implementing Indonesian laws and regulations vis-a-vis the transitting fishing vessels.

#### **Arrangements with Neighboring Countries**

In 1969, possibly taking the hint from the Interim Arrangement between Indonesia and Japan, Malaysia

took the initiative in concluding an agreement on fishing activities by Malaysian nationals in Indonesian waters in the Strait of Malacca. After some lengthy negotiations, however, the attempt failed to have concrete results because Indonesia was reluctant to apply the interim arrangement system with regard to fishing activities in the Strait of Malacca. Indonesia was, however, prepared to cooperate with Malaysia on the basis of the Indonesian Foreign Investment Law of 1967 (Indonesian Law No. 1, 1967) to the effect that Malaysian private companies would be encouraged to invest through joint ventures with Indonesian fisheries cooperatives or companies. This idea was not so attractive to Malaysia and therefore no agreement on fisheries has been concluded between the two countries.

Singapore was also an issue. Singapore claimed that for years its fishermen had traditionally fished in certain parts of Indonesian archipelagic waters. Moreover, for years, Singaporean vessels had been visiting and plying the waters between Indonesian islands to buy fish from Indonesian fishermen. The latter activities were more of commercial and trading activities rather than fishing activities.

At the same time, Indonesia was concentrating its efforts on maintaining, implementing, and gaining international recognition for its archipelagic state concept. These efforts created problems with Singapore fishing activities in Indonesian archipelagic waters. To gain Singapore's recognition of its archipelagic state concept, Indonesia undertook several consultations with the former and it seemed essential that Indonesia give some concessions to Singapore. One of the concessions given was the recognition of Singaporean traditional fishing rights in certain areas of the Indonesian archipelagic waters. As later incorporated in Article 51 of the ICNT, an archipelagic state must recognize traditional fishing rights of neighboring states immediately adjacent to it in certain areas falling within its archipelagic waters.

The recognition of traditional fishing rights, however, should be a qualified one. Firstly, the concept of traditional fishing rights should be clearly distinguished from the concept of traditional right to fish. While some may argue that under customary international law, all states may have traditional rights to fish in the high seas or in the waters which once were high seas, the concept of traditional fishing rights should be based on real and existing practices. So, the existence of sufficiently long practices of fishing in certain areas of the Indonesian archipelagic waters must first be established before traditional fishing rights can be recognized. Secondly, the concept of traditional fishing rights does not relieve foreign fishermen of the obligation to observe Indonesian laws and regulations and shall not detract the Indonesian Government



from protecting its fisheries resources as well as the well-being of its indigenous coastal fishermen; in short, the concept of traditional fishing rights should not be in conflict with the efforts exerted by the Indonesian Government to develop its fishing industries for the well-being of its own fishermen.

The concept of traditional fishing rights, based on actual fishing, must therefore be clearly defined. As far as Indonesia is concerned, the word "traditional" should refer and respond to several criteria. Firstly, "traditional" should be judged in terms of time-frame, that is, the actual existence of sufficiently long fishing activities must be established. Secondly, "traditional" should also indicate the area frequently visited by the fishermen, that is, the fishing ground visited should be relatively constant. Thirdly, "traditional" should also refer to the fishermen themselves, in the sense that the right shall be granted only to the same fishermen who have visited the area traditionally. Fourthly, "traditional" should also refer to equipment and vessels used as well as the amount of catch, in the sense that to qualify under the meaning of "traditional fishing right," the vessels used should be relatively traditional ones. It therefore excludes the possibility of granting traditional fishing rights to modern vessels with modern equipment, primarily because such modern vessels and equipment would put Indonesian local fishermen in an extremely disadvantaged position.

The concept of traditional fishing rights is thus a complex one. Therefore, Article 51 (1) of the ICNT stipulates that "the terms and conditions of the exercise of such rights and activities, including the nature, the extent and the areas to which they apply," shall have to be determined by bilateral agreement between the states concerned. The text also stipulates that the right conferred on the basis of traditional fishing rights shall not be transferred to or shared with third parties, either through joint ventures with other countries or through any other arrangements. It is therefore clear that in the future, the enjoyment of traditional fishing rights by adjacent neighboring states in Indonesian archipelagic waters is recognized although its implementation and modalities would depend on the bilateral agreement to be concluded between the countries concerned. Up to now, no such agreement has been concluded.

Needless to say, the recognition of traditional fishing rights of neighboring states immediately adjacent to the Indonesian archipelagic waters equally applies to Malaysian fishermen. It definitely excludes fishermen from Japan, Korea, and other far-distant fishing nations.

#### **Arrangement with Thailand**

Thailand is one of the fast-growing countries, fast

becoming a far-distant fishing nation. It also has one of the most developed fishing industries in Southeast Asia. Although Thai fishermen still fish largely within the Gulf of Siam and in the Andaman Sea, many Thai fishermen have traditionally visited Indonesian archipelagic waters within the last several years.

Due to its fast growing fishing industry, Thailand has also put up some conditions to support Indonesian archipelagic state principles. Fully aware that Thai fishing activities within Indonesian archipelagic waters may or may not be included within the concept of traditional fishing rights, Thailand, in supporting the Indonesian archipelagic state concept, is also asking for concessions in the form of special arrangements and cooperation on fishing in the Indonesian archipelagic waters. As in other cases, Indonesia is always prepared to enter into some kind of arrangement with Thailand on the basis of its Foreign Investment Law of 1967. The officials of the two countries have met twice to discuss the matter and they have agreed to conduct a joint survey to look for appropriate species that are economically and commercially exploitable. The survey was conducted in 1977. Both countries are now studying and analyzing the result of the survey before attempting to conclude the necessary and appropriate fishing arrangement.

#### **The Right of Landlocked and Geographically Disadvantaged States**

Aside from Singapore and Laos, it would be difficult to name other Southeast Asian states that fall within the meaning of landlocked and "geographically disadvantaged states." At any rate, aside from Singapore, no other landlocked and geographically disadvantaged state has exercised fishing activities in the Indonesian archipelagic waters or territorial seas. Therefore, there is no need to discuss arrangements for this group.

The question may, however, arise should Indonesia proclaim its own exclusive economic zone, as many of its neighbors have. By then, in accordance with Articles 69 and 70 of the ICNT, some kind of arrangement will have to be made between Indonesia and the landlocked and geographically disadvantaged states adjacent to it to allow the latter to use the surplus fishing resources in the area falling within the former's exclusive economic zone. Since Indonesia has not yet declared its exclusive economic zone, the question is more hypothetical than real.

#### **Indonesian Traditional Fishing Rights in Waters off Australia**

For centuries, Indonesian fishermen from eastern and southern Indonesia have traditionally visited the waters off the coast of Australia for various kinds of traditional

fisheries. Fishermen from Ambon and the South Moluccas, for instance, have traditionally visited the Gulf of Carpentaria for pearl fisheries. The Australian government has recognized these traditional fishing activities which have continued up to the present without much difficulty.

On the other northern coasts of Australia, Indonesian fishermen, primarily from the Lesser Sunda Islands, have also regularly visited the area around the Ashmore and Cartier Island groups for various kinds of fishing. Many of these island groups now part of Australia were once regarded as belonging to the ancient kingdom of Roti, an island chain in the Lesser Sunda Islands group. The fishing activities themselves were not much of a problem since the Government of Australia has always recognized the traditional fishing rights of Indonesian fishermen. The problem was more of an environmental nature than of fisheries. The Indonesian fishermen, being traditional, used traditional vessels, equipment, and methods of fishing. They were generally unaware of modern environmental problems. They therefore had the habit of going ashore to look for fresh water and firewood. Sometimes they hunted birds which, in Australia, were sometimes seasonally protected. After various discussions between the Government of Australia and the Government of Indonesia, a Memorandum of Understanding was signed on November 7, 1974. The Memorandum granted Indonesian traditional fishermen permission to operate in the exclusive fishing zone and on the continental shelf adjacent to the Australian mainland and offshore islands until February 28, 1975. As of March 1975, Australian laws and regulations would apply within its 12-mi exclusive fishing zone. "Traditional fishermen" means the fishermen who have traditionally taken fish and sedentary organisms in Australian waters by methods which have been traditionally used over decades of time. "Exclusive fishing zone" means the zone of waters extending 12 mi seaward from the baselines from which the Australian territorial sea is measured. The memorandum further stated that after February 28, 1975, Australia would continue to respect and allow operations by Indonesian nationals around Ashmore Reef, Cartier Islet, Scott Reef, Seringapatam Reef, and Browse Islet subject to the following conditions:

1. The operations shall be limited to traditional fishermen;
2. Landings by Indonesian traditional fishermen for the purpose of obtaining supplies of fresh water shall be confined to East Islet and Middle Islet of Ashmore Reef;
3. Traditional Indonesian fishing vessels seeking shelter may do so within the island groups mentioned above, but persons shall not go ashore except as mentioned in (2) above.

The memorandum stipulated further that Indonesian fishermen would not be permitted to take turtles in the Australian 12-mi exclusive fishing zone. Trochus, beche de mer, abalone, green snail, sponges, and all molluscs can be taken from seabeds adjacent to Ashmore and Cartier Islands, Browse Islet and Scott and Seringapatam Reefs.

Implementing the memorandum has not been easy. Up to this day, despite numerous circulars issued by either the Directorate General for Fisheries or the local governments fishermen have continued to violate the memorandum. It has not been easy also to ask the traditional fishermen to refrain from going onshore of an island where they have traditionally visited for ages. The problem was therefore more one of education rather than one of law enforcement. It is fortunate that up to the present, the Australian government has shown sufficient understanding of the complexities of an enforcement action.

Recently, Australia has also declared its intention to enforce a 200-mi economic zone around its territory. The 200-mi area, if claimed by Australia, although it has not been clearly delimited, would almost certainly affect the fishermen from neighboring countries, especially fishermen from Indonesia who have been fishing in the area. This is something different from the traditional fishermen discussed above. Taking cognizance of this fact, Australia has also indicated its willingness to consider the matter and has offered the states concerned, including Indonesia, opportunities to discuss whatever fishing interests Indonesia has in the area which would be claimed as part of Australian exclusive economic zone. The matter is now under serious study by the states concerned.

### Conclusion

At present the only important agreement on fisheries concluded by Indonesia is the interim arrangement of 1968 with Japanese Fishing and Tuna Associations to fish in the Banda Sea area. After several renewals, the interim arrangement was replaced in 1975 by a profit sharing arrangement between the Indonesian State Fisheries Enterprise and the Japanese Fishing and Tuna Associations. The terms of the interim as well as the profit sharing arrangements were not really profitable to Indonesia. It felt that the terms set forth in the interim arrangement and the profit sharing system needed revision. The arrangements concluded in the past have had many political overtones.

Enforcement of these arrangements has not been easy. Firstly, some of the fishing vessels themselves were reluctant to report to the Indonesian naval authority at Ambon after completing their fishing activities. Secondly,

the area of fishing was too large for the limited number of Indonesian patrol facilities to effectively supervise, resulting in many violations committed unnoticed. Thirdly, the Indonesian law enforcement capabilities themselves were extremely limited either in number, equipment, or other facilities. The emphasis on economics in the Indonesian development program within the last two Five-Year Development Plans has failed to strengthen or improve Indonesian surveillance capabilities for law enforcement at sea. Fourthly, while there was inadequacy in the capability and the efficiency of the law enforcement agencies at sea, the procedures involving judicial solution for any violators caught also required improvement, particularly in speed. Finally coordination among the various law enforcement agencies at sea was poor. It is a well-known fact that in Indonesia the navy, police, immigration, customs, and communications offices has its own enforcement jurisdiction and officers at sea. Although in theory these agencies are under the operational command of regional Defense Commanders, in practice it has not been easy for them to coordinate their activities at sea.

The other arrangement that Indonesia will make with regard to fishing activities in its archipelagic waters concerns the implementation of the traditional fishing rights of the immediately adjacent neighboring states in certain

areas of the archipelagic waters. The details of these arrangements must be negotiated and determined further through bilateral agreements.

Indonesia also has problems concerning its traditional fishing rights in waters off the coast of some of its neighbors. Some of these rights, such as the right to fish off the coasts of Australia, have been regulated through bilateral arrangements. However, more time is needed to effectively implement and enforce such arrangements, especially since traditional fishermen concerned have to be fully educated to get used to the new arrangement.

For various reasons, Indonesia has not yet declared its own exclusive economic zone, although it will certainly do so within the shortest possible time. If and when Indonesia decides to enforce its own exclusive economic zone, it would almost certainly conclude bilateral agreements with the relevant landlocked and "geographically disadvantaged states" in the subregion of Southeast Asia to enable fishermen from those countries to participate in the exploitation of the surplus living resources within the exclusive economic zone. Similarly, if and when Indonesia declares and enforces its own exclusive economic zone, it would also certainly undertake negotiations with the relevant neighboring countries to delimit the exclusive economic zone of these countries.

# Implementation of Regulations for Domestic Fishermen

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## Introduction

Fishing is a very important industry in Southeast Asia. It not only generates employment but also provides the greatest source of animal protein for the people in the region. Approximately one-half or more of animal protein is supplied by fish. The actual percentage varies from country to country. In recent years Southeast Asian countries have witnessed the rapid development and expansion of their fishing industries. A number of problems associated with management of fishery resources have been brought about by this rapid expansion of the fishing industry.

One of the most critical problems in Southeast Asian fisheries is the steady depletion of inshore marine resources. A number of fisheries scientists have observed that the fisheries in this region, especially the coastal resources, seem to be overexploited or nearly so. Similar observations were made by participants in the workshop on fishery resources in the Malacca Straits.<sup>1</sup> The fishery resources here were noted to be at least moderately heavily fished and some stocks have reached full exploitation. Increasing the number of fishermen or improving the efficiency of the present number of fishermen may not increase the quantity of catch. The workshop also noted that for all the stocks in the Malacca Straits, any substantial increase in fishing will result in a significant drop in the catches of fishermen already exploiting the stocks.

Almost similar conclusions have been made by participants in the Southeast Asian Fisheries Development Center (SEAFDEC) Technical Seminar on South China

Sea Fisheries Resources held in Bangkok in 1973.<sup>2</sup> The Seminar noted that many fisheries within the region are gradually reaching full exploitation and that unless suitable action is taken to control this, economic waste, social distress, and damage to the resources will result. There are indications that overfishing has led to a decline in the proportion of high valued species, a decline in the size of fish caught, and an increase in the quantity of trash fish. In Malaysia before 1966 less than 16% of the total landings consisted of trash fish. Now more than 33% of the total landings from all types of gear are trash fish. This tremendous increase is attributed mainly to trawlers whose average catch consists of up to about 70% trash fish. While a portion of the trash fish consists of uneconomic species, sometimes a significant portion of catch consists of juveniles of economically important species. Jones (1976) reported that 27% of the trash fish from trawlers consists of juveniles of economically important species.

Most indicative of overfishing is the rapid decline in the average catch per unit effort. In spite of poor available statistics, indications of decline in catch per unit effort were noted at the seminars on fish stocks in the Straits of Malacca and the South China Sea. An analysis of the data of Mohd. Shaari (1976) showed a tremendous decrease in catch per unit effort in the trawl fishery off the Northern half of Peninsular Malaysia (Fig. 1).

Another proof of overfishing in Malaysia is the drop in total fish landings in recent years despite increases in the number of fishermen and fishing vessels. One exam-

<sup>1</sup>Report of the Workshop on the Fishery Resources of the South China Sea Fisheries Programme, SCS/GEN/76/2.

<sup>2</sup>SEAFDEC Technical Seminar on South China Sea Fisheries Resources, 21-25 May 1973. Bangkok, Thailand. SEAFDEC/SCS 73.

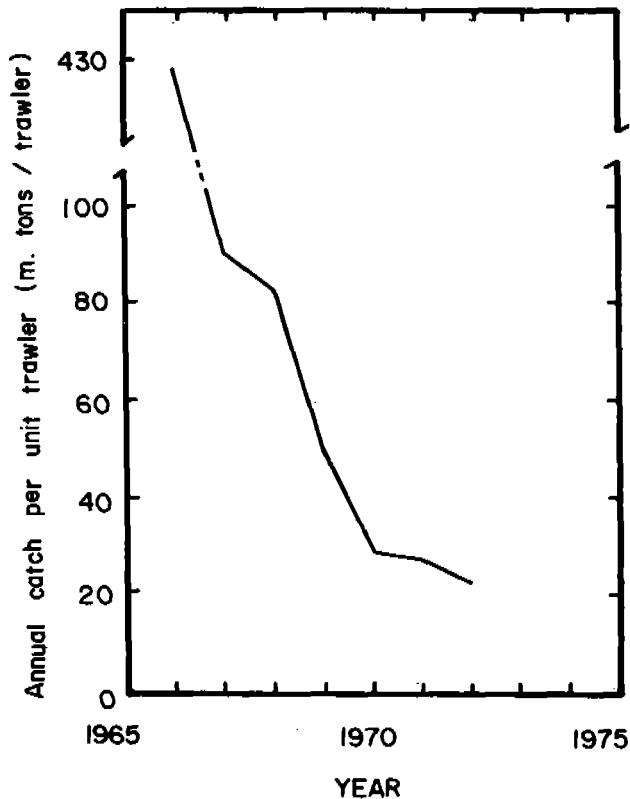


Fig. 1. Catch per unit effort of trawlers off Perak, Penang, Kedah and Perlis (Based on Mohd. Shaari 1976).

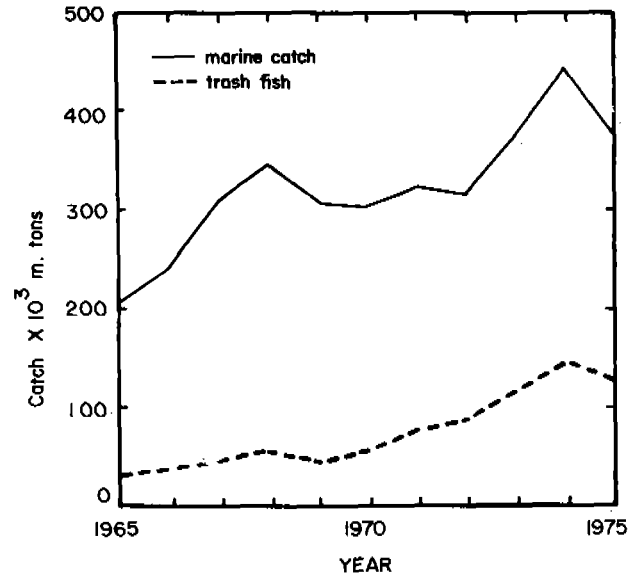


Fig. 2. Total marine landings and landings of trash fish in Peninsular Malaysia.

ple is the 14.6% decrease in total annual landings in 1975 as compared to the annual landings in 1974. The total catch in 1975 was 375,235 mt tons as compared to 459,574 mt in 1974. While the annual catch sometimes decreased, the landings of trash fish continued to increase (Fig. 2). Although an analysis of total landings indicates overfishing in the fisheries of Southeast Asia, analyses of the landings of an individual species or even genus of commercial importance can give better insight into the fisheries. Examples of such analyses are presented in Figures 3, 4, and 5. In Figure 3 can be seen a rapid increase in the annual landings of *Rastrelliger* in Peninsular Malaysia during the early 1960s. Since 1968 however, there has been a drastic decline in the *Rastrelliger* catch, suggesting that these stocks off Peninsular Malaysia may be overfished. Some of this decline may be due to natural fluctuations although the relatively small size of fish in recent catches suggests that overfishing may be the major reason. A similar pattern of rapid increase in fish landed followed by a sharp decline in annual catch is true for most of our commoner fishes, e.g. *Stolephorus* (Fig. 4). There are at present few data on the status of any individual species.

The rapid development of small trawlers in Indonesia, Malaysia, the Philippines, and Thailand during the early 1960s has led to severe conflicts with local

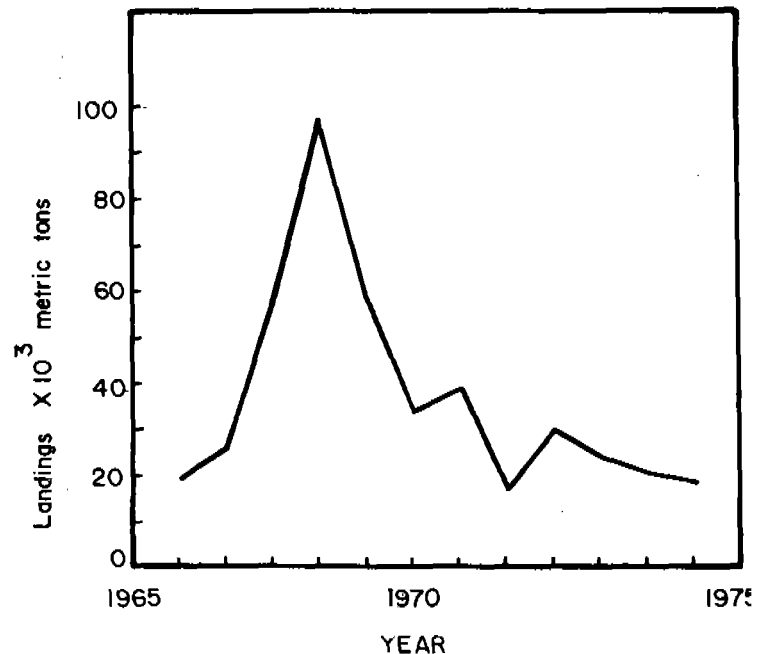


Fig. 3. Landings of *Rastrelliger* sp. in Peninsular Malaysia.

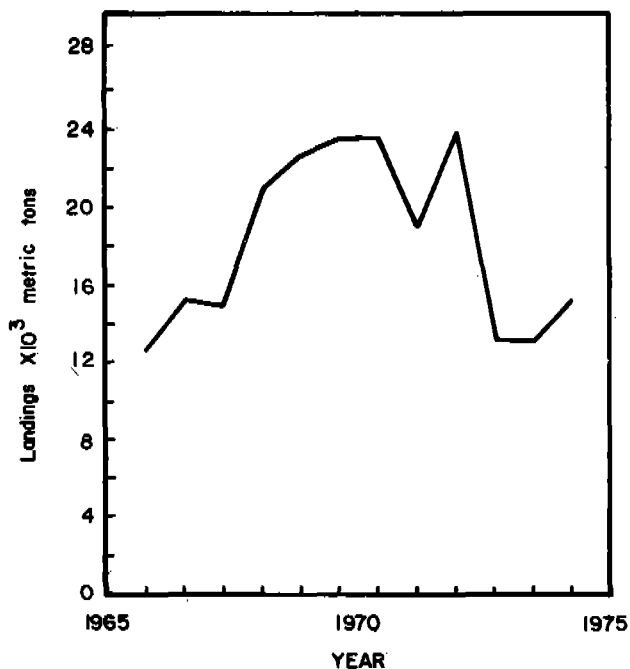


Fig. 4. Landings of *Stolephorus* sp. in Peninsular Malaysia.

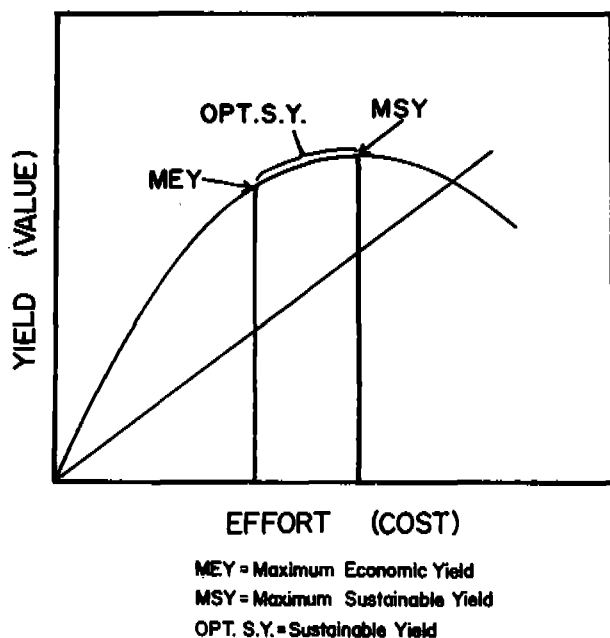


Fig. 5. The relationship between yield and fishing effort.

small-scale fishermen using different types of gear, particularly hand lines, gill nets, bag nets and other small gear. Artisanal fishermen resisted the introduction of trawlers because they considered trawl fishing an indiscriminate fishing method which had adverse effects on the spawning and breeding grounds of fish and prawns. They also feared competition from trawlers. During the early introduction of trawling there was much destruction of inshore gear especially bag nets and drift nets. This aggravated the conflict between trawlers and artisanal fishermen.

In west Malaysia a total of 113 clashes between inshore and trawler fishermen were reported between 1964 and 1976 (Goh 1976). These clashes, involving 437 trawlers and 987 inshore vessels, resulted in 34 deaths. In reviewing the conflict in West Malaysia, Goh (1976) noted that the greatest tension and conflict occurred in areas where there existed critical problems of steady depletion of inshore marine resources. One such area is the stretch from Penang to Pangkor Island where 90% of the clashes occurred.

Another important problem confronting managers of fisheries resources in this region is the extent of illegal fishing and the lack of success of their current enforcement programs. All of the countries have legislation regulating the fishing industry. Most of this legislation attempts to deal with the conflicts of fishermen who use different types of gear. All countries within the region have prohibited trawling in coastal areas. Some are more restrictive than others. In Malaysia otter trawl nets are restricted according to the distance from the coast as follows:

- Vessels of 100 gt and above with 200 hp and above should be used only in waters beyond 12 mi.
- Vessels of 25 gt and above with 60 hp and above should be used only in waters beyond 7 mi.
- Vessels of less than 25 gt and with less than 60 hp should be used only in waters beyond 3 mi.

Exceptions are permitted from November to February in the east coast of Peninsular Malaysia.

Vessels of less than 25 gt and less than 60 hp fishing with otter trawl nets are only permitted to fish between 0600 and 1800 hours.

The use of beam trawl nets to catch prawns is prohibited.

In Thailand trawling is not permitted within 3 km from the shore. Further, no trawling or push netting is permitted in a region between Sittracha and Sattaheep, this region being an important nursery ground for demersal fish species. No daytime trawling is permitted in a spawning region for *Rastrelliger* from February till the end of March.

In the Philippines no trawling is permitted in depths

less than 7 fathoms.

There appear to be widespread violations of these prohibitions in all the countries.<sup>3</sup> Trawlers continue to poach in prohibited areas because of the location of prawn resources which have a high economic value. The intrusion of trawlers into prohibited coastal areas is one of the most pressing problems facing fisheries authorities in this region. Enforcement of these prohibitions has not been very effective despite complaints from inshore fishermen about the illegal poaching.<sup>4, 5</sup> Poor enforcement of these prohibitions contributes greatly to the conflicts within the fishing industry. All the countries within the region need more personnel and vessels for enforcement. There are allegations that enforcement officers can be easily bribed. These problems as well as the apparent leniency of the courts encourage illegal fishing. Another cause of poor enforcement is the political influence of trawlerfishermen. One example of this is that when one trawler boat in a fleet of about 1250 trawlers was caught for illegal fishing, all 5000 fishermen in these trawlers stopped fishing.<sup>6</sup>

Many trawlers in this region fish without licenses despite existing legislation requiring them to have such. In Malaysia it has been estimated that in addition to the 4000-odd licensed trawlers, are more than 4000 unlicensed trawlers. These unlicensed trawlers contribute greatly to excessive fishing effort and to the problems of fisheries management in Southeast Asia. These unlicensed trawlers also contribute to the overexpansion and overcapitalization in the fishing industry (Yap 1973).

Another form of illegal fishing is poaching by foreign fishermen within the territorial waters of Southeast Asian countries. Illegal fishing by foreign vessels normally occurs at the fringe of each country's territorial waters. In some places poaching is so rampant that authorities have taken a very serious view of it. One example is the illegal poaching by fishing vessels from foreign countries in Malaysian waters in the South China Sea near Mersing. In response to this Tan Sri Abdul Kadir Yusof, Law Minister of Malaysia, issued a warning that foreign fishermen who intruded into these waters and catch fish using explosives will be charged under the Malaysia Internal Security Act which metes out the death penalty to violators found guilty.<sup>7</sup>

Another serious problem confronting the management

of fisheries resources is the use of illegal gear both by foreign and local fishermen. Although "destructive" fishing methods, e.g., the use of dynamite, poison and electricity, have been banned, violations of these prohibitions are frequently reported. There are also reports on unscrupulous fishermen using tuba root and sometimes pesticides to poison fish.<sup>8</sup> These methods of fishing are very destructive as their use destroys all fish including fry. There is also the potential danger of poisoning from eating such fish.

Fishing by electricity also causes tremendous wastage as the young fish are much more susceptible than the large fish. In a few places crudely assembled instruments are used, posing tremendous risk to the fishermen.<sup>9</sup>

In most countries severe penalties are given those who use explosives in fishing. In Malaysia the possession and use of explosives for fishing is covered by the Internal Security Act which metes out the maximum penalty of death.

Piracy and poaching by foreign fishermen and vessels in the domestic waters is another problem. This problem is expected to grow with the extended jurisdiction of the economic zones. In some cases these foreign fishermen use illegal methods such as explosives for fishing. In other instances it is a question of encroachment. A number of reports of piracy and kidnapping of fishermen and vessels have been reported.

It is clear from the above that there are several problems confronting management of fisheries in Southeast Asia. These problems, though unrelated to the changes in the Law of the Sea, must be resolved before the potential benefits of the extended jurisdiction can be realized.

The establishment and implementation of effective management is of critical importance to all fishing industries in Southeast Asia. Without effective control very little benefit can be derived from the exploitation of fisheries resources or from investments made. Temporary benefits may be obtained through some management efforts or through the adoption of technological innovations. These benefits will quickly be dissipated as greater pressure on the fish stocks will lead to reduced yields and lower income.

### Objective of Fisheries Management

The principal need of any fisheries management program is a clear set of well-defined objectives that everyone in the fishing industry clearly understands. Failure

<sup>3</sup>"Fishermen Hit by Invasions." *Echo*, Malaysia, 4 August 1976.

<sup>4</sup>"Poaching by Trawler Hits Perak Fishing Folks," *Malay Mail*, Malaysia, 28 February 1977.

<sup>5</sup>"Illegal Fishing," *Star*, Malaysia, 24 April 1978.

<sup>6</sup>*New Straits Times*, Malaysia, 10 May 1978.

<sup>7</sup>"Foreign Fishermen Warned," *Star*, Malaysia, 19 January 1977.

<sup>8</sup>"Poisoning Fish," *Malay Mail*, 6 August 1977.

<sup>9</sup>"Catching Fish by Electricity: A Warning," *New Straits Times*, Malaysia, 18 July 1977.

to adopt such objectives greatly affects all aspects of fishery management. The absence of well-defined objectives gives rise to confusion as to the kind of regulations needed for proper and effective management. Decisions tend to be ad hoc and haphazard and give rise to contradictory fishery programs which offer limited benefits to the fishing industry.

A fishing industry with well-defined objectives will enable the authorities to adopt proper regulation. Fisheries scientists will be able to collect the right type of data to support management efforts. Fishermen will then be in a better position to understand all regulations and support all management programs.

It is possible to adopt various objectives for the fishing industry. Some of the objectives are:

1. Maximum sustainable yield
2. Maximum economic yield
3. Maximum employment opportunities
4. Maximum production for exports
5. Maximum production of animal proteins
6. Increased efficiency of the fishermen
7. Optimum sustainable yield

The above list is not complete as there are other objectives proposed by policy makers, scientists, administrators, and fishermen. While all of these objectives are by themselves laudable, unfortunately it is not possible to adopt all of them for a particular fishery as some of the objectives are in direct conflict with the others. For example, the objective of maximum economic yield is in direct conflict with the aim of increased employment opportunities. It is not possible to simultaneously and successfully pursue both objectives in a fishery. Similarly, the goal to increase efficiency of fishermen via the introduction of technology and advanced gear runs counter to the need to maintain employment opportunities. If dual objectives of increased efficiency and maximum employment are adopted, the increased income, because of the introduction of technologically improved gear, will attract more people into the fishing industry. This was evident when trawlers were introduced in Malaysia. Unfortunately, the majority of these people were unemployed urban youths who were not from the existing fishing community (Gibbons 1976). The increase in productivity and production has not been accompanied by a significant reduction in poverty or an improvement in the level of living of traditional fishermen. Most of the economic profits from the modernization was reaped by boat owners who had little or no previous experience as fishermen. On the other hand, the increased productivity and exploitation had a greater pressure on the fish stocks and led to subsequent declines in catch per unit effort and productivity. Conflicting objectives of management have led to a variety of results, most of them bad.

Maximum sustainable yield is a useful objective of fishery management especially for the conservation of fish stocks. However, strict adherence to the maximum sustainable yield concept will not achieve socioeconomic goals (Crutchfield 1967; Rothschild 1971). While maximum sustainable yield may be a useful guideline as to the limits of exploitation of a fishery, socioeconomic objectives should be considered in any fishery management program.

A concept of optimal sustainable yield may be useful for the fisheries in Southeast Asia. This optimal sustainable yield is at a level of exploitation somewhere between the maximum net economic yield and the maximum sustainable yield (Fig. 5). This objective takes into account the maintenance of fish stocks as well as the socioeconomic aspects of fisheries. This optimal level of exploitation should be based on analyses of the interest to all users of fishery resources. It should ensure reasonable wages and a reasonable return on investments for those involved in the fishing industry. Further, unless otherwise necessary, the maximum sustainable yield should never be exceeded.

#### Allocation of Resources

The basis of regulations governing the use of fishery resources is usually the status of the stocks. However, allocation of the resources and the economic status of the user are obviously involved. Unfortunately, insufficient attention has been given to the allocation of resources among user groups in the management of fisheries.

Conflict between traditional inshore fishermen and trawler fishermen has developed as a result of poor allocation of resources between them. They essentially compete for similar resources. This problem is a consequence of the common property nature of fishery resources, and its importance increases with the increased competition for fish.

The allocation problem is not unique to the fisheries in Southeast Asia. It is a difficult issue that managers of fishery resources must consider. In Southeast Asia fishery managers must make decisions on the allocation of resources between traditional artisanal fishermen and those using trawlers and other modern gear. The recurring conflict among different user groups is clear evidence that there is an urgent need for proper allocation of fishery resources.

With resources becoming more scarce and the problems more critical, fisheries management in Southeast Asia should immediately take steps to solve this problem. A useful policy would be to reserve the inshore resources including the important prawn resources to the more selective traditional or artisanal gear. Trawling fleets should be developed to exploit only offshore fish-



ery resources. The traditional gear should be improved to increase their selectivity and efficiency in exploiting prawn resources.

Serious consideration should be given to the allocation of an adequate area or adequate resources to maintain fauna assemblages or population of certain species for conservation purposes.

#### **Methods of Fisheries Management**

As a number of fish stocks in this region are either becoming fully exploited or are already overexploited, fisheries authorities must examine the various methods by which they can regulate fisheries to achieve optimum fishing. This optimum fishing should take into consideration the biological and economic aspects of the fisheries.

The productivity of a fishery is related to four main variables: (1) growth rate of the fish, (2) recruitment of fish into the fishery by reproduction or migration, (3) natural mortality of the fish, and (4) fishing mortality. Of these, we have no control over natural mortality and rate of growth. We can control fishing effort and recruitment into the fishery. Recruitment into the fishery is controlled mainly by regulating the age at which fish enter the exploited phase of the fishery.

All schemes for regulating fisheries can be classified as those to control fishing intensity and those to control the age at which fish entered the fishery. The two basic methods of regulation are:

- (1) Control of fish effort
  - (a) catch limitation
  - (b) control of fishing intensity (effort)
  - (c) reduction of fishing time
  - (d) protected area
- (2) Control of age of entry into fishery
  - (a) minimum mesh size regulation
  - (b) minimum size of fish
  - (c) protected area

These two groups of methods are complementary and not alternatives. Regulations for optimum fishing must concern both. The main consideration is therefore one of deciding which method or combination of methods is most effective in regulating the fishery at its optimum.

#### **Control of Fishing Effort through Catch Limitation**

Catch limitation or the establishment of annual or seasonal quotas for regulating fisheries is an indirect method of controlling fishing effort. When quotas are filled, fishing is stopped. With this method no consideration is given to the exact size of the fishing fleet and the methods of fishing. Although the regulation by catch limit may be administratively simple, there is no precise

control of the fishing. This method of regulation requires a very precise estimate of the total fish landed, and hence a very extensive infrastructure for the collection of data as fish is landed in numerous fishing villages in all the countries. This method appears to be very costly and difficult to enforce. Furthermore this type of regulation may result in extremely short fishing seasons, as in the Pacific Halibut Fishery between 1941 and 1952 where quotas were the only regulative methods adopted (Bell 1970). However, the greatly improved fishing resulting from catch limitations induced a large influx of new fishing vessels, thereby doubling the fleet. With this uncontrolled entry into the fishery, quotas were filled within a very short time. The fishing season, originally about 8½ mo, was reduced to about 1 mo. There was no fishing for the rest of the year. If this method were adopted as the only method for regulating fisheries in Southeast Asia, a similar problem of short fishing seasons could arise. The harmful effects of short fishing seasons will be more pronounced as there is no alternative fishery or employment for fishermen.

Whereas quotas may be suitable for sport fisheries, it should be avoided for social and economic considerations in commercial fisheries.

#### **Control of Fishing Intensity**

Control of fishing intensity is one of the most important methods of regulating fisheries. Even when it is feasible to establish other regulative methods, it is still necessary to stabilize fishing rates at reasonable levels; otherwise, the benefits of regulative measures will be lost. This regulation method limits the entry of manpower and vessels into the fishery. It is practiced, although sometimes not successfully, in all fisheries in Southeast Asia.

With this method of regulation, restrictions are placed on the number of fishing vessels or gear for each fishery. The number of licenses issued should be limited to some predetermined number based on the policy for that particular fishery. This limitation should take into consideration biological, economic, social, and political factors.

Fishing intensity is very responsive to economic influences. To maintain it constantly at optimum, it is necessary to fix it by limiting the number of pieces of gear and vessels engaged in the fishery. If fishing intensity is not controlled, it will continue to increase until inefficiency, caused by scarcity of fish, eliminates the incentives for expansion. This will give rise to the dual problems of overexpansion and overfishing.

Effective control of fishing effort at a predetermined optimum will maintain optimum abundance of fish and hence provide optimum yield; permit efficient use of

manpower and equipment; and permit improvement in the earning and living standards of fishermen.

The potential benefits of this regulation can be achieved only if the limits of fishing intensity are properly determined and the limitations are strictly enforced. The failure of current fisheries authorities in Southeast Asia to prevent overexploitation is mainly due to lack of enforcement, and hence, the presence of a large number of unlicensed vessels. As far as the fish stocks are concerned, any fishing activity, licensed or unlicensed, will apply pressure on them. The actual fishing intensity is the sum of all fishing activities, legal or illegal. This is an excellent method of regulating fisheries. Unless enforcement is improved and unless more effective measures are adopted to check illegal fishing, this method of regulation will fail.

The importance of regulating fishing intensity in fisheries management must never be underestimated. The success or failure of any fishery management program largely depends on whether it can maintain fishing intensity at or near the optimum. This is best done by limiting the number of boats and gear engaged in the fishery. If the fishing rate is excessive, it can be reduced by eliminating some of the units or by requiring each unit to operate at less than its capacity. The biological effects of both methods of reducing fishing intensity are the same but the social and economic consequences are vastly different.

Methods to reduce the fishing efficiency of each vessel are much more difficult to implement as they impose hardships for the fishermen. There will be an immediate decrease in catch. Unless the reduction in catch is matched by a corresponding increase in the price of fish, there will be a reduction in income for the fishermen. It will be extremely difficult to convince fishermen to accept short-term losses for future potential increases in income. Even if regulations are implemented, it will be difficult to enforce them.

When there is excessive capacity in the fishery, a better alternative is to gradually reduce the fishing fleet by discarding the oldest and least efficient vessels. There is much merit in the recent attempts by the Canadian Fisheries Authorities to reduce excessive capacity by introducing the "buyback" policy.<sup>1</sup> Governments in Southeast Asia should consider subsidies to the fishing industry and use the money to remove old and inefficient vessels from the fisheries. This should be examined together with programs to find alternative employment opportunities for fishermen, especially in aquaculture pro-

grams as a long-term solution to the problems of excessive fishermen in the fishing industry.

The problems associated with reduction of excessive fishing capacity—either excessive fishermen or fishing vessels—are very great. It is a better policy to determine the optimal effort of a fishery before expanding it. Furthermore, during the exploration and location of new fishery resources, it is important that both the standing crop and the maximum sustainable yield are estimated. Limits to the fishing intensity in these new fishing grounds, either inshore or offshore, should be established before the fish stocks are exploited. The limitation of fishing effort should consider biological, social, and economic factors but should not exceed the maximum sustainable yield unless absolutely necessary. Only when the fishing rate is predetermined can the problems of overfishing and overcapitalization in the fishing industry be solved.

### Control of Fishing Time

Restriction of fishing to selected seasons has been tried in some temperate countries. The concept of seasonal fishing may not apply directly to tropical areas. A modification of seasonal fishing with respect to specific areas or zones may be useful in some fisheries.

Limitation of fishing time may be useful if there is a need to immediately reduce fishing effort due to scarcity. A good example is the regulation permitting trawling for 6 d a week. This will reduce the effective fishing effort of the trawlers by one-seventh. The fishing effort can be reduced further by limiting trawling or other fishing methods to 5 da or less per week. Under certain conditions these regulations are enforceable although such methods increase the cost of fishing.

Limiting fishing to specific times has been implemented to improve enforcement of fishery regulations. In Malaysia otter trawlers of less than 25 gt with less than 60 hp are only permitted to fish from 0600 to 1800 hr. Although this reduces illegal fishing by trawlers at night, additional poaching problems are presented by larger trawlers.

### Protected Areas

The establishment of specific sanctuaries in the fishing grounds to protect fish during specific stages in their development or to protect the species may provide a partial solution to the problem of overfishing. The creation of a sanctuary in areas which have large concentrations of juvenile fish or are known spawning grounds will protect these young fish until they are much larger. Furthermore, fish within these specific reserves will mature and breed with greater success. This concept of specific re-

<sup>1</sup>Report of the Workshop on the Fishery Resources of the South China Sea Fisheries Programme, SCS/GEN/76/2.

serves has been used quite successfully in the management of wildlife and forests.

The location of these specific reserves is very important as the enforcement of such protected areas largely depends on their location. Furthermore, if these areas are chosen based on biological, geographical, and aesthetic factors they will be useful educational tools to inform fishermen and the public on the need and importance of proper management and conservation of fishery resources. Support of fishermen and the public for conservation of fishery resources will greatly help the introduction and implementation of proper management policies.

Enforcement of specific reserves may be much easier to implement as management can concentrate enforcement units within these specific reserves. Moreover, I have been informed by some trawler fishermen that they would help patrol these specific reserves if they are created. A scheme such as the "Rukun Tetangga" scheme in Malaysia can be implemented to provide surveillance within the area on a voluntary basis. For fishery reserves or marine reserves, fishermen living near these reserves could help provide surveillance.

Closed areas is an imprecise method of managing these fisheries as it cannot maintain the spawning stock at any desired level. It generally results in overstocking of the sanctuary areas and understocking of the unprotected areas. In spite of their inefficiency these sanctuary areas could provide breeding as well as nursery grounds for fish. Stocks of fish within these sanctuaries could migrate and replenish the exploited areas of the fisheries.

### Mesh Regulations

A method to control the age of entry of fish into a fishery is the establishment of legal minimum mesh size of fishing nets. This method is widely used in temperate countries, especially in fisheries exploiting a single demersal species. A mesh size regulation reducing the capture of young and small fish could possibly increase the yield of some of the larger and more valuable species.

If the mesh size of fish nets, especially those of trawlers, is increased, many smaller fish will be able to escape through the meshes. Soon these small fish will grow until they are big enough to be caught by the net. With suitable mesh size the increase in weight of fish caught will more than balance the reduction caused by escapement. There will also be an increase in the population of larger, mature fish and this may result in greater production of young fish.

The fisheries in this region are based on a great variety of species. The optimum mesh for each species is

different, depending on the species' size and shape. Most of the countries within Southeast Asia have established minimum mesh size limits for some gear.

In the establishment of minimum mesh sizes especially for trawlers, overemphasis may be placed on the ability of trawlers to catch small fish, especially those that are unable to grow larger. While ensuring that trawlers can exploit these resources, fisheries administrators may have encouraged the development of a nonselective gear which endangers the stocks of other commercially important fish. This contributes greatly to the conflict between the trawlers and the artisanal fishermen. If the mesh sizes of trawl nets were made larger they would allow the escape of juvenile fish as well as fish and prawn that are small by nature. These naturally small fishes could be exploited by other more specific gear especially those used by artisanal fishermen. With some modification and development, traditional gear will be able to exploit these resources specifically without endangering the stocks of juvenile fish.

By the introduction of larger mesh sizes it may be possible to reduce the competition for similar resources between traditional gear and trawlers. This reduction in competition will also minimize the conflict within the fishing industry. Moreover, if the mesh sizes of trawl nets are such that they cannot catch small fish and prawn resources effectively, then trawlers will be forced by economic factors to go further out to sea to fish and thereby reduce the problem of encroachment into coastal waters by trawlers.

In a recent analysis of the trash fish in the commercial landings of fish in Southeast Asia, Aoyama (1973) reported that there was a wastage of young fish. The ratio of trash fish to total catch was very high. Based on his analysis he recommended that the mesh size of trawlers in Southeast Asia be enlarged to over 50 mm.

### Size Limits

Minimum size limits are established to increase the sustainable yield by allowing more animals to mature and increase reproduction. Size limits have been cited as the most effective method of managing some stocks. This method of regulation has been adopted by Malaysia to regulate the cockle (*Anadara granosa*) fishery. The Malaysian regulation states that:

(1) No cockle which is less than  $\frac{1}{4}$  inch, measured in a straight line across the widest part of the shell, shall be taken for the purpose of transplanting to a cultured cockle bed.

(2) No cockle which is less than  $1\frac{1}{4}$  inches, measured in a straight line across the widest part of the shell, shall be taken for consumption.

Unfortunately no legislation for teleosts exists. A size limit can be used to enforce the closure of nursery areas to fishing and encourage the fleet to search for larger fish and thus avoid the nursery grounds. Size limits may be useful for the *Rastrelliger* fishery in Southeast Asia.

In practice, a size limit is valuable in enforcing a mesh regulation for different species whose habitats do not overlap. In a multispecies fishery it may be easier to introduce and enforce minimum size limits than mesh size regulations. Where a mesh regulation exists and fishermen voluntarily adopt it, there will be no need for size limits. Mesh regulations normally release a large number of fish; hence there is temptation to use a smaller mesh size, especially in a fishery where it is virtually impossible to ensure that all fishermen adhere to the mesh regulations. If minimum legal size is the only regulation, there will be an increase in the catch of small-sized fish which cannot be landed. Unless these rejected fish can survive after capture, there will be wastage. This varies greatly with the species concerned. With the use of minimum size limit some wastage is inevitable. Unless there is a reasonably clear-cut segregation and selection of large and small fish of a species, size limits will not be a useful measure to adopt.

#### Choice of Regulation Methods

The choice of methods of regulation should take into consideration economic, biological, social, and political factors existing within the fishery. Methods that are difficult to enforce are less likely to succeed than methods that are slightly less efficient but more easily enforced. In selecting the method of regulation the cost of enforcement should be taken into consideration. It will be difficult to sustain the enforcement of regulations that are too expensive and are beyond the economic value of the resource.

It will be extremely useful to discuss various regulative methods with fishermen's associations and cooperatives before a final decision is made. The extent of support from fishermen for various regulative methods depends on their perception of the regulations adopted. Support from fishermen will be greatly weakened if they feel that there is little or no benefit at all for them. With regulations that are designed to redistribute the fishery resources, fishermen who feel that the redistribution is unfair will have little incentive to abide by it. Although such regulations may be useful to the fisheries in the long term, they will be extremely difficult to implement. In such cases it will be better if fishermen are first convinced of the need to conserve fish stocks. In quite a number of fisheries, including those exploited by trawlers, this will not be too difficult, as the recent poor

catches have convinced many fishermen of the need to conserve. Some trawlerfishermen are convinced that fish stocks can be exploited to extinction. If fishermen are convinced of the depletion of fisheries resources and the need for control, then implementation of regulative methods will be much easier. They will then be more willing to help in surveillance efforts, and there will be peer pressure to observe the regulations.

Regulations drafted wholly by officials may be inadequate because officials do not have access to many of the pertinent economic and social facts known only to fishermen.

While there may be many different methods in regulating fisheries as discussed above, one stands out as critical to the proper management of fisheries. If there is satisfactory control over the fishing intensity as well as over new entries into the fisheries, measures adopted to maximize the economic returns from the fishing industry will be fruitful. While the other methods are useful in managing fisheries, they can at best provide only short-term benefits unless there is effective control of the level of fishing. Where there is no effective control of the amount of capital and labor that can enter a fishery, the total costs of the industry will rise until they equal the total revenues. Licensing systems to control entry into fisheries are already operating in the region. They may require improvements especially in their implementation before the benefits can be evident.

Effective control of fishing effort will:

1. Maintain optimal abundance of fish stock and hence yield.
2. Permit close approach to fully efficient use of manpower and equipment.
3. Permit improvement in the earnings and living standards of fishermen.

#### Enforcement

Perhaps no management problem is greater for fisheries authorities and fishermen than that of enforcement. Although there is a variety of regulations for fishery resources, there is considerable difficulty in ensuring that these regulations are adhered to. This is particularly true of the Southeast Asian fisheries.

The most important task is to raise the morale of enforcement officers and to replace corrupt ones. At the same time the efficiency and number of patrol vessels should be increased. Aircraft with modern detection devices should be introduced to carry on surveillance within the fishing grounds. This can be done with other surveillance activities such as the control of smuggling and piracy.

There is an urgent need to eliminate bribery in the

fishing industry. Illegal fishing by fishermen must be stopped as it encourages bribery. Fisheries authorities in Southeast Asia must solve the problems of the unlicensed vessels. Licensed or not, they exert pressure on fish stocks. Wherever possible, those caught fishing illegally should be prosecuted.

The existence of an extensive number of unlicensed trawlers calls for a new approach to the problem. One possible solution is to declare amnesty for all unlicensed fishing vessels and then to license them. This will enable fisheries authorities to obtain better statistics and be in a better position to determine the effective fishing effort to be exerted. After the amnesty period, enforcement of regulations should be stricter.

Control of piracy and poaching by foreign fishermen can be achieved through strict surveillance and by introducing joint patrols at the border areas. For example, at the Thai-Malaysia border, vessels with enforcement officers of both countries can be used to patrol the fishing grounds. These joint patrols can be based on bilateral agreements or on one covering all of Southeast Asia. With the introduction of joint patrols, there will be a reduction in cost. Hot pursuit and arrest of the culprits can be more effective. The sensitive issue of nationality of pirates or illegal fishermen vis-a-vis that of the enforcement officers will be reduced. Although this suggestion may be new to Southeast Asia, a system of international control of approved regulations between members is provided for in the International Pacific Halibut Commission (Bell 1969).

#### **Suggested Strategy for Management of Domestic Fisheries**

While formulating policies and methods to regulate fisheries in this region, the authorities should take into consideration two fundamental elements—one concerning the common property nature of the resource and the other concerning the multispecies fish stocks exploited by different gear of varying efficiency. Two different strategies can be adopted. One is "composite regulation" where several different regulative measures either on an area or gear basis are adopted so that each major species or group of species is exploited at its optimum. With this type of strategy the criteria for optimum fishing will depend on the fishing fleet and the status of the fish stocks.

The other strategy is to have uniform regulation, that is, to accept the existing distribution of fishing effort and to stabilize the fishing effort in all the fisheries by similar regulations. Regulations will then be required to give the best average result for all species and all types of gear. This will be extremely difficult to implement be-

cause of the multispecies fishery in Southeast Asia.

There is no doubt that composite regulation of the fisheries in Southeast Asia would produce better results than uniform regulations. This is so despite the great overlap in the distribution of many species and the selection of existing fishing gear.

The main problem with composite regulation is the need to enforce regulations which apply to some areas and species but not to others. This seems insurmountable with the current status of enforcement. There is a greater dependence on voluntary conformity with regulative measures by fishermen.

One approach which can be adopted is to allocate the inshore fishery resource to artisanal fishermen and other selective gear, while the trawlers and other modern types of gear are restricted to the offshore fishing grounds. In adopting this allocation the boundary between the inshore and offshore fishing grounds must be clearly defined. The boundary must consider the distribution of fish as well as the implementation and enforcement of such boundaries. A useful factor in allocating fishery resources is the distribution of prawns. Competition for this resource is the main cause of conflict within the fishing industry. It may be useful to allocate the prawn resources to the inshore fishery. If this is accepted many of the problems can be solved. Even with this, there is a need to increase the selectivity of some gear as well as to improve other types of gear so that they can exploit the inshore resources, including prawns, more efficiently. The artisanal fishery can be developed with a policy of providing more employment, but due consideration should also be given to the status of the stocks to prevent overexploitation. The economic returns to fishermen can be regulated by regulating the marketing of fish.

The offshore fishery resources should be exploited by trawlers as well as other modern gear. Within this fishery, advances in technology and efficiency should be encouraged. In this fishery the common property nature of the resource can be curtailed by limiting the entry of fishermen.

No management program can be successful unless policy makers, fishery administrators, and fishermen themselves are convinced of the need for regulations and proper management of the fishing industry. This calls for an educational program to increase the awareness of all concerned for the conservation of fish stocks. Greater public awareness of the need to conserve fish stocks will bring greater support for management efforts.

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# Panel Reports

## Report of Group A

### Introduction

It is recognized that there is a lack of factual data, and even conflicting sets of statistics, on shared stocks in Southeast Asia. Hence there is a need for regional cooperative mechanisms for data exchange.

More specifically, there is a need for improved communication and information distribution. There is a need for a regional mechanism to stimulate and coordinate regional and national research and collection of data on types of equipment, use of research vessels, and teaching of skills. Such a regional mechanism, acting as a clearing-house among other functions, can carry out schemes for regional and national benefits which may be low on the scale of a particular state's priorities. It is recognized that some regional organizations already exist. The idea is to supplement and complement those already in existence.

A region-wide framework for more refined data collection is needed, especially in resource evaluation.

It is furthermore recognized that planners have, of necessity, to make timely decisions, but it is also recognized that there should be a firm basis for medium- and long-term research. In this respect there should be greater attention to improved research methodologies as well as fuller use of standardized methodologies.

There is also a widespread need to develop strong national research capabilities through education and training schemes. Also skills in fishery development and management should be built up.

It is emphasized that many of the problems reviewed here are clearly national problems. They become regional in cases when stocks are shared, for example. In such

instances, cooperative efforts such as regional tagging programs are clearly called for.

A division of labor in the area of cooperative research is needed.

A small but competent regional mechanism can keep track and coordinate activity of many kinds, provide a wider, balanced regional view, prevent waste in research effort, and can do some work more effectively than national bodies and also stimulate such national bodies.

### Allocation and Waste

Domestic and international arrangements to deal with allocation and waste may be necessary, but it is understood that institutionalized infrastructures are not necessarily a prerequisite for action.

It is emphasized that whatever measures are taken for resource allocation, some of the benefits derived should seep down to the traditional fishing communities.

There is a need to examine closely the efficacy of zone and catch quotas in relation to resource allocation.

In allocation and in the prevention of resource waste, enforcement of rules is an essential ingredient. Such enforcement could be achieved through suitable forms of agreements covering regulations on stocks and harvesting.

When there are such agreements, it is important that they incorporate clauses which help develop national capacities for enforcement against waste and infringement of agreed allocations.

To carry out resource allocation and waste prevention effectively, stable financing of research workers is needed. Also needed is the accumulation of a reservoir of skill in

terms of technology and management.

One negative point in this connection is the widespread practice of promoting highly skilled and experienced researchers to purely administrative functions. This leads to a loss of skill which should be remedied by a continuity of training programs.

The generally low remunerations of both research and administrative personnel works against motivation, commitment, and high competence.

Any form of bilateral, multilateral or regional arrangements should not infringe upon national sovereignties, insofar as possible. Care should be taken to ensure that benefits should exceed the costs.

Some problems cannot be solved except through such agreements. Therefore, it is advantageous to have mechanisms to facilitate such agreements.

It is recognized that political decisions may often be crucial in regard to allocation as well as in the making of agreements. In this sense bilateral arrangements may have some advantage over multiparty arrangements.

#### **Extensions of National Jurisdiction**

Extensions of national jurisdiction will lead to greater necessity for bilateral and other agreements since some states will get increased resources, while others get less.

Inevitably there is the problem of enforcement. Here there is a need for a summary review of mechanisms and costs involved. While there are opportunities for better management of resources, the techniques should be examined through cost-benefit analysis.

Extensions of jurisdiction will necessitate, among other things, a strengthening of security arrangements and pollution controls. These should again be seen in the context of bilateral or multilateral agreements.

One disadvantage is the possibility that international political problems will arise out of overlapping claims and loss of access to resources by some states. When highly sophisticated techniques are introduced in relation to traditional fishing rights, friction may well arise.

Extensions mean that traditional navigational methods, e.g., coast-hugging, use of coastal landmarks, and lack of a compass, may become risky for some traditional fishermen who may be accused of trespassing on another state's property. Education of such fishermen is therefore needed, as well as the building up of technological capability.

All this calls for proper policing of transit and passage in the region.

The responsibilities of coastal states claiming extended jurisdiction are emphasized. They should therefore develop their own capacities to respond effectively to these responsibilities. These responsibilities are outlined in the LOS III ICNT.

#### **Enforcement**

It is important to streamline national enforcement implementation procedures to minimize irregularities at all levels, where such irregularities are a problem.

Enforcement will be more effective if all personnel involved obtain improved remuneration and at the same time wrong-doers are faced by stiffer penalties.

To ensure against poaching and other infringement by distant water fleets or vessels, those caught should be given heavier penalties as has been done in some countries.

There should be cooperative working arrangements between neighboring states to better enforce rules.

In some cases, boarding of foreign vessels by research, technical, and other personnel will help in gathering needed data and in ensuring compliance. Also better education of fishermen to understand rules and to report infringements will help.

Regional cooperation in the use of satellite surveillance and "black boxes" (transponding devices) should be examined.

Some problems of enforcement include the fact that it may be expensive for governments.

Cost-benefit and cost-effectiveness studies are called for in relation to the building up of large patrol fleets.

Above all, in enforcement the coastal state has to weigh the effects of strict enforcement in the overall context of its relationship with the other states involved, in terms of trade, aid, capital inflow, etc.

#### **Some Other Observations**

The system of franchises should be examined in relation to use of resources.

Joint and cooperative ventures are suitable vehicles for development, technology transfer, teaching of skills, and capital inflow.

Private companies within the region should be encouraged to go into regional joint ventures. These "cooperative ventures" will strengthen regional capabilities and regional cooperation.

Joint or cooperative ventures will probably be based on high value species, and post-harvest processing will likely be involved. This will necessitate higher technology and skills to which the regional mechanisms, e.g., regional joint ventures, will have to respond. In this process, a movement of labor may be created. This labor should, where necessary, be provided by the traditional fishing communities, which should benefit from the creation of the new fishing ventures.

Ventures wholly owned by externals may create problems of compliance if the technological gap is too great.



Generally, joint ventures will help to ensure compliance with national regulations, as well as increasing

the effectiveness of resource use.

## Report of Group B

- I. The allocation of valued shared stocks of fish must be dealt with by bilateral, multilateral, or regional agreements among the states concerned.
  - A. Cooperative research is necessary by the states concerned to assess the state of the stocks under exploitation.
  - B. Allocation might be based on zonal quotas.

### *Advantages*

1. Management becomes the responsibility of the coastal states.
2. Zonal quotas support the establishment of property rights.

### *Disadvantages*

1. If management is inadequate, the stocks could be jeopardized.  
(Possible solution: To ensure adequate management, enforcement agencies of the concerned states must, from time to time, coordinate their activities.)
  2. If the waters of one zone contain the stock only in its juvenile form, fishing in that zone could lead to lower yields in other zones and to the eventual depletion of the stock.  
(Possible solution: Size limits could be imposed and some means for compensating the losing state could be worked out by the parties concerned.)
  3. Zonal quotas would require detailed knowledge of the stocks.  
(Possible solution: Cooperative research by the concerned states could facilitate the acquisition of the knowledge.)
- C. With regard to stocks of interest to extra-regional countries, cooperation to maximize returns and benefits may be desirable by states in whose waters the stocks are found.

### *Advantages*

1. The concerned states have a better negotiating position with regard to the extra-regional

states.

2. There are improved possibilities for the transfer of technology.
3. Information for management would be improved.

- II. Extension of national jurisdiction over fisheries is desirable.

### *Advantages*

1. It helps to guarantee the integrity of the coastal states.
2. It guarantees the primacy of the interests of the states within the region with regard to the activities of extra-regional states.
3. It increases opportunities for development of fisheries by certain countries.

### *Disadvantages*

1. There is a reduction of fishing areas for some states.  
(Possible solution: Cooperative arrangements among concerned countries can alleviate difficulties.)
2. There are increased responsibilities and costs for research, conservation, management, and enforcement.  
(Possible solutions: Cooperative arrangements among concerned states can reduce costs and facilitate meeting of responsibilities.)
3. Delay in creating Extended Economic Zones creates uncertainty about fisheries boundaries, thus creating problems for fisheries development and for cooperation in fisheries arrangements.  
(Possible solution: Tentative agreements among concerned states may be reached for special purposes.)

- III. Strengthening of enforcement requires strengthening of surveillance and arrest capabilities, improvement of judicial systems, and reporting of results, each commensurate with the others.

- A. Increased public awareness of the objectives of

- enforcement is necessary.
- B. Effective surveillance and arrest require a greater degree of coordination or unification of enforcement forces within countries than presently exist.
  - C. Cooperation between neighboring countries over enforcement in border areas, or in other areas as necessary, is desirable.
  - D. For shared stocks, enforcement is made easier if there is uniformity in rules and regulations on fisheries among bordering states.
  - E. Flag states should take more responsibility in teaching their fishermen the rules of the states in

- which they fish, to prevent them from violating the rules. Coastal states should educate the concerned law enforcement officers so that laws and regulations will be enforced correctly.
- F. Attempts should be made to develop a uniform record of catch for all fisheries in the Southeast Asian region.
- G. Enforcement will be more effective if there is increased communication and understanding among Southeast Asian states through more frequent contact between officials.

## Report of Group C

### Problems of Allocation and Management of Fish Stocks

It was the feeling of the group that there is a need for additional information bearing on the management of fishery stocks in the region. Nevertheless, the group was of the opinion that there already existed sufficient data indicating that substantial proportions of pelagic fisheries, especially scads (*Decapterus* spp.), mackerel (*Rastrelliger* spp.), and tuna, are shared by more than one country in the region.

On the basis of the available evidence it appeared that the present "free for all" situation would not advance the interest of either individual countries or the region as a whole. Indeed, it was felt that there was both necessity and room for some sort of regional arrangements for more effective management of such shared stocks.

It was also noted that such regional agreements could be reached only if it was seen to be advantageous by each of the participating countries. For example, artisanal fishermen, who comprise a significant element of most of these countries in the region, would have to be considered through the setting up of designated fishing areas.

Some advantages of regional cooperation would be to:

- i. promote the orderly and rational conservation and utilization of fisheries resources,
- ii. provide more effective mechanisms for dealing with nonregional parties,
- iii. reduce cost of management,
- iv. allow for more efficient gathering and dissemination of information relating to fisheries, and

- v. facilitate the securing and utilization of technical aid from appropriate international bodies.

A possible problem anticipated is that it may be difficult for all parties concerned to agree on a common approach. As such, regional cooperation may have to proceed from a bilateral to a multilateral stage.

### Implications of Extended Jurisdiction

The extension of jurisdiction by states in the region will benefit the coastal states with the exception of Thailand and Singapore. Thailand, as a nation with a distant fishing fleet, may lose some fishing grounds. Singapore would gain little spatially and would also lose some fishing grounds.

On the other hand, extended jurisdiction may allow for more effective handling of fishermen from countries outside the region.

### Enforcement

It was felt that to realize maximum benefit from the foregoing, there has to be more coordinated enforcement. There is a need to improve the quality of surveillance and monitoring of fishing activities in the region. New technology for surveillance should be examined and introduced as appropriate. The capability to apprehend illegal fishing vessels should be enhanced.

Here, it should be emphasized that such enforcement would be possible only if there is maximum cooperation between and among participating countries.

For example, this would be particularly applicable

for policing of transiting fishing vessels.

**Conclusion**

The group, having considered the advantages and dis-

advantages of regional cooperation in the management of fisheries based on shared stocks and in dealing with extra-regional countries, concluded that cooperation was both possible and desirable.

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#### INTERNATIONAL CENTER FOR LIVING AQUATIC RESOURCES MANAGEMENT

The International Center for Living Aquatic Resources Management (ICLARM) is an autonomous, nonprofit, international scientific and technical center which has been organized to conduct, stimulate, and accelerate research on all aspects of fisheries and other living aquatic resources.

The Center was incorporated in Manila in 20 January 1977 and its operational base was established in Manila in March 1977. Although the interests of ICLARM are worldwide, initially the organization's primary attention is being directed to problems in Southeast Asia and the Southwest Pacific.

ICLARM is an operational organization, not a granting or funding entity. Its program of work is aimed to resolve critical technical and socioeconomic constraints to increased production, improved resource management, and equitable distribution of benefits in economically developing countries. It pursues these objectives in the fields of aquaculture, traditional fisheries, resource development and management, fisheries affairs, and education and training through cooperative research with institutions in developing and developed countries.

Policies are set by a Board of Trustees with members drawn from the international community. Direction of ICLARM, under the policies set by the Board, is the responsibility of the Director General. Advice on programs is received by the Director General from a Program Advisory Committee composed of scientists drawn from the international community.

The ICLARM core staff consists of internationally recruited scientists drawn from the areas of aquaculture, fishery biology, population dynamics, economics, anthropology, and international law. In addition, provision is made for interns, consultants and visiting fellows, contributing to breadth of competence and flexibility. The core program and core staff are supported by private foundations and governments.

#### INSTITUTE OF SOUTHEAST ASIAN STUDIES

The Institute of Southeast Asian Studies (ISEAS) was established as an autonomous organization in May 1968. It is a regional research center for scholars and other specialists concerned with modern Southeast Asia. The Institute's research interest is focused on the many-faceted problems of development and modernization, and political and social change in Southeast Asia.

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