

## Section 2

### WORKING PAPERS

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WORKING PAPERS ISSUED FOR AND DURING THE  
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IPFC/C49/1.	Agenda.	IPFC/C49/12.	Institutions, Projects, Vessels and Personnel.
IPFC/C49/2.	Agenda Item 7—Draft Rules Procedure (issued from Washington). Also re-issued as IPFC/C49/2 revised. Replaced by adopted rules, see pp. 22-32.	IPFC/C49/13.	Report of the Committee for Taxonomy—Chairman, Dr. S. L. Hora.
*IPFC/C49/3.	Communication from the International Commission on Zoological Nomenclature.	IPFC/C49/14.	Baguio Agreement Acceptances.
IPFC/C49/4.	Agenda. Item 6—Organization of the Council (issued from Washington).	IPFC/C49/15.	Report on the Survey of existing Fishery Programmes in and related to the Indo-Pacific Area and on the collection of special information.
*IPFC/C49/5.	Programme of Statistical Work.	*IPFC/C49/16.	Technical Committee II. (Re-issued as IPFC/C49/16 revised).
IPFC/C49/6.	F.A.O. Journey's Fund.	*IPFC/C49/17.	Fish Marketing in Batavia.
IPFC/C49/7.	Report on the items relevant to fisheries in the Programme of the Seventh Pacific Science Congress, New Zealand, Feb. 2—22nd, 1949.	IPFC/C49/18.	Suggested Terms of Reference for the Technical Committees.
*IPFC/C49/8.	Report of the Fisheries Technology Committee.	IPFC/C49/19.	Secretary's Report on the Proposed Rules of Procedure.
*IPFC/C49/9.	Proposal for Establishment of a Panel of Experts. Buitenzorg Meeting, Resolution VII.	*IPFC/C49/20.	Recommendations of Technical Committee I.
IPFC/C49/10.	Appointment of Technical Committees.	*IPFC/C49/21.	Recommendations of Technical Committee II.
*IPFC/C49/11.	"A programme of Socio-Economic Research for the Fisheries of South East Asia".	IPFC/C49/22.	Budget.
		Un-numbered.	Rules of Procedure as adopted on Thursday 31st March 1949.

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Only papers marked with asterisk are published in this report.

COMMUNICATION FROM THE INTERNATIONAL  
COMMISSION ON ZOOLOGICAL NOMENCLATURE

Personal address of the Sec'y:  
28 Park Village East,  
Regent's Park,  
London, N.W. 1, ENGLAND.  
9 January 1949.

Dear Sir,

Indo-Pacific Fisheries Council; Invitation to the International Commission on Zoological Nomenclature to be represented by an Observer at the meeting to be held at Singapore in March, 1949.

1. With reference to the recent letter addressed to Dr. James L. Peters (Museum of Comparative Zoology at Harvard College, Cambridge, Mass.), President of the International Commission on Zoological Nomenclature, on the above subject, I write to say that the International Commission on Zoological Nomenclature greatly appreciate the invitation extended to them by you that they should be represented by an Observer at the meeting of the Indo-Pacific Fisheries Council to be held in Singapore in March next, but that they regret that, so far as they can see at present, it will not be possible for them to be represented on this occasion.

2. There is, however, a proposal which the International Commission desire should be submitted to the Council, the adoption of which would, the Commission are convinced, materially assist research officers working on fisheries problems in the Indo-Pacific region. At the request of the Commission, therefore, I have the pleasure to transmit the accompanying short memorandum which they will be grateful if you would be so good as to cause to be laid before the Council when it meets.

3. No one single factor has caused more confusion in scientific literature and consequently in the work of research officers in the applied fields of biology than the confusion caused by the multiplicity of scientific names applied to particular species and the constant changes in the names so used, made not on taxonomic grounds but solely for nomenclatorial reasons. The International Commission, as the body charged with the duty of co-ordinating all matters in connection with zoological nomenclature, realises that the confusion resulting from constant changes in the names of species of economic importance constitutes a serious impediment to the orderly develop-

ment of research and they accordingly strive by all means in their power to promote greater stability in zoological nomenclature. One of the principal instruments which, with the approval of the International Congress of Zoology, has been developed by the International Commission for this purpose is represented by two "Official Lists" one for the names of genera, the other for the names of species, which the Commission have established, for once a name has been placed on either of these "Official Lists" it is assured of stability by being immune from disturbance on purely technical nomenclatorial grounds.

4. The proposal now submitted is designed to secure stability in the scientific names of fish and other marine animals of economic importance in the Indo-Pacific Region by making arrangements for the names of those species to be placed on the "Official Lists" referred to above. A considerable part of the necessary work, including the whole of the cost of publication can be defrayed by the International Commission from its own resources, but a small grant would be required to enable the Commission to engage, on a fee basis, a specialist or specialists to examine the scientific literature involved and to prepare list of the names to be added to the "Official Lists".

5. The International Commission believe that great material advantages would be secured for fisheries research officers in the area by the stabilisation of scientific nomenclature in the manner proposed and they sincerely hope both that their proposal for a co-operative attack on this problem will meet with the approval of the Indo-Pacific Fisheries Council and that either the Council or the Food and Agriculture Organisation will ensure that the necessary small financial contribution towards the cost of this scheme is made available.

Yours faithfully,

(Signed) Francis Hemming.

Secretary to the International Commission  
on Zoological Nomenclature.

The Director-General,  
Food and Agricultural Organisation of the  
United Nations,  
2000 Massachusetts Avenue, N.W.,  
Washington 6,  
D.C. U.S.A.

## THE IMPORTANCE TO FISHERIES DEVELOPMENTS OF A STABLE SYSTEM OF ZOOLOGICAL NOMENCLATURE

1. The International Commission on Zoological Nomenclature greatly appreciate the honour of being invited to be represented by an observer at the meeting of the Indo-Pacific Fisheries Council opening at Singapore on 24th March 1949. As the central international body charged by the International Congress of Zoology with responsibility for all matters affecting zoological nomenclature, the Commission is keenly conscious of the fact that workers in the applied fields of biology, such as fisheries research workers, are directly concerned to secure a stable scientific nomenclature for the fishes and other marine species with which their work is concerned. The Commission recognise that formerly insufficient attention was paid by systematic zoologists to the importance of this consideration and too often the names of species of economic importance were changed for technical nomenclatorial reasons of no interest to workers in the applied fields and that such changes caused much inconvenience to, and in some cases confusion in the work of, this important group of workers.

2. The International Commission consider it one of their most important duties to do everything possible, either directly or with the assistance of interested bodies, to promote stability in zoological nomenclature, particularly as regards the names of genera and species of economic importance. In this matter, the Commission have received enthusiastic support from the International Congress of Zoology, the body which acts as the mouthpiece of zoologists of all countries and from which the Commission derive their authority. With the approval and authority of the Congress, the Commission have established two "Official Lists" of names, the first for the names of genera, the second for the names of species, designed to secure stability for the names of the genera and species standardised in this way. Once the name of a genus or species has been placed upon the "Official List" concerned, that name may not be discarded on nomenclatorial grounds in favour of another name or used in any sense other than that specified in the List without the prior approval of the Commission, an approval not given except in the most exceptional circumstances. The placing of names on these "Official Lists" thus guarantees a high degree of stability for the names of the genera and species concerned.

3. In compiling proposals for the addition of names to these "Official Lists", the Commission needs, first the active co-operation of specialists in

the systematics of the groups concerned, second the support of organisations and institutions, either national or (preferably) international, in order to ensure that the names of all species of importance in the economics or other applied fields of biology are stabilised in this way.

4. In their policy of stabilising the names of genera and species of economic or other special importance, the Commission are assured of the support of every responsible zoologist and it is only lack of the necessary funds which has so far prevented the Commission from making as rapid an advance in this field as they would have desired. The Commission enjoy an annual grant from UNESCO for the furtherance of their work, but this grant, though of the greatest value in many ways, is not sufficient to enable the Commission to develop the "Official Lists" in the only way by which this can effectively be done, namely by commissioning specialists in the systematic field, on a fee basis, to undertake the laborious and highly technical task involved in the study of a complex scientific literature necessary before names can properly be admitted to the "Official Lists".

5. The International Commission accordingly desire to submit for the consideration of the Indo-Pacific Fisheries Council a proposal that the Council should arrange for the provision of a limited sum to enable the Commission to invite a leading systematic worker or leading systematic workers possessing a special knowledge of, and interest in, fisheries problems, to prepare proposals for the addition to the "Official Lists" of the names of genera and species of fish and other marine animals of special importance to the fisheries of the Indo-Pacific Region.

6. The International Commission estimate that, if it were possible to provide a sum of five-hundred pounds (£500) for the payment of specialists for the fore-going purpose, it should be possible within a short time to make substantial progress in the stabilisation of the scientific names of genera and species of fishes and other marine animals of importance to the Indo-Pacific fisheries. For their part, the Commission would be prepared both to undertake the editorial work involved in preparing for publication the proposals submitted to them by the specialists concerned. The Commission would be prepared also to defray the whole cost of printing and publishing the consequent additions to the two "Official Lists".

7. It is the sincere hope of the International Commission that the foregoing proposals will commend themselves to the Indo-Pacific Fisheries Council and that the Council will be able to secure the provision of the small sum necessary to secure, on the co-operative basis suggested, the stabilisation of the names of the fishes and other marine animals which are of importance to the work of the Council and, through it, to the Governments of the countries and territories associated with its work and thus at a small cost to make an important contribution to

the orderly development of fisheries research in the Indo-Pacific Region.

Signed on behalf of the International Commission on Zoological Nomenclature

FRANCIS HEMMING

Secretary to the Commission

Secretariat of the Commission:

28 Park Village East,

Regent's Park, LONDON, N.W.1

7th January 1949.

2

PROGRAMME OF STATISTICAL WORK

Annexure to the Report of Sub-Committee on Statistics Appointed by the Fisheries Conference New Delhi, September 27th to 30th, 1948. Modified and added to in accordance with recommendations of the Informal Meeting of British Fishery Officers, Singapore, October, 1948.

1. Objects of Statistical Collection.
2. Definitions and List of Factors.
3. Methods of Collection
  - 3.1 Programmes of Collection.
  - 3.2 Points of Collection.
  - 3.3 Collecting Agencies or Personnel.
  - 3.4 Forms.
4. Compilation, analysis and interpretation.

the statistics relating to factors of production are necessary for a proper understanding of the phenomena presented in the statistics of production.

In general it may be stated that statistics of the industry are the essential data upon which Governmental action, of administrative, developmental and research nature, should be based.

1. OBJECTS OF STATISTICAL COLLECTION

Statistics are collected:—

- A. In connection with administrative programmes, to furnish basic data for an understanding of the industry, and for the formulation of all types of administrative action in respect of conservational or other management of the industry and socio-economic work among the fishermen.
- B. In connection with socio-economic research, where statistics relating to the social and economic factors of the industry constitute the raw material for study.
- C. In biological research programmes, where sible to an effective programme of research;

It must be pointed out here that some statistics relate to the industry—to the factors of production and distribution, whilst others relate to the resource; the separate uses of these two types must be recognised. Further, it should be observed that, because of the concealed nature of the resources, in most cases, as distinguished from agricultural resources, the availability of statistics is of greater importance in fisheries work than in agriculture, and therefore greater importance attaches to the proper planning of the collection and use of such statistics.

2. DEFINITIONS AND LIST OF FACTORS

The collection of statistics will be made in respect of areas (districts, villages, etc.) or of unit fisheries (sardine fishery, hilsa fishery, lake fisheries, etc.). A natural area or method unit should be sought.

**AREAS.** The area in respect of which statistics will be collected for unit fisheries may be defined in simple geographic terms or on the basis of the distribution of selected critical ecological factors, such as salinity or temperature; it would be desirable that such boundaries should be proposed by the fishery workers of each province or state and be examined by an expert committee to ensure uniformity and effective integration of the collection systems.

**UNIT FISHERY.** The unit fishery is the set of operations distinguished as to area, time, method or species.

Statistics will be collected within the following framework —

**A. Factors** (These statistics will consist of number of units, and their capacity, etc.).

**a. Production**

i. Area of Cultivation or Exploitation.

*Area of Cultivation.* This must be some mean, surveyed estimate of area of water under cultivation; it might be found necessary to consider some specification of depth in this connection

*Area of Exploitation.* It will be desirable to form some general estimate of the areas of marine, brackish and fresh waters subject to exploitation.

ii. Fry Collection.

Clear specification of the stage enumerated will be essential; that is, ova of various stages, fry, fingerlings must be indicated and an attempt made to equate them on the basis of allowing for mortality; that is to say, a certain number of ova collected will not be equivalent to the number of fry liberated.

iii. Men Engaged.

A classification of this item by importance of fishing activity, that is, by the number partly or fully engaged in fishing, according to the type of work on which engaged etc. For some studies it will be necessary to collect data on nationality, age, educational status and so forth.

iv. Equipment (boats, nets, lines, traps, other means of capture).

*Boats.* There must be specification of type of vessel, length,

breadth and draft, motive power, and where powered, the type and strength of equipment, and the character of the standing fishing gear; nature and character of inboard storage must also be shown.

*Nets.* These will be specified as to type, size and mesh.

*Lines.* These will be specified as to type and number of hooks, and where long lines are used, length of main line and of snoods.

*Traps.* Specified as to type.

**b. Distribution**

v. Transport Units.

Specified according to whether water, land or air transport; length of haulage and frequency of trip to be noted; technical details of transport unit, with respect to motive power, equipment for holding fish in good condition.

vi. Storage Units.

Specified as to type of storage with technical detail of capacity of plant, refrigeration method and so forth.

vii. Processing Units (curing yards, oil plants, smoke houses, etc.).

Specified as to design, capacity, technical features of equipment and method.

viii. Ice Production.

**B. Volume and Movement of Supply.**

These statistics will relate to:—

Distinct species of fish.

*Species (Fish names).* It is important that the true identity of fish species to which statistics refer should be established; a project to fix the scientific name corresponding to each local name usage is necessary.

They will be recorded either for (a) area of catch or (b) point of landing;

*Point of landing.* The first point at which fish is discharged upon land; if fish should be transferred from a fishing vessel to a carrier vessel at sea or during operations, the point of discharge of the carrier vessel will constitute the point of landing. If fish should be collected by a carrier vessel from a landing point and taken to some other point the former will nevertheless be the point of landing for that fish.

or (c) point or area of handling or processing;

or (d) point of market discharge.

### 3. METHODS OF COLLECTION

Whilst it is recognised that there is at present a minimum of staff and facilities for the collection of any statistics at all, and that finance and personnel problems will restrict the programme severely for some time to come; nevertheless it is thought desirable to set out the methods of collection in detail.

It is also recognised that there are three major difficulties which impeded the development of an accurate and comprehensive statistical system. These are:—

- A. The diffuse nature of the fishing operations, with relatively few points at which supply is concentrated;
- B. The fact that there is no licensing or registration, as a result of which it is difficult for administration to establish an accurate picture of the industry;
- C. The low educational status of the operatives, as a result of which there can be no operatives' returns which in other countries serve as the basis of the statistical system.

It is probable that real advance in this programme will await effective action in respect of these problems.

**3.1 Programmes of Collection:** The basic requirement to which the programmes of collection (and of subsequent handling of the statistics) should conform is that they should relate to unit fisheries. In this way it becomes possible to identify the fish supply with a specific group of men, vessels and units of gear, and eliminates some confusion effects which otherwise tend to develop.

A further point which requires emphasis is that the programme should be planned to yield specific information for specific purposes. For this reason it is essential that the people who require the information should participate in the design of the programme and should state their requirements.

The following will exemplify the type of programme which might be undertaken.

#### A. *Routine Collection.*

By routine collection is meant the collection of statistics indefinitely as a more or less fixed function of fisheries administration; collection of this sort will necessarily relate in the beginning to only a proportion of the array of factors, but the system should aim to effect routine collection of all relevant statistics, in appropriate time

pattern; it is probable also that the routine collection will initially relate to only a part of the industry. Routine collection of statistics may be effected by (a) complete enumeration, or (b) sample survey of a selected group of factors over a restricted sample section of the total field of survey.

#### B. *Intensive Investigation.*

This means the collection of statistics within restricted areas or sections of the industry, for specific periods, for part or all of the array of factors, with an intensity which would not be possible in routine collection. Such projects might relate to socio-economic, technological, biological or administrative problems.

#### C. *Research in Statistical Techniques.*

These are projects of a research and experimental character, undertaken to evolve suitable statistical techniques which can subsequently be adopted for purposes of routine collection or intensive investigation.

**3.2 Points of Collection:** It may be assumed that eventually statistics would be collected at all the significant points at which fish catch is assembled. At some remote time it might be possible to arrange for statistical record to be made at the point of catch, as is done in the more advanced fisheries of European countries, Canada and the U.S.A. However, at present a selection must be made of the strategic assembly points at which a significant proportion of the supply may be noted. These will include certain discharge and landing points, certain markets and various processing centres.

In the case of some collections, where an officer is appointed solely for this purpose, point of collection will be unspecified—that is, the collector will roam widely and collect on the beach, in the village and on the road.

Even in the interim programme, collection points should, if possible, be selected to stand in some logical relation to the whole industry to permit of extrapolation.

**3.3 Collection Agencies and Personnel:** The ultimate aim may be the provision of staff engaged solely on this task of collecting statistics with their efforts supplemented by part-time workers. In the initial stages, it is probably inevitable that it should prove necessary to make use only of part-time personnel. It is necessary, in this programme, to recognise the contribution which is made to this work

by other departments. Data may be drawn from revenue, customs and other departments.

**3.4 Forms:** The choice of forms will depend upon the programme of collection, in which must be included the facilities available. Separate forms will be required for the collection of statistics in respect of (1) factors of production, (2) factors of distribution, (3) volume of supply, and (4) prices. It will be necessary to have separate forms for inland and marine fisheries and it may prove necessary to have further distinct forms for special unit fisheries.

It will be possible for the statistical section to evolve interim standard forms on the basis of present collection procedure; at the same time standard forms satisfying the full requirements of this programme should be prepared and it should be the aim of government to evolve their collection programmes to be able to employ these forms.

It is to be noted that the standardisation of forms would be undertaken (1) to serve the purposes of standardisation of terminology etc. indicated in section 2 above, and (2) to ensure efficiency in the collection and tabulation of the data.

#### 4. COMPILATION, ANALYSIS AND INTERPRETATION

After the primary collection of the statistics there follow the three stages of compilation, analysis and interpretation. In the compilation phase the statistics will be assembled and tabulated in accordance with the requirements stipulated by the experts. In this phase checks will be exercised as far as

possible. Initially there will be little opportunity for checks but as the system develops it should be the aim to establish a fully consistent body of data. In this connection it may be remembered that the fish catch passes along channels of distribution and is progressively diverted and reduced in volume; reduction follows from wastage, from gutting, scaling, cleaning, and in the case of processing from dehydration or other modes of elimination. The degree of reduction can be measured and fairly reliable conversion factors can be produced for relating fish of one form to fish of another. The most important conversion required is back to round weight.

In the analytical stage the data will, in the case of time series, be transferred to graphs, and trends will be worked out and measured statistically. In this process seasonal and random fluctuations will be eliminated and major secular trends corresponding to significant developments in the industry and the resources will be identified. From this point an attempt will be made to establish circulations between various series in order to determine whether there is any casual relationship between their respective movements. Deeper analysis will proceed as dictated by the Specialists' requirements.

The final stage is the interpretation of the data and of the analytical results, and this is the responsibility of the Specialists engaged in the programme, assisted by the Statistician.

It should be clearly understood that the above programme does not include collection of biometrical data, and it should be realised that there are other data on economic and social matters which will influence statistics collected for fisheries work but which may not be readily available.

### 3

## REPORT OF THE FISHERIES TECHNOLOGY COMMITTEE

by

Dr. D. V. Villadolid, Chairman of the Committee on Technology.

#### Fish Processing

At the Baguio Meeting it was planned that a more specific programme be brought into being by the chairman for circulation to various government representatives for comments and suggestions. It was also planned that the final programme would

consist of the views agreed upon after the first draft programme had been fully considered.

An idea of the status of the processing industries and activities on fisheries technology has been gathered in general way from Dr. Kesteven's papers—Fisheries in South East Asia,<sup>1</sup> and Report on the Fisheries of Pakistan, India and Ceylon.<sup>2</sup>

<sup>1</sup> Office of the Commissioner-General for the United Kingdom in South East Asia. July Liaison Officers' Meeting, Paper No. 1. 8th July, 1948.

<sup>2</sup> Report issued 19th August, 1948, Commissioner-General's Office, Singapore.



Certain salient facts from his report given below may be of interest to the members and upon which the Committee might wish to draw a programme for direct action:

1. "Processing methods vary in their efficiency and in cleanliness."

2. "In some parts of the area they (methods) involve a considerable degree of wastage."

3. "Some of the processing methods produce most unattractive products and involve considerable wastage, and it is known that such products can command only a very low price from a relatively small market."

4. "It would be the height of folly to propose an immediate change in these methods."

5. "A much clearer understanding of these methods must be available in any programme of development of that industry."

6. "...the methods employed for processing fish are not satisfactory, from the point of view of efficiency or hygiene and that the products could be improved in many ways to increase their appeal."

It follows therefore from the above that this Committee might recommend for the consideration of the members of the following programme for direct action on a short range plan:

1. Survey of processing industries and the handling and transportation of fish, keeping an eye on every step of the process which may have possibility of mechanization to attain efficiency and/or may have to require improvement to prevent wastage. From this survey a compilation of descriptions of methods of fish preservation in the Indo-Pacific region may result. From this compilation the committee might wish to make a classification of the methods for uniformity in accordance with accepted English terms.

2. Gradual implementation by the establishment of experimental and demonstration stations for fish preservation methods and/or mobile units that may demonstrate proper methods of fish preservation and utilization of fishery by-products in different fishing centres during the fishing season.

3. Gradual adoption of regulatory measures to effect cleanliness and sanitation in fish processing and fish by-products plants.

## FISHERIES GEAR TECHNOLOGY (FISH CAPTURE)

The committee might consider the following programme for consideration:

1. Increasing the efficiency of methods of fish capture by adoption of up-to-date methods, modifying these wherever possible to conform with existing conditions, and mechanization of operations if possible.

2. Motorization of fishing boats to increase radius of operation and to shorten cruising time to reach port so that spoilage in transit may be avoided.

3. Survey of fishing grounds for both demersal and pelagic fishing outside territorial waters.

## PISCICULTURAL TECHNIQUE

In the event of emergency when for certain reasons fishing operations has become paralyzed, it has been found that fishponds serve as the most stable mainstay of a country's fish supply. There are extensive swamps in brackish water regions which may be converted to fishponds for brackish water species, as *Chanos chanos* which is widely cultivated in the Philippines and Java. The committee might therefore consider the following long range programme on this line:

1. Survey of the presence of sources of supply of *Chanos chanos* fry.

2. Training of personnel in piscicultural techniques to handle the activities in this line.

3. Survey of the location and extent of brackish water swampy areas for eventual exploitation.

4. Establishment of demonstration fish farms for *Chanos chanos* at strategic places.

5. Implementation of the programme with the co-operation of other entities of the respective governments concerned with the disposal of the swampy lands to facilitate disposal of these lands and encourage the project.

PROPOSAL FOR ESTABLISHMENT OF A PANEL OF EXPERTS.  
 BUITENZORG MEETING, RESOLUTION VII

The Buitenzorg Meeting passed the following Resolution:—

**Resolution VII.**

Whereas the factor which most seriously hampers progress of research and development programmes of this area is the lack of trained personnel so that there is a need to make the fullest use of all available persons.

And whereas also it is desirable to make the fullest use of the experience of the leading worker in each field;

*This Meeting resolves*

To recommend to the Indo-Pacific Fisheries Council that it establish a panel of names of specialists to be a reference point for the subjects in which they specialise, to give directions in method of observation and collections made in the area; such a panel would be received from time to time; a tentative list is attached as annexure to this resolution, and the Secretariat is directed to communicate with the people named on the list to ascertain their willingness to act in the capacities indicated in this resolution.

*This Meeting further resolves*

To recommend to the Indo-Pacific Fisheries Council that it endeavour to arrange that whenever collections are made in this area, duplicate material should be retained in the area under the supervision of the specialists concerned with the groups represented.

**HYDROLOGY**

PHYSICAL — P. Ch. Veen, NETHERLANDS

CHEMICAL — D. Rochford, AUSTRALIA

Dr. M. van Raalte,  
 NETHERLANDS

**BIOLOGY**

PLANKTON — H. Delsman, NETHERLANDS

ALGAE — J. Zaneveld, NETHERLANDS  
 Mrs. Valerie Jones, AUSTRALIA

PORIFERA — H. Srinivasa Rao, INDIA

MOLLUSCA — Mrs. Thera van der Feen,  
 NETHERLANDS  
 Miss Joyce Allen, AUSTRALIA

CRUSTACEA — M. Tweedie, SINGAPORE  
 K. Sheard, AUSTRALIA

HYDROBATHIDS — M. A. Lieftinck,  
 NETHERLANDS

**ECHINODERMATA—**

J. Fisher, CALIFORNIA  
 E. Mortensen, DENMARK

TUNICATA — H. Thompson, AUSTRALIA

PISCES — Dr. S. L. Hora, INDIA  
 Dr. J. D. F. Hardenberg,  
 NETHERLANDS  
 G. P. Whitley, AUSTRALIA

REPTILIA — M. Tweedie, SINGAPORE  
 P. E. P. Deraniyagala, CEYLON.

AVES — C. Gibson-Hill, SINGAPORE  
 D. L. Serventy, AUSTRALIA  
 C. J. Manuel, PHILIPPINES

MAMMALIA — T. Vervoort, NETHERLANDS  
 H. van Deirse, NETHERLANDS

In accordance with the above resolution a circular letter was addressed to the persons listed. This letter quoted the resolution and went on to say:—

“You will see that this resolution proposes that the I.P.F.C. should establish a panel of

names of specialists who should be asked to undertake certain duties and obligations. You will observe from the tentative list which is attached hereto, that the meeting proposed that your name should be included in connection with.....

The meeting instructed me to communicate with you to ascertain whether, in the event of the I.P.F.C. adopting this recommendation, and agreeing to the inclusion of your name on the list, you would be prepared to accept such nomination and to act in the capacities indicated in the resolution.

You will recognise that this proposal is in only a most tentative stage and that the Council may adopt the suggestion in its entirety or only after substantial modification. You may perhaps have some views on the practicability of this suggestion or on the wording of the resolution, and if you should, I would be most grateful if you would communicate these to me so that I might present them to the Council or one of its committees."

Replies conveying willingness to undertake the necessary work have been received from the majority of the persons named. Dr. Fisher declined, but suggested alternative names.

## 5

# A PROGRAMME OF SOCIO-ECONOMIC RESEARCH FOR THE FISHERIES OF SOUTH EAST ASIA\*

1. Definition and Relationships of the Study.
2. Descriptive Phase.
3. The Operation of the System.

There is urgent need, in the countries of South East Asia, for a thorough study of the socio-economic factors of the fishing industry. The need exists because, *inter alia*, the socio-economic factors are the most important in the fishing industries of this area and the most susceptible of direct action. It is urgent because of the seriousness of the prevailing world food situation.

Among the fisheries of the world those of South East Asia are characterised by the primitiveness of the equipment employed (with consequent limitations on the geographic range of the operations and, further, on the types of stock exploited) and by the numbers of men engaged. There is relatively little mechanisation for motive power, for haulage or for processing; in general, power is provided by either men or wind, and by modern standards production efficiency is low. There is thus a considerable emphasis on human aspects of production, and many of the problems of the industry stem back to the human factor. Whereas in other countries the critical questions are chiefly technological, relating to the apparatus for seeking, capturing and handling the fish, here the questions of personnel are of greatest importance. The problems of the resource are not greatly urgent here; there is generally ample

evidence of the scope for immediate expansion of the industry, in all its geographical and ecological divisions; nor is there immediate fear of depletionary conditions developing. Again, there is considerable scope for the introduction of modern apparatus to the industry; this will include modern vessels, with diesel engines, mechanised apparatus for handling fishing gear of modern design, echo-sounders, asdic and so on for navigation and for seeking fish; but the urgent problem is not so much a technological one of how to effect introduction of such apparatus, as a social and economic one of what introduction would be judicious at this stage and of what would be the effects on the existing industry of such introduction.

It may be stated categorically that the primary requirement in this area is a profound understanding of the structure and organisation of the industry; the status of employed persons, their work and their reward, especially their training and their skills, and their relations with their employers; the ownership of capital equipment; the distribution of earnings; the control of finance and so on.

## 1. DEFINITION AND RELATIONSHIPS OF THE STUDY

As suggested by this preamble, and by its name, this study will be concerned with the examination of the social and economic elements of

\* A Regional Study by G. L. Kesteven, F.A.O. Regional Fisheries Officer for Asia and the Far East.

the fishing industry. It will be concerned with these elements only as parts of the socio-economic complex and not for themselves, or their inner structure, except insofar as these might effect their role in the socio-economic complex. Thus this study is concerned with boats only as so many units of fishing power, or transport capacity, of such and such a level of efficiency; on such questions it will accept from the technologists the results of their work. Again, medical and other aspects of the human elements fall beyond the purview of this study.

This study will therefore be concerned with social and economic elements of the fishing industry; it will enumerate and classify these elements and describe their relationships; it will then proceed to a description of the operation of these elements, their interaction one with the other and their response to external elements.

It will be well to state some of the work which will not be carried out under the name of socio-economic studies. Thus the study will consider fish solely in quantitative terms of the available amount of different kinds of fish; questions of how the volume of the composition of the catch might be determined by natural conditions do not concern this study, although the influence of manpower, of various levels of operational efficiency, on the volume of catch is germane to the study. Again, the design of the various units of the equipment, vessels, nets and so on, is not the concern of this study. Again certain realms of sociology and economics as such are not to be included within the limits of this specialisation. From all of these adjacent studies, socio-economics will draw such description or measurement of these elements as may be necessary to effect proper enumeration and classification of them and description of their relationships. Further it must be accepted that much of the enumeration work is the responsibility of administration whose normal apparatus of registration, licensing and collection of data should furnish the raw material of the study. However the results of the study will give some guidance in the task of gathering the data.

## 2. DESCRIPTIVE PHASE

The first part of this study must be to ensure the availability of reliable statistics relating to the various elements. These elements may be listed as follows:—

### A. Production:

- a. Catch; dissected according to species and locality; given for specified units of time;

- b. Men engaged; classified according to occupation, wages, etc.;
- c. Boats; classified according to size, design, motive power, carrying capacity and type of fishing for which employed;
- d. Gear; classified according to types;
- e. Finance; classified according to nature, source, use.

### B. Distribution:

- a. Supply; dissected according to class of fish (method of capture, market for which caught, etc.), channel of distribution;
- b. Men engaged; classified according to occupation, wages earned etc.
- c. Equipment, classified as for transport, storage or processing, and describing capacity, power required;
- d. Finance; classified according to nature, source, use.

### C. Organisation:

A classification and enumeration of the units of organisation from the family as a fishing unit, through teams and village organisations, companies of varying legal status, co-operatives and so forth.

It may be expected of the administrative divisions that they will engage on the collection of statistics relating to each of these categories; in some sections assistance will be obtained from the biologists and technologists for the accurate specification of the categories into which the data must be fitted; the economist must grant similar assistance in respect of wages, prices, finance and other essentially economic elements.

It must be recognised that there are considerable difficulties in the way of collecting statistics in this part of the world; all the problems of unsatisfactory methods of weighing, lack of uniformity in terminology, inadequate private records, reluctance to divulge information, which are met in other parts of the world are accentuated here. And this is true not only for the weighing systems and so forth in themselves, but is increased by the character of the industry and the dispersion of all its units. It is necessary to develop special techniques for the col-

lection of statistics, based upon close contacts with the fisherfolk and requiring a recognition of the value of incomplete sampling practices and of qualitative results. In the early stages such results can contribute much toward the description of the industry and can lay the basis for extended programmes.

When the full range of these elements is established it is essential that their nature should be understood to a sufficient degree and in this phase there must be continued and full co-operation between the economist, biologist, technologist and so forth. This co-operation will not cease upon reaching the first understanding about these elements, but will continue as long as these investigations should be necessary.

There already exists a substantial body of descriptive work relating to the boats and equipment of the fishing industries of this area; however, much of this material suffers from inadequate understanding of the uses of the equipment and of the need for exact technical account of construction and operation: much can be done therefore by the technologists in examination of the gear and methods employed in this area, and the results of their work will greatly assist other workers. This is particularly true in respect of the equipment and methods for the preservation and processing of the fish.

Statistics in respect of the quantities in each of the categories will be collected in time units of magnitude determined by the variability of the quantity in each category; thus a twelve month time interval may be sufficient for certain items, whilst a weekly or even a daily interval may be necessary for specific purposes for certain categories. Again the size of the geographic area, in respect of which the statistics will be collected, will depend upon the variability of the categories along geographic coordinates. Determination of this will depend upon the degree of development of the programme and upon the particular requirements of the investigations.

Between these elements we may recognise various relationships for which the following classification may be used.

1. Institutional Relationships: that is, those which exist by virtue of legal, social or other convention. Among these will be that of *ownership*, between men and their catch, boats, gear and finance; employer-employee; buyer and seller; and the general relationship between the fisherman and the community to which he belongs.

2. Technical Relationships: as between classes of boats and classes of equipment.

3. Causal Relationships: that is, the operative relationships of varying degree between independent and dependent variables. Thus there is a fairly close relation between numbers of men and the numbers of boats, the amount of gear and of finance; there is a less close relation between these categories and the amount of catch. These relations can be measured statistically, and indicate that the existence or operation of one category will cause or be accompanied by the presence of another category, even though the response of the other need not be precise. The fishermen do not *cause* fish, but their work results in *catch*, and the relationship, which may be measured as between units of effort and amounts of catch, may be very close or very loose.

These relationships are of very considerable importance to any attempt to understand the fisheries of this area. The nature of the problem and the value of the work along these lines can be seen from Raymond Firth's book on the Malay Fisherman, in which considerable attention is devoted to the organisational features of the particular community which was studied. The relationships between owners, financiers and others on the one hand, and the fishermen, as operatives, on the other, are dealt with at great length and provide considerable matter for thought. Throughout the area the status of the fisherman in the community is a matter deserving close attention; this is not merely a matter of financial condition: in India it has been and to some extent still is an aspect of the caste system; traditional usages in this connection prevail throughout the area. Again, the role of the owner-financier and of the dealer-financier is of great importance and one which must be well understood before measures may be proposed in connection with financing, marketing and so on. Thus the towkays of Malaya and the laans and honges of China are organisational phenomena which should be fully understood; the role which they play in the industry is an important one: whether the manner of playing it is not in the best interests of the industry is a question which could be answered satisfactorily only after proper study, and any proposal for serving the industry with alternative organization should have proper relation with the remainder of the industry's tradition and organization. Analysis of this kind is essential also for any programme for the development of co-operative organizations or large-scale companies. The history of the Japanese fishing industry, with its twentieth century development of fishing societies, co-operatives and large-scale highly capitalised and highly organised fishing companies (for salmon fishing, high-seas fisheries and whaling) will furnish object lessons on the problems involved in this section of the industry. It seems to be true that small units, developed largely on co-operative principles, are the

most appropriate manner of organisation of inland, coastal and other fisheries in which native, traditional methods of operation persist and in which the assimilation of new techniques is much slower than is the case for high-seas fisheries.

It must be pointed out that the importance of these institutional relationships is a matter itself for investigation: that is to say, they are of significance not only for the general organisation of the industry but also for the effect which they have on the movement of the fish supplies, or producer and consumer supplies, and finance, and these effects must be measured in themselves.

### 3. THE OPERATION OF THE SYSTEM

The foregoing may seem like an anatomical account of a static body; the real interest of this system however lies, in its operation—in the movement of supplies of fish through it, its assimilation of supplies of various commodities required for the production of the supplies of fish, and its use of finance. This operation may be considered from two points; firstly, the historical descriptive and secondly, by measuring, quantitatively, the relationships between the different elements and their effects upon one another, these being far from simple and operating to the third and fourth degree and beyond.

**3.1 Historical Descriptive Section:** The first task here is to describe the passage of the fish through the system. Such a description may first of all relate to the fish as physical entity; it will begin with so much crude catch, of which a proportion may be rejected as entirely useless, from then on the volume becomes steadily reduced according to the type of system, until an amount of edible food is eventually delivered to; and eaten by the ultimate consumer. The proportion of the catch which is discarded as offal varies widely in different countries, and also between sections of the industry; a realistic measure of this is desirable. The practices which are followed in handling, storing, preserving, transporting and processing vary greatly and require careful investigation by technologists and others, and understanding by the economist. The amount of wastage which results in the various stages must be measured by the economist. In this area more effective use is made of a wider range of natural types than in other (western) countries; a great deal of small fish, and of species which westerners regard as unpalatable, is consumed; moreover there is generally more efficient use of the whole fish. The flow of fish supplies may be regarded as being diverted, in varying proportions, and through various channels, to the ulti-

mate consumers; from each channel there is always some measure of leakage. The greatest proportion of the catch in this region is of low price variety; the relation between the different price categories would warrant some investigation.

The movement of fish through this system may be described in terms of costs and of profits and prices charged at various levels. In this process, a basic price obtained by the fisherman, and from which he must meet his operational and personal costs, is added to, stage by stage, through this system and eventually becomes the price which the consumer pays; the process should be the reciprocal of the diversion of the flow to various consumers.

The second task in this section is to describe the functioning of the system through periods of time. This requires the collection of continuous series of statistics; these must be plotted as time series and secular trends must be calculated; the existence of rhythms, of any period whatsoever, must be detected.

**3.2 Examination of Relationship:** From the last mentioned sets of statistics, tabulated and graphed as time series, and in which rhythms have been detected and measured, the investigation must proceed to calculation of the degree of relation between the movements of the different series. Whilst there may be a close and fairly reliable relation between the available records of any two series in a section of time, this may be merely statistical and it may be unsafe to extrapolate beyond the limits of that time section. This means that the nature of the relationship between any two series must be understood and the significance of the statistical coefficient of correlation must be assessed on grounds other than only statistical. The more obvious relationships which will be examined will include:

1. catch and men, catch and vessels, catch and gear; from these there must evolve calculations of effort expended and of catch per unit effort, these will involve correlations between three and four variables.
2. between the volume of supply passing into various distributional channels; for example, fresh fish trade and processing, or, within the fresh fish trade, between different price levels.
3. between volume of supply and price levels; also between costs and prices, and subsequently multiple correlations involving all three and also other economic and social factors.

## FISH MARKETING IN BATAVIA\*

1. Introduction
2. The Market Premises
3. Control of the Markets
4. The Supply of Fish
5. Market Operations
  - (a) Physical Movement of the Fish
  - (b) Auction Practice and Record Systems
  - (c) Market Staff and Operational Costs
6. Subsequent (post-auction) Movement of the Fish
7. Prices and the Dealers
8. Other Official Activity Associated with the Market
9. The Tanjong Priok Market

### 1. INTRODUCTION

During a brief visit to Java in connection with the work of the Indo-Pacific Fisheries Council, the opportunity was taken to make a study of the organisation of the market in Batavia. Requests had been received for detailed information on marketing practices of this area, and an effort was being made to meet them by collecting whatever published reports might furnish this information and by supplementing these with special surveys where necessary. This study is one of the latter. Information had already come to hand indicating that much valuable experience had been gained in Java in the marketing of fish, and it was therefore believed that a study of the methods there employed would prove of great value.

Whilst practically all of the methods referred to here were observed by the writer, the bulk of the material consists of information supplied by Dr. J. Reuter and Mr. van der Wal of the Division of Sea Fisheries of the Department of Agriculture and Fisheries. These officers were at considerable pains to make me fully informed of the details of the scheme. I understand that they are jointly responsible for development of the scheme in its present form. Before the war, marketing in Batavia was organised by the municipality, but after the war the Department of Economic Affairs took over the market and administered it, placing emphasis on socio-economic aspects.

### 2. THE MARKET PREMISES

The market premises are situated at Pasir Ikan at the northern edge of Batavia. The market site is

roughly triangular and is bounded on two sides by water; one of these water frontages is on a canal which communicates with the sea, the other is a backwater in which fishing vessels are moored. Both water frontages carry wharves to which the fishing vessels tie and on which the fish is discharged. The third side is occupied by general market premises, of the usual type of the region, where the fishermen may purchase their consumer and producer goods.

The general dimensions and lay-out of the market are given in the diagram (Figure 1). It will be seen that the auctioning floor occupies a great deal of the floor space; there are the usual accountancy offices and stores for fishing gear and space in which the buyers can sort their purchases.

The main auctioning floor is closed off by a low fence of metal tube and netting, with appropriate entrances. There is access to this floor by large doors on the wharf side; these are used for bringing the fish for sale. The auctioning floor is divided into three bays, separated by the low fence; each bay contains three low "platforms" on which the fish are laid out in heaps for selling. The platforms are marked off by a shallow path or gutter, about four inches deep; they are made of stone, which is very smooth and kept clean; walking on the platform is kept to a minimum. In addition to the selling platforms, each bay has an area, on the wharf side, where the booking clerks, cashier, and so on, do their work.

The diagram shows the relationship of the buyers' sorting-out area to the auctioning floor, the buyers' entrance and exit, the stores, offices, and so forth.

At present the market handles supplies amounting to about 3.2 million kilos per year. It would appear that the physical facilities and the administrative arrangements are such that the market could handle an increased volume of supply. There is only very small holding space; about 8 tons could be held at 1°C.

### 3. CONTROL OF THE MARKETS

The markets are the property of the Municipality of Batavia. Until recently the market operations were conducted by the Division of Sea Fisheries

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of the Department of Agriculture and Fisheries with staff who were originally part of the establishment of the Department of Economic Affairs and lately unattached. However, as from August,\* the Municipality assumed control of these operations, but obtained technical guidance from the staff of the Division of the Sea Fisheries of the Department of Agriculture and Fisheries. The market, therefore is at present a municipal function, and the unusual situation exists that by virtue of the arrangements established for the implementation of a socio-economic programme through the machinery of the market, strengthened by the success which that programme has met, the Municipality will now undertake socio-economic work in the fishing industry.

It is important to emphasize the significance of the principle guiding the administration of this market. In point of fact, it can be considered that the actual sale of fish is secondary to the main purpose of the market, which is to afford facilities to the fishermen in the conduct of their profession.

#### 4. THE SUPPLY OF FISH

The Batavia market receives something in the order of 3.2 million kilos of fish per year. This volume of supply is low at present because of the transport difficulties; when these are overcome it may be expected that the supply will increase to at least twice the present level. The supply includes brackish water fish as well as sea fish; it includes a wide range of species captured by a variety of fishing methods. No direct information is obtained as to the locality in which the fish is captured, but report is made of the method by which it has been taken. This supply comes from people living in other parts of Java and Batavia. Actually, there are very few fishermen resident in Batavia, but the outside fishermen are attracted to the city by the higher prices offered and the availability of consumer goods.

A small proportion of the Batavia market handlings is drawn from the Tanjong Priok market, where prices are somewhat lower than in Batavia and permit a profit even with the extra transport costs. The bulk of the discharge at the market is sold on the day of arrival and only a small proportion is held over; holding is for only one night.

The practice is that the fish which is sold wholesale on one day is retailed on the following day. This is based upon the retailer's programme of moving about his district in the early morning to sell his fish to the housewives, and then, after having dis-

posed of his purchases, proceeding to the market to replenish his supplies. For this reason, the market commences operations at 11.00 a.m.

The fish is brought to market by the following methods:

##### A. By Water

- (1) By fishermen; sailing and motor vessels of all sizes.
- (2) By fish carriers; using sailing and motor vessels, giving simply transport services.
- (3) By fish buyers; using sailing vessels, providing transport and a buying service.

##### B. By Road

This supply is chiefly from the tambaks and is brought by shoulder load, bicycle, car, truck and horse-drawn vehicle.

In these various modes of transport, the following in-board handling techniques are employed.

- (1) Some fishermen (the majority) have no ice or other facility for preserving the fish; after capture it is immediately stowed below deck and left there until discharge; these fishermen engage only in day fishing and must return before 5.00 or 6.00 in the evening.
- (2) Some fishermen have an icebox in which the fish is stored between layers of ice; the vessel returns to port when the box is filled.
- (3) Some vessels carry salt, but this is used on board only in emergency, such as in the event of there being an excessive distance to travel, or a feeble wind, both of which mean delay in delivery.

It is to be borne in mind that the market does not receive the entire catch of the area from which its supplies are drawn; a proportion of the catch is processed on the neighbouring islands, and although the transport which brings the fresh catch to the market may also carry the processed (cooked in salt water) fish, the latter does not go through the market. However, the salt for this processed fish is purchased through the market.

The catch is taken by eleven or more different methods, all of which are of importance during some

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part of the year, but the palele and the muro-ami are of greatest general importance. There is seasonal variation in the volume of catch provided by each method; since the methods are generally fairly highly selective, the variations in the volume of catch from each are rightly identified with changes in the availability of the fish upon which they operate; the changes in availability of the fish are associated with the behaviour of the fish and the effect of environmental conditions (for instance, prevailing winds). It is clear that the statistics from these operations will be valuable data in biological investigations and, conversely, that the biological investigations will yield crucial information leading to an understanding of the fluctuations in supply and probably to prediction systems.

The principal fishing methods are the following:

- a. Motor majang (pelagic)
- b. Sailing majang (pelagic)
- c. Djharing (pukot, gill nets, djaboer, djeharing pukit)
- d. Sero (traps)
- e. Pantjing (hand lining)
- f. Muro-ami (reef fishery, with fixed net)
- g. Bubu (littora set traps)
- h. Sodok (scoop net)
- i. Pelele (buying direct from fishermen at sea)
- j. Djala (cast net)
- k. Empang (Tambak; Blackish water ponds)

Whilst these methods are selective and specific, there is some "interaction", and, for instance, the mackerels, *Scomber kanagurta* and *S. neglectus*, are caught by sero on the full moon and by the djharing pukot on the dark.

The market supply is made up of many different kinds of fish. The market records show 69 different species plus an item for mixed fish. It is certain that the total number of species greatly exceeds 70, but many of these appear only in small quantities. The neighbouring market at Tanjong Priok, which previously listed only 52 species, now lists as many as Batavia, but it receives really a more restricted range of species. This is chiefly because the motor majang and the muro-ami vessels do not ordinarily supply Tanjong Priok because of the absence of harbour facilities for fishing vessels at the latter city. Be-

cause of the selectivity of these fishing methods, the absence of catch from motor majang and muro-ami has a considerable influence on the composition and the volume of the supply available to Tanjong Priok. Of the 69 species listed at Batavia, some 14 to 18 appear in quantities greater than 1% of the total supply. The variation in this relative magnitude of supply of important species may be shown by the following figures for the first half of 1948.

In January,\* 18 species exceeded 1% of the total weight of supply, in February, 17; in March, 16; in April, 14; in May, 14; in June, 16.

These variations are chiefly the consequence of the fluctuations in the catch of a few dominant species which represent large percentages of the total. The Teri (*Stolephorus sp.*) Selar (Carangid spp.) and Ekor Kuning (*Caesio sp.*) are among the most important of the Batavia species.

Detailed statistics are kept of landings (i.e. discharges at the market) and these include data on method of capture and weight of each species. Compilation and analysis of such records is proceeding continuously and it is to be hoped that a full report will soon be made giving effective valuation of the seasonal fluctuation in supply and its correlation with species and method. The influence of economic conditions on these elements should then receive attention.

## 5. MARKET OPERATIONS

As stated above the market is operated entirely under local government administration. The following therefore is the official plan of operation in respect of receipt, display and auctioning of the supply and the maintenance of the accounting system. It is not supposed, or pretended officially that there are no malpractices in the operation of the market or in the subsequent disposal of the supply, but every effort is made to eliminate the opportunity for them in the market.

(a) **Physical movement of the Fish.** At the wharf the fish is discharged into baskets each carrying roughly 50 kilos of fish. In this process of discharge and placing into baskets, the fish is sorted into species. The baskets are then weighed and the total weight of each species in the load is recorded. The fish is then carried to the auction platform and is laid out in heaps, each of about 10 kilos. The small fish however are kept in baskets. The heaps of fish are placed in neat rows and the heaps from each vessel are kept together so that the whole

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of the fish from one vessel may be sold before the fish from the next vessel is put up for auction. The fish may be sold in single lots or in groups of lots. The fish may be removed as soon as auctioned, and, provided purchase money has been paid, may be removed at once from the market. It is a general practice for buyers to band together and purchasing different species of fish separately, to split their lots so that each may then have a supply of several species; this sorting is done on the open market floor on the area marked in the diagram. Coolies employed by the market assist at the discharge and sorting and placing out in heaps. Their service is free of charge to the fisherman.

The market records show that for 1947, 64,000 individual discharges of fish were made at the market and that the fish so discharged was laid out in approximately 400,000 selling lots; that is 6.25 lots per discharge (or 62.5 kilos).

Some of the fish, arriving late at the market, or for some other reason, is not sold on the day of discharge but held over. Such hold-over never exceeds 24 hours. In the case of vessels with ice-box the fish may be held on board over-night. For those vessels which have no ice-box, icing and storage for hold-over is done at the market; some of it stands iced in ordinary boxes on the market floor, but in the case of motor boats, especially those which operate the muro-ami, the fish is packed in boxes with ice and is stored in the refrigerator at +1°C.

(b) **Auction Practice and Record Systems:**

The fish is auctioned to the highest bidder by an official auctioneer employing the ordinary system. The buyers remain outside the auction bay to bid, but enter to pay for their purchase and to remove it. The fishermen remain on the wharf side of the auction bay until their fish is sold and the cash received, whereupon they enter and collect their money in the procedure described below.

There are three selling teams on duty for part of the day and one team remains on duty during the afternoon to take care of late sales. Auctioning at the various platforms takes place in a system of rotation: the fish on platform A of Bay 1 is sold first, then Platform A of Bay 2, followed by platform A of Bay 3, then B in 1, B in 3 and so on. In this way auctioning takes place continuously but whilst it is taking place in one bay, in the other two bays fish is being cleared away by the buyers, new fish is being laid out, and the accounting work is being checked and completed, including the collection of the cash from the sale. This prevents the auction becoming confused. Moreover, this staggered sale enables buyers to arrange for continuous attendance

where they wish. Above all, the alternate selling and checking ensures speedy detection of errors in the records.

As described above, the fish is sorted and placed in baskets on the landing wharf; it is then weighed. For each discharge the weighing clerk prepares a weight slip (in duplicate) which sets out the following information:—

1. The name of the dischargee: fisherman, carrier or buyer.
2. The method by which the fish was caught.
3. The weight of each species.
4. The total weight.

The original of this weight slip is handed to the dischargee who holds it until it comes to the turn for his fish to be auctioned at which time he hands the weight slip to the auctioneer's assistant; no fish is auctioned without presentation of the weight slip. In exchange for the weight slip the dischargee receives a wooden slip carrying a number identifying his parcels of fish. The movement of this wooden slip will be described later. The dischargee is held responsible for his fish in the market until he receives the wooden slip; at that time responsibility passes to the market.

The auctioning team consists of the following persons:—

1. Overseer
2. Cash register operator—group chief.
3. Cashier.
4. Auctioneer.
5. Crier.
6. Auction bookkeeper.
7. Ticket writer.
8. Statistics clerk.
9. Board writer.
10. Mandoer.

During the auction the auctioneer, the crier and the statistics clerk are on the auction platform; the auction bookkeeper is seated in a spare space of the bay, away from the cash register; the cash register operator is seated behind the cash register in the recess on the wharf side of the bay, on his left is seated the ticket writer and on the left of the ticket writer, in a small cage, is the cashier; the board writer stands at the blackboard at the inner end of the bay; the overseer and mandoer move about as required. The auctioneer, accompanied by his crier and statistics clerk, moves about the auction platform up and down the rows of heaps of fish. He carries a stick with which he indicates the fish

up for sale and invites bids; the fish may be sold in single heaps or he may sell a group of heaps together. His crier calls the number of the dischargee's lot when auction first begins on it, then for each transaction he calls the name of the successful buyer and the price at which the fish is sold in each heap or lot of heaps. The mandoer keeps a record of the number of heaps set out and the manner (single or multiple) in which they are sold. The statistics clerk keeps the weight slip and on the back of it he writes the price of each transaction. The board-writer writes the dischargee's name and number and the name of the buyer and the price for each transaction; exactly the same information is entered in the auction book by its keeper. The cash register operator records first the number of the dischargee and then in sequence the value of each transaction; the machine prints this information on two copies of a continuous strip and also on a sales slip composed of an upper and lower part. The slip is coloured, separately numbered in its own sequence and in duplicate; one is printed for each transaction. The word "duplicate" here means that it is perforated at a point about one-third along its length, and the sales information is printed on each side of the perforations. As each slip comes out of the machine it is received by the ticket writer who inscribes on it the name of the buyer, and then passes it to the cashier.

When the fish on each platform are all sold, a rapid check is made of all these records. The blackboard record is held as a last check if required and is not expunged until the other checks are completed. The auction book record is checked against the cash register continuous strip. This strip is torn up into sections, each carrying the record of the sales of the fish of a particular dischargee; when checked, these sections are handed to the cashier who holds them to keep with his stubs of the sales slips.

As soon as the fish is sold, it may be paid for and removed. Payment must be made promptly. When payment is made, the buyer receives the lower part of the sales slip as a receipt. As stated, the stubs of the sales slips for the sale of each dischargee's fish are assembled and put with the section of the cash register continuous record. When all payments are made and the upper parts assembled the dischargee shows his wooden slip and receives the upper parts and the cash register strip. He takes all three to the commission calculator who makes an entry in a sub-cashbook of the dischargee's name, gross value of the sale, and charges to be made against it; he then calculates the net payment to be made to the fisherman and enters this on the cash register

slip; the three (wooden slip, sales slips and cash register slip) are then returned to the dischargee who presents them to the head cashier who gives him cash in exchange.

It will be observed that the sales are recorded on the blackboard and the auction book. They are also recorded by the cash register on two continuous strips and on the sales slips, and some figures are entered in the sub-cash book. These books are carefully checked and cross-checked, and this work must be completed each day; no sales may be undertaken on any day if the previous day's records are incomplete. It is presumed unnecessary to attempt any description of the accountancy procedures adopted in handling the cash and the fiscal records.

The information given on the weight slip, listed above on p. 57, plus the value of the sales, is worked on in a section of bio-economic statistics where tables are prepared to show total sales, total sale of each species, quantity from each fishing method, and average prices by species and method. Information on the quantity of each species taken by each method can at any time be taken out of these tables as required. Graphs are prepared showing trends in supply and in prices. Some general information on area of supply can be deduced from these tables, by people acquainted with the habits of the fishermen. However, arrangements are being made to develop the records further to include data on the place of catch.

(c) **Market Staff and Operational Costs.** There are four auction teams of the size and composition listed above; there is always one of these teams on leave. In addition to the forty persons thus engaged, there is the following staff:

At the weighing scales—1 clerk and 1 mandore.

On the auction floor—2 mandoers for general oversight and 4 groups of 4 or 5 coolies.

In the statistics section—6 clerks.

In the socio-economic section—2 contact persons (Adj. consultants).

In the cashier's office—2 assistant cashiers, 1 cashier, and 1 chief cashier.

In the Office—1 Adj. consultant, 2 typist-clerks, 1 Administrator.

At the main gates—2 mandores.

The whole is under the supervision of a market manager.

Thus there are some 81 persons engaged on the floor. Their total basic wages are apparently in the order of f60,000, to which is added a further sum of f90,000, representing the cost of living adjustment which is allocated on the basis of marital condition and number of children. Further a sum of f45,000 is spent on food and transport for these employees, making the cost of labour in the market a total of f195,000. There is no information on the total labour cost of this operation, nor on what other charges have to be met. But against these costs, the market charges a 5% commission on all sales, which yields about f500,000 in the year. There are other sources of revenue.

## 6. SUBSEQUENT (POST-AUCTION) MOVEMENT OF THE FISH

The fish supply moves off in two courses. The bulk of it is termed kampong supply; it is taken away generally on head loads, or bicycle; each dealer carries a variety of fish and generally gets this by the arrangements, and sorting out, described above. The other supply is styled "western fish;" it is generally larger fish. None of the fish is gutted, cleaned or in any way processed on the market floor; it all moves off unaltered. No information was collected on the retail practices. The kampong fish is ten times in volume to the western fish, but only five times its value.

## 7. PRICES AND THE DEALERS

The market is open to anyone wishing to buy, and the only apparent limitation is that sales are made only of complete heaps (of 10 kilos). Buying for fresh fish trade for western and kampong consumers constitutes the bulk of the operations, but processors buy on the market and the market authorities can always be assured of a basic price and of being able to dispose of supplies through the processors. On the other hand, if the price falls too low, the Sea-fishery Institute may intervene and buy heavily to exercise a control on the market. It is stated that the Institute has never lost in such operations because the relationship between supply and demand, dominated by the day-by-day nature of the operations, is too close to allow either side to play hard and fast with the market.

It is probable that four million kilos of fish will be sold in the Batavia and Tanjong Priok markets during 1948, and this quantity would have a total value of f10,000,000 if an average price of f2.5 per kilo were maintained, but already there has been some recession from these prices. In May, 1948, first quality fish was sold in the auction for

2.62, medium quality for f1.20 and low class fish at f0.80. It would appear that there is a retail margin of anything from 100% to 300%, and that the margin is higher on the kampong class of fish than on the western.

## 8. OTHER OFFICIAL ACTIVITY ASSOCIATED WITH THE MARKET

The planning and directing of the activities of the fish market have been based on the principle that the fish market is traditionally the centre for trading and other activities for the fisherman. It is recognised that the fisherman has been accustomed to receive financial aid from the person to whom he has sold his fish, and perhaps also to buy from him his producer and consumer goods; this means that if administration undertakes the task of selling fish it must also accept these ancillary duties. Further, it is recognised that the principal selling point is of very considerable importance in maintaining contact with the fishermen and with the industry generally. The movement of the fish through the market furnishes information whose importance is greater than any other body of data; in addition to this, the financial condition of the fishermen can be kept under constant watch and their need of goods, financial aid, and so on, will readily appear at this point. Moreover, constant personal touch can be maintained through the market with fishermen, dealers, and so on. Recognition of these facts has guided the people responsible for this market, and the operation of the method can be observed any day at the market. An observer cannot fail to be impressed by the atmosphere and by the evidence of ready collaboration.

The market organisation (personnel) includes two special sections for socio-economic work. One section is on the market floor, as it were, and serves as a contact point for the fishermen to receive their reports of problems, requests for assistance, and so forth.

From this section the information passes to a section in the main office of the market where a decision is made and action taken for the granting of loans and credits, and other assistance. This assistance, when fully operating, will involve a fund of approximately f500,000. The recovery of advances made is effected through the cash system of the market, a deduction being made from the amount payable to the fisherman as the result of each separate market operation on his behalf.

The market authorities undertake to look after boats and goods left in their care; the backwater referred to in Section 2 is used for this purpose, and

space is reserved in the market for storage of sails, etc. This service is rendered free of charge.

Producer and consumer goods of various kinds are sold through the market organisation. These include sails, lines, hooks, and so forth, and in addition such goods as timber. An important item is the issue of salt, which is made pro rata on the basis of fish delivered to the market. The volume of business involved here amounts to something on the order of f50,000 per month. From time to time certain goods (such as clothing) are made available free of charge to the fishermen, and the distribution is made through the market. A similar programme of supply of producer and consumer goods is conducted by the Sea-Fishery Institute, and the two programmes are co-ordinated.

The market provides accommodation for the staff of the "Thousand Islands" Fishermen's Co-operative.

Free medical service is provided by the market, the entire cost of which is borne by the market. The Clinic for these services is, however, housed in the Sea-fishery Institute.

It is to be remembered that all of these services are provided without any charge to the fishermen.

The cost of them is charged against the 5% commission from the gross proceeds of the sales.

9. THE TANJONG PRIOK MARKET

The market at Tanjong Priok is run along lines identical with those described above for the Batavia market. Its supplies are, however, much smaller, being only 25% (in volume) of the Batavia supplies. These supplies are drawn from a smaller area than the Batavia supplies and are taken by fewer methods. The demand is weaker at Tanjong Priok, and this fact, coupled with the fact that the supply and that transport costs to Tanjong Priok are lower, results in a generally lower price for the Tanjong Priok fish. As remarked above, this leads to a small diversion of fish into the Batavia market from Tanjong Priok. A further results of the weaker demand in Tanjong Priok is that the auction is obliged to sell the fish in smaller individual lots than the Batavia auction uses.

Before World War II there was an extensive chain of inter-linked markets along the north and west coasts of Java. It has not yet been possible to restore this chain, but, as noted above, the character of the markets has been developed substantially.

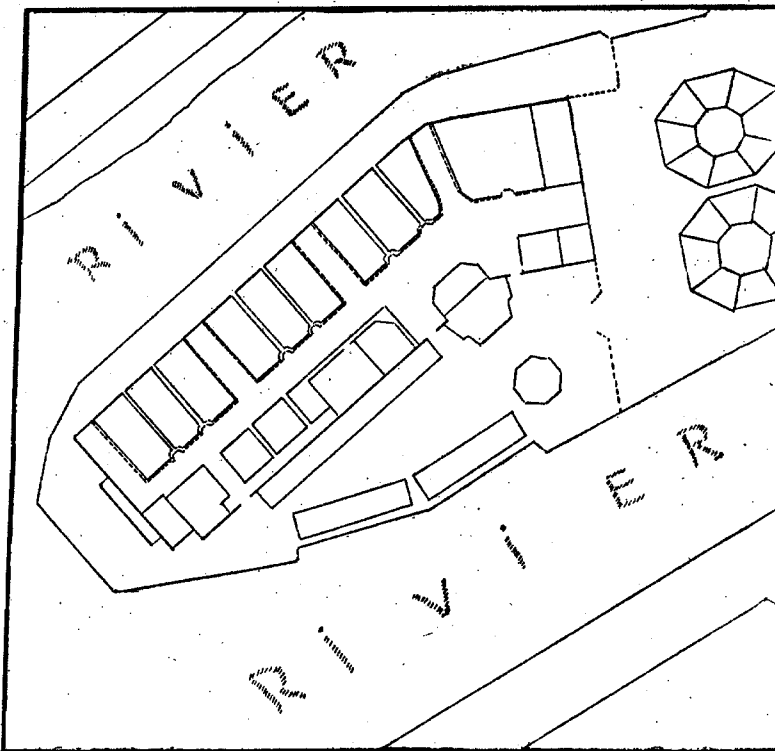


Figure 3.

Site of the fish market at Batavia. The right-hand side of the island is shown in greater detail in Figure 2. See page 38.

## TECHNICAL COMMITTEE II

(Issued as Working Paper C49/16).

1. Proposal for the scope of activity of the Technology Committee.

The subject to be allocated to this Committee may be divided into four and subdivided further according to the fields.

## SECTION I—Production

1. Boats and gear.
  - a. Local boats and gear.
  - b. Experiments with non-indigenous gear and other methods and equipment.
  - c. Treatment and maintenance (research on gear and net efficiency and preservation).
2. Piscicultural techniques.

## SECTION II—Storage and Processing.

1. Drying, salting and smoking.
2. Canning, Packaging and Refrigeration.
3. By-products.

## SECTION III—Distribution and Socio-economics.

1. Distribution.
2. Finance.
3. Organization.

SECTION IV—To summarize existing documents on international law as they pertain to fisheries and to exchange information with regard to fishery legislation and regulations.

2. It was also agreed that the best way of tackling the problem speedily was to appoint working committees for each of these sections.

3. It was also agreed that the papers contributed to meeting falling under the Committee II will be taken up as follows:

*Tuesday, March 29th at 2:00 p.m.*

1. Preliminary Report on studies of salted fish paste by Mr. J. I. Sulit and Mr. S. B. Santiago.
2. Notes on the experimental canning of fish at the fish preservation station, Estancia, Philippines by Mr. C. Martin.
3. Paper on refrigeration by Mr. W. B. Braxton.

*Wednesday, March 30th at 10:00 a.m.*

1. Note on the effect of explosives on fish in Siamese coastal waters by Mr. Boon Indrambarya.
2. Hongkong Fish Marketing Scheme by Mr. J. Cater.
3. Vitamin A and Oil content of some Philippine fish livers by Mr. C. Butler.

*Wednesday, March 30th at 2:00 p.m.*

1. Elucidation of the functions of working party on SECTION III by Mr. J. A. Tubb using IPFC/C49/5 and IPFC/C49/11 papers prepared by the Secretary.
4. Programme for the ensuing year—See IPFC/C49/8.

## RECOMMENDATIONS OF TECHNICAL COMMITTEE I

(Issued as Working Paper C49/20).

## I

The Committee on Hydrology and Biology recommends that Sub-Committees on particular problems take cognizance of and be guided by the following.

1. The basic structure of the Council's biological and hydrological programme must be related to national projects of research and development for which the Council would propose measures of co-ordination and integration aimed at ensuring that, wherever possible, the projects are complementary to

one another and yield a maximum amount of information of common value from the existing resources of personnel and equipment.

2. The Sub-Committee will need to apprise itself fully of the nature and scope of the national programmes and of the resources available for carrying them out.

3. The Sub-Committee, as a working unit, should formulate and state the specific problems referred to it and recommend assignment of priorities in the working programme, taking into consideration where appropriate:-

- (a) Recognition of the interest in, and allotment of responsibility for geographic and subject units.
- (b) Exchange of information on
  1. Methods and equipment,
  2. Results,
  3. Conclusions.

(c) Adoption of standard methods of equipment and terminology.

## II

The Committee on Hydrology and Biology recommends to the Council that co-ordinated efforts would be desirable in the scientific investigation of pelagic fisheries and considers that the following two groups of fishery resources need study from the point of view of collaboration by the member nations:-

1. The Tuna Fisheries
2. The fisheries concerned with the commercially important marine clupeids (including anchovies), scombroids other than tuna and pelagic carangids.

## III

The Committee recommends to the Council the recognition of the importance of fish-culture in the Indo-Pacific area and the need for collecting and pooling information on biological methods relating to fish cultural practices in coastal, brackish water and inland areas.

## 9

### RECOMMENDATIONS OF TECHNICAL COMMITTEE II

(Issued as Working Paper C49/21).

1. It was agreed to delete entirely in Working Paper IPFC/C49/16, Section IV.

2. With reference to the suggested terms of reference IPFC/C49/18, it was agreed to adopt (b) with the insertion of "statistics", making this No. (3), (3) becoming (4) and (4) becomes (5).

3. Proposed programme for the ensuing year. Working Party I (Section I)

- (1) Survey of local boats and gear with descriptive details.
- (2) Progress reports on non-indigenous gear and other methods.
- (3) Progress reports on research on gear, net efficiency and preservation.

Working Party II (Section II)

- (1) Survey of processing industries with a view to improving efficiency.
- (2) Progress report on canning, packaging and refrigeration.
- (3) Progress report on byproducts

Working Party III (Section III)

- (1) Symposium on current financial factors as they affect equipment, facilities and manpower in fishery production.

4. Proposal to insert the heading "International Fisheries Law" after Mammalia on Page 2, Working Paper IPFC/C49/9, and propose the names of Dr. W. E. S. Flory and Mr. E. Allen.