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AGRICULTURE NO. 5**

June 1, 1971

FISHERIES

A Selected List of References for A.I.D. Technicians

**Prepared by
Office of Agriculture and Fisheries
Bureau for Technical Assistance
in cooperation with
A.I.D. Reference Center**

**Agency for International Development
Department of State
Washington, D. C. 20523**

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INTRODUCTION

While AID reports and documents are the primary focus of this bibliographic series, other materials covering the work of international agencies, and various foundations and organizations in the field of technical assistance are included to a limited extent. AID employees should be able to benefit from the past experience of the Agency. This particular bibliography reflects much of this experience with respect to programs dealing with fisheries.

Guides to the Use of this Bibliography

1. The first point of reference should be the table of contents to see if the subject of particular interest is listed. Additional information about the topics covered in individual publications is provided by the annotations which are included as a part of each listing.
2. In classifying documents, a strong geographical emphasis has been given. This was done because many technicians will want to obtain the latest information on the fisheries situation in the country to which they are assigned.
3. For a review of AID programs in the fisheries field the following two publications are recommended:
 - (a) *International Development of the Marine Resources: Perspectives and Prospects* (see Item No. 14 in this bibliography).
 - (b) "Food from the Sea" section of the *Development Digest*, Vol. VII, No. 4, October 1969, p. 51-72. (see Item No. 12 in this bibliography).

Sources of Information

1. AID technicians who wish to obtain up-to-date information on fisheries in newly developing countries should contact the National Marine Fisheries Service (formerly the Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior). This agency issues the *Foreign Fisheries Leaflet Series*, *Foreign Fisheries Briefs*, and a bi-monthly periodical, *Commercial Fisheries*. The address of this organization is:

National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20230
2. Another important information resource is the Fisheries Department of the Food and Agriculture Organization of the United Nations. This organization publishes bi-monthly *Fisheries Abstracts*, the *FAO Fisheries Bulletin* and a yearbook of Fisheries Statistics. It also issues two series of publications titled

FAO Fisheries Studies and *FAO Manuals in Fisheries Science*. AID technicians may obtain a catalog of FAO publications and detailed information about FAO fisheries publications by writing to:

Distribution and Sales Section
Food and Agriculture Organization of United Nations
Via delle Terme de Carracalla
00100 Rome, Italy

or to their publication sales agent for the United States:

UNIPUB Inc.
650 First Ave.,
P.O. Box 433
New York, N.Y. 10016

AID in 1969-70 made grants authorized by Section 211(d) of the Foreign Assistance Act of 1966 to strengthen and expand the services of two university research centers concerned with the fisheries problems of developing nations. These two centers are:

- a. International Center for Marine Resource Development
University of Rhode Island
Kingston, Rhode Island 02881
- b. International Center for Aquaculture
Agricultural Experiment Station
Auburn University
Auburn, Alabama 36830

The Rhode Island Center focuses its research, training, and advisory programs on salt water fisheries, both deep sea and coastal, while the Center at Auburn specializes in the "farming" of fish and other aquatic animals such as shrimp and oysters in freshwater ponds and lakes and in coastal inlets. AID technicians may address inquiries to the appropriate source, and may obtain a brochure from either Center describing its services in detail.

HOW TO OBTAIN DOCUMENTS

Loans

Documents have ARC Catalog numbers as a part of their listing may be used in or borrowed by AID/Washington staff members from the AID Reference Center, room 1656, New State. Documents bearing State Department library catalog numbers may be obtained from that library's reference desk located in room 3239, New State.

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ARRANGEMENT OF LISTINGS

This bibliography was developed primarily for the use of AID technicians and administrative officials. Because of their special interests and needs, the listings are not arranged alphabetically by personal or institutional author as are most bibliographies. AID technicians are most of all interested in what the developments are in the countries to which they have been assigned or in which they are already working. Emphasis has, therefore, been given to the geographical classification of materials. An author-publisher index is provided to enable users to locate materials by this method, and a general index facilitates finding pertinent references under main technical assistance categories.

PART I. GENERAL

1. *Build a Fish Pond, Grow Your Own Fish*. Farmers Bulletin No. 1. September 1958, 8 p. USOM/Monrovia, Liberia.
ARC Catalog No. LB 639.311, L695.

A simplified, diagrammatic guide to constructing ponds for growing fish.

2. Chapman, Wilbert McLeod, *Fish Potential of the World Oceans for the Manufacture of Fish Meal and Fish Protein Concentrate*. March 1967, 13 p. Paper prepared for the 9th Annual Fisheries Symposium, National Fish Meal and Oil Association, Washington, D.C.
ARC Catalog No. 664.94, C466.

The author (Van Camp Sea Food Division, Ralston Purina Company) has prepared a technical description of the vast potential of food products from the sea. Topics cover the physical base of these foods, the arrangement of plant matter in the seas, the complexity of sea life, crustacea, and the amount of fish in the oceans. Indicates the way small fish as well as large can be push-button processed on a mass scale, and that FPC can be prepared in an acceptable way for wide human consumption.

3. *Development of Conservation Processes for Fish Products*. Contract No. csd/1904. 1968 and 1969. Prepared by the Faculty of Fisheries, Agrarian University, Lima, Peru for AID/Washington.
ARC Catalog No. PE 664.94, A277.

Two quarterly reports on a project to perform research on the development and application of methods that would permit better processing and utilization of fish products:

- a. *Quarterly Report No. 1*. September-November 1968, 5 p. Describes the organization and development of a program to survey existing fisheries, and the best methods to transport, process, salt, dry and smoke fish.
 - b. *Quarterly Report No. 2*. December-February 1969, 9 p. This is in two parts—the report proper, and a folder of 28 photographs plus copies of published articles. Describes progress of the project, equipment development, experiments with anchovies, and preserving processes.
4. Expert Group Meeting on the Production of Fish Protein Concentrate Sponsored Jointly by the United Nations Industrial Development Organization (UNIDO) and the United Nations Food and Agriculture Organization (FAO), December 8-12, 1969, Rabat, Morocco. The following publications were

developed in connection with this meeting and reference copies of the complete set are available in the AID Reference Center and the New York Liaison Office, United Nations Industrial Development Organization, United Nations, N.Y. 10017:

ARC Catalog No. 664.94, U58.

- (a) *History and Present Trends in Fish Protein Concentrate Production* by Oswald A. Koels of the Marine Biology Division, Lamont-Doherty Geological Observatory, Columbia University, Palisades, N.Y. ID/WG.48/1. 22 September 1969, 44 p.
- (b) *Some Observations on Fish Processing* by N.R. Jones of the Tropical Products Institute, London. ID/WG.48/2. 14 November 1969, 37 p.
- (c) *Some Aspects of Planning FPC Production Facilities* by A. Carsten of Surveyer, Nenninger & Chenevert, Inc., Montreal. ID/WG.48/3/Rev. 1. 6 January 1970, 9 p.
- (d) *The Determination of Nutritional Effectiveness and Acceptability of Fish Protein Concentrates* by C.O. Chichester, F. Monckeberg and E. Yanez, Department of Food Science and Technology, University of California, Davis, Calif. ID/WG.48/4. 12 November 1969, 26 p.
- (e) *Production of Fish Protein Concentrate from Moroccan Sardines* by John Blake, Portula Valley, Calif. ID/WG.48/5. 24 November 1969, 26 p.
- (f) *Provisional Agenda and Programme of Work*. ID/WG.48/6/Rev. 1. 24 November 1969, 5 p.
- (g) *Analysis, Testing and Uses of Fish Protein Concentrate* by V.D. Sidwell, B.R. Stillings and G.M. Knobl, Jr. of the Bureau of Commercial Fisheries, National Center for Fish Protein Concentrate, College Park, Md. ID/WG.48/7. 14 November 1969, 45 p.
- (h) *The Halifax Isopropanol Process for the Manufacture of Fish Protein Concentrate* by D.R. Idler of the Research Board of Canada; Halifax Laboratory, Halifax, Nova Scotia. ID/WG.48/8. 17 November 1969, 17 p.
- (i) *Nutritional Value, Utilization and Quality Control of Fish Protein Concentrates*. Prepared by the Food and Agriculture Organization of the United Nations, Rome. ID/Wg.48/9. 27 November 1969, 17 p.
- (j) *Utilization of FPC: An Analysis to Help Frame National Protein Strategies* by G.D. Bernstein, S.M. Cantor and S.H. Chafkin for General Oceanology, Inc. Cambridge, Mass. ID/WG.48/10. 19 November 1969, 15 p.
- (k) *Potential Raw Material Supplies for the Industrial Production of Fish*

Protein Concentrates. Prepared by the Food and Agriculture Organization of the United Nations, Rome. ID/WG.48/11. 20 November 1969, 18 p.

- (i) *Technical Description of Operational Fish Protein Concentrate Plant* by J.S. Tolin of Marine Protein, Inc. Panorama City, Calif. ID/WG.48/12/Rev. 1. 23 December 1969, 6 p.

5. *The Feasibility of and Recommendations for the Introduction of FPC in the School-Lunch Program in Brazil*. About 1969, 38 p. Prepared by Department of Food Science and Technology, University of California, Davis, California, for the Office of the War on Hunger, Food From the Sea (WOH/FFS), AID/Washington.
ARC Catalog No. BR 613.2, H224.

This report evaluates the feasibility of using fish protein concentrate (FPC) in foods for school children in the national school lunch program. It examines FPC product development, safety, and acceptability. Recommends commercialization of FPC as rapidly as possible, further experimenting, procurement of plant equipment, larger staffs, additional U.S. advisors, market survey for fish oil in Latin America and expansion of market utilization of FPC in Brazil.

6. Finn, D.B., *Fish: The Great Potential Food Supply*. World Food Problems No. 3. 1960, 47 p. Food and Agriculture Organization of the United Nations. Order from UNIPUB, Inc., 650 First Avenue, P.O. Box 433, New York, N.Y. 10016. Price \$.50.
ARC Catalog No. 639.2, F 686.

Discusses the increasing world catch of fish and the need for more international cooperation. Covers problems which hamper fish production, and gives some examples of work and progress in fisheries. Considers the potential for increasing the supply of fish.

7. *Fisheries*, Food and Agricultural Organization of the United Nations. Monthly indexes and yearly cumulative indexes contain current sections on fisheries, also special indexes on fisheries. Order from UNIPUB, Inc., 650 First Avenue, P.O. Box 433, New York, N.Y. 10016.

- (a) *FAO Documentation: Current Index (Cumulative, January - December 1970) Annotated Bibliography, Vol. 1*.
ARC Catalog No. 016.63, F 686 b.

- (b) *FAO Documentation: Current Index (Cumulative, January - December 1970) Author and Subject Index. Vol. 2* p. 148 - 162.
ARC Catalog No. 016.63, F 686 b.

- (c) *Fisheries: Index 1945 - 1966*. DC/Sp. 2 1967. Contains an analytical index, index by authors, and bibliographical list.
ARC Catalog No. 016.639, F 686.

(d) *Fisheries: No. 1, Annotated Bibliography*. DC/Sp. 14 1969. Combined price for volumes 1 and 2 \$12.00.

ARC Catalog No. 016.639, F 686 V. 1.

(e) *Fisheries: No. 2, Author and Subject Index*. DC/Sp. 14 1969.

ARC Catalog No. 016.639, F686, V. 2.

8. *Fisheries Training Facilities in the United States for Scientists, Technologists, and Technicians from the Developing Countries*. June 1968, 18 p. Prepared by Food From the Sea Service, Office of the War on Hunger, AID/Washington. ARC Catalog No. US639.20973, A265.

Encourages training in fresh and salt water fisheries, describes the types of training available in the United States, and notes the advantages of training overseas in or near local waters. Lists degree granting institutions and describes their courses.

9. *Fishery Aspects of the National Oceanographic Program*. August 1964, 69 p. Van Camp Sea Food Company, 840 Van Camp Street, Long Beach, Calif. 90802.

ARC Catalog No. 639.2, V217.

Covers the world-wide problem of protein malnutrition, world production of fish, the U.S. fishing industry, ocean research and fishery economics. Includes the twin aspects of fish conservation and harvesting, ocean research useful to fisheries, pending oceanographic projects in the Pacific, fishing vessels and engineering aspects and fishery administration.

10. *Fish Protein Concentrate: A Comprehensive Bibliography*. 1970, 77 p. Compiled by the Special Bibliographies Section, Science and Technology Division, Library of Congress for the National Center for Fish Protein Concentrate, U.S. Department of the Interior. Order from: National Technical Information Service, Springfield, Va. 22151. Price \$3.00.

NTIS Order No. PB 191 100.

ARC Catalog No. 016,66494, L697.

This annotated bibliography containing 308 listings, covers the literature on this subject which appeared from 1940 through 1969. Besides a general section, there are classifications such as processing methods, chemical composition, animal and human nutritional studies, and acceptability and use in foods. There is also a detailed subject index.

11. *Fish Protein Concentrate Reference List*. May 13, 1970, 5 p. League for International Food Education, 1155 Sixteenth Street, N.W., Room 705, Washington, D.C. 20036.

Lists thirty-one references to articles on fish protein concentrate. The League

for International Food Education, under contract to the Office of Nutrition, AID/Washington, may be used as a source by AID personnel for up-to-date publications and information on FPC at no charge.

12. "Food from the Sea" section of the *Development Digest*, Vol. VII, No. 4, October 1969. Prepared for AID/Washington by the National Planning Association. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price for single copies \$.75.

This section includes the following articles:

- (a) "Food from the Sea," by George Parman, Director of the Food from the Sea Service, AID/Washington. p. 51-58.
 - (b) "The Management of Fishery Resources," by the Food and Agriculture Organization of the United Nations (FAO), Rome, Italy. p. 59-62.
 - (c) "Status and Potential of Aquaculture," by Dr. John H. Ryther, Woods Hole Oceanographic Institute, Woods Hole, Mass. and by Dr. John E. Bardach, School of Natural Resources, University of Michigan, Ann Arbor, Mich. p. 63-72.
13. *International Center: Fisheries Research and Training*. Contract No. AID/csd-1581. 1969, 34 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. 639.3, A897.

Deals with Auburn University's international fisheries project, "Increasing Fish Production by Improved Fishcultures." This project is designed to assist developing countries increase their capabilities to produce adequate amounts of high-quality protein through cultures of fish, shrimp and other organisms in fresh, brackish and salt waters. Discusses the research program, field facilities, fisheries staff, teaching program, foreign students trained and reports produced by the staff on international fisheries activities.

14. *International Development of Marine Resources: Perspectives and Prospects*. March 1967, 39 p. AID/Washington.
ARC Catalog No. 639.2, A265.

A report to the U.S. National Council on Marine Resources and Engineering Development. Includes a summary of AID's activities relating to the marine sciences and technologies in less-developed nations. Reviews AID assistance to marine resources for Africa, the Far East, Latin America, the Near East and South Africa. Covers AID's past activities in the Food From the Sea program as well as present organization, management, policies and programs. Reports on the proposed establishment in the U.S. of one or more international training

centers for marine skills. Contains an annex of fishery studies done on Africa and another annex on the U.N. Marine Sciences Program, Special Fund Sector.

15. *Market Entry Strategies: Shrimp Processing Industry United States*. January 1968, 133 p. Thomas H. Miner & Associates, Inc., 135 South La Salle Street, Chicago, Illinois 60603.
ARC Catalog No. 380.143, M 664.

Although this survey is mainly centered in the United States, shrimp fishing and supply is such an international business that many developing nations may find the study useful. Shrimp is the most valuable U.S. commercial fishery and there is a growing demand for them from other parts of the world. Already 60 percent of the U.S. imports come from Mexico, India, Panama, Guyana, Kuwait and Venezuela. The sections on procurement and foreign procurement, p. 58-71, should be of special interest.

16. Murry, Sue T., *Home Curing Fish: A Guide for Extension and Village Workers in Many Countries*. July 1967, 17 p. Prepared in cooperation with the Federal Extension Service, U.S. Department of Agriculture. Order from the Office of Agriculture and Fisheries, Bureau for Technical Assistance, AID/Washington. 20523.
ARC Catalog No. 641.494, D419.

Contains information on catching, handling and cleaning fish and on methods of curing them by salting, air drying and smoking. Includes seven ways to use cured fish. Also in Spanish.

17. *Plant Requirements to Set Up and Operate a Seafood Processing Plant*. Code No. PR 122. September 1962, 46 p. Prepared for AID/Washington by Fehmerling Associates, Consultants to Food and Allied Industries, Bridgeton, New Jersey through the Office of Technical Services, U.S. Department of Commerce, Washington, D.C. 20230.
ARC Catalog No. 664.94, A265.

Presents detailed methods and information for processing fish, spiny lobster and shrimp in various forms preserved by freezing. Briefly discusses the preservation of certain species of fish by brining and drying. Contains information on plant site selection and layout, equipment, labor, financial requirements and production techniques.

18. Ranft, Joseph L., "Farming the Oceans and the Ponds." *War on Hunger*, Vol. V, No. 4, April 1971, p. 3-6. Published by the Office for Public Affairs, AID/Washington.
ARC Catalog No. 639.2, R195.

This article explains the rationale behind the AID fisheries program and describes briefly the activities of two grantee institutions working to help newly

developing nations with their problems in this field: (a) International Center for Aquaculture, Auburn University, Auburn, Alabama and (b) International Center for Marine Resource Development, University of Rhode Island, Kingston, R. I.

19. Rawson, G.C. and Florence A. Sai, *A Short Guide to Fish Preservation*. 1966, 68 p. Food and Agriculture Organization of the United Nations. Order from UNIPUB, Inc., 650 First Avenue, P.O. Box 433, New York, N.Y. 10016. Price \$1.00.
ARC Catalog No. AFR 664.94, R262.

The preservation of fish on a domestic scale under West African conditions by salting, drying and smoking. Appendixes on icing, fish protein concentrate production, canning, and a chapter on the nutritional importance of fish.

20. *Research and Technical Assistance Programs in Agriculture and Fisheries*. Fiscal Year 1970-1971, 56 p. Office of Agriculture and Fisheries, Bureau for Technical Assistance, AID/Washington.
ARC Catalog No. 630.72, A265, 1970/71.

In this compilation of AID's major centrally funded projects originated over the past decade, pages 34-37 are devoted to fisheries. The fisheries activities includes one research project on conservation processes for fish products, and three technical assistance programs dealing with fish culture, fish protein concentrate marketing (Chile, Korea and Morocco), and the third on the purchase, inspection and evaluation of fish protein concentrate.

21. Swingle, H.S., *History of Pondculture in the United States*. 1969, 31 p. Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. 639.3, S978.

Discusses the historical development of the farm pond program, sportfishing ponds, pond fertilization and warmwater and coldwater ponds. Reviews commercial bait minnow and commercial fish production in ponds. Considers feeds, aquatic weed control and control of parasites and diseases. Bibliography of nearly 90 listings.

22. *Transactions of the Fish Protein Concentrate Seminar*. November 7-8, 1967, 99 p. AID/Dacca, East Pakistan.
ARC Catalog No. PK 639.2, F532.

Presents twenty-three papers given at the AID-sponsored seminar on Fish Protein Concentrate (FPC) in Dacca, Pakistan. Covers production, marketing, nutrition, biology, resources and requirements of FPC, mainly for East Pakistan. Lists questions, answers, and remarks made, and also presents observations and conclusions of the seminar.

23. Wadsworth, Peter T., *Factors Affecting Investment Decisions in Aquaculture*

Projects in the Developing World, With Particular Reference to Southeast Asia (draft). 1971, 34 p. To be published by the International Center for Marine Resource Development, University of Rhode Island, Kingston, R.I. 02881.

After analyzing the general factors affecting investment decisions in aquaculture, the author examines the data from a catfish "farming" project carried out at the Skidway Institute of Oceanography in Savannah, Georgia. Three appendixes supply additional data. Recommendations are made as to technical assistance programs in this particular area of development. There is an eight-item bibliography.

PART II. AFRICA

24. Crosnier, A., E. de Bondy and S. Lefevre, *Commercial Shrimps of the Tropical West African Coast: Their Biology and Fisheries in July 1967*. Original report in French by Office de la Recherche Scientifique Outre-Mer, Paris. Translated Document No. 13 of the Tropical Atlantic Biological Laboratory, United States Bureau of Commercial Fisheries, Miami, Florida 33149. 1968, 94 p. and 10 p. of plans of shrimp trawls.
ARC Catalog No. AFR 639.543, C949.

Describes the present state of shrimp fisheries on the West Coast of Africa from Senegal to Angola and their rapid growth in recent years. Reviews the principal commercial species and present knowledge of their biology. Discusses methods of shrimp fishing, country by country, and concludes that shrimp fisheries should expand steadily if better equipment is coupled with exploration and research.

25. Moss, D.D., G.B. Pardue and M.J. Donner, *Fishculture Survey Report for West Central Africa*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-1581. June 30, 1969, 115 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. AFR 639.3, A897
NTIS Order No. PB 195916.

Survey carried out from March 30 to May 27, 1969 with visits of about one week to each of the following countries in West Central Africa: Senegal, Central African Republic, Cameroon, Nigeria, Togo, Ghana and Ivory Coast. Summarizes for each country the present general economic status, status of present fisheries, fish marketing and processing methods, and nutritional status and fish consumption. Recommends the establishment of a cooperative program of fishculture development for Ghana.

26. Douglas, Hugh and J.R. Townsend, *The Feasibility of Auxiliary Facilities for an Industrial Fishing Port, Republic of Dahomey*. SRI Project No. I-5954. Contract No. AID/afr-378. June 1966, 38 p. Prepared for AID/Washington by the Stanford Research Institute, Menlo Park, Calif. 94025.
ARC Catalog No. DM 627.3, S785.

Determines the economic feasibility of expanding and improving auxiliary facilities for a fishing port at Cotonou and proposes two alternatives to these facilities. Estimates capital and operating costs, net income before taxes, and the internal rate of return over a 20-year period. Additionally, analyzes the fishing grounds along the continental shelf of Dahomey, lists fish production figures for the past five years, and briefly presents the fish marketing and distribution system.

27. *Evaluation Report of "Fishing Port of Contonou" First Stage Development.* Contract No. AID/csd-724. April 1965, 42 p. Prepared for AID/Washington by the J.E. Greiner Company, 1106 N. Charles Street, Baltimore, Md. 21201. ARC Catalog No. DM 627.3, G824.

Evaluates the Bureau Centrale d'Etudes pour les Equipments d'Outre-Mer Report and related studies on proposed fishing port facilities for Cotonou, Republic of Dahomey. Indicates that the technical aspects of the project have been well-conceived and well-researched in the preliminary phase. Comparatively little additional information is required, and this mainly with regard to construction cost estimates and back-up data. Considerable additional information is required if the proposed project is to be evaluated for economic soundness in accordance with A.I.D. requirements. The lack of detailed economic information, however, does not preclude the conclusion that Dahomey is in dire need of the facilities proposed and that socio-economic benefits are almost certain to be realized if the fishing port is adequately and ably organized, staffed, managed, operated and maintained.

28. *Summary Report on Unfinished Investigations of Expansion of the Fish Industry in Egypt.* Contract No. TA 62-102-4001, C59200. September 1, 1965, 25 p. Prepared for the International Cooperation Administration, Washington by Arthur D. Little, Inc., Acorn Park, Cambridge, Mass. 02140. ARC Catalog No. UA 664.94, L778.

Investigates the possible expansion of Egypt's fishing industry and fish processing operations. Includes a summary on fish harvesting, consumption of fish, price control of fish and fish products, and fish marketing and processing.

29. Klima, Edward F., *Technical and Feasibility Study Shrimp Survey - Gabon.* April 8, 1966, 23 p. Prepared by the Technical Assistance Branch, Bureau of Commercial Fisheries, U.S. Department of the Interior, for USAID/Libreville, Gabon. ARC Catalog No. GB 639.543, K65.

Report of a survey conducted by a shrimp fisheries biologist to determine shrimp resources off the coast of Gabon. Describes briefly the marine fisheries of Senegal, Guinea, Sierra Leone, Ivory Coast, Nigeria, Cameroun, as well as Gabon. Recommends an exploratory shrimp survey of 1½ years to delineate primarily the shallow, and secondly, the deep water shrimp potential.

30. *Ghana—Investment Opportunities in the Fish and Agricultural Canning Industries: A Preliminary Survey.* April 1968, 101 p. Del Monte Corporation, San Francisco, California. ARC Catalog No. GH 664.0282, D331.

The first 33 pages of the survey are devoted to fisheries and the rest to food canning and related agricultural production. Fishing methods, marketing,

processing and government operations and policy are described in detail. The recommendations in regard to fisheries include: (1) Ghana no longer is deficient in her capabilities to produce fish for internal consumption, but there is a distribution problem which the Ghanaians can best solve themselves, and (2) tuna fishing may be possible as a commercial venture, but the government must finance and support an experienced private organization to conduct an experimental fishery program.

31. North, W. Haven, *Volta Lake Technical Assistance Project in Ghana*. Project No. 641-11-190-028. 12 February 1970, 8 p. Office of Central and West African Affairs, AID/Washington.
ARC Catalog No. GH 639.21, N867.

Project proposal to aid the Volta River Authority through the U.N.-assisted Volta Lake Research Project in developing programs and techniques to increase the fish harvest from the lake and to effectively control the aquatic weed problem in the lake. Includes data on the lake and present fish catch. Discusses action to implement the proposal and funding requirements.

32. *Report on the Guinean Trawling Survey*. Publication No. 99. Sept. 1962–April 1966. Scientific, Technical and Research Commission of the Organization of African Unity, Addis Ababa, Ethiopia.
ARC Catalog No. GV 639.2096652, 068 v. 1, 2 and 3.

This survey report of Joint Project No. 19, carried out in cooperation with the U.S. Agency for International Development under Grant Agreement 698-11-180-62C, is made up of the following three volumes:

- a. Williams, F., Volume I, *General Report*. 827 p. A detailed report of the marine resources of the West African continental shelf based upon the analysis of actual trawling operations.
 - b. Williams, F., Volume II, *Environmental Charts*. 529 p. This volume consists mainly of detailed maps showing bottom deposits, trawlability, and such surface and bottom water conditions as temperature, salinity, oxygen and transparency from Senegal south to the Congo.
 - c. Bargeski, Albert M. and Charles B. Selkirk (Compilers), Volume III, *Data Report*, prepared by the National Oceanographic Data Center, Washington, D.C. 552 p. This volume contains detailed statistical tables presenting the results of the trawling surveys of the West African continental shelf described in Volume I. There are sections on oceanographic station data, meteorological data and biological data.
33. Sparks, Albert K., *A Report on the Status and Potential of the Marine Shell Fisheries of Kenya*. 1965, 33 p. USAID/Nairobi, Kenya.
ARC Catalog No. KE 639.4, S736.

This survey, prepared under short-term contract by an expert from the University of Washington, outlines the historical background and status of the fisheries in Kenya. It describes the main species of fish, the fishing industry and the economic and marketing problems it faces. A sound marketing structure is strongly recommended, together with a reorganization of the Fisheries Department. It also suggests a shrimp survey, oyster research, and experimentation with spiny lobsters.

34. McFerren, Lew L., *The Marine Fisheries Program in Liberia: Annual Report for 1955*. December 5, 1955, 19 p. USOM/Monrovia, Liberia.
ARC Catalog No. LB 639.209666, M143.

Discusses the lack of scientific fisheries knowledge for fresh-water and marine areas. Covers fisheries control and fishing methods and organization. Describes the three-part fisheries program organized in December 1954: 1) the operating program; 2) the exploration program; and, 3) the technical assistance program. This program was coordinated with an FAO fisheries project commencing at the same time. Summarizes the progress made during the year and suggests continued support until completion.

35. Miller, George C., *Marine Fishery Development in Liberia, 1952-54*. Fishery Leaflet 440. September 1957, 41 p. Foreign Operations Administration, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C. 20240.
ARC Catalog No. LB 639.3, D419.

Reports on the development of marine fisheries in Liberia up to 1952 and outlines in a general way the lines of development and progress made from 1952-54. Includes information on the fisheries and fishery resources, fishery development program, current production and prospects of expansion. Also, includes extracts from "The Marine Fisheries in Liberia - Annual Report for 1955," by Lew L. McFerren, USOM/Monrovia.

36. Smith, William A., Jr., *Annual Report for Calendar Year 1963 on Fresh Water Fisheries*. January 8, 1964, 3 p. USAID/Monrovia, Liberia.
ARC Catalog No. LB 639.209666, S664.

Reports on the progress of the fisheries program in Liberia in 1963. Lists major achievements and implementation problems.

37. *A Program for Fisheries Development: Report to the Government of Malawi*. FAO No. TA 2239. 1966, 53 p. Food and Agriculture Organization of the United Nations, Via Delle Terme di Caracalla, 00100 Rome, Italy.
ARC Catalog No. MI 639.2096897, R421.

This survey is based on the work of H.L.F. Renson, Fisheries Development Adviser, United Nations Development Programme, and was designed to improve production and distribution of fish products in Malawi. Relating to lake and

river fisheries, the report covers the history of fisheries, organization of government services, statistics, legislation, marketing, research, and the Fisherman's Institute. Recommends a census of ponds, lake stocking, a survey prior to any major development program, and the possible use of aquatic weeds for fish food.

38. *Industrial Growth Possibilities in Several Sectors of the Economy of Morocco: Project 2A, A Program for Developing the Moroccan Fish Industry*. August 1963, 36 p. Prepared for AID/Washington by Porter International Company, 1776 K St., N.W., Washington, D.C. 20006.
ARC Catalog No. MR 639.2758, P845.

Outlines a program for commercially proving the existence of a tuna resource and suggests a policy for the development of a tuna fishing and processing industry. Recommends methods of exploitation when tuna are found, which include fish harvesting, processing and marketing programs. Contains supplementary information on the existing fishing industry.

39. *Industrial Growth Possibilities in Several Sectors of the Economy of Morocco: Section II, A Survey of the Fish Processing Industry in Morocco*. April 1963, 24 p. Prepared for AID/Washington by Porter International Company, 1776 K St., N.W., Washington, D.C. 20006.
ARC Catalog No. MR 664.94, P845.

Examines the fishing and fish-processing industries and suggests possible solutions to their problems. Includes a detailed project outline for a plan to market a new brand of Moroccan sardines in the United States. Covers the prices, processing and marketing of sardines, tuna, mackerel, anchovies and crustacea. Also discusses the principal by-products of fish such as fish meal and fish oil.

40. *The Potential for the Expansion of the Moroccan Industrial Fishery: A Preliminary Study*. August 1, 1967, 26 p. Del Monte Corporation, San Francisco, Calif.
ARC Catalog No. MO 639.20964, L331.

Reports on the possibilities for the expansion of the Moroccan industrial fishery and the manner in which this might be done. Includes data on the present status of fishing, processing and marketing. Recommends a detailed feasibility study be made, since it appears the sardine, mackerel, anchovy and tuna resources off Morocco are ample for further expansion. Fourteen appendices include data on fish catch, vessels, processing firms, canned fish and sardine exports, world catch of sardines, and preliminary cost and profit projection.

41. *Fisheries Survey of Nigeria: A Summary Report*. Consultants Reports Series No. 3. August 14, 1961, 25 p. Prepared for the International Cooperation Administration by the Bureau of Commercial Fisheries, Fish and Wildlife

Service, Department of the Interior, Washington, D.C. 20240.
ARC Catalog No. NI 639.209669, F532.

Advises the ICA Mission on the further development of fisheries. Surveys the fishing operation at selected ports along the coast, the marketing operations, fish farming, and freshwater fisheries of Lake Chad. Contains materials on national and international assistance programs. Suggests projects by which private, government or donor agencies could assist in the development of fisheries. Includes a two-page bibliography.

42. Williams, Edward W., *A Review of Fisheries Activities in Western State Nigeria*. Project No. 620-11-180-704. February 1969, 8 p. USAID/Lagos, Nigeria.
ARC Catalog No. NI 639.209669, W722.

Presents observations, assessments and recommendations of the Fisheries Development Project 704 (Western State). Discusses the history of fisheries development in Western State and sector goals and targets for accomplishment. Comments on USAID assistance and local government support. Includes data on the budget of the Nigerian Fisheries Division and an organizational chart of the Division.

43. *Amerafrika, Inc., Fully Integrated Tunafish Complex: Prefeasibility Report*. August 1, 1964, about 50 p. The Ralph M. Parsons Company, Engineers—Constructors, Los Angeles, and New York, N.Y.
ARC Catalog No. SG 639.3758, P 269.

This survey presents the results of a technical and cost study for a tunafishing complex to be located in Dakar, Senegal. It includes more analyses, assessing and evaluating, together with four packets of drawings, than an earlier report of March 19, 1964 which it supersedes. The report contains sections on the tunafish complex (design, fleet, freezing, power, administration, etc.), investment requirements, production costs, projected earnings, and financing. It concludes that the Government of Senegal should commit itself to assisting the project.

44. Kaufman, Charles L., *Report on Preliminary Survey of Shrimp Trawling Survey of Continental Shelf-Senegal to Liberia*. Report No. 0-28. May 16, 1966, 8 p. USAID/Lagos, Nigeria.
ARC Catalog No. LI 639.543, K21.

Reports on the availability of shoreside facilities and the seasonal habits of shrimp for the Ivory Coast, Liberia, Sierra Leone, Gambia and Senegal. Describes the search for a suitable trawler for a long-term commercial survey, and discussion of proposed survey with local governments. Includes data on shrimp for each country.

45. *Application to Development Banking Section of Credito Somalo for a Loan to*

Establish a New Freezing Plant and Fishing Operation in the Somali Republic. September 1964, 102 p. Quincy Market Cold Storage and Warehouse Co., Boston, Mass.

ARC Catalog No. 664.94, Q7.

Includes an application, made jointly by the Somali Fishing Company of Mogadiscio, the Somali Republic, and the Quincy Market Cold Storage and Warehouse Co., Boston, Mass., on behalf of a new company to be established in Mogadiscio. Proposes the construction and operation of a fish processing plant; initiating, developing and sustaining a fisheries operation; and future development and expansion of these and other related fish-processing and fisheries operations in Somalia. Includes the description of a proposed tuna operation, with details on construction, installation of equipment, and operating costs.

46. Johnson, Ralph L., *Fisheries Reconnaissance: Somalia, East Africa.* June 18, 1956, 29 p. USOM/Rome, Italy.
ARC Catalog No. SM 639.2096773, J68.

This survey was in response to a request by the A.F.i.S. (Italian Fiduciary Administration for Somalia) to USOM/Italy that a fisheries specialist investigate the more important problems of the fisheries industry, the relationship of the industry to the national economy, and whether a specialist could be economically justified for a two-year period. Includes data on the situation of the fishing industry, its potential, and government administration of fisheries.

47. Mattson, V.E. *Report on Tuna Operation of the Somali American Fishing Company: (Report of Evaluation and Recommendations on the Somali-American Fishing Company).* Contract No. AID/AFR-517. June 24, 1967, 33 p. Prepared by Inter-Oceanic Factors, Inc., Long Beach, California, for AID/Washington.
ARC Catalog No. SO 639.3758, M444.

This is a study of the Somali-American Fishing Company (SAFCO) which was formed in 1964 as a joint U.S. and Somali effort to upgrade the fishing industry. After considerable investment by both parties, the venture was not successful and the new plant placed on a standby basis. The report draws conclusions and makes recommendations as to various alternative plans for rejuvenating the enterprise in the face of USSR offers to perform the same tasks at a lower cost.

48. *Phase II - Installation: Preliminary Study of Feasibility and Costs of Installation and Operation of Cannery, Cold Storage and Fishing Fleet Complex* (rough draft). February 1963, 50 p. Starkist Foods Inc., Terminal Island, Calif. 90731.
ARC Catalog No. SM 664.94, S795.

Proposes the construction of a fisheries-processing complex in Somalia based on the assumption that one location is desirable and that the appropriate fishing

concession will be obtained from the Somali government. Includes specifications for the complex and the engineering drawings. Also, gives a preliminary financial analysis which includes expected cost of construction, equipment and installation, as well as potential operating costs and annual revenues.

49. *Fisheries Survey of Sierra Leone: Summary Report*. Attachment to TOICA A-105. September 23, 1961, 8 p. Prepared for USOM/Freetown, Sierra Leone by the Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of Interior, Washington, D.C. 20240.
ARC Catalog No. SL 639.209664, U58.

Surveys the fishing, processing and marketing operations around Freetown and in the Yawri Bay–Sherbo River areas. Includes background information on Sierra Leone and its marine and freshwater fisheries.

50. Smith, Robert O., *Marine and Fresh Water Fisheries Survey and Recommendations for the Sudan*. November 1959, 38 p. Prepared for USOM/Sudan and the Division of Game and Fisheries, Ministry of Animal Resources, Government of Sudan by the International Cooperation Administration, Washington, D.C.
ARC Catalog No. SN 639.3, U58.

Describes the characteristics of fishing along the Sudanese Red Sea coast and the main stems of the Blue Nile, White Nile, and Nile rivers. Presents the objectives and organization of the fisheries service. Makes various recommendations concerning the increase of fish production, particularly in the fresh waters. Appendixes include names of Red Sea commercial fish, previous Red Sea fisheries surveys and reports, summary of experimental fishing along coast, survey of the White Nile, possibilities of fish meal production and requirements for a multi-purpose fishing boat.

PART III. ASIA - MIDDLE EAST

51. Kirkegaard, I., and R.H. Walker, *Synopsis of Biological Data on the Rainbow Prawn: *Parapenaeopsis Sculptilis* (Heller, 1862)*. DFO/S4. Fisheries and Oceanography. 1970, 36 p. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Sydney, Australia. On file IOS/SEC, U.S. Department of Agriculture, Washington, D.C.

This is one of a series of documents issued with the Food and Agriculture Organization of the United Nations concerning species and stocks of aquatic organisms of present or potential economic interest. A highly technical study on the identity of the species, distribution (East Asian waters), bionomics and life history, population, exploitation, protection and management, and culture.

52. Bardach, John, *Report on Fisheries in Cambodia*. June 1959, 55 p. USOM/Phnom Penh, Cambodia.
ARC Catalog No. CB 639.209596, B949.

A detailed study and report on fresh water fisheries in Cambodia in which Dr. Bardach covers hydrographic features, fishing techniques, spawning methods and migrations, food, fish culture, production, trade and the fisheries administration in the Cambodian Government. Makes recommendations on netting, fishing laws, spawning research, statistics, exports, and fish rendering. Contains a bibliography of about 75 references, mainly in French.

53. Sands, Waldo M., *The Fisheries Conservation Program in Cambodia: A Status Report*. February 1958, 9 p. USOM/Phnom Penh, Cambodia.
ARC Catalog No. CB 639.209596, S221.

Fresh water fish production dropped from 61,000 tons in 1954 to 16,000 tons in 1956, a loss of 75 percent in two years, which prompted this brief survey by the USOM Forest Resources Advisor. A four-year program is outlined which calls for research on fish production, increase in size of fish preserves, improved administration, better transportation, develop fish hatcheries and hiring of fishery advisors.

54. Manley, T. M., *Taiwan Fisheries in 1965*. July 29, 1966, 13 p. Airgram, A-96, U.S. Embassy, Taipei, Taiwan, Republic of China.
ARC Catalog No. TW 639.20951249, U58.

Surveys Taiwan's commercial fish catch in 1965 which reached a new high of 382,268 metric tons. Outlines the 1966 production goal of 400,000 metric tons. Reviews the production of processed fish products, fisheries exports, status of the powered fishing fleet, and wholesale prices.

55. Lin, S. Y., *Milkfish Farming in Taiwan: A Review of Practice and Problems*.

Fish Culture Report No. 3. February, 1968, 63 p. Taiwan Fisheries Research Institute, Taiwan, Republic of China.
ARC Catalog No. TW 639.20951249, L 735.

Traces the history of milkfish farming from the 1600's to the present day large scale experiments in stocking and propagating. Contains sections on feeds and feeding, stocking and yield, growth rate, pond tillage and fertilization, diseases and pests. Lists about 50 references on the subject.

56. Swingle, H.S. and D.D. Moss, *Report of Fishcultural Investigations in Taiwan*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-1581. June 17, 1969; revised August 15, 1969, 24 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. CH 639.3, A897.
NTIS Order No. PB 195 904.

Discusses the importance to Taiwan of fisheries and production from fish cultures. Gives data on fish farms, research stations, culture stations and fisheries stations, and includes information on research experiments, training and facilities. Also covers the Taiwan Chlorella Factory, mushroom culture, and fishery training at Taiwan National University.

57. *A Case Study on Project 386-18-005: Expansion and Modernization of Marine and Inland Fisheries*. October 15, 1962, 6 p. Agriculture Division, AID/New Delhi, India.
ARC Catalog No. IN 639.20954, U58.

Describes the Indian Fisheries Program that was part of the "Grow More Food Campaign" initiated in 1951. Includes AID's method of operation, and analyzes the fishing industry's progress and problems from its inception to 1961.

58. Heggem, Ole J., *Report on the Indo-American Fisheries Program*. April 1957, 44 p. Prepared by the Technical Cooperation Mission/New Delhi, India.
ARC Catalog No. IN 639.20954, H463.

Reports on Indian fisheries in general and gives statistics on fish production. Includes information on shrimp fisheries, subsidies and loans, fisheries cooperatives, mechanization of vessels and exploratory fishing. Discusses fisheries marketing, extension services, and training. Comments on the utilization of equipment and commodities procured. Appendixes include data on vessels and on fisheries technicians assigned to India, and a 45-page report by Dr. Richard Van Cleve titled "Survey of the TCM Fisheries Program in India" prepared in March 1957.

59. Moss, D.D., *Report on the Development of the College of Fisheries, University of Agricultural Sciences, Bangalore*. March 20, 1970, 119 p. Prepared for the

University of Tennessee/India Agricultural Programs by D.D. Moss on leave from the International Center for Aquacultures, Auburn University, Auburn, Ala. 36830.

ARC Catalog No. IN 630.711, M913.

Comments on the new fisheries school to be located, possibly, at Bangalore; includes background data on organization and curriculum. Describes the Marine Products Processing Training Center at Bangalore near the possible location of the College of Fisheries. Discusses soils, rainfall, evaporation and seepage at the new site. Includes data on concrete pools, wells, earthen ponds, a field and research laboratory, a fisheries library, and training and technical assistance.

60. Richard, Harris H., *Development of Near East and South Asian Marine Resources*. About 1960, 8 p.
ARC Catalog No. NEA 639.20956, R 512.

A brief general survey of fisheries in the Middle East and India prepared by an agricultural marketing and processing specialist. Deals with development of country-owned modern fishing industries, fishing for domestic consumption, domestic markets, world markets, canned fish, shrimp, India's fishery development program, and schedule of conditions for foreign collaboration.

61. Sandven, Per, *The Indo-Norwegian Project in Kerala*. 1959, 152 p. Norwegian Foundation for Assistance to Underdeveloped Countries, Oslo, Norway.
ARC Catalog No. IN 639.20954, S221.

Reports on Norwegian aid to India, which started in 1952-53 as a fishing community development project in the State of Travancore-Cochin (now Kerala). The purpose of the First Supplementary Agreement, signed in New Delhi in January 1953, was to bring about an increase in returns to the fisherman, introduce efficient distribution of fresh fish and improvement of fish products, improve health and sanitary conditions of the fishing population, and raise the standard of living of the community in general. Initially two fishing communities about seven miles north of Quilon were selected for the project. This project was expanded, by the Second Supplementary Agreement signed in April 1956, to start a new fishing center in Cochin, to provide health facilities and to better the water supply to areas adjoining the project. Appendixes include copies of the agreements and a list of abbreviations.

62. Smith, R.O., *Marine Fisheries Development in India* 1959, 72 p. prepared for End of Tour Report, USOM/New Delhi, India.
ARC Catalog No. 639.20954, S657.

The report covers the period of March 1958 - March 1959 by the marine fisheries advisor when Indian consumption of fish was about 3.6 lbs. per capita as compared to 11 lbs. in the United States. The host country estimated a 400 per cent increase was needed to supply protein requirements. No formal

recommendations are presented, however the advisor states that the "... bottleneck is lack of know-how in translating fishery research into more fishery products." Contains a number of charts and maps together with a bibliography of 3½ pages.

63. Swingle, H.S. and D.D. Moss, *Report of Fishcultural Investigations in India*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-1581. February 16, 1968; revised August 15, 1969, 18 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830. ARC Catalog No. IN 639.3, A897. NTIS Order No. PB 195 906.

Gives background information on fisheries in India. Surveys the Central Fisheries Station, a research substation and a brackish-water station. Includes data on fisheries education and state fisheries. Recommends a new location for a large freshwater fishcultural research station, establishment of several fishcultural substations, a survey to determine the desirability of a large brackish-seawater fishcultural research station, and one or more universities setting up a formal fisheries training program.

64. Swingle, H.S., *Research Evaluation Report on the Central Inland Fisheries Research Station, Government of India* March 1961, 34 p. Prepared for the Rockefeller Foundation by H.S. Swingle on leave from the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830. ARC Catalog No. IN 639.31, S978.

Reports on the main fisheries research station at Barrackpore and nearly all substations and units throughout India. Discusses riverine, estuarine and lacustrine fisheries research. Also describes culture fisheries and special units at the main station. Gives 17 recommendations regarding the research of the Central Inland Fisheries Research Station.

65. Van Cleve, Richard, *Survey of the TCM Fisheries Program in India*. March 1957, 45 p. International Cooperation Administration, Washington, D.C. ARC Catalog No. IN 639.2094, V217.

Surveys various fisheries projects for TCM in order to advise on future lines of development, to indicate whether there is duplication of effort in the fisheries programs of TCM and FAO, and to evaluate the research program of the Central Government Fisheries Department. Includes summary of observations, general results of the survey and recommendations. Appendixes contain an outline of the fisheries tour, summary of TCM aid to India, an exploratory fishing program and a proposed reorganization of the Central Fisheries Department.

66. Bardach, John E., *Report on Indonesian Fisheries*. August 1968, 27 p. Prepared

for the Office of Agriculture of Fisheries, East Asia Bureau, AID/Washington.
ARC Catalog No. ID 639.20991, B245

Professor Bardach of the School of Natural Resources, University of Michigan, describes marine inshore fisheries, high seas fisheries, brackishwater fish culture, freshwater fisheries and suggests future development possibilities for each. He recommends increased boat motorization, more small boat building, increased training, improvement of salt and sauce production, research in fish protein concentrate and better methods of fish preservation. With modernization, Indonesia can overcome a fish shortage and some day become a fish exporting nation.

67. *Proposal for Indonesian Fisheries Project Feasibility Study*. May 1961, 58 p. Prepared by the International Research Organization, Inc., 1908 "Que" Street, N.W., Washington, D.C. for the International Reconstruction Corporation of Indonesia, 30 Djalan Kedah, Semarang, Indonesia.
ARC Catalog No. 639.20991, I61.

Actually a "pre-feasibility study", this survey recognizes that acute deficiencies in protein nutrition can largely be made up from a substantial increase in fisheries production. Recommends a feasibility study be conducted in Indonesia costing about \$30,000, leading to a possible long range program totalling up to \$6 million to conduct training, equipping, and organizing modern fishing operations.

68. Swingle, H.S., *Pondfisheries and International Limnological Symposium*. August 6-28, 1968, 25 p. Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. IS 639.311, S978.

Reports on symposium held in Haifa, Israel from August 6-28, 1968. Discusses tour of the fishing industry in several selected spots in the country. Includes data concerning carp, Tilapia, hake, grey mullet, fish feeds and fish culture. Contains materials on the Fish Disease and Parasite Laboratory at Nir David, fish problems in Israel and the Fish Breeders Association, and notes on some papers given at the symposium.

69. Perlmutter, Alfred, *Sea Fisheries: Report to the Government of Israel*. Project 71-19-062. October 1956, 58 p. Prepared for the United States Operations Mission/Tel-Aviv, Israel by the Research Foundation of the State University of New York, 411 State Street, P.O. Box 7126, Albany, N.Y. 12224.
ARC Catalog No. IS 639.2095694, P451.

Reports on a 22-month assignment in Israel as a consultant on sea fisheries. Includes data on sea fisheries potential and a program for the development of Israel's sea fishery resources. Details are given on the development and progress

of this program at the Sea Fisheries Research Station at Haifa. There is a two-page bibliography, as well as appendixes containing a list of commercially important fish, a list of commercially important invertebrates and plants, and a section on the use of estuarine and sea fish of the Family Mugilidae, grey mullets, for pond culture in Israel.

70. *General Aspects of Fisheries in Japan*. April 1956, 19 p. Fisheries Agency, Ministry of Agriculture and Forestry, Government of Japan, Tokyo, Japan. ARC Catalog No. JA 639.20952, J35.

A brief history of fisheries in Japan since 1900, describing the introduction of power boat fishing, damage caused by World War II, comparison of catches before and after the war, licensed trawlers operating from 1946 to 1954, purse seine fisheries, and tuna fishing boats. Includes tables and diagrams.

71. Swingle, H. S. and D. D. Moss, *Report of Fishcultural Investigations in Japan*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-1581. April 15, 1968; revised August 15, 1969, 17 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830. ARC Catalog No. JA 639.3, A897. NTIS Order No. PB 195 902.

Surveys several fisheries stations and farms primarily involved in carp culture in ponds and ricefields. Summary sheets are attached on carp culture in paddy fields in Nagano Prefecture. Also gives a short history of the Freshwater Fisheries Research Laboratory including its organizational structure, facilities and principal research projects.

72. *Agriculture and Fishery Development Corporation*. 1968, 24 p. The Agriculture and Fishery Development Corporation, Government of Korea, Seoul, Korea. ARC Catalog No. KS 639.2095195, A278.

A well-illustrated chamber of commerce-type publication explaining what the Government is doing to expand farm and fisheries production. Contains sections on fields of activities, projects in progress and planning for the future.

73. *Commercial Feasibility of Fish Protein Concentrate in Developing Countries: Volume I - The Protein Situation in Korea and the Potential Role for Fish Protein Concentrate*. Final Report, Go Report No. 8. Contract No. AID/csd-2158. October 1969, 138 p. Prepared for Food from the Sea Service, Office of War on Hunger, AID/Washington by General Oceanology, Inc., 27 Moulton St., Cambridge, Mass. 02138. ARC Catalog No. KS 664.94, G326. NTIS Order No. PB 195 913.

Establishes that protein malnutrition exists in certain groups in Korea, and that

fish protein concentrate (FPC) might contribute to ameliorating this shortage. Present economics and raw material shortages, however, mitigate against a self-priming commercial FPC operation in Korea today. However, some alternative paths for protein relief through FPC are possible. Reviews the problems of protein nutrition, and the Korean protein system. Calculates the "protein gap" for various groups and determines the cost/effectiveness of protein fortification. Examines the feasibility of producing FPC locally, the implications of a protein supplement program on national nutrition policies and the cost of closing the protein gap.

74. Cooley, Edward H.E., *Report on Korea's Fish Markets and Marketing Problems*. 1958, 37 p. Prepared for the Office of Marine Affairs, Republic of Korea and the Office of the Economic Coordinator for Korea, United Nations Command, by the Cooley Associates, Inc., 419 Baylston Street, Boston 16, Mass. ARC Catalog No. KS 380.1437, C774.

Discusses methods for the improvement of marine products and marketing practices. Includes a survey of fisheries organizations, including guilds, unions, associations and federations. Also covers financing, oil distribution to the industry, cotton-twine supplies, fish markets, the Puson Guild Market, processing areas, new market locations and needed equipment and facilities.

75. *A Feasibility Study of Harvesting, Processing and Marketing Mackerel and Tuna in an Expanded Fish Industry in Korea*. AID Loan No. 489-H-030. June 1, 1968, 207 p. Prepared for AID/Washington by International Development Services, Inc., 1725 Eye Street, N.W., Washington, D.C. 20006, and Inter-oceanic Factors, Inc., 110 West Ocean Boulevard, Long Beach, Calif. 90802. ARC Catalog No. KS 639.27, I61.

Studies the economic, commercial, technical and financial feasibility of establishing an integrated fish-processing enterprise in Korea. This proposed enterprise is to harvest, process, produce and market an estimated 60,000 tons of mackerel and 20,000 tons of skipjack and yellow-fin tuna annually. Contemplates that the project may include facilities or provisions for boat construction, operation and maintenance, cold storage, container supply and/or manufacturing, fish canning, offal reduction, finished product warehousing, marketing, training and auxiliary operations. Includes data on: fishing resources available, fisheries in the Korean economy, possible location of the fisheries complex, tuna and mackerel fleet specifications, financial aspects of the plant and fleets and estimates of national benefits to the Korean economy. Conclusions and recommendations are to be written subsequent to a conference in Korea on this draft version of the report.

76. *Fisheries Cooperative Law, Law No. 1013, (Promulgated Effective January 20, 1962)*. 1962, 45 p. Ministry of Agriculture and Fisheries, Government of Korea, Seoul, Korea. ARC Catalog No. KS 351.0823, K84.

A compilation of the fisheries cooperative laws containing chapters on General Provisions, Fishing Cooperatives, Fisheries Manufacturers Cooperatives, Central Association of Fisheries Cooperatives, Accounting, Supervision, Penalties and Miscellaneous Rules.

77. Fuqua, Charles L., *A Report on the Development of the Fresh Water Fisheries of South Korea*. K-TC-AV-216. May 1958, 21 p. Office of the Economic Coordinator Korea, Division of Agriculture, Branch of Fisheries, USOM/Seoul, Korea.
ARC Catalog No. KS 639.2095195, F982.

A survey of freshwater fisheries resources (particularly of carp and pondfish), Government fish hatcheries, and private fish farms to determine the economic need for enlarging and improving such facilities. Concludes that this important resource has a potential of a minimum of 220,200,000 pounds of fresh water fish annually. Recommends construction of more rearing ponds, improved stocking and further experimentation with new species and techniques.

78. Kelly, C.B., et. al., *Sanitary Control of Shellfish in Korea*. 1968, 104 p. Prepared for USOM/Seoul, Korea by the Public Health Service, Department of Health, Education and Welfare, Washington, D.C. 20201, the Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, and the Fisheries Research and Development Agency, Pusan, Korea.
ARC Catalog No. KS639.4, K29.
NTIS Order No. PB 196 351.

Report covers the public health aspects of establishing effective oyster production for export to the United States. Includes a review of oyster culture and production, shellfish administration and control activities, shellfish legislation, incidence of enteric diseases, laboratory services, sanitary surveys of oyster areas, research and training needs and control of harvesting. Contains a two-page bibliography and several appendixes.

79. Marr, John C., *Report to USOM/K on the Fisheries and Fishery Problems of Korea*. June 4, 1963, 15 p. Prepared by the Area Director, U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Box 3830, Honolulu 12, Hawaii, for USOM/Seoul, Korea.
ARC Catalog No. 639.2095193, M358.

A brief study on the future outlook for fisheries development in Korea which predicts economically sound growth if specific problems are overcome. Recommends more detailed examination of oyster culture and lobster fishing, the examination of basic problems between private and government fishery agencies, establishment of priorities, and the assignment of a fishery advisor and specialists as required by USOM/Korea.

80. *Rebuilding Korea's Fishing Industry: A Report of the First Fisheries Workshop*. Special Report Series, No. 6. CEB-P-58-569. September 1958, 51 p. Prepared

by the Combined Economic Board, United Nations Command, Republic of Korea, Seoul, Korea.

ARC Catalog No. KS380.1437, 028.

This report on the first fisheries workshop held September 12-13, 1958 reviews the background of the fishing industry in Korea and pinpoints problem areas and possible solutions for expansion and modernization. Concludes that primary technical problems can be solved by training and procuring modern fishing equipment. Contains 41 pages of the minutes of the conference.

81. *A Survey of the Salmon and Trout Resources of the Republic of Korea*. June 30, 1967, 103 p. Prepared by the United States Bureau of Commercial Fisheries, Department of the Interior (transferred in 1970 to Department of Commerce), for AID/Washington.

ARC Catalog No. KS 639.2095195, A875.

Report of an advisory team working with fishery experts from the Republic of Korea to determine the feasibility of the commercial development of salmon and trout in Korea and to survey inland waters suitable for these two species. The study recommends construction of three salmon hatcheries; training of technicians in hatchery work, management and marketing; adoption of special methods for harvesting salmon runs; collection of further data, and sending of additional AID advisors.

82. *Bulletin of Fisheries*. 1968. Director of Fisheries, Fisheries Division, Ministry of Agriculture and Co-operatives, Kuala Lumpur, Malaysia.

ARC Catalog No. MY 639.209964, M239.

Bulletins of February, March, April, and the "Fourth Quarter," 1968, averaging about 20 pages including appendixes. Reports on marine fisheries, registration of boats, cooperatives, imports and exports, piracy, fish storage, and fresh water fisheries. Tables provide data on catches, prices, breeding ponds, storage and fishing gear.

83. Ling, S.W., *Report to the Government of Malaysia on Development of Inland Fisheries, with Special Emphasis on Fish Culture*. Rep. FAO/EPTA 2095. 1965, 93 p. Food and Agriculture Organization of the United Nations, Rome, Italy. Order from UNIPUB, Inc., Box 433, N.Y., N.Y. 10016.

ARC Catalog No. MY 639.209964, F686.

Reports on the progress and accomplishments of this FAO project from Dr. Ling's arrival in June 1959 to his departure in December 1964. Covers development of fisheries stations, survey of inland waters, improvement and development of fish culture practices, development of extension services and research. Recommends fuller utilization and better management of existing natural resources, increasing fish stocking operations, improvement and development of fish culture, enlargement of extension services and additional recruitment and training of technical personnel.

84. Swingle, H.S. and D.D. Moss, *Report of Fishcultural Investigation in the Federation of Malaysia*. Series title: *Increasing Fish Production by Improved Fishcultures*. February 26, 1968; revised August 15, 1969, 15 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. MY 639.3, A897.
NTIS Order No. PB 195 900.

Surveys the Fisheries Department of the Ministry of Agriculture, which operates three marine stations and seven freshwater fish hatcheries. Covers the physical plant, water supply, facilities, staff and major research projects of the Tropical Fish Culture Research Station at Malacca, which is not part of the Fisheries Department. Discusses the problems involved in the future operation of the research station.

85. Baldauf, Richard J., *Teaching in Fisheries at East Pakistan Agricultural University*. October 4, 1968, 10 p. Department of Wildlife Sciences, College of Agriculture, Texas A & M University, College Station, Texas 77843.
ARC Catalog No. PK 639.2007, B175.

A report based on a visit to East Pakistan August 4 to September 2, 1968, for the purpose of expanding fisheries through university courses and improvement of present facilities and techniques. Recommends the enlargement of fisheries science and offers suggestions and changes in course syllabi at the East Pakistan Agricultural University. Suggests research in taxonomy and distribution of freshwater fish, water quality and food habits of freshwater fish, biology of air-breathing fish, and pond culture.

86. Conner, J. Van, *Fisheries Advisor Terminal Report*. 30 June 1970, 12 p. USAID/Dacca, East Pakistan.
ARC Catalog No. PK 630.711, C752.

Reports on fisheries advisory role at the Agricultural University, Mymensingh, East Pakistan from 16 February 1969 to 30 June 1970. Discusses establishing a curriculum and syllabi for the new Faculty of Fisheries, university administration, ichthyofaunal survey work and taxonomic studies. Reviews current status of the Faculty of Fisheries and gives conclusions and recommendations concerning the future development of the Faculty and of inland fisheries in East Pakistan.

87. *Fishculture Project Report for East Pakistan: Phase I, Final Report*. Contract No. AID/csd-1581. February 1, 1969, 132 p. Prepared by the Agricultural Experiment Station, Auburn University, Auburn, Alabama 36830, for USAID/Dacca, Pakistan.
ARC Catalog No. PK 639.31, A897.

This report summarizes the findings of three trips by Auburn advisors to

Pakistan to advise on expansion of fresh water fisheries. Chapters cover fish farms, facilities at East Pakistan Agricultural University, the Fisheries Development Corporation of E. Pakistan, and the brackish-water fisheries research station. Recommends expansion of research facilities, construction of ponds, inspection visits, and experiments on reduction of seepage in ponds.

88. Morgan, Alvin M. and James G. Unti, *Desirability and Implications of Developing a Pakistan Deep Sea Fishing Industry*. August 23, 1968, 10 p. USAID/Lahore, Pakistan.
ARC Catalog No. PK 639.209549, M847.

Reviews the coastal fishing industry of West Pakistan and the coastal fishing community. Suggests the possibility of establishing a deep sea tuna industry, utilizing the facilities at the deep-water port of Karachi. Recommends that the Government of Pakistan investigate markets, catch data, costs, bait sources, and shipyards in Japan and Korea if interested in establishing a deep-sea tuna fishing industry.

89. Parman, George K., *Report and Recommendations on Fisheries and Food from the Sea Development in West Pakistan*. April 1968, 10 p. Office of the War on Hunger, Food from the Sea (WOH/FFS), AID/Washington.
ARC Catalog No. PK 639.2095491, P253.

A brief survey of fisheries in West Pakistan following inspection visits during February - March 1968. Reports on Expansion of marine fisheries, much of which was due to an AID project for the creation of a modern fish-handling port in Karachi and the provision of an exploratory fishing vessel. Recommends supplying another vessel for experimental fishing and fish mapping in deeper waters, and the building of a research plant for making fish protein concentrate (FPC).

90. Swingle, H.S. and D.D. Moss, *Report of Fishcultural Investigations in East Pakistan*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-1581. January 30, 1968; revised August 15, 1969, 14 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. PK 639.31, A897a.
NTIS Order No. PB 195 901.

Discusses the need for increased fish production as a means of increasing the supply of protein. Surveys the freshwater fisheries station at Chandpur and the features contributing to its unsuitability as a main research station. Covers the School of Fisheries at the East Pakistan Agricultural University at Mymensingh and the advantages and disadvantages of establishing a freshwater fisheries research station at the University. Includes information on the possible establishment of a brackishwater station and a Fisheries Development Corporation. Gives preliminary recommendations for a fishculture project in East Pakistan.

91. Swingle, H.S., H.R. Schmittou, D.D. Moss and W.A. Rogers, *Fishculture Project Report for East Pakistan*. Series title: Increasing Fish Production by Improved Fishcultures. (Phase I, Final Report.) Contract No. AID/csd - 1581. February 1, 1969, 132 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. PK 639.31, A897.
NTIS Order No. PB 195 915.

Summarizes the results of three trips to East Pakistan. The first trip, November 23-29, 1967, concerned the present and future needs of high quality protein, the role of fisheries, organizations in fisheries education, research and management, and available research facilities. The second trip, June 19-21, was for conferences at the University of Mymensingh and the Directorate of Fisheries at Dacca. The final trip, October 26 to November 22, 1968, was to investigate fish seed farms, research stations and sites for fisheries research stations. Recommends the expansion of research facilities, establishment of a pond fishery research station, periodic visits by Auburn research specialists and experiments on the reduction of seepage in ponds.

92. Swingle, H.S. and D.D. Moss, *Report of Fishcultural Investigations in East Pakistan*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-1581. January 30, 1968, Revised August 15, 1969, 14 p. Prepared by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830, for USAID/Dacca, Pakistan.
ARC Catalog No. PK 639.31, A897a.

This report is based on a survey made from November 23 - 29, 1967 in East Pakistan where the population is expected to increase by 23 million by 1980 with a resultant almost tripling of the protein requirement for minimum nutrition. Tests show that fish production can be increased dramatically. Preliminary recommendations include setting up an experiment station in a better location than the old one, conducting more testing, bringing in advisory technicians, and training Pakistanis in research and extension.

93. Dendy, J.S. and F.F.W. Morawa, *Report to the Government of the Philippines on the Organization and Operation of the Limnology Project 1959-1960*. FAO/ETAP Report No. 1319. 1961, 25 p. Food and Agriculture Organization of the United Nations, Rome, Italy. Order from UNIPUB, Inc., Box 433, N.Y., N.Y. 10016.
ARC Catalog No. RP 639.21, D391.

Reports on the inland fisheries project conducted during the period 6 April 1959 to 21 August 1960 under the U.N. Technical Assistance Program. Discusses work on Laguna de Bay and establishing a limnological station on this lake. Includes observations, results, conclusions and recommendations concerning studies on fish population, fisheries census, snails, shrimp, plankton,

aquatic insects, hydrochemicals and lake mapping. Reviews scientific literature and translations.

94. *Fisheries and Oceanography: Report of Philippines—U.S. Workshop, December 4-9, 1967, Manila, Philippines*. Contract No. AID/csd-1122. 1967, 129 p. Prepared by the National Science Development Board—National Research Council of the Philippines and the U.S. National Academy of Sciences-National Research Council, under contract with AID/Washington.
ARC Catalog No. PH 639.209914, N277.

This is a summary report of the third workshop in a series on fisheries with the principal aim of accelerating production of food from the sea. It recommended that: (a) fisheries be identified as an important national objective, (b) policy formulation and strategy be coupled with effective implementation, (c) new approaches based on research and modern methods be developed, and (d) both government and private agencies devote major resources to fisheries development. Included are reports and papers of working groups and other background materials.

95. *Fisheries Statistics of the Philippines*. 1965, 118 p. Economics and Statistics Section, Fisheries Information Division, Philippine Fisheries Commission, Manila, Philippines.
ARC Catalog No. RP 639.209914, P549, 1965.

Statistics on commercial fish catches, fishpond production, municipal fisheries and sustenance fishing from 1951 through 1965. Contains appendixes with tabulation of the fishery regions into which the country is divided, the different fishing grounds, and an inventory of fishing gear in 1953.

96. Heggem, Ole J., *Observations on Philippine Fisheries*. December 19, 1959, 24 p. Prepared for USOM/Manila, Philippines.
ARC Catalog No. RP 639.209914, H463.

A survey of Philippine fisheries conducted from November 5, 1959 to December 19, 1959 which contains summaries of previous reports (printed in the appendix). Recommends additional training, better use of existing facilities, a study of tax laws and administration to encourage private enterprise, improved marketing, expanded credit facilities and the establishment of a canning industry.

97. Parsons, John W., *Report to the Government of the Philippines on Freshwater Fisheries Investigations*. FAO Report No. 1565. July 1962, 60 p. Food and Agriculture Organization of the United Nations, Rome, Italy. Order from UNIPUB Inc., Box 433, N.Y., N.Y. 10016.
ARC Catalog No. RP 639.209914, P268.

The FAO Inland Fisheries Biologist reports on his investigations during the

period of April 1961 to March 1962 which was a continuation of the "Limnology Project" under Dr. J.S. Dendy in 1959-1960. Recommends reorganization of the Bureau of Fisheries, improved personnel administration, additional experimental facilities, increased training and research.

98. *Preliminary Results of the Marine Fishery Biological Research Programme*. Technical Bulletin No. 26. 1959, 15 p. plus 14 p. of illustrations. Agricultural Information Division, Department of Agriculture and Natural Resources, Manila, Philippines.
ARC Catalog No. PH 639.3072, P552.

Reviews the fishery biological program developed by the Bureau of Fisheries in Manila with the assistance of an FAO expert. The commercial species of fish in Manila Bay were selected for use by the expert for the training program on the methodology and technique of marine fishery biological research.

99. *Report of Philippines-U.S. Workshop on Fisheries and Oceanography*. Contract No. AID/csd-1122. December 4-9, 1967, 129 p. U.S. National Academy of Sciences, National Research Council, 2101 Constitution Ave., N.W., Washington, D.C. 20418.
ARC Catalog No. PH 330.9914, N277a.

This workshop, held in Manila in December 1967, had as its principle aim accelerated production of food from the sea. This was the third workshop held to identify areas in which technology might bring about major advances in economic development. Cooperating in this program are the National Science Development Board - National Research Council of the Philippines and the U.S. Academy of Sciences - National Research Council, with assistance from AID. Contains reports and position papers on the following: Working Group I, Production Technology; Working Group II, Research - Fisheries, Agriculture, New Products, Oceanography; Working Group III, Inventory of Marine Biological Resources - Regional Marine Specimen Storing Center; and, Working Group IV, Economic and Social Factors.

100. Swingle, H.S. and D.D. Moss, *Report of Fishcultural Investigations in the Philippines*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-1581. October 10, 1967; revised August 15, 1969, 52 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. PH 639.3, A897.
NTIS Order No. PB 195 909.

Describes the overall fisheries situation in the country. Reviews a proposed cooperative fishery project to establish both an adequate brackishwater and a freshwater fishcultural research station. Discusses the best location and site for each station and the agencies and institutions which will cooperate in the use of the stations. Descriptive data are given on the proposed freshwater

pondculture station at Mindanao State University, including capital and operating costs. Similar materials are given for the proposed brackishwater pondculture station at Leganes on Panay Island.

101. Christey, Leroy S., *Fish and Fish Products in Thailand's Nutrition Program*. June 20, 1969, 30 p. Contract No. AID/ea-67. Prepared for the Office of Agriculture and Fisheries, AID/Washington under the Protein Food Development Project Agreement.
ARC Catalog No. TI 639.209593, C554.

A preliminary assessment of the potential for the further development and commercial exploitation of processed and preserved fish products, and the possible introduction of new fish food products such as Fish Protein Concentrate. Reports on the inspection of Child Nutrition Centers, fish markets, freshwater and marine fisheries stations and fish processing facilities. Surveys the work being done at the Fisheries Technological Laboratory in Bangkok and the pilot plant of the Food Research and Industrial Development Center at Kasetsart University.

102. Fraser, Thomas M., Jr., *Social Aspects of Fishing in the Mekong Basin of Thailand and Laos: Report of a One-Month Survey*. 1969, 39 p. Prepared for the Southeast Asia Development Advisory Group (SEADAG) by the Department of Anthropology, University of Massachusetts, Amherst, Mass. 01002.
ARC Catalog No. TI 301.52, F842.

Describes representative types of fishing communities and fishing activities both on the mainstream of the Mekong and its tributaries. This was done to assist in assessing the adaptive changes fishermen will be required to make in order to exploit the resources of the large reservoir to be formed by the proposed Pa Mong dam on the Mekong. Includes observations on fishing in reservoirs, ponds and fields, and describes the marketing system. Recommends areas of further research.

103. Hatfield, Peter S., *First Report to the Government of Thailand on Fishing Boats* FAO Report No. 1846. May 1964, 95 p. Food and Agriculture Organization of the United Nations, Rome, Italy. Order from UNIPUB Inc., Box 433, N.Y., N.Y. 10016.
ARC Catalog No. TH 639.2, H362.

Following a disastrous storm in October 1962 which destroyed much of the Thai fishing fleet, the FAO/UN ordered this study for the purpose of rehabilitation, to initiate a long term reconstruction program, advise on fishing boat building by the Government in the future, and to train Thai engineers as

fishing boat technicians. The survey and recommendations cover construction, stability, engines and propellers, painting and corrosion protection, wood, fastenings, fish hold construction and insulation. Recommends establishment of a design section in the Department of Fisheries, continue FAO advisory assistance, improved government credit and increased technical assistance to private enterprise.

104. *A New Industry for Thailand*. About 1953, 39 p. Department of Fisheries, Ministry of Agriculture, Bangkok, Thailand.
ARC Catalog No. TI 664.94, U58.

Discusses the establishment of a fish meal plant in Chumporn, in south Thailand, which demonstrated the practicability of building similar plants to produce low-cost nutritious food products, principally fish meal, and low-cost industrial products, from marine fish formerly wasted. Includes data on construction, fish used, nutrition, markets, costs and profits.

105. Swingle, H.S., et al, *The Inland Fisheries Program of Thailand*. Series title: *Increasing Fish Production by Improved Fishcultures*. Contract No. AID/csd-2270. January 1, 1970, 156 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Alabama 36830.
ARC Catalog No. TI 639.209593, A897.
NTIS Order No. PB 195 914.

Reports on surveys conducted in 1967-69. Presents materials on fishery research programs, hatchery production and fish distribution. Also covers the status of fisheries extension and production programs, inland fisheries stations and units of the Department of Fisheries, the College of Fisheries of Kasetsart University, and the Northeast Agricultural Center. Recommends an expanded program of fisheries development with technical assistance and advanced training.

106. Swingle, H.S. and Ray Allison, *The Inland Fisheries Progress in Thailand*, 1970. Series title: *Increasing Fish Production by Improved Fishcultures*. Contract No. AID/csd-2270. February 15, 1971, 106 p. Prepared by the International Center for Aquaculture, Auburn University, Auburn, Alabama 36830 for USAID/Bangkok, Thailand.
ARC Catalog No. TH 639.209593, S978a.

This is a survey of fisheries in Thailand conducted November 8–December 4, 1970. Topics covered are management, species, fertilizing, experiments planned for 1971, previous research projects, parasites, hatchery production, fisheries extension, physical and biological data on inland stations, and rainfall. Recommends use of efficient species, better feeding, parasite control, construction of more ponds, management improvement, additional experiments, better statistics, and other measures.

107. Swingle, H.S., H.R. Schmittou and G.B. Pardue, *Report on Fisheries Training in Research and Extension at the Fisheries Stations of Thailand*. Series title: *Increasing Fish Production Through Improved Fish Cultures*. Contract No. AID/csd-2270. September 19, 1969, 69 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. TI 639.3, A897c.

Reports on the training sessions for research and extension personnel held at the fisheries stations at Bangkok, Khon Kaen, Sakon Nakhon and Chiang Rai. Includes data on personnel taking part in the training, content of the training courses and current research at the stations. Gives recommendations for improvement of fisheries training and research. Appendixes list personnel and equipment available for research and extension at each inland fisheries station, equipment and chemicals need for a basic water chemistry laboratory, equipment needed for a basic fish parasite and disease laboratory and equipment needed for a basic limnological research laboratory.

108. Swingle, H.S. and D.D. Moss, *Report of Fishcultural Investigations in Thailand*. Series title: *Increasing Fish Production by Improved Fishcultures*. Contract No. AID/csd-1581. January 15, 1968; revised August 15, 1969, 35 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. TI 639.3, A897a.
NTIS Order No. PB 195 905.

Reports on the present areas from which freshwater fish are available and on future changes to inland fish production because of the rapid increase in reservoir construction. Discusses the Northeast area, giving data on soils, rainfall and evapotranspiration. Analyzes the work of the Department of Fisheries and lists their freshwater and brackishwater fisheries stations. Includes data on the main station at Bangkok, the College of Fisheries at Kasetsart University and the Khon Kaen Agricultural Research Center. Makes recommendations for a fishculture project in Thailand.

109. Swingle, H.S. and R.O. Smitherman, *The Marine and Coastal Fisheries Stations of Thailand*. Contract No. AID/csd-1581. July 30, 1969, 39 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington and the Rockefeller Foundation by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. TI 639.3, A897.
NTIS Order No. PB 195 911.

Describes the Phuket and Rayong Marine Stations, the Prachuap Kheri Khan, Chantaburi and Songkla Coastal Fisheries Stations and the Samut Sakhon Shrimp Station. Includes information on the research, personnel, equipment and facilities at each station.

110. Swingle, H.S. and D.D. Moss, *Increasing Fish Production by Improved Fishcultures*. AID/csd-1581. Report No. 1, January 5, 1968, 35 p., and Report No. 2, July 26, 1968, 17 p. Prepared by the Agricultural Experiment Station, Auburn University, Auburn, Alabama, for USAID Bangkok/Thailand. ARC Catalog No. TH 639.209593, S978b.

Reports of two surveys for the purpose of improving fisheries in Thailand. Recommends integration of 15 freshwater fisheries stations into an effective research organization to improve management, an increasing number of ponds, training researchers and extension personnel, establishing a brackishwater research station for seafoods culture, increasing number of advisors from Auburn University, and preparation of extension publications for Thailand.

111. Swingle, H.S. and R.O. Smitherman, *Report on Extension and Research at the Fisheries Stations of Thailand*. Series title: *Increasing Fish Production by Improved Fishcultures*. Contract No. AID/csd-1581. May 15, 1969, 45 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830. ARC Catalog No. TI 639.3, A897b.

Reviews the status of Thailand's fisheries extension and production program. Summarizes research dealing with the efficiency of various species of fishes, and on the effects of rates of stocking, fertilization and feeding upon fish production in paddies, ponds and cage cultures. Discusses the hatchery production and fish distribution, extension programs in the Northeast, and the difficulties encountered that affect fisheries programs. Includes recommendations on facilities at stations, pond construction, research and training.

112. Swingle, H.S., *Report to Department of Fisheries, Bangkok, Thailand*. February 1958, 23 p. Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830. ARC Catalog No. TH 639.209593, S978.

Reviews important fisheries problems in the rivers, swamps, reservoirs, lakes, klongs (canals), and ponds. Discusses fishculture in paddies and brackishwater pond culture. Describes the fisheries stations at Bangkhen, Bung Borapet, Chainat, Phayao, Chiangmai, Udon Thani and Sakon Nakhon. Also examines the central office in Bangkok, and makes recommendations for improving the fisheries program.

113. D'Astugues, T., *Note on Deep-Sea Fishery Development in Vietnam*. September 3, 1969, 5 p. United Nations Development Programme, Saigon, Vietnam. ARC Catalog No. VS 639.209597, D231.

Notes on an inventory of courses of action available to Vietnam in the further development of the UNDP/FAO Offshore Fishing Project and of a fishing industry.

114. Dang, Duc Tu, *Data on Industrial Credit Organizations and the Fishing Industry in Vietnam*. November 16, 1966, 16 p. Prepared for USAID/Saigon, Vietnam by the Industrial Development Center, 40-42 Nguyen-Hue Blvd., Saigon, Vietnam.
ARC Catalog No. VS 639.209597, D182.

Includes data on the location of fish culture ponds, fishing areas, shell fish and crustaceans, fish boat building yards, main marine fisheries in Vietnam, fish markets, fresh fish products, fisheries cooperatives, statistics on fish products exported and a checklist of cold storage and quick freezing plants.

115. Davison, Verne E., *Fisheries Assistance Programs to South Vietnam: Reports and Recommendations*. 1966, 53 p. Soil Conservation Service, U.S. Department of Agriculture (West Region), 701 N.W. Glisan, Portland, Oregon.
ARC Catalog No. VS 639.209597, D265.

This collection of reports, studies, tables and other data were compiled during a two-month survey in Vietnam of freshwater, brackishwater and marine fisheries. Topics covered include studies of various types of fish, the Thu-Duc Fishculture Station, manufactured fish feeds, engines for fishing boats, fishmeal, financing, credits, and loans. Recommends greater motorization of fishing boats, increased construction of boats, expanded fish culture, improved feeding and management techniques, and additional research.

116. *The Fish Market in Phan Thiet*. Airgram No. A-261. October 6, 1967. Amembassy/Saigon, Vietnam.
ARC Catalog No. VS380.143, D253.

Discusses the province's current major industries—fish, nuoc mam (fish sauce) and salt. Fishing and its ancillary activities, canning nuoc mam and fertilizer production remain Phan Thiet's main occupations; nearly 5,000 fishing boats, half of which are motorized, employ 22,000 fishermen. Presents information on the three-kilometer restriction, fish prices and catches, financial arrangements, equipment, nuoc mam and the INTRACO fish cannery.

117. Gower, Gerald F., *Status Report - UNDP/SF Offshore Fisheries Development Project*. TOAID A-4466. August 5, 1969, 11 p. Free World Assistance, USAID/Saigon, Vietnam.
ARC Catalog No. VS 639.209597, G723.

Report on the offshore fisheries project considered to be 80% operational. Discusses project purpose and funding, initial project findings, project execution and relationship to regional and national fisheries development programs.

118. Kuronuma, Katsuzo, *A Check List of Fishes of Vietnam*. Contract-IV-153. January 1961, 66 p. Prepared for USOM/Saigon, Vietnam by United States

Consultants, Inc., Saigon, Vietnam.
ARC Catalog No. VS 597 K96.

Provides a handy reference aid in the study of fish fauna of this region, and also a means to identify species known only by local names. Both fresh-water and marine-water fish are listed in their scientific, Vietnamese, Japanese and English names, covering 807 species in 411 genera and 139 families.

119. Le, Van-Dang, *Present Situation and Possibilities of Postwar Development of Inland-Fisheries in the Mekong Delta*. Working Paper No. 42. Contract No. AID/fe-291. November 1968. 84 p. Prepared for the Governments of Vietnam and the United States by the Joint Development Group, Saigon, Vietnam. NTIS Catalog No. PB 196 341.

Describes the hydrographical and ichthyological features of the Mekong. Discusses the different methods of exploitation of natural water bodies and ponds, the processing and stocking of fishery products, and the transportation and marketing situation. Recommends the increase of fishing production to keep pace with population growth, raise the income of rural people, and strengthen the agricultural economy. Analyzes the interaction and integration of fisheries activities in the post-war development program. Appendixes include a list of fish species in rivers and flooded areas of SVN and a checklist of fishculture species cultivated in SVN. A one-page bibliography is included.

120. Schoettler, Robert J., *Fisheries Resources Development of Vietnam: Status Report*. 1965, 6 p. USOM/Saigon, Vietnam. ARC Catalog No. VS 639.209597, S367a.

Discusses marine fisheries prior to the advent of American aid and after aid commenced in 1952. Lists the objectives of the fisheries program. Includes data on the inland and marine fisheries service, program development and project funding.

121. Schoettler, Robert J., *The Motorization of Vietnamese Fishing Junks*. 1960, 31 p. Division of Agriculture, USOM/Saigon, Vietnam. ARC Catalog No. VS 639.209597, S367.

Discusses the project of motorizing the "basket bottom" fishing boats in Vietnam. With U.S. aid about 1,000 boats a year were being motorized and, so equipped, fishermen were able to bring three times more fish to market. Includes several photographs of fishing boats and a longitudinal-section drawing of a motorized fishing junk.

122. Swingle, H.S. and D.D. Moss, *Report of Fishcultural Investigations in South Vietnam*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-1581. February 15, 1968; revised August 15, 1969, 17 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the

Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
 ARC Catalog No. VS 639.3, A897.
 NTIS Order No. PB 195 903.

Contains general information on the present fish catch and suggests a means of increasing the availability of high quality protein in inland areas by increasing fish production in existing ponds and lakes. Includes data on the South Vietnam Directorate of Fisheries and the 14 inland and three brackishwater stations. Describes the Revolutionary Development Training Center and its fisheries training ponds. Makes recommendations for a research and training program.

123. Takagi, Z. and K. Torikai, *Marine Fisheries Statistics of Vietnam 1962*. Contract No. ICA-430-414-T. Circa 1963, 42 p. Prepared for the Division of Agriculture and Natural Resources, USOM/Saigon, Vietnam by United States Consultants, Inc., Saigon, Vietnam.
 ARC Catalog No. VS 639.209597, T136.

Presents data collected primarily from 1 December 1960 through 1962 with some spot survey statistics for 1963. Includes statistics for each coastal province on the number of fishermen's households, fishing boats and the fish catch.

124. Thuan, Nguyen Van, Nguyen Gao Dan and Larry L. Pressler, *A Description of Ocean Fish Marketing in Saigon*. Joint Development Group Working Paper No. 24. Contract AID/fe-291. May-June 1968, 49 p. USAID/Saigon, Vietnam.
 ARC Catalog No. VS 380.143, P935.
 NTIS Order No. PB 196 352.

This is a survey of ocean fish marketing in Saigon conducted by the Joint Development Group, which was composed of advisors from the Development and Resources Corporation, headed by David E. Lilienthal, working with the Government of Vietnam. The report covers transportation, prices, species of fish, fishing areas, and fishing cooperatives. It concludes that private cooperatives are possible, excellent management potential exists, government involvement should be in low key, and fish traders and fishermen need a protective organization or union.

125. Yamamura, Makio, *Report on Experiments with Vietnamese Tea Seed as Exterminator and Fertilizer for Fish Ponds*. Contract No. ICA-400-414-T. June 1, 1964, 20 p. Prepared for USOM/Saigon, Vietnam by United States Consultants, Inc., Saigon, Vietnam.
 ARC Catalog No. VS 639.3, Y19.

Reports on experiments conducted at the Thu Duc Fisheries Experimental Station. Discusses use of tea seed in fish culture, methods of using the seed, Vietnamese tea seed, conditions and methods of conducting experiments, and results of the experiments. Gives recommendations.

PART IV. LATIN AMERICA

126. Kasahara, Hiroshi and C.P. Idyll, *United Nations Special Fund Caribbean Fishery Mission: Report to the Managing Director*. Document No. SF/310/REG.16. June 1962, 37 p. plus 134 p. of appendixes separately bound. United Nations Special Fund, United Nations, N.Y. 10017.
ARC Catalog No. LAT 639.2098, K19.

Reports on Mission's discussions with authorities of various governments who expressed interest in the establishment of a regional fisheries project and requested assistance from the Special Fund. The countries concerned were Surinam and the Netherlands Antilles, Haiti, British Guiana, the Dominican Republic, Barbados and the then West Indies Federation. Recommends Special Fund support of a regional fishery project to last four years and consist of three parts: exploratory fishing, market research and training. Specifies how the project might be drawn up and implemented. Includes details of the financial arrangements required. The appendixes, in a separate volume, include: details on Caribbean fisheries; questionnaire on fisheries trends, policies and problems; replies to the questionnaire from each interested country; and a nine-page bibliography.

127. *Report of Meeting of Caribbean Fishery Officers*. November 23, 1961, 18 p. Secretariat of the Caribbean Organization, Hato Rey, Puerto Rico.
ARC Catalog No. LAT 639.2098, C277.

Reports on meeting held in Puerto Rico, 20-23 November 1961, to discuss matters relevant to fisheries development in the Caribbean area. Papers were presented by delegates from Surinam, British Guiana, the West India Federation, the Netherlands Antilles, the Virgin Islands and Puerto Rico. Consideration was given to the establishment of a Standing Advisory Committee and planning for regional cooperation. Appendixes include the fisheries papers of the delegates.

128. Dendy, John S., Eddie W. Shell and Edmund E. Prather, *Report of Short Term Survey of Perira De Miranda Reservoir and Amanari Fish Culture Station: to Establish Criteria for Improved Fresh Water Fisheries Management*. Attachment to TOAID A-110 dated 9-26-66. September 1966, 39 p. Prepared for AID/Washington and Bureau of Commercial Fisheries, Department of the Interior, Washington, D.C. by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. BL 639.31, D391.

Suggests ways to manage reservoir fisheries in Northeast Brazil to increase the supply of food for people. Report covers three investigations made with the participation of DNOCS personnel that were conducted concurrently: 1) on the biology of species of fish in the Pentecoste Reservoir; 2) on the study of

the population dynamics and present management of the fishery; and 3) on the feasibility of using water from the reservoir for intensive fish culture in ponds.

129. Dendy, John S., Eddie W. Shell and Edmund E. Prather, *Second Report of Short Term Survey of Periera De Miranda Reservoir to Establish Criteria for Improved Fresh Water Fisheries and Intensive Fish Culture Management*. PIO/T 512-247-4-2-80107. October 1967, 63 p. Prepared for AID/Washington and the Bureau of Commercial Fisheries, U.S. Department of the Interior by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830. ARC Catalog No. BL 639.31, A897.

Studies the records obtained since September 1, 1966 to ascertain such additional data as are necessary to recommend a suitable program to obtain the best yield of fish from the waters of the reservoir. Fish population samples were made, experimental netting done, and commercial fisherman catches studied. Physical, chemical and biological conditions during the dry year of 1966 were compared with those for the wet year of 1967. Plans a layout of ponds in the area below the dam for the use of some of the water of the reservoir in a program of intensive culture of fish. Initiates a program for obtaining information on other reservoirs. Recommends priorities on all programs in Brazil.

130. Lincham, John F. and William Y. Brown, *Short Term Marketing Study of the Intensive Freshwater Fisheries Development of Northeast Brazil*. August 1967, 23 p. Prepared for USAID/Recife, Brazil by the Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C. 20240. ARC Catalog No. BL 380.1437, L754.

Indicates that a large market potential exists for production from the intensive freshwater fish culture program. Suggests that the handling, marketing and distribution of fish from this program should follow established guidelines and recommends a typical marketing study be made to acquaint Brazilian Government personnel with market sampling techniques. Suggests the improvement of existing marketing and distribution systems because they are archaic and unsanitary. Includes a two-page bibliography and several samples of fish marketing questionnaires.

131. Shell, Eddie W., Edmund E. Prather and Norris B. Jeffery, *Third Report of Short Term Survey of Periera De Miranda and Araras Reservoirs to Establish Criteria for Improved Fresh Water Fisheries and Intensive Fish Culture*. September 1966, 71 p. Prepared for AID/Washington and the Bureau of Commercial Fisheries, U.S. Department of Agriculture, Washington, D.C. by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830. ARC Catalog No. BL 639.31, A897a.

Reports on the third of three programmed annual visits to make recommenda-

tions on the management of water resources in the large reservoirs of the Northeast for fish production. Discusses the evaluation and summary of information collected by DNOCS biologists who conducted the sampling program recommended by the 1967 survey team. Reviews the effort made to acquaint the biologists with useful statistical techniques, and the system developed to make fish catch data more accurate. Includes conclusions and recommendations for Brazil.

132. Taylor, Francis William, *Fish Processing Plants: Brazil*. March 20, 1966, 7 p. plus 6 p. of appendixes. Prepared for AID/Washington and the Council for International Progress in Management (USA), Inc. by Hydraulic Services Inc., Pensacola, Florida.
ARC Catalog No. BL 664.94, C855.

Final report on the fish-processing plants in the Rio Grande area. Concludes that the plants could handle a much larger volume providing that there is increased fish production through the establishment of fish farming and the opening of new fishing areas. Recommends the improvement of sanitation and methods of fish disposal, types of plant equipment required and organizational improvement in Centro Industria.

133. *Commercial Feasibility of Fish Protein Concentrate in Developing Countries*. Report No. 12. Contract No. csd-2158. 1970. Prepared by General Oceanology, Inc., 27 Moulton Street, Cambridge, Mass. 02138, for the Office of Agriculture and Fisheries, Technical Assistance Bureau, AID/Washington.
ARC Catalog No. CI 664.94, G326.

This two-part study analyzes the feasibility of commercial production of fish protein concentrate (FPC) in Chile. This Volume II (Volume I on another country has not been released), describes in Part I the Chilean food system, market for FPC, the isopropyl alcohol process of making FPC and possible competitors, cost of FPC production, financing, alternative protein sources and conclusions. Part II contains appendixes with background information and supporting data referred to in Part I, with sub-titles of these two parts as follows:

- (1) *Chile, Investment Aspects and General Summary*, Volume II, Part I. June 26, 1970, 71 p.
- (b) *Chile, Background Information and Supporting Data*, Volume II, Part II. July 21, 1970, Parts I-XV plus charts.
134. Heggem, Ole J., *Centolla Industry in Tierra Del Fuego*: November 1961 - January 1962. March 1962, 25 p. USAID/Santiago, Chile.
ARC Catalog No. CL 639.542, H464, Nov. 1961 - Jan. 1962.

Contains preliminary information on a Centolla (King Crab) Study Project in

Porvenir, Chile. Gives a description of fishing methods, processing methods and fishing gear. Includes data on the extent of the fishing area, weather conditions, migration, costs, catch results and graphs of the carapace length frequency. The appendixes contain statistical data on: catch and daily landings for the local processing plants; miscellaneous costs; drawings of traps and nets; a hydrochart; and several photographs of the fishing camps.

135. Heggem, Ole J., *Notes Regarding Centolla (King Crab) Industry, Punta Arenas - Porvenir*. July 21-29, 1961, 10 p. AID/Santiago, Chile.
ARC Catalog No. CL 639.542, H464, July 21-29, 1961.

Examines the king crab fishing industry in the Tierra del Fuego area of Chile with the purpose of planning a program of exploratory fishing and further study. Discusses the processing plants, gear and equipment used and the fishing areas observed. Includes statistical data on the plants, vessels, gear and costs. Four appendixes contain data on fisheries production in the province, fish prices, and a proposed plan of exploratory fishing.

136. McMillan, Harvey C., *Fisheries Project: Final Report*. About 1965, 12 p. USAID/Santiago, Chile.
ARC Catalog No. CI 639.20983, M 167.

A general report by the fisheries advisor who visited over 30 canneries, interviewed over 600 people in the fishing industry, and visited the main fishing areas of the nation. Topics covered include biological background, resources of the five zones, oysters, canning, processing and experimental fishing.

137. Ripley, Wm. Ellis, *Report to U.S. AID/Colombia on the Fishery of Cartagena, Colombia and its Development*. Contract No. AID 1017. April 18, 1963, 5 p. plus 66 p. of appendixes. Prepared for USAID/Bogota, Colombia by the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.
ARC Catalog No. CO 639.209861, R589.

Studies the fisheries and cooperatives of Cartagena in order to: 1) determine the problem areas affecting the fisheries; 2) propose methods of improvement; 3) foster the development of the fishing industry; and, 4) expand the economic opportunities and production capacity of the local fishermen. Recommends that AID sponsor a fisherman's marketing cooperative and a fishery consultant, and that assistance be given in forming a coordinating and advisory council. Also recommends that Colombia join the U.N. Special Fund Caribbean Fisheries Development Project when and if it becomes operative. Appendixes include a statement of the conditions affecting the development of the Cartagena fisheries, a suggested plan for their development, a list of fish with their scientific classifications, a three-page bibliography and catch statistics for Cartagena.

138. Swingle, H.S. and F.A. Pagan, *Fishculture Survey Report for Colombia*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-2270. January 10, 1970, 63 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. CO 639.3, A897.
NTIS Order No. PB 195 908.

Reports on survey conducted October 7-18, 1969. Presents material on the status of nutrition, fisheries statistics, fisheries management agencies, the FAO fisheries program, universities involved in fisheries research and training, freshwater fisheries and marine fisheries. Recommends several programs to improve production, exploitation and management of fishculture in Colombia.

139. Hamilton, Curtis E., *Final Report on the Vocational Industry Program for Fisherman Presented in Puntarenas*. Contract AID-515-70 March 25, 1963, 16 p. USAID/San Jose in cooperation with the Centro de Cooperacion Tecnica Industrial Ministerio de Industrias, San Jose, Costa Rica.
ARC Catalog No. CS 639.2007, H218.

Puntarenas is the leading port on Costa Rica's Pacific coast and almost totally dependent on the success of about 60 fishing boats in its commercial fleet. The industry was born out of primitive conditions only a few years ago and in growing so rapidly a shortage of trained captains occurred. This is a report of a three-month seminar to teach map reading, navigation, sounding, care and handling of fishery products, and making and maintenance of fishing gear including nets.

140. Heggem, Ole J., *A Report Concerning a Proposed Fisheries Project for the Caribbean Coast of Costa Rica*. May 9, 1962. Prepared for USAID/San Jose, Costa Rica.
ARC Catalog No. CR 639.2097286, H463.

Proposes that the marine resources of the Caribbean Coast of Nicaragua, Costa Rica and Panama be further studied and utilized through a regional exploratory fishing program, to cover a period of about one year. Recommends a small amount of technical assistance and demonstration equipment for the fishermen of the Limon area; this to be in the immediate impact project. Recommends a different type of immediate impact project for Puntarenas. Appendixes contain prices of fish and meat in San Jose, data on spiny lobster exports from Limon, 1955-62 and on fish landings and fishery products imports, and a list of items for immediate procurement. Contains a two-page bibliography.

141. Arvelo G., R. Alberto, *Program for the Fisheries Development of the Dominican Republic, Initial Stage*. Circa 1965, 22 p. Office of Fisheries Oceanography, Secretaria de Planificacion Nacional, Santo Domingo,

Republica Dominicana. Available only in the AID Reference Center.
ARC Catalog No. DR 639.2097293, A795.

An unpublished proposal, in Spanish and English, of an initial, basic program to develop the fishery resources of the country. More attention is given to an educational fisheries program than to exploratory research on fish and invertebrates. However, some exploratory research is proposed. Includes an outline covering the reasons for the program, details of the program, budget and explanation of the technical aspects involved.

142. *Dominican Republic Fishing Complex*. September 9, 1967, 20 p. Atlantic & Gulf International, Inc., 591 S.W. 8th Street, Miami, Fla. 33130.
ARC Catalog No. 639.2097293, A881.

Reports on the state of the commercial fishing industry in the Dominican Republic. Concludes that there are many fine and productive fishing areas which could support an excellent fishing industry. Discusses materials on species of fish in different areas, a proposed multi-purpose fishing boat, fishing gear, a training program, methods of handling fishery products and the establishment of a system of distribution and marketing.

143. Smith, Robert O. and Patrick H. Ramsey, *Status of Fisheries in the Dominican Republic with Conclusions and Recommendations*. June 10, 1960, 24 p. United States International Cooperation Administration, USOM/Dominican Republic.
ARC Catalog No. DR 639.2097293, S658.

Surveys the relationship between fish production and consumption, the condition of the sea fisheries, the fish culture station at San Cristobal, and the exploitation of high seas fisheries. Concludes there is necessity for a vigorous program of fresh-water fish culture coupled with an educational program, the improvement of fishing boats and gear, and a fisheries advisor.

144. *Copedi S.A.: Study of an Integrated Operation of the Fishery, Freezing, and Canning of Tuna, Guayaquil, Ecuador*. Circa 1966, 166 p. ADELATEC (Adela Technical and Management Services Company S.A.), Panama, Republic of Panama.
ARC Catalog No. EC 639.2758, A228.

Reports on a new tuna enterprise to be established in Ecuador by a group of prominent Ecuadorians and Americans acting through their company, COPEDI S.A., based in Guayaquil. Communicates the basic information necessary for an integrated effort by all participants, as part of ADELATEC's continuing effort to implement the project. Includes materials on the Eastern Pacific fishery for tuna, fleet costs, catch, canning and freezing operations and site location.

145. Swingle, H.S. and F.A. Pagan, *Fishculture Survey Report for Ecuador*. Series title: Increasing Fish Production by Improved Fishcultures. Contract No. AID/csd-2270. December 20, 1969, 46 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. EC 639.3, A897.
NTIS Order No. PB 195 907.

Surveys the fisheries in the provinces of Pichincha, Manabi, De Los Rios and Del Guayas. Includes data on nutritional requirements, geography, status of fisheries, fisheries management, training and seafood processing plants. Reviews the inland fisheries and coastal aquaculture. Numerous recommendations are made for improvement of the fishculture of the country. Discusses the FAO fisheries project to begin in January 1970. A one-page bibliography is included.

146. Jai, Dong Noh and Sung Hwan Ha, *A Survey Report Relating to the Fishery Industry and Establishment of a Tuna Long Line Fishery in El Salvador*. March 1969, 114 p. Office of Fisheries, The Korean Fisheries Mission, Seoul, Korea.
ARC Catalog No. KS 639.2758, J25.

Includes general recommendations for the fishery industry and detailed information concerning the establishment of a tuna long line fishery. Discusses technical and financial aspects of the tuna fleet. Reports on the establishment of and capital requirements for land facilities for a tuna fishing base.

147. Lin, S.Y., *Report to the Government of El Salvador on an Inland Fisheries Project*. No. 1735. August 1963, 26 p. Fisheries Division, Expanded Program of Technical Assistance, Food and Agriculture Organization of the United Nations, Rome, Italy. Order from UNIPUB Inc., Box 433, New York, N.Y.10016.
ARC Catalog No. ES 639.2097284, L 735.

Prepared by an inland fisheries biologist, this report cites surveys made in 1957, 1960 and 1962 and presents observation on the combined work in this field to date. Recommends construction of 20 more propagation ponds, better filter systems, culture experiments on special species, fertility, and establishment of a commercial fish farm demonstration center.

148. Dorris, Troy C. and Robert C. Summerfelt, *The Fishery of Lake Atitlan, Guatemala: A Preliminary Report*. 1967, 47 p. Oklahoma State University, Stillwater, Oklahoma 74074.
ARC Catalog No. GT 639.21, D 716.

This is a study of the fresh water fish in Lake Atitlan, Guatemala for the purpose of determining the size and structure of the fish population, to evaluate the actual and potential productivity of the lake, and to develop improved

methods of fish harvest. Contains a useful bibliography listing 37 references.

149. Lin, S.Y., *Second Report to the Government of Guatemala on Development of Inland Fisheries*. FAO-EPTA Report No. 1719. July 1963, 44 p. Food and Agriculture Organization of the United Nations. Order from UNIPUB Inc., Box 433, New York, N.Y. 10016.
ARC Catalog No. GT 639.2097281, F686

A general survey of the major lakes and rivers to determine ways of increasing inland fish production and the advisability of introducing new species. Recommends studies on national lake management, fish culture experiments, the establishment of fish culture demonstration centers, and the training of fishery workers. Contains a bibliography of 54 items.

150. *Port Feasibility Study: Pacific Coast of Guatemala, C.A.* 1963, 83 p. plus 44 p. of plates and photographs. Prepared for AID/Washington by the U.S. Army, Corps of Engineers, Washington, D.C.
ARC Catalog No. GT 627.2, D419.

Evaluates two separate projects: 1) a fishing port at the most suitable site, designed in such a manner as to permit development of the full fishing potential along the Pacific Coast of Guatemala, and suitable for ultimate expansion to include facilities for commercial shipping; and, 2) a port designed to include initially commercial shipping berths with dockside facilities adequate to meet requirements of present and immediately prospective Pacific and Orient commerce, and as well provide adequate space and facilities for a fishing port. Covers economic aspects and benefits, engineering aspects, financial requirements and estimated revenue, and a comparison of benefits and costs.

151. Allsopp, W.H.L. (Editor), *Review of the Fisheries of British Guiana*. Bulletin No. 1, 1958, 52 p. Fisheries Division, Department of Agriculture, Government of British Guiana, Georgetown, Guiana.
ARC Catalog No. GY 639.209881, A442.

This is a review of the nation's fisheries. There are chapters on administration of the Fisheries Division, status and conditions of the industry, development and extension (trawling, seines, marketing, cooperatives, loans and training), research experiments, surveys and objectives.

152. Kaufmann, Charles L., *Survey of Fisheries Development in British Guiana*. June 1960, 32 p. International Cooperation Administration, Washington, D.C.
ARC Catalog No. BG 639.22, K21.

Assesses and evaluates the fisheries in British Guiana with respect to possible USOM participation in their future development. Includes descriptive data on

the country, the 1960-64 development program, and fisheries. Covers local fishing, marketing, fish meal potential, snapper fishing, offshore trawling, and preparatory work and training. There is a one-page bibliography. Appendixes contain a report on a government fishing vessel, a survey of the brackishwater fishculture station, and a report on the building of jointly owned inshore trawlers.

153. Shell, E.W., *A Review of Guyana's Program in Brackishwater and Freshwater Fisheries*. June 1969, 27 p. Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. GY 639.209881, S544.

Reports on the fishing sites visited and represents a good cross-section of the inland fisheries resources. Deals not so much with the description of each site but rather with the problem of the utilization of fisheries resources as typified by that particular site, and with the potential of that site and similar sites for increased production of fish. An active program for developing some of the individual resources is outlined. Makes recommendations for continued technical assistance.

154. Kaufmann, Charles L., *Survey Report on Fish Landing and Marketing Facilities*. September 1961, 85 p. AID/Washington.
ARC Catalog No. JM 380.143, K21.

Examines all aspects of marketing and landing facilities in Jamaica to explore all possible means of increasing production. Includes numerous photographs of fishermen, fish, boats, markets, gear and ice facilities. A map gives the location of all fish shops in Kingston, and several hydrographic charts are included. Gives detailed data on a cold storage plant, the Pedro and Morant fishing banks, fish imports and a proposed fisheries development company.

155. *Foreign Fisheries Leaflets*, NO's 102 (September 1966) and No. 7 (October 1966), *Mexican Fisheries*. 11 p. (No. 102) and 33 p. (No. 7). Branch of Foreign Fisheries, Division of International Affairs, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.
ARC Catalog No. MX 639.20972, I 61.
ARC Catalog No. MX 639.20972, I 61a.

Part of the former "Market News Leaflet" series, these two studies were based on information supplied by the U.S. Embassy, Mexico City. Leaflet No. 102 provides general information on fisheries development in the Territory of Baja California Sur, Mexico, and No. 7 deals in more detail with the overall subject. The latter contains 11 tables and covers major developments, production, fishermen, fishing craft, exports, imports, and Mexico-United States trade.

156. Butler, Johnny A. and Norman L. Pease, *Spiny Lobster Explorations in the*

Pacific and Caribbean Waters of the Republic of Panama. December 1963, 50 p. Prepared for AID/Washington by the Bureau of Commercial Fisheries, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C. 20240. ARC Catalog No. PN 639.541, I61. NTIS Order No. PB 195 912.

Surveys in 1962 were carried out in both Caribbean and Pacific waters with wood, reed and wire traps. Wood traps proved most economical and successful. Bait for traps was obtained locally. Indications of commercial potential were gained. During 1963, work included simulated commercial fishing with traps and trawls; excellent catches resulted. In addition to spiny lobsters, sand lobsters and bay scallops were found in sufficient quantities to start a new Panamanian industry.

157. Smitherman, R.O. and D.D. Moss, *Fishculture Survey Report for Panama*. Contract No. AID/csd-2270. September 1, 1970; 64 p. Prepared for The Office of Agriculture and Fisheries, AID/Washington by the International Center for Aquacultures, Agricultural Experiment Station Auburn University, Auburn, Ala. 36830. ARC Catalog No. PN 639.3, A897.

Surveys the potential of fish culture as a source of low-cost protein and as the basis of a new industry. Includes data on nutrition, areas for pond construction, status of fisheries, government agencies responsible for fisheries, and fisheries training. Covers inland fisheries in rivers, lakes, reservoirs and ponds, as well as possible sites for inland research stations. Describes the culture of shrimp and catfish in Honduras. Gives recommendations and includes a bibliography. Appendixes include temperature tables and checklists of freshwater fish.

158. Smitherman, R.O. and D.D. Moss, *Fishculture Survey Report for Paraguay*. Contract No. AID/csd-2270. September 20, 1970, 38 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the International Center for Aquacultures, Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830. ARC Catalog No. PA 639.3, A897. NTIS Order No. PB 195 910.

Reviews the geography and the nutritional and economic aspects of the country. Discusses water resources and the status of fisheries. Includes data on fisheries training and the agencies responsible for fisheries. Examines sport fishery and its potential for increasing tourism. Makes recommendations for advisory and training assistance.

159. Kuhns, John W., *Final Report and Proposal: Lake Titicaca Research and Development Project*. November 9, 1966, 73 p. Prepared for USAID/Lima, Peru by John W. Kuhns, Stanford Research Institute advisor to Oficina

Regional de Desarrollo del Sur (ORDESUR) - Southern Peru Regional Development Office), Lima, Peru.
ARC Catalog No. PE 630.1185, S785.

Presents a project proposal for the study and development of the natural resources of the Lake Titicaca region. Research and development needs are to be fulfilled by assisting Peruvian and Bolivian organizations, with outside aid in the form of technical assistance, equipment and training. Selects three areas for emphasis: agriculture, fishing and community development. Includes a description of the project, a project outline for the first stage of three-years' duration, detailed justification, organizational structure and methods of possible project financing.

160. Smitherman, R.O. and D.D. Moss, *Fishculture Survey Report for Peru*. Contract No. AID/csd-2270. September 30, 1970, 41 p. Prepared for the Office of Agriculture and Fisheries, AID/Washington by the International Center for Aquacultures, Agricultural Experiment Station, Auburn University, Auburn, Ala. 36830.
ARC Catalog No. PE 639.3, A897.
NTIS Order No. PB 196 355.

Surveys two regions to assess the status of trout fishery in Lake Titicaca and to provide technical advice on the development of warmwater aquacultures in the Amazonas Region. Includes data on geography, aspects of nutrition and economics, status of fisheries, government agencies responsible for fisheries, fisheries training and inland fisheries. Appendixes include a list of ornamental fish exported from Amazonas and a list of fish in the Iquitos area. A one-page bibliography is included.

161. *Study of the Fishing Industry for Human Consumption in Southern Peru*. Contract No. AID/la-239. April 1967, 68 p. plus 25 p. addenda. Prepared for AID/Washington and the Southern Regional Development Office of Peru ORDESUR by H.W. Maynard and Company, Inc., Latin American Division, Pittsburgh, Pa. 15221.
ARC Catalog No. PE 639.22, M471.

Surveys the fishing industry in southern Peru from the port of Pisco to the frontier of Chile. Examines the general characteristics of Peru's fishing industry, its fishing ports, gear and equipment, marketing and distribution systems. Recommends a production program, vessel specifications, a preservation program and improved marketing methods. There is a 20-item bibliography.

162. Oberg, Kalervo and Frank van Dijk, *The Fisherman of Surinam*. April 1960, 64 p. USOM/Parimaribo, Surinam.
ARC Catalog No. NS 639.209883, O 12.

Examines the older, traditional system of inshore fisheries and the recent system of off-shore fisheries in which modern trawlers are used. Gives a detailed description of six fishing areas along the coast which includes the various fishing methods, types of fishing grounds, gear used, and the kinds of fish taken.

163. *Report of James R. Townsend, Fishery Consultant*. Contract No. AID/csd-1168. February 5-16, 1968, 13 p. Prepared for AID/Washington and the Council for International Progress in Management, Inc. by Mr. James R. Townsend, International Fisheries Consultant, Monterey, Calif.
ARC Catalog No. UY 664.94, C855.

Reports on the feasibility of converting a former meat-packing plant at Punta de Lobos, Uruguay to a frozen-fish plant. Includes information on utilization of facilities, on equipment required for processing fresh-frozen and canned fish, and on equipment for preparing fish meal and oil. Also estimates costs for plant renovation and installation of equipment, and production costs of the fresh and frozen fish operation. Lists other fishery developments for consideration.

164. *Report on the Feasibility of an Integrated Fish Processing Operation in Venezuela*. Contract No. AID/la-53. October 1963, 79 p. Prepared for AID/Washington and the Corporacion Venezolana de Fomento (CVF) by Ebasco Services, Inc., Two Rector Street, New York 6, N.Y.
ARC Catalog No. VE 664.94, E15.

Reports on Venezuelan fishery resources, its sardine packing industry, markets for fish meal and oil, operating facilities, plant construction costs and overall financing. Concludes that the construction and operation of an integrated fish-processing operation in Punto Santo would be economically desirable. Recommends that the operation be designed to produce, during and after the third year, 800,000 cases of canned sardines and 4,800 metric tons of fish oil for the export market, and 6,960 metric tons of fish meal for the domestic market.

165. Simpson, John C., *Report to the Government of Venezuela on Development of the Marine Fisheries Research Program*. Rep. FAO/EPTA (1606). May 1963, 61 p. Food and Agriculture Organization of the United Nations, Rome, Italy.
ARC Catalog No. VE 639.20987, S613.

Reports on the development of a biological research program to study the sardine, other clupeoid stocks of potential commercial value, and the training of Venezuelan biologists to implement this program. Includes data on research accomplished, present status of the program, publications completed, training, the fisheries research center and recommendations.