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TRAINING AND RESEARCH NEEDS FOR VALUE-ADDED
FISH PROCESSING IN ASIA**

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* Organized by UNIDO in co-operation with ESCAP and Technonet/Asia

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Introduction

Fish has long been a traditional and important food in many countries in Asia. The production of fish through fishing and aquaculture forms a major rural occupation especially in coastal nations. Today, fish production remains one of the key economic activities in the region. Asia contributes almost 45% of the total world fish landings and 75% of aquaculture production.

The seafood sector in many developing countries in Asia is normally seen as a provider of raw materials for the manufacturing industry in developed countries. Over the past years, however, tremendous changes have been observed. Governments have played a very important role by providing incentives and creating appropriate infrastructure in the form of legislation, physical structures as well as financial arrangements. The availability of cheap and abundant labour, and easily accessible and relatively cheap raw materials have also contributed a great deal.

There is a strong feeling in developing countries in Asia that production of value-added products is not only desirable but also a necessity. In the first place, there are numerous companies producing first grade products, now destined for

reprocessing in the importing countries. Furthermore, there is an economic need to utilize fully the available raw material in view of stagnant domestic production and world market prices of raw material.

Training and Research Needs

Training and research institutions play both a direct and indirect role in stimulating and supporting the development of the fish processing industry through its activities.

1. The development of Value-added fish products is a very specialized area. To improve efficiency in carrying out programmes on new technologies for value-added fish products, institutions should develop curricula and research programmes relevant to the country's requirements, taking into consideration type and quantity of raw material available, level of technology required and manpower availability. Existing facilities including infrastructure and sufficient up-to-date training equipment should be made available and adequate qualified professional staff recruited.
2. Ideally students who seek a career in the fish processing industries should have a strong base in the basic sciences and should be able to major in postharvest technology and not as part of a Food Science or Food Technology Course. In addition, courses in Product Development should be made available whereby principles and application of the entire

process of Product Development should be taught. This would be particularly useful to graduates who will be eventually involved in the development of new value-added products. For both types of training, a research project on value-added fish products should be carried out.

3. Training and research institutes should be sensitive to the demands of industry and conduct fundamental and applied research to solve current problems in the processing of value-added products. Results from the research projects will also provide a continuous source of new information which can be used as material for training programmes the institution may develop.
4. Product Development of new technologies for value-added products or new value-added products should also be developed by the research institutions. This is best carried out in collaboration with industry who normally provide funding and the marketing skills and the institution contributing in terms of the researcher's training and expertise. One area that merits collaborative research is in the export of shrimp, tuna and cephalopod products, three principal commodities currently exported from the Asian/Pacific countries to major world markets, where they are usually converted to successful value-added products. With proper research, companies in Asia can produce value-added products from these commodities at internationally competitive prices instead of exporting for reprocessing.

5. To provide advisory and consultancy services on scientific and technological problems and to facilitate rapid transfer of technology to the industry. This is especially relevant to the processing, packaging and marketing of value-added products, the three major problem areas faced by processors.

Role of International, Regional and National Organizations

Many international organizations are involved in promoting research and development and training of technical personnel in the fisheries industry sector.

The International Foundation For Science (Sweden) gives grants to scientists involved in fish processing work and also promotes scientific contacts and create regional contacts between grantees and other scientists working in the same field. The most recent workshop on 'Postharvest technology, preservation and quality of fish in Southeast Asia' was held in Bangkok, 13-17 November, 1989. Participants from 14 countries presented 25 papers on value-added products .

Infofish through FAO, started a project 1987 (TCP/RAS/6653) to improve the participation of developing countries in the international trade of value-added seafood products. Expertise in packaging, processing and marketing were provided. Three countries were chosen, India, Indonesia and Thailand, on the basis of availability of raw materials and infrastructure, export potential and active promotion of the production and export of value-added products by the respective governments. The three

companies displayed their developed value-added products at the ANUGA Fair, Cologne, on 10-15 October, 1987 and the response was good. Pilot production will take place in the premises of the selected private companies. The prime objective is to produce a number of high-quality, value-added seafood products at private plants in several developing countries. In the next project, companies from Bangladesh, Sri Lanka and Malaysia will be involved.

The International Development Research Centre (IDRC) of Canada, Australian International Development Assistance Bureau (AIDAB) and FAO, United Nations also support research in value-added fish products in developing countries in Asia e.g. production of dried fish in Philippines and Malaysia; fish noodles and shrimp processing. In addition, FAO has organized four training courses in fish canning in Thailand, Indonesia, Malaysia and the Philippines. The Australian Government, through the ASEAN-Australian Economic Cooperation Programme (AAECP) also supports research in fish processing. A workshop on Fish and Fish Waste Processing and Utilization was held in Jakarta, Indonesia, 22-24 October, 1986.

Regional organizations such as the Southeast Asian Fisheries Development Centre (SEAFDEC) has a Marine Fisheries Research Department in Singapore which run short courses in postharvest technology e.g. low-price fish for conversion for human consumption. Up to 1985, 372 individuals were educated and trained in postharvest fisheries technology. In addition,

seminars are organized for researchers in postharvest technology every two years to review current technology in value-added products. The most recent seminar 'Advances in postharvest technology in Southeast Asia' was held in Singapore 6-11 May, 1991.

The Asian Fisheries Society was set up in 1983 to promote interaction and cooperation among scientists involved in fishery research. It also awards grants of US\$10,000/year to scientists from developing countries in Asia who wish to embark on fisheries research. To date, six grants have been awarded to scientists involved in research on value-added products.

All the above mentioned organizations have contributed a great deal to the training of personnel and research and development of value-added products in Asia.

In addition, some countries in the Asian region will have national organizations actively involved in the promotion of fish processing. For example, the Fisheries Development Board in Malaysia sponsors research in value-added products in the local universities. Upon completion of the project, it will conduct training courses with the university for fish processors. The Malaysian Agriculture Development Institute (MARDI) conducts courses on fish crackers, surimi and fish jelly products annually to selected processors. Even professional societies can stimulate and lead discussion through conferences and workshops for resolving issues related to the development of value-added products.

However, in most Asian countries, the fish industry remains unevenly developed compared to agriculture or other agro-based industries. The support of national organizations therefore is much needed.

Suggestions for Future Research and Development Programmes

In order to sustain the value-added fish products industry, challenges of the future will have to be faced. The demands on the fisheries sector in terms of human and animal food production are likely to increase in the foreseeable future. The predicted global shortfall in supplies are estimated at 20-30 million tonnes by the year 2000. Two-thirds of this shortfall will occur in developing countries, particularly in those parts of Asia where reliance on fish is greatest.. The major emphasis for research and development efforts therefore should be fall in the following areas :-

1. To reduce losses from existing catch due to wastage, spoilage and other postharvest problems. It is widely accepted that postharvest losses are extremely high, being in the region of 20-40% of the total landings. This will amount to about 4-5 million tonnes of fish being lost annually. Poor handling, processing and storage of fish result in microbial spoilage, insect damage, as well as nutritional changes caused by autolysis, all of which result in both quality and quantity losses.

2. Aquaculture - aquaculture is expected to generate about 20 percent of all raw material for the seafood industry by the year 2000. In addition to conventional techniques of fish breeding, the long term development in the field of biotechnology are likely to have benefits in aquaculture systems, with novel means of fish breeding, gene transfer and disease resistance.
3. To improve management of marine and inland fisheries in order to maximize output.

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