

IOARM
International Center for
Living Aquatic
Resources Management

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ICLARM, ORGANIZATIONAL STATEMENT

Our commitment:

ICLARM is committed to improving the well-being and livelihood of present and future generations of poor people in developing countries.

We aim for:

- poverty eradication;
- a healthier, better nourished human family;
- reduced pressure on fragile natural resources; and
- people-centered policies for sustainable development.

A way to achieve this:

We undertake, facilitate and disseminate scientific research to improve the production, management and conservation of aquatic resources such as fish. The research thrusts are:

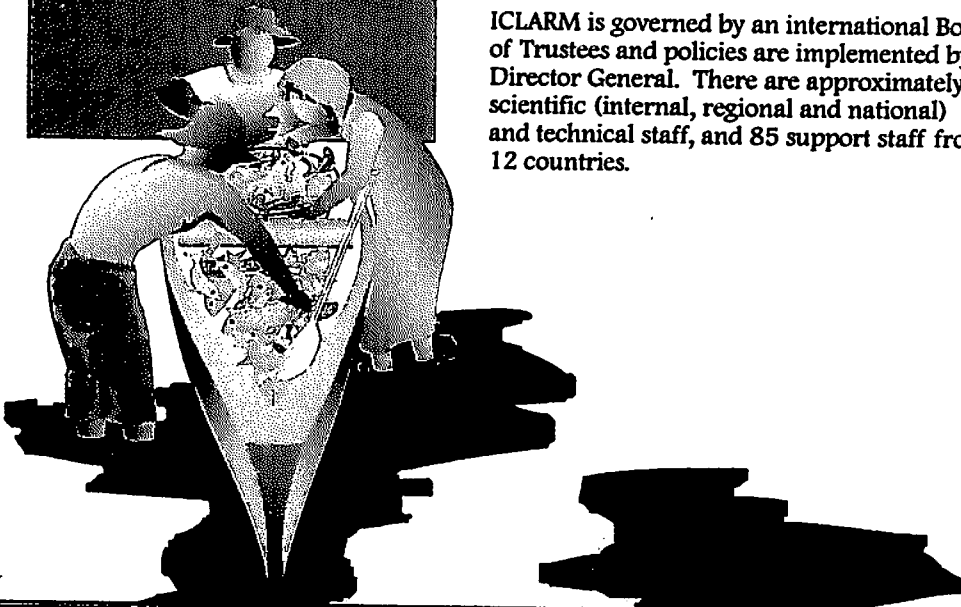
- improving productivity;
- protecting the environment;
- saving biodiversity;
- improving policies; and
- strengthening national programs.

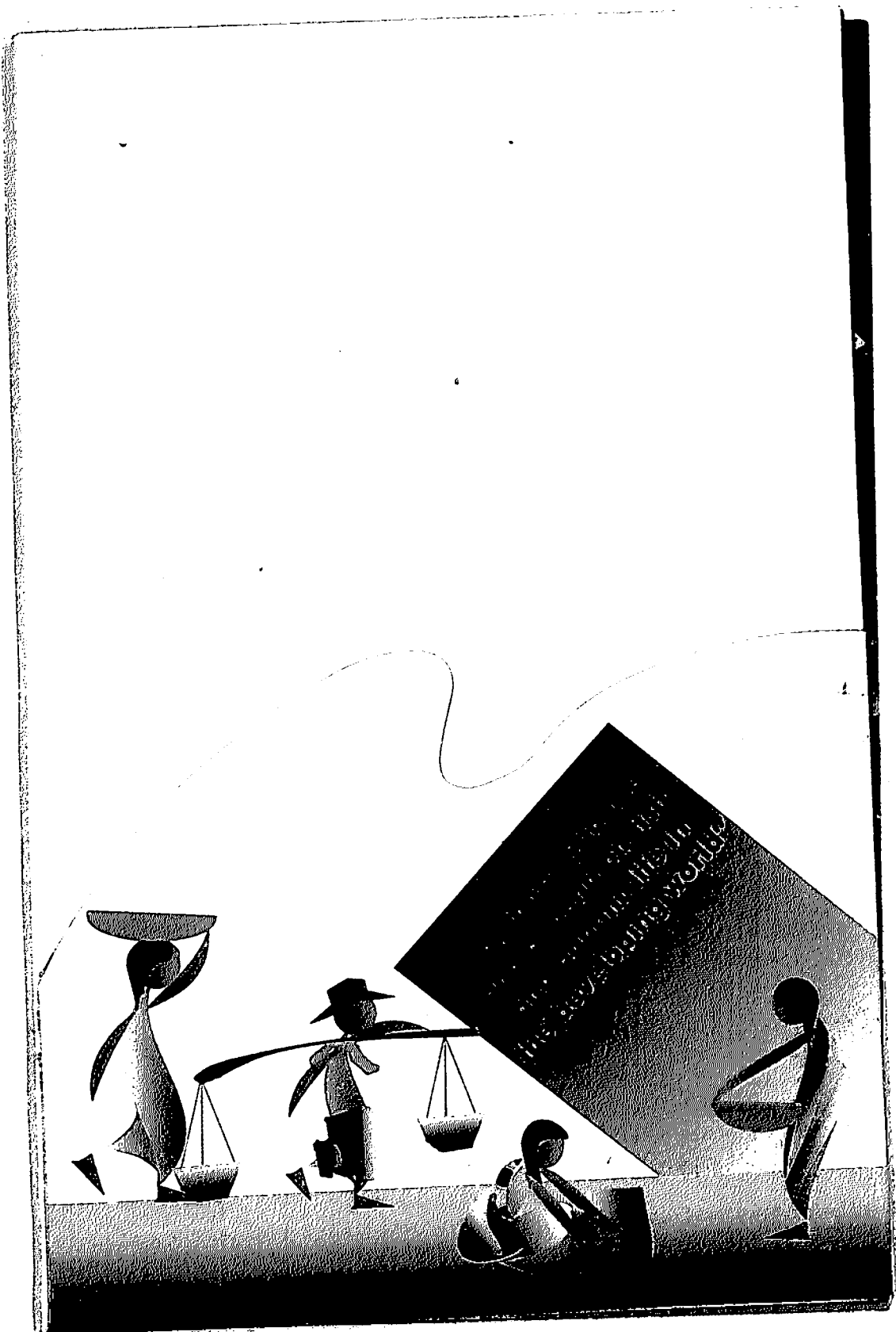
We believe this work will be most successful when undertaken in partnership with national government and nongovernment institutions and with the participation of the users of the research results.

Our corporate makeup:

ICLARM is an autonomous, nongovernment, nonprofit organization, established as an international center in 1977, with headquarters in the Philippines. ICLARM is an operational entity with programs funded by grants from private foundations and governments.

ICLARM is governed by an international Board of Trustees and policies are implemented by the Director General. There are approximately 125 scientific (internal, regional and national) and technical staff, and 85 support staff from 12 countries.





ICLARM

OUTPOSTED OFFICERS

Denmark
North Sea Centre

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University of Perpignan

Canada
University of British Columbia

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MALAWI

BANGLADESH

Headquarters
PHILIPPINES

SOLOMON ISLANDS



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Visit our home page on <http://www.cgnet.org/iclarm/>

RESEARCH PROGRAMS

ICLARM's research covers both marine and freshwaters in important tropical ecosystems - coastal waters, coral reefs and freshwater waterbodies. The research is carried out through the following ten programs:

Program	Focus
1. Biodiversity and Genetic Resources	Conservation of aquatic life.
2. Germplasm Enhancement and Breeding	Ways of improving fish breeds.
3. Aquatic Environments	Conservation of aquatic habitats.
4. Fisheries Resources Assessment and Management	Methods to improve the way fisheries are managed.
5. Integrated Aquaculture-Agriculture Systems	Improving overall production on small farms.
6. Coastal Aquaculture and Stock Enhancement	Increasing marine harvests through fish farming and augmenting natural fish populations.
7. Policy Research and Impact Assessment	Analysis of aquatic resource issues to improve policy decisions, including investments in research.
8. Fish Health	Helping prevent and manage fish disease outbreaks, especially in Africa. This program is under development.
9. Information and Training	Assisting both scientific and public understanding of global fisheries problems; and helping in ICLARM's training activities.
10. International Partnerships and Networks	Strengthening connections and collaborations between fisheries organizations and individuals, especially in developing countries.

The guiding principles for the research are:

- Sustainability;
- Equity;
- Gender role in development;
- Participation;
- Systems approach; and
- Anticipatory research.

The values of our work are:

- Excellence in achievement;
- Relevance to our beneficiaries' needs;
- Partnerships;
- Centerwide teamwork;
- Communication;
- Efficiency and flexibility in program delivery; and
- Continual growth in our knowledge and understanding.

ICLARM International Center for Living Aquatic Resources Management

1

Biodiversity and Genetic Resources

The Biodiversity and Genetic Resources Program (BGRP) pursues strategic research on fish biodiversity and genetic resources and the development of genetic resources research methods, in partnership with international, regional and national agencies and institutions, nongovernment organizations (NGOs), scientists, farmers and fishers. The BGRP contributes to the meetings of the Convention on Biological Diversity (CBD), including the latter's Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA). It collaborates with organizations concerned with the sustainable use and conservation of living aquatic resources, including FAO and IUCN. The BGRP provides ICLARM's contributions to the CGIAR's System-wide Genetic Resources Program (SGRP) and System-wide Information Network on Genetic Resources (SINGER).

The BGRP's largest activity is an EU-funded project which will focus on capacity building in fisheries and biodiversity management in the national programs of 55 African, Caribbean and Pacific (APC) countries. The project emphasizes training for establishing national fish biodiversity databases, based on the concepts implemented in FishBase, and the forging of regional and intraregional partnerships through electronic networking. Work on versions of FishBase in major languages other than English will also begin in 1997, commencing with French.

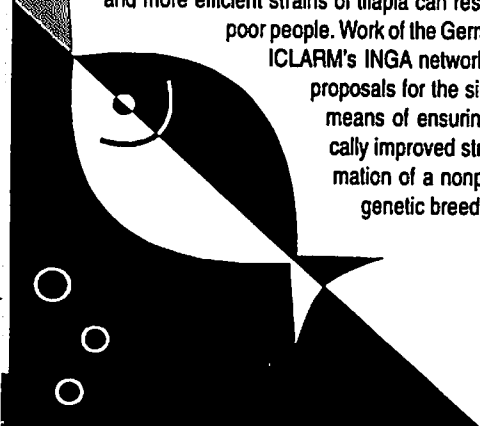
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Germplasm Enhancement and Breeding

This program aims to develop techniques for improving breeds of fish, disseminate these techniques, and train staff. The Genetically Improved Farmed Tilapia (GIFT) project, which began in 1988, is a major strategic research initiative in the applied genetics breeding and germplasm improvement of Nile tilapia (*Oreochromis niloticus*). In 1996, experiments were completed on the magnitude of genotype by season interaction and the estimation of response to selection for late and early spawning in females. The GIFT project is closely allied with the Dissemination of Genetically Improved Tilapia in Asia (DEGITA) project, which has examined the performance of the GIFT strain and its socioeconomic impact on fish farming households in selected countries in Asia. The project has shown that the improved GIFT tilapia continues to express enhanced growth and survival traits in various aquaculture environments. It has also proved that the farming of early maturing and more efficient strains of tilapia can result in lower prices for these species for the benefit of poor people. Work of the Germplasm Enhancement Program has also contributed to

ICLARM's INGA network activities, and to the development of new research proposals for the similar development of carp species in the future. As a means of ensuring the continued and increased availability of genetically improved strains, ICLARM and its partners are evaluating the formation of a nonprofit foundation to maintain both the distribution and genetic breeding research on tilapia in the Philippines.



3 Aquatic Environments

The ReefBase 1.0 CD-ROM and Manual were released at the International Coral Reef Symposium in Panama in June 1996. ReefBase was designated to be the official database of the Global Coral Reef Monitoring Network, an activity initiated as part of the International Coral Reef Initiative (ICRI) and which involves more than 80 countries. ReefBase 2.0, which will be released by June 1997, will contain a wide range of ecological and management information on over 7 000 coral reefs. A collaboration with the World Resources Institute will result in a global analysis of the threats to coral reefs by the end of the year. A manual is being finalized for the ReefBase Aquanaut System, which will enable sport divers, park rangers and others to gather standard data on the ecological status of coral reefs.

A study will be initiated of Population Interdependencies in the South China Sea Ecosystem (PISCES). This project will compare the genetic structures of selected coral reef species in six countries to obtain information on possible shared stocks that must be accounted for in ecosystem management policies. Work was completed in 1996 on the Lagonoy Gulf Project, a coastal zone management study, leading to specific recommendations for the future management of the area. This activity will be succeeded in mid-1997 by a regional project to study fisheries ecosystems and management in Southeast Asia. The Coastal Management Training Project will continue. It will focus on finalizing and testing training packages for local government officials in the Philippines to whom the primary responsibility for coastal zone governance has recently devolved. Numerous requests for these materials have been received from other countries, and possibilities for developing a regionally focused package are being explored.

4 Fisheries Resources Assessment and Management

This program seeks better tools and approaches to assess and manage tropical fish stocks, including developing methods for acquiring data for aquatic resources management. Included in this program is a scientific assessment of the role of marine reserves in fisheries management and the conservation of biodiversity.

In 1996 a Windows-based version of Ecopath (Ecopath 3.0), an ecosystem assessment software designed for fisheries, was released. Individual modules of this software were also improved and, in collaboration with scientists at the University of British Columbia in Canada and DIFRES in Denmark, a new package for dynamic systems modelling, termed Ecosim, has been developed. Other advances include the development of a multispecies analysis program, the development of a routine to determine yield per recruit for incorporation into ICLARM's FishBase CD-ROM, and a FISAT reference manual to supplement the existing FISAT Users Guide.

Work has continued in the Caribbean in finalizing project arrangements with the University of West Indies and the University of the Virgin Islands to conduct research on marine protected areas. Work consists of tagging and recapturing indicator fish species to provide evidence for the scientific placement and extent of marine protected areas and their probable effects on stock enhancement and adjacent fisheries.

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5

Integrated Aquaculture-Agriculture Systems

This program aims to improve the productivity of smallholder farms through integration of fish farming and development of methods to assess sustainability of integrated aquaculture-agriculture (IAA) systems.

RESTORE (consisting of farmer-participatory field procedures and software) is the analytical tool developed at ICLARM for this purpose. The beta-version was completed in 1996 and distributed to over 100 testers worldwide. Feedback will lead to a final version to be released in 1997. Data from previous projects in Ghana, Malawi and the Philippines (Cavite, Muñoz, Antique) are being analyzed. As part of this framework, the Spanish translation of a participatory diagnostic methods book was produced, as well as the proceedings of a workshop on the potential for smallholder aquaculture in Ghana.

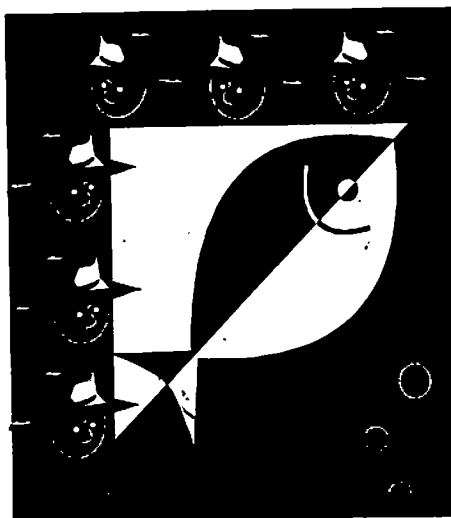
A five-year study of the ecology and sustainability of Philippine rice-based farms (including rice-fish culture) was completed, applying for the first time in a terrestrial environment ECOPATH, a steady-state nutrient-flow modeling software. The results were presented in the form of a Ph.D. thesis at the University of Copenhagen. A technical report and peer-reviewed publications are forthcoming. In collaboration with the University of Kassel, Germany, a dynamic simulation model of the rice-fish farming system in the Philippines was completed.

As a new initiative, a small study on the potential for IAA in the context of rainforest borderzone management was begun in collaboration with a bilateral development aid project in the uplands of Quirino province in Luzon, Philippines.

In Malawi, activities are entirely core-funded and continue in the form of collaborative research on station with the Fisheries Department, strategic research on-farm and on-station, and the provision of training courses and of improved information services through an upgraded library. Points of focus were the study of adoption and impact of IAA on smallholder farms, partial harvest strategies for continuous fish supply (as opposed to bulk harvests after several months of culture) and on community management of seasonal small waterbodies (*thamandas*) for fish culture. Further highlights were the contribution to an expert consultation on smallholder aquaculture in Africa held at FAO in Rome, and a suite of publications on work performed by the project staff.

In Bangladesh, work continued on developing sustainable technology for smallholder aquaculture through studies of socioeconomics on rice-fish farms and on provision of training, particularly on hatchery and broodstock management to avoid inbreeding, to national research and extension institutions and to NGOs. Scheduled for 1997 is the start of a project to study the socioeconomic and technical aspects of community-managed deepwater rice-fish operations in Bangladesh and Vietnam, in collaboration with national partners and IRRI.

Among the new activities planned for 1997 are (1) the involvement in the System-wide Initiative on Water Management (SWIM) in the fields of multiple use of irrigation water, watershed management, and water-use efficiency; and (2) the design of a study of the potential for improved management of small water bodies with a primary focus on subSaharan Africa.



6

Coastal Aquaculture and Stock Enhancement

The development of village farming systems for giant clams and blacklip pearl oysters, and the artificial propagation of sea cucumbers, continued throughout 1996 at the Coastal Aquaculture Centre in Solomon Islands.

The series of large-scale grow-out trials for giant clams at village farms was concluded in late 1996. These trials demonstrated that five species (*T. crocea*, *T. derasa*, *T. gigas*, *T. maxima* and *T. squamosa*) can be reared by village farmers for the aquarium trade at substantial profits. One species, *T. derasa*, had exceptionally high mean rates of growth and survival, and was the outstanding species for cultivation as food. Additional village farms were established to produce sufficient *T. derasa* to test and develop markets for clams of 150 mm shell length in the live seafood trade. In 1997, work on giant clams will focus on developing cost-effective ways to reestablish overfished stocks, enhancing the value of farmed giant clams, testing other markets for cultured clams and assessing the economic and social impact of giant clam farming.

Systems for farming of blacklip oysters in the "open" lagoon systems of the central-western Pacific were refined by identifying the types of sites where spat were most abundant, removing spat from collectors after three months and rearing them in panel nets, and by modifying the design of the spat collectors. In 1997, a pilot-scale pearl farm will be established and the feasibility of commercial operations, based on the collection of wild spat, will be assessed.

Two batches of the most commercially important sea cucumber, sandfish, were produced in the hatchery at the Coastal Aquaculture Centre. The juveniles appeared to be suitable for mass-rearing in hatcheries as they grew rapidly, and had simple food requirements. In 1997, research will concentrate on developing larval rearing methods for other species of sea cucumbers of high value, and on refining methods for producing sandfish. Also, the early success in rearing sandfish, and their apparent suitability for stock enhancement, has brought forward the need for experiments to identify the best way to release the juveniles into the wild. As a prelude to these experiments, we will identify the nursery habitats of sandfish, determine what time of year they recruit, assess how fast they grow, and establish the timing of migration from nursery to adult habitats.

7

Policy Research and Impact Assessment

This program became operational in 1996. A full-time Program Leader was appointed during the second half of the year. The program is building on the experiences of past and ongoing activities such as research on fisheries co-management; evaluation and assessment of aquaculture technologies; bio-economic analysis; and valuation of coastal resources.

The research on fisheries co-management, bio-economic analysis and valuation of coastal resources will now be carried out under a broader theme: *ecological economics for sustainable use of aquatic resources*.

Research to assess the results and evaluate impacts of aquatic resources will involve assessment of impact for major completed projects as well as development of internal mechanism to include *ex-ante* impact and built-in impact assessment for every major research initiative by ICLARM. Impact assessment projects will be categorized under the theme *impact of aquatic resources research: methods and assessment*.

Increasing emphasis will be given to examine a range of policy issues and measures by which governments might strive to increase the supply of fish for human consumption and the economic benefits which are available from the fisheries sector. These projects will fall under the theme *policy analysis of the contribution of fisheries to food security*. Substantial cooperation with IFPRI and other partners is foreseen on this.

8 Fish Health

This program is a recent initiative and a research plan is being developed.

9 Information and Training

In 1996 all units broadened their services. At the same time an in-depth analysis was undertaken of the role and operations of the whole area, and a new and progressive future focus designed.

Major changes are expected over 1997, including the wider integration of this program into ICLARM and its research projects so that the units under the program are viewed as information dissemination tools. A strategic approach will be taken to use these tools to develop information dissemination strategies as an interdisciplinary component to ICLARM's research projects and to develop new initiatives.

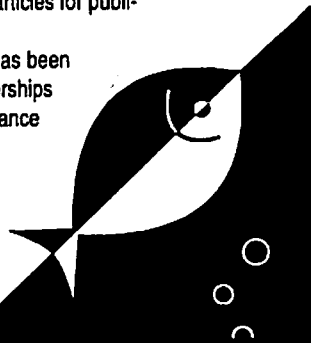
To achieve these goals, many developments will be needed, including new focuses, restructuring, more efficient operations of each unit, funding source, changed expectations, and planning for the further development of Public Awareness, Training and Translations Units. The year 1997 will see some major progress towards these.

10 International Partnerships and Networks

For better management of living aquatic resources worldwide, existing research partnerships are being strengthened and new partnerships are being developed with national and international institutions and NGOs, through research and information networks and collaborative research programs with and among developing countries. Through the International Network on Genetics in Aquaculture (INGA), national breeding programs have been developed, training programs in quantitative genetics and selective breeding have been conducted and INGA national chapters have been formed. GIFT germplasm has been provided for national breeding programs. New collaborative programs on carp and tilapia genetic improvement will be started in Asia and Africa, respectively, during 1997. The Asian Fisheries Social Science Research Network (AFSSRN) has been transferred to the Asian Fisheries Society. In addition to the AFSSRN newsletter, the INGA newsletter has been incorporated in NAGA, the ICLARM quarterly.

Information networks—Network of Tropical Aquaculture Scientists (NTAS) and Network of Tropical Fisheries Scientists (NTFS)—continue to attract new members and articles for publication in Aquabyte and Fishbyte sections of NAGA.

ICLARM Partnership Policy for Research and Related Activities has been approved by the Board of Trustees. ICLARM will continue to forge partnerships with NARS, ARIs, NGOs, GOs, private sector and development assistance agencies.



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5

Integrated A

This program aims at integrating aquaculture with farming and development (IAA) systems.

RESTORE (conservation and restoration tool developed at ICLARM) is being tested by over 100 testers. Data from previous projects are being analyzed. As part of the project, a methods book was produced on aquaculture in Ghana.

A five-year study on rice-fish culture was completed. A steady-state nutrient-flow analysis was completed. A thesis at the University of the Philippines is forthcoming. In collaboration with the University of the Philippines, a study on the rice-fish farming system is being conducted.

As a new initiative, a study on aquaculture management was begun in the Quirino province in Luzon.

In Malawi, activities are being conducted on search on station with the provision of training courses. Points of focus were the development of strategies for continuous improvement and on community management. Other highlights were the training course held at FAO in Rome, and the development of a manual.

In Bangladesh, work is being done on aquaculture through studies of the impact of aquaculture on hatchery and broodstock management, institutions and to NGOs, and technical aspects of integrated aged deepwater rice-fish culture in Bangladesh and Vietnam with national partners and NGOs.

Among the new activities in 1997 are (1) the involvement of the World Bank in the fields of multiple use of water, watershed management, and water use efficiency; and (2) the development of the potential for improved small water bodies with sub-Saharan Africa.