

# **DEVELOPMENT INFORMATION DISSEMINATION TECHNIQUES: DIRECTION FOR AQUACULTURE DEVELOPMENT AND HEALTH PLANNING IN INDONESIA DURING AND AFTER THE ECONOMIC CRISIS\***

**By Widharto Widharto**

## **Summary**

Within the next two decades, the population of Indonesia is projected to be 258.2 million. Thus, the need for food will dramatically increase and agricultural productivity should be increased accordingly. However, concomitantly industry, housing, and other sectors must also expand and call on land resource availability. These conflicts have created a major problem that must be addressed to guarantee that resources will be sufficient to at least provide the food security of the growing population.

SEAMEO BIOTROP to conduct and disseminate relevant research that supports the aquaculture development and ways in SEAMEO BIOTROP hopes to help solve this problem by disseminating appropriate information necessary for the attainment of fish resource proficiency. Fish is a very important yet relatively cheap protein source for the people of Indonesia and most of the other Southeast Asian countries.

SEAMEO Regional Centre for Tropical Biology (BIOTROP), a Regional Centre operationally funded by the Indonesian Government, has played an important role in support of the agricultural development that Indonesia has achieved. It is the mission of which farmers profit and compete in the global arena.

## **Background**

Indonesia is a country comprising 13.667 islands straddled out along the equator between the Indian and Pacific Oceans, and sandwiched between the continents of Asia and Australia. A country rich in natural resources, Indonesia's population stood at more than 200 (two hundred) million people as of 1997 with more than

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50% inhabiting the island of Java and the remainder distributed over Sumatra, Kalimantan, Sulawesi, Irian Jaya and other islands.

Oka (1996) stated that in Indonesia, agriculture is the backbone of the economy and the major propeller of national development. The role of agriculture in the economy of the nation, is to provide food, foreign exchange earnings, and job opportunities as well as to contribute development of other sectors especially providing raw materials for industry to meet the expansion of domestic demands. During the fifth five-year Development Plan (1988 - 93) the agricultural sector contributed about 19% of the total Gross Domestic Product (GDP), and more than 7.8% of the total export earnings or 12.5% of the total non-oil exports. Likewise, agriculture employs 42.3 million people, or 59.9% of the total labour force. Thus, increasing agricultural productivity must be generated not only to achieve self-sufficiency in food but also to improve employment and welfare levels in the rural areas, where most of the Indonesians live.

Increasing population pressures on the world's limited resources, coupled with escalation in energy costs, have emphasized the necessity of developing new methods of food production. An additional concern is the recent emphasis on industries that are environmentally clean, yet able to provide tax revenues and employment opportunities, particularly for communities that traditionally have been agricultural. Aquaculture, the systematic cultivation of aquatic plants and animals, has demonstrated the potential to meet these needs. Aquaculture development projects are being initiated in many parts of the world, particularly in Indonesia. Most effort in aquaculture has been oriented towards improved productivity through intensive feeding of formulated diets, better pest management, water quality management, and utilization of open waters for aquaculture. This requires research in areas such as water management (irrigation), pest and diseases management, fertilizers, land preparation, farm management and marketing, harvesting and post harvest technology. Information on aquaculture and its related fields is very important to the success of that project. However, such information to support the development of aquaculture and its impacts on the public health is very scarce.

### **What is SEAMEO BIOTROP?**

SEAMEO (The Southeast Asian Ministers of Education Organization) is an organization created for the purpose of promoting cooperation among Southeast Asian nations through activities in education, science and culture. The SEAMEO member countries are: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam. The Associate

member countries are: Australia, Canada, France, Germany, The Netherlands, and New Zealand - countries outside the region that cherish the organization's aspirations and share its cooperative spirit. Other donor countries include Japan and the United States of America.

The organization operates through its 11 Regional Centres located in the member's countries. The SEAMEO Regional Centre for Tropical Biology (BIOTROP) is located in Bogor, Indonesia, and was established by the Third SEAMEC (The Southeast Asian Ministers of Education Council) Conference in Singapore, on 6-9 February, 1968. The Bogor Agricultural University (Institut Pertanian Bogor), as host institution to BIOTROP plays a very important role in BIOTROP's development as a first-rate institution (Sahertian - Bakhoven, 1984).

BIOTROP was developed to provide the SEAMEO member countries with increased capability in biological sciences, relevant to regional economic needs. The objective of this organization is to identify and help solve critical biological problems, to enhance economic development in the member states and conduct research, publication and training programmes and related activities within and outside Indonesia. Based on its objectives and its functional goals, BIOTROP disseminates relevant information on BIOTROP's programme achievements and research results (through BIOTROP publications, papers, seminars) to scientists, appropriate authorities, interested organizations and key persons in the region. acts as a central clearing house for storage and exchange of tropical biological information within the region, and foster international cooperation, communication and exchange of biological information within the region. This task is entrusted to the Information Resource Unit.

The Centre's activities are mainly focused on research and training in areas of tropical biology, namely Tropical Forest Biology, Tropical Pest Biology, and Tropical Aquatic Biology. Research studies have focused on inland water ecosystem with special emphasis on natural and manmade lakes of Java on a broad range of topics including water quality monitoring, aquatic weeds, water pollution, fish population structure and dynamics, feasibility studies on use of lakes for aquaculture and the formulation of the appropriate fisheries management concepts. The Information Resource Unit (IRU) supports these professional programmes. The objectives of the IRU are to provide a two-way flow of information between BIOTROP and the scientific community in Southeast Asia and other tropical areas.

The experimental results are disseminated to professionals in the region through the training courses organized by BIOTROP. Training professionals at BIOTROP

stimulate further biological research in the SEAMEO member countries, thus producing the maximum multiplier effect from BIOTROP programmes.

The studies, though focused mainly on fisheries production, have also a number of public health and socioeconomic implications.

### **Socioeconomic Development of Building New Dams**

The Indonesian government has implemented water resource development programmes by the construction of dams and irrigation systems in order to provide more water for agricultural land and/or for hydro-power production. Other benefits obtained include flood controls in the downstream area, inland navigation, communication and transportation upstream and down-stream, fish raising in the manmade water reservoir and public recreation in the dam area. However, these programmes may cause adverse effects on health and nutritional status of the communities. Seldom are the health aspect and the sociocultural aspects of the project on the community to be flooded of the migrant population that will settle on the shore, considered. Such health and nutritional problems may be major obstacles to the socioeconomic development of the country as a whole..

For the success of both the development of aquaculture and the public health service, information transfer between research, development and implementation is of great importance. Examples of such transfer are:

#### **Provision of Safe Water Supply**

Using the same data collected to examine the suitability of water for fisheries activities can be used in making decisions as to the suitability of the water as source of domestic water supply and the kind of treatment the water has to undergo prior to its distribution to the community.

#### **Nutritional Aspects**

Although fish is still one of the cheapest source of protein for most people in the rural communities of Southeast Asia, there is still a need to inform the population on proper fish culture techniques in terms of proper feeding regimes, stocking densities, choice of breeds, proper use of fishing would ensure a sustainable development of the ecosystem.

#### **The BIOTROP's Documentation and Information Service**

The objective of BIOTROP's Information Resource Unit is to gather, analyze, produce and disseminate information for scientists, technicians, Training Course and Symposia participants of BIOTROP and the outside users as well. Outputs include: (I) Scientific Serial: BITROPIA, (ii) Symposia Proceedings "BIOTROP

SPECIAL Publications", (iii) Training Course Reports, and (iv) an information service, a document delivery service and consultancy. Those jobs have been implemented into the services as follows: (1). The Library and Documentation Service, (2). Publications Service, and (3). Communication Service.

### **The Library and Documentation**

#### The Library

The BIOTROP Library and Documentation Service is classified as a special library and is headed by a librarian who is directly under the supervision of the Head of the Information Resource Unit. The Library has a seating capacity for forty readers. It provides up-to-date references and learning resources both print and non-print media. Currently, the library holdings consist of 15.500 volumes of books, more than 1.000 of serial titles, voluminous pamphlets, and microfiches. They are acquired and collected from a large variety of sources within and outside the Southeast Asian Region, 80% of the books collected are in English. Due to recent budgetary constraints, the acquisition of books and other library materials through purchase have been reduced. However, with the higher activities programmed through the programme thrusts, which will increase the number of BIOTROP publications, we are sure that they will allow BIOTROP to make exchanges with other institutions both local and international that will contribute greatly to the growth of the library collection.

Needless to say, scientists are interested in having immediate answers to their questions, rather than getting lengthy reports. Having the right information at the right time will give scientists the competitive edge they need to help them in their regionalization effort. The BIOTROP library should be more proactive in providing value added services such as online searching, alerts and customized information that meet the BIOTROP's scientists specific needs. Information specialists with specific BIOTROP subject areas have to be on hand and equipped with the right skills to tap databases around the world to extract, analyze and present relevant information to the scientists and other BIOTROP's clientele.

However, in this time of economic crisis, the Libraries have been subjected to a budget reduction. Effective Fiscal Year 1997/98, a number of vacant positions are not being refilled, moreover, other activities related to library and librarianship jobs have to be cancelled. It seems probable that Indonesian librarians will have to devise new methods to solve their problems; techniques that have proved to be effective in the developed countries will probably not work because of geographical differences. Moreover, the proliferation of information makes it impossible for BIOTROP library to collect all information, especially in times of the crisis. Thus, to optimize the returns on government investment in BIOTROP

library development, BIOTROP library has to distribute its information available to others.

Whatever ideas, practices and procedures may be borrowed, of whatever origin, they must be adapted to fit local needs to support Indonesia.

### The Documentation

The first step to build up a documentation of the institute's publications, unpublished and published reports was the systematic collection of these materials. Further dissemination of BIOTROP results of research would not be possible if the materials could not be located or be available for consultation. These materials are stored separately from the library, and are catalogued using its own systematic classifications. As required by SEAMES (SEAMEO Secretariat in Bangkok), BIOTROP has to submit the list of Published and Un-published Reports and Papers, every year, which will be compiled together with those from the other Centres under SEAMEO. This publication is very important as it is the medium to promote as well as to disseminate hidden gray literatures available at the Centre.

### **Publication and Information Dissemination**

The Publication Service's role in supplying information is just as important for the transfer of information as that of the other services. BIOTROP has disseminated information through various publications, such as the Annual Report, BIOTROP Special Publication which contains proceedings of the BIOTROP Meetings and Symposia, and its scientific journal BIOTROPIA.

### **Literature Search**

The most popular service recognized by users is literature search. Having established a computerized database, this service can provide things much faster than before. To back -up the information retrieval service, IRU is also offering document supply service. Related journals and other publications regularly scanned for the database are part of the library collection. Therefore, photocopies of the original documents are available for any information included in the database. Information retrieval service on BIOTROP related subjects areas, particularly on weeds has been speeded up with the creation of the home databases. Requests for literature search were significantly high, so far the Information Resource Unit receiving an average of one request per week.

### **Methods of Requesting and Supplying Documents**

There are no standard procedures for requesting and supplying documents existing in Indonesia. Zultanawar (1989), stated that the Centre for Scientific Documentation and Information developed an Interlending form system in 1982,

but it was abandoned a few years later. Indonesian libraries, including IRU, usually accept requests by any method. The use of mere letters is commonly acceptable by most libraries. The request by telex or by telefacsimile are being used by only a few clients and rarely by libraries.

### **Delivery of Primary Documents**

To complement the information retrieval service, IRU offers back up service by providing photocopies of the original documents. This service has been utilized very extensively by the students, consultants, and researchers. Especially, the literature on weeds as IRU has been depository of grey literature produced in southeast Asia. Request for document delivery were received not only resulting from the information retrieval service, but also from the List of Indexed Articles and Annotated Bibliography.

The dissemination of Information, however, depends on the technology; it depends on the organization and efficiency of documentation services; on the production of a medium of the message; on the financing of programmes and equipment of storing, cataloguing, and redistributing materials; and on the people in all the intermediate agencies who edit, publish, and distribute information. The key to this complex network of actions is speed.

### **Delivery Options**

We know that many scientists and researchers expect libraries primarily to deliver needed material when it is required. They need ready access to the information that will enable them to do their job effectively. To provide the right information in a convenient and comprehensible form to those who need them are really the objective of IRU. As Information itself is a resource that cannot be wasted, that must be handled efficiently.

A close look at the delivery methods, comparing their advantages and disadvantages, help to identify the options for IRU to take a more proactive posture in meeting the information needs of users. Five factors are important in analyzing the desirability of each delivery mode; these are cost, speed, reliability, ease of use, and in the case of facsimile, the quality of the received document.

## **The Utilization of Information Technology**

### **Telefacsimile**

Telefacsimile (fax) machines transmit copies of documents over telephone lines. This technology has been known for quite some time but has not has a great impact yet. Advances in speed of transmission, increased memory for storing and sending

documents. The current economic crisis, and the increasing fee for the said technology has hampered the intensive promotion to use.

### **Database building**

Technology provides users with solution to their need for speed delivery, but also creates new, sometimes overwhelming, hardware or software requirements for utilization. The user's needs for high-resolution documents, along with her or his time and technological limitations will determine how a document is transmitted by its respective staff. However, it is important for libraries to assist users in sorting through the available delivery choices and also to serve as a relay center, when necessary, to equalize access to the more sophisticated, high quality document delivery technologies.

To allow easy access to information resources available at the Information Resource Unit, different kind of databases were produced for different purposes. Until recently five databases have been established namely the WEEDOC (Weed documents), RESABS (abstracts of research), and HERBAR (herbarium data bank). After trial and error, the choice was made on a user-friendly software, INMAGIC. Following up a series of training on the use of the software, the bibliographic database on Weed.

- *WEEDOC*, a database which contains bibliographical information on weeds of the Southeast Asia. IRU may proud to have a larger database on Southeast Asian weeds than what a user can get at any one place.
- *LIA*, a database which contains index of scientific articles from the journals available at the IRU library.
- *DOC*, a database which contains bibliographical data of published and unpublished publications and reports, and/or other articles/papers written by BIOTROP staff.
- *BIOTRO*, a database which contains bibliographical data on books acquired by BIOTROP library.
- *SERIAL*, a database which contains bibliographical data of the serials title acquired regularly by BIOTROP library.

### **Electronic Mail**

Computer-based messaging system evolved from simple programmes used on individual computer systems to exchange short messages. As computer networks became more prevalent in the late 1960s and 1970s, these systems were expanded to allow users of different computers to send messages to one another. These messaging system then to be called electronic mail or e-mail systems.

The equipment used to access e-mail services usually consists of a microcomputer, a communication software package, and a modem. The modem provides the connection between the telephone line and the computer, and the communication software allows the computer to interact with modem.

Since e-mail makes more efficient use of communication media than do conventional services such as telex, its use can generate significant cost savings. Of course the cost of the service, other than the monthly administrative fee, depends on how much it used, but most users realize a significant reduction in total cost.

Since e-mail is cheaper, users tend to explain themselves more fully and correspond more frequently when using it. Many matters that might have been discussed only in a letter, or not at all, can be reviewed economically in an e-mail message. The benefits of this faster and more frequent communication cannot be easily translated into specific monetary amounts. The ability to make better and timely decisions, for example, can be profoundly important yet difficult to quantify.

### **BIOTROP Library's Service in the New Millennium**

Changing and adapting are two essential requirements for survival and growth. A Library generally operates with no great sense of urgency and by their nature, are more conservative and protective. Here, inertia, reigns and valuable traditions and status quo are jealously guarded against disturbing change. Thus, as a supporting unit, BIOTROP library today is confronting daunting new challenges as it enters the early years of the 21<sup>st</sup> Century. BIOTROP library is forced to grapple with these pervasive changes in order to meet the demands of times, the relevance of its services to societal needs, its role in social, economic and political activities.

The new challenge of BIOTROP library in the new age is to remain contemporary. It must preserve what it is most valuable in its tradition, while at the same time introducing the changes required by dynamic society entering the 21<sup>st</sup> Century. In general, libraries must ask which changes they must take, rather than whether or not. Changes will be required, significant change must involve innovation, that is purposeful action taken to accomplish something new. To achieve this, libraries must create an environment that encourages innovative thinking and risk taking.

Any attempt to transform the work philosophy of a certain library must have a well - defined mission with diversity of its institutions they support's goals and objectives. They should be inline with their supporting institutions responsibility of developing its own quality. Whatever ideas, practices and procedures may be

borrowed, whatever their origin, they must be adapted to fit local needs and circumstances. Indonesian librarianship can undoubtedly profit from the experience of others, which had found solutions for problems of library services. The most urgent of these problems would seem to be education for librarianship. Without enlightened leadership in this field, Indonesian librarianship will have difficulty in achieving status it needs and deserves. Indonesian librarians by the very magnitude and special nature of their problems are in the position to develop new techniques and to offer other countries useful suggestions.

## **Conclusion**

Of the issues discussed in this paper, the following may be considered the most important:

1. The Information Resource Unit of SEAMEO BIOTROP, can do a better job at selling its usefulness for the National Development, especially for Ministry of Agriculture, specifically for the Aquaculture Development Programme.
2. Greater access to information and technology is needed for better service, but:
  - Researchers on Aquaculture Development and Public Health personnel need more than just a CD index or abstract
  - Both the Scientists and their institutions should contribute to the availability of literature
3. The high costs of telecommunication are a major impediment to large-scale use of computerized information retrieval facilities in developing countries.
4. There is a need for more specialized information centres that set up and maintain integrated bibliographical files in well-defined. They should serve users on a worldwide scale.

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Widharto Widharto  
SEAMEO BIOTROP  
JL. Raya Tajur KM6, P.O. Box 116  
Bogor 16001  
Indonesia  
tel.: (62-251)323-848  
fax: (62-251)326-851  
e-mail: [w\\_widharto@bogor.wasantara.net.id](mailto:w_widharto@bogor.wasantara.net.id)