Postgraduate fisheries education in the Philippines

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SUMMARY: Postgraduate programs in fisheries and marine science in the Philippines, many of which have been instituted within the last decade, cover both master’s and doctoral levels. These are reviewed in terms of curricular content and program implementation. Information from major institutions involved in postgraduate fisheries education are presented. The paper discusses issues and concerns as well as challenges in postgraduate fisheries education. Concerns range from the more basic inadequacy of facilities to harmonization of the different programs. More dynamic networking and innovative teaching strategies confront the present group of educators. A brief discussion of the government’s policy efforts toward human resource development is included.

KEYWORDS: postgraduate education, fisheries, Philippine education

POSTGRADUATE PROGRAMS

The first postgraduate program in fisheries in the Philippines was instituted at the University of the Philippines (UP) in 1975; this was the Master of Science in Fisheries major in Aquaculture program which was offered in collaboration with SEAFDEC Aquaculture Department in Iloilo. Until such time, Filipino researchers obtained their postgraduate degrees in fisheries and marine sciences from foreign universities. Five years later (1980) CLSU implemented a similar program. At present, ten of the 49 state colleges and universities with programs in fisheries and marine science offer postgraduate programs in this field (Table 1). Not included in the table (and in the discussion) are programs on environmental science and environmental policy, both of which have fisheries components. Some of these programs have been reviewed earlier.1)

Objectives of postgraduate programs as stated in the information brochures range from production of high-level scientists for academic and research institutions (MSI) to those capable of providing innovative solutions to problems in the discipline (MSU). Some programs also aim to equip students with methodologies to hasten technology transfer as well as for managing aquaculture systems and marine resource (ISCOF, ZSCMST). The emphasis on training for independent research is reflected in the programs of MSI, UPV and MSU. Some programs require a published paper or a manuscript in publishable form, respectively. The Philippine educational system is largely patterned after the American system where formal courses are required before students proceed to thesis or dissertation. There is yet no postgraduate degree by research but the option is being considered at UPV.

<table>
<thead>
<tr>
<th>Program</th>
<th>Institution</th>
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<tbody>
<tr>
<td>PhD Fisheries (Aquaculture)</td>
<td>UPV</td>
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<tr>
<td>PhD Aquaculture</td>
<td>CLSU</td>
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<tr>
<td>PhD Marine Science (Mar. Biol.)</td>
<td>MSI</td>
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<tr>
<td>D Fisheries Technology</td>
<td>ISCOF</td>
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<td>MS Fisheries, major in</td>
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<tr>
<td>Aquaculture</td>
<td>UPV, ZSCMST, BU</td>
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<td>Fish Processing Technology</td>
<td>UPV, BU</td>
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<tr>
<td>Fish Biology</td>
<td>UPV</td>
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<td>Coastal Resource Management</td>
<td>BU</td>
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<td>MS in</td>
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<td>Aquaculture</td>
<td>CLSU, MSU, ZSCMST</td>
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<td>Marine Science</td>
<td>MSI</td>
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<td>Marine Biology</td>
<td>MSU, SU, USC</td>
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<td>Coastal Resource Management</td>
<td>SU</td>
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<td>Marine Biodiversity</td>
<td>ZSCMST</td>
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<td>Ocean Sciences</td>
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<td>Fisheries Technology</td>
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<td>Aquaculture</td>
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<td>Marine Affairs</td>
<td>UPV</td>
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<tr>
<td>Fisheries Technology</td>
<td>ISCOF, DNSSC</td>
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<tr>
<td>Fisheries Management</td>
<td>ZSCMST</td>
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<tr>
<td>Marine Management</td>
<td>ISCOF, DNSSC</td>
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<tr>
<td>Master of Professional Studies in Aquac.</td>
<td>CLSU</td>
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</table>

Students in postgraduate programs are mainly faculty members of state universities and colleges, employees of government agencies and those involved in research projects in universities, government or non-government institutions. Very few come from the industry and the private sector. Entry, retention and promotion systems in universities and to some extent in government agencies are biased.
towards a graduate degree and this becomes a strong motivation for personnel to enroll in postgraduate programs. Teachers feel a strong need for updating of knowledge and methodologies and faculty members of fisheries institutions make up more than half of enrollees.

About 70% of the postgraduate programs have been instituted within the last decade and this is perhaps one factor that could explain the fact that some of the programs are not research-oriented but address management, technology transfer aspects. In the D Fisheries Technology program, instead of a dissertation in the traditional way, the students, individually or in group, establish a fishery business enterprise and ensure the success of the business for the next two years. Of the programs available, those of CLSU include social science components.

NATIONAL FISHERIES EDUCATION SYSTEM

Both the Fisheries Code of 1998 (R.A. 8550) and the Agriculture and Fisheries Modernization Act (AFMA, R.A. 8435) provide for the development of human resource in fisheries. Under AFMA, a National Agriculture and Fisheries Education System (NAFES) is established, to rationalize the system of private and public colleges offering programs in fisheries. It provides for network of national centers of excellence. Under this system, centers of excellence are identified in every region; and centers of development in every province; schools which are not included in the network must re-direct their programs to non-fisheries areas. As of 1997, there are 96 doctoral and 202 master’s degree holders, mainly in marine fisheries, fish biology and aquaculture. Sixty-one percent of these personnel are in only three institutions: MSI, UPV and SEAFDEC-AQD. The 5-year plan (1997-2001) targets 130 doctoral and 300 master’s degree holders. Human resource development plan should not only predict the number of master’s and doctoral degree holders needed but the critical areas of specialization. The latter in turn must dovetail with technology forecasts. It is only when these data are available can one fully rationalize education and human resource development.

Rationalization of the postgraduate education system

The AFMA and Fisheries Code have been enacted nearly four years ago; yet the implementation of the NAFES has been rather fragmented and operationalization of the system has been a slow process. The government must seriously address the emerging proliferation of educational institutions and streamline postgraduate program offerings. It must avoid the situation for the undergraduate programs when at one point there were more than 100 schools offering the program, resulting to poor quality education because limited resources were spread over too many schools. The preparedness of the institution to offer postgraduate programs in terms of both faculty resource and physical facilities is a crucial factor. Assuming that with the NAFES an educational system is in place, there is yet no systematic study to indicate the critical mass needed for the country’s fisheries development. As of 1997, there are 96 doctoral and 202 master’s degree holders, mainly in marine fisheries, fish biology and aquaculture. Sixty-one percent of these personnel are in only three institutions: MSI, UPV and SEAFDEC-AQD. The 5-year plan (1997-2001) targets 130 doctoral and 300 master’s degree holders. Human resource development plan should not only predict the number of master’s and doctoral degree holders needed but the critical areas of specialization. The latter in turn must dovetail with technology forecasts. It is only when these data are available can one fully rationalize education and human resource development.

Harmonization of programs

The diversity of program titles (Table 1) is both interesting and confusing. On one hand, it shows the wide range of specializations covered; on the other hand it demonstrates the seeming lack of a reference point for classifying postgraduate programs. One may ask for example, the difference between MS Fisheries major in Aquaculture and MS in Aquaculture. At UPV, all master’s programs at the MS category are with thesis and the Master category is non-thesis. However this is not true across schools; the M Fisheries Technology program of ISCOF has a 6-unit thesis requirement. Two programs with different titles may have practically the same content or vice-versa.

The Commission on Higher Education (CHED), an agency under the Office of the President of the Republic, has yet to finalize the guiding principles and minimum standards for postgraduate programs in fisheries. Postgraduate programs in fisheries have been instituted within the decade but it can also be
observed that there is a tendency towards program proliferation. It is thus the opportune time to streamline programs both in program title, content and implementation.

Program accessibility and implementation

There is no lack of interested clientele in fisheries postgraduate programs. Potential enrollees can be estimated from the 49 fisheries institutions offering diploma or undergraduate programs in fisheries, where faculty members express the desire to take up postgraduate courses. However, in many instances, poor quality undergraduate education limits accessibility of the program to interested clientele. Admission systems allow enrollment in background subjects but this shortens the effective time available to the student for the graduate courses.

To date, 375 master’s degree holders in fisheries have graduated, with the highest number from UPV (153) and CLSU (60). Graduation rate especially for programs with thesis requirements tends to be low. The first enrollees in our Ph D program have not graduated, almost 5 years after the program was implemented. The major bottleneck is the thesis. Students often go through the formal courses and finish the same within the allotted time but the research work takes much more than the allotted one year for MS and two years for Ph D. Much time is spent in sourcing equipment, reagents and in some cases, funds. This is where institutional networking and consortiums is important, not disregarding the need to upgrade laboratories. The last would emphasize the need to rationalize the educational system in order that institutional development funds for infrastructure and equipment can be better allocated. MSI however, does not seem to encounter the same difficulty; it has graduated 7 Ph D’s since 1990. Students taking part in their professor’s research projects as in many universities abroad are usually able to complete the program earlier.

Majority of the graduate students enjoy scholarships which necessarily specify the period for completion of the degree. In more than 80% of the case, the student is recalled by the institution without completing the degree; when this happens the students’ chance of graduating becomes slimmer since time is divided between work and studies.

Networking

There is no lack of initiative to network but the problem is sustainability. Many networking efforts are precipitated by specific projects, at the end of which, the network often collapses. Examples of institutional cooperation in fisheries education are:

a. the Philippine Fisheries Institutions Network Inc. is made up originally of UPV and 7 other recipients of the 6th World Bank Loan. It has recently conducted a curriculum review for the BS curriculum and in the pipeline is a similar review of graduate programs;

b. ISCOF, DNSC, SRSF have formed a consortium for the offering of the MFT, Aquaculture program;

c. SPCP has an agreement with SU in the implementation of a graduate program in coastal resource management;

d. UPV taps expertise of SEAFDEC-AQD scientists as thesis advisers and panelists through a memorandum of understanding; graduate students sometimes conduct part of their thesis at SEAFDEC;

The Federation of Institutions in Marine Science (FIMS) has formed a consortium in the early 1990’s, consisting of members offering the MS in Marine Biology program, namely USC, SU, MSU-Naawan and Iligan Campuses. The consortium provides for transfer of course credits, exchange of faculty for a common program. Exchange of faculty members, however has been nil, largely due to funding constraints. The Network of Aquaculture Centers in Asia (NACA) has on-going project to establish an aquaculture education consortium in the Asia-Pacific region, including the Philippines. UPV has also proposed technical cooperation in postgraduate fisheries education with a university in Japan.

Networking can:

a. facilitate interaction and discussion of problems in fisheries education;

b. assist each other in curriculum development, faculty upgrading, sharing of facilities, accreditation and generally, improving fisheries education; and

c. organize an information system on fisheries education and research.

The network could also address the issue of transfer of academic credits, mobility of students across institutions to avail of institutional specialization and continuing education of fisheries educators and administrators.

Distance education

ISCOF is implementing fisheries postgraduate programs in the DE mode namely, D Fisheries Technology and M. Fisheries Technology. UPV has proposed for the institution of the M Aquaculture
program in the DE mode. The same proposal introduces an innovation in postgraduate education in that the subjects will be “stand-alone” courses; the student may opt not to complete the program but enroll only in specific subjects for which s/he will get a certificate of completion. In this model, individual courses do not progress into the next but are more or less independent of each other. Distance education has a very high potential; however, as pointed out during the Experts’ Consultation on aquaculture education,\textsuperscript{7)} distance learning should be used only to augment conventional modes of teaching and learning but not as substitute. Teaching aquaculture needs laboratory and field experience for the students and unless the satellite learning centers are fully equipped, the program content may be more difficult to deliver. Distance learning can perhaps be used completely for those courses that focus on management, technology transfer and resource use. This, however, is a mode which must be continuously explored given the many advantages that distance education presents coupled with developments in information technology.

**Role of external funding agencies**

At UPV, the MSF Aquaculture Program was started as a collaborative program with SEAFDEC-AQD and assistance through scholarships from PCARRD. The Master’s program in the other fields were implemented with assistance from GTZ. The FIMS consortium for the offering of MS Marine Biology program was likewise assisted by DAAD. Donor agencies’ contribution range from provision of scholarships, to visiting professors, fellowships for faculty members and upgrading of laboratories. Our experience in this aspect is positive but there is need for government commitment and support on a long-term basis and not simply in terms of counterpart funding.

**Information Technology**

Developments in information technology made teaching and learning simpler on one hand and more complicated on the other. Communication is less difficult and so with information search. The burden and the challenge has shifted to that of integrating the volume of information available and discerning what is relevant and critical from the trivial. This ability is largely the result of life-long learning putting to disadvantage those who come from less-equipped schools. While availing of opportunities for teaching innovations, the teacher in the graduate school has to maintain a balance among students whose background knowledge and access to technological innovations vary widely. Information technology is supposed to narrow the gap due to geographical distance, however, one can not also disregard the fact that it is not only geographical distance that brings about differences in the degree of learning.

**List of institutions and abbreviations used:**

UPV - University of the Philippines in the Visayas
MSI - Marine Science Institute, University of the Philippines
MSU - Mindanao State University
BU - Bicol University
SU - Silliman University
CLSU - Central Luzon State University
USC - University of San Carlos
ISCOF - Iloilo State College of Fisheries
ZSCMST - Zamboanga State College of Marine Sciences and Technology
DNSC - Davao del Norte State College

**ACKNOWLEDGEMENT**

We wish to thank all the institutions which provided information on their graduate programs.

**REFERENCES**

2. Republic Act No. 8550. An act providing for the development, management and conservation of the fisheries and aquatic resources, integrating all laws pertinent thereto, and for other purposes.
3. Republic Act No. 8435. An act prescribing related measures to modernize the agriculture and fisheries sectors of the country in order to enhance their profitability, and prepare said sectors for the challenges and globalization through an adequate, focused and rational delivery of necessary support services, appropriating funds therefore and for other purposes (Agriculture and Fisheries Modernization Act of 1997).