

THE POST-HARVEST FISHERIES SECTOR: CAPACITY OF ACADEMIC & RESEARCH INSTITUTIONS TO RESPOND TO FUTURE NEEDS

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INTRODUCTION

The fisheries sector contributes about 5% of agricultural GDP and 3% to overall GDP in Ghana (DOF 2004). Furthermore, close to 10% of the population are dependent on it (FAO 1998). An important aspect of the industry is the post harvest fisheries sub-sector which provides a major source of employment, income, food security and foreign exchange in Ghana. While a lot of emphasis has been laid on fish preservation technologies to minimize post-harvest losses, little attention has been placed on the role of institutions to respond to the future needs of the sector, particularly training and research.

Institutions involved in the sub-sector generally could be placed into the following broad groups: academic and research, research only, governmental agencies, private institutions (NGOs and CBOs), international development agencies; and the "private sector" which comprises the fishing companies, industrial fish processors and financial institutions (Appendix A). In all the efforts of the institutions involved, the livelihoods question appears to have been under-represented. This is unfortunate as the majority of the post-harvest workers belong to the poor and vulnerable lower income group. Out of these, the training and research components are fundamental pillars on which the future development of technologies and strategies for improved and sustained management of the sub-sector rest. This paper looks at the challenges and human capacity needs of academic (training) and research institutes with a stake in the management of post-harvest fisheries in Ghana.

ACADEMIC INSTITUTIONS

The main challenge facing academic institutions is the introduction of appropriate post-harvest fisheries management topics into curricula of schools from primary, secondary to tertiary levels that reflects not only technology but issues related to livelihood enhancement.

Primary and secondary levels.

Hygiene and basic food handling are covered in school curricula at the primary level but no where are specific topics on fish handling and spoilage included. The case for including the topic at the primary level is buttressed by the fact that most children in the poor rural fishing communities drop out at the JSS (Junior Secondary School) level (between ages 12-14). Further, educating children helps immensely in developing more aware and informed future consumers. The educated child is also effective in influencing older generations to improve their handling practices.

There should not be any fears on how this could be done as several strategies can be used. Post harvest fisheries material could be inserted into a range of existing school courses without necessarily creating new ones, for example general science, health science or social science.

Ideally, a short module covering the topic with teacher guides and student activity workbooks would need to be developed and used as a resource or enrichment material or inserted into existing courses as stated earlier. Heavy illustrations are desirable at the primary level for greater and more lasting impact.

At the SSS (Senior Secondary School) level (between ages 15-18) a fisheries syllabus has recently (1999) been included as an option in the Agricultural Science curriculum by the Ministry of Education. It comprises 28 Units to be taken over the three-year duration of the programme. The section on processing, preservation and spoilage covers only 3 Units i.e. barely 10% of the entire programme. Even so, extremely few schools offer this option to students due to paucity of qualified teachers.

Tertiary level

The social element in post harvest management courses is equally under-represented in tertiary institutions as illustrated by two Departments from the University of Ghana which offer relevant courses. The Department of Food Science and Nutrition has 4 relevant courses namely:

- Principles of food preservation
- Quality control in food processing
- Food packaging
- Post-harvest management

The Department of Oceanography & Fisheries has a specific course on post-harvest fisheries management. The contents are:

Post-harvest Fish Management

Principles of fish processing and preservation. Methods of fish processing and preservation by artisanal and industrial fisheries in the tropics. Types of fish product- chilled fish, dried fish, salting, smoking, fish oil, fish meal, fermented products. Fish handling, storage and effects of bumper harvest. Fish spoilage. Fish utilization. Fish by-products. Local and foreign markets for diversified fish products. Quality control and packaging.

Interestingly, while the courses offered by the Department of Food Science and Nutrition are core courses, that of the Department of Oceanography & Fisheries is an elective.

A quick inspection of the scope of the above courses clearly shows that the focus has been on minimizing post-harvest losses with little or no direct emphasis on livelihood improvement strategies especially for the poor involved in post-harvest fisheries. This shortfall may be addressed by introducing a specific course or topic on post harvest fisheries management in relation to livelihoods and poverty alleviation. Such a course or topic, for example, should focus on causes of poverty and poor livelihoods as well as their possible solutions.

In other words, there is the need to have more emphasis, on the social and economic issues that will improve the lot of post-harvest fisheries workers in the curricula of academic institutions in addition to the normal courses or topics such as wet fish handling, fish processing, storage, distribution and marketing.

The Department of Oceanography & Fisheries of the University of Ghana runs both undergraduate and graduate programmes in fisheries. Sadly to note, both levels have little content on post harvest fisheries management in relation to livelihoods and poverty alleviation. The matter of post harvest fisheries management is therefore quite remote in the academic training of several students in the country.

Human capacity needs

The challenges mentioned above, that is, curriculum enrichment and staffing can only be overcome with the development of appropriate human capacity. Teachers in Fishery Science at the secondary level are grossly inadequate. Currently, the number of Senior Secondary Schools offering the Fisheries option is less than 10 in the entire country. This, among others, compelled the establishment of an undergraduate degree programme in Oceanography and Fisheries of the University of Ghana in 2002. It is hoped this effort would help immensely in solving the problem of inadequate teachers for Fishery Science in the Senior Secondary Schools. The courses are designed to make graduands quite versatile and capable of teaching other biology and general science courses at the senior secondary level thereby, increasing their employment chances.

RESEARCH INSTITUTIONS

The Food Research Institute of the Council for Scientific and Industrial Research (CSIR) and to a lesser extent the Department of Nutrition and Food Science of the University of Ghana are the only research institutions dealing on post harvest fishery research in the entire country despite the vast number of fishing and landing sites along the coast and in the hinterland. This poses a great challenge to technological innovations to alleviate the lot of the poor processors as the losses in the post harvest fisheries sector are phenomenal.

There is, therefore, the need for the training of more scientific staff to enable the research institutions provide the industry with qualified personnel and appropriate

technology with the overall goal of improving livelihoods, particularly of the poor involved in post harvest fisheries sub-sector

The main challenges facing research institutions may be categorized as:

- Development of new and appropriate fresh-fish handling techniques and storage
- Development of improved smoking or drying techniques
- Development of new preservation methods

These could comprise research activities focusing on alternative fuels for fish smoking or improving efficiency of existing smoking facilities, improved conditions of fish drying, improvement of product quality and the reduction of fish spoilage and standards of hygiene practices, among others.

The technologies that may be produced to meet the above challenges must be appropriate to the needs of the artisanal sector if any positive impact should be made on the livelihoods of the vulnerable poor. An important aspect of the technological development should be the ability for effective dissemination of research results.

Another challenge is the promotion of the exploitation of under-utilized aquatic protein resources that could improve the food security of the poor. For example, lots of shell fish and crustaceans are either not exploited or under-exploited especially from the lagoons e.g. fiddler crabs (*Uca* spp.) and mud snails (*Tympanotonus* spp.)

Human capacity needs

The human capacity needs for research institutions can be seen at three levels:

- Training of personnel for research and technology development. Here training must be to the highest level possible in such areas as design, construction, testing and promotion of prototype appropriate technologies for fish handling, storage and preservation.
- Training of skilled personnel for extension services. Experience elsewhere has shown that it is best to train local folks for extension services. Further, if the training is done in a different locality, the trainees are seen as 'experts' and their views more respected than if they were trained locally (Novaczech and Chamberlain, 2001). NGOs and school teachers as well as other opinion leaders should be targeted for training.
- Training of entrepreneurs is also important and this should be targeted to the youth and /or those who have already proven their skills and are ready to make an investment. It should also aim at generating or expanding small-scale businesses in order to address the issue of poverty alleviation.

CONCLUSION AND RECOMMENDATIONS

The academic and research institutions of the country would be able to meet the future needs of the post-harvest fisheries sector with particular reference to the poor, if academic reforms, new appropriate technological innovations and skilled extension officers (including those with entrepreneurial skills) suggested in this paper are implemented.

Academic

We further recommend that the Directorate of Fisheries should encourage the recruitment of students into fishery science programmes by providing special scholarships to help build up the required number of teachers nationwide. Research grants and awards in post-harvest fisheries management must be provided to research and tertiary institutions.

While the tertiary programmes in fishery science must be broad-based to give graduands wider job opportunities to double up as biologists, ecologists, aquaculturists etc, the courses must include topics on socio-economics (livelihoods and poverty alleviation strategies) and not dwell on the technological elements as currently is the case.

Research

The Food Research Institute, with co-operation
The Department of Nutrition and Food Science of the University of Ghana, in particular, was involved in a major research and training project for artisanal fish handling from 1987 to 1996. An offshoot of the project was the establishment, in Accra, of a Fishery Resource Centre at the Food Research Institute of the Council for Scientific and Industrial Research. This effort need to be extended to the huge fishing communities of the Volta Lake for the benefits to be realized by the poor inland fishers as well. This would further ensure that the downstream effects of the research results become nationwide and at the doorstep of the artisanal processors and not limited to the coastal areas.

Funding

Funding is critical to the realization of the goals of alleviating poverty among the post harvest processors. Adequate funding must be sourced for the academic and research institutions involved in the entire fishery sector since without the fish the post-harvest sector would naturally collapse.

Funding for small scale business promotion should be aggressively pursued through bodies like the NBSSI (National Board for Small-Scale Industries).

Appendix A. List of institutions involved in the Fishery Sub-sector

(Source: DOF/ IMM Ltd./PHFRP, 2004)

Academic and research

University of Ghana

Department of Nutrition & Food science

Department of Oceanography & Fisheries

College of Agriculture & Consumer Sciences

Institute of Statistical, Social and Economic Research (ISSER)

Department of Economics

Kwame Nkrumah University of Science & Technology

Faculty of Agriculture,

Department of Economics

Institute of Renewable Natural Resources

University of Cape Coast

Faculty of Agriculture

Department of Economics

Centre for Development Studies

Research

Food Research Institute

Directorate of Fisheries (Post Harvest Fisheries Research Programme

Ghana Standards Board

Marine Fisheries Research Division

Water Research Institute

Governmental agencies and sectors

Department for Women's Affairs

Forestry Commission

Fisheries Commission

Department of Social Welfare

Environmental Protection Agency

Directorate of Agricultural Extension Services

Ghana Regional Appropriate Technology Industrial Service

Volta River Authority

Social Investment Fund

Ministry of Roads & Transport

Ministry of Trade & Industry

Ministry of Local Government & Rural Development

Ministry of Education

Private institutions (NGOs and CBOs)

NGOs

Adventist Development and Relief Agency

ActionAid

Catholic Diocesan Development Unit

Friends of the Earth - Ghana
Friends of the Nation
Resource & Environment Development Organisation
Sasakawa Global 2000
World Vision Ghana

CBOs and other societies/ associations

Central and Western Fishmongers Improvement Association
Chorkor Fish Processors Association
Ghana Inshore Fisheries Association
Ghana National Association of Farmers and Fishermen
Ghana National Canoe Fishermen's Council
Ghana Tuna Association
Ghana Tuna Traders Association
Kromantse Fish Smokers Association
National Fisheries Association of Ghana
National Inland Canoe Fishermen Council

International Development Agencies

DANIDA
DFID
EU
FAO
JICA
SNV (Netherlands Development Organisation)
UNDP
UNIDO
CIDA
World Bank

Private Sector

About 70 (seventy) fishing companies, industrial processors and allied businesses e.g. ice block makers are involved in the private sector. All the major financial institutions have lending facilities to promote development of the post-harvest fishery sector

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