VOCATIONAL EDUCATION FOR THE DEVELOPMENT OF KNOWLEDGE SYSTEM IN FISHERIES SECTOR

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ABSTRACT

The paper aims to give the concept and functional approach of knowledge system with reference to the fisheries sector. The background and strategies to develop knowledge workers by translating the concept of knowledge system are presented. The job opportunities given in the paper strengthen the need of the development of knowledge workers through vocational education and training. The Vocational Education Programme in the backdrop can be effective both in the formal system of education through different models suggested and through the non-formal system. The modular courses varying from 50 hours and 2-3 weeks to 6 months or one year can be introduced in the formal system as pre-vocational modules (50-h duration) in IX-X classes in vocational institutions, and the non-governmental organizations/Krishi Vigyan Kendras/Indian Council of Agricultural Research may offer occupation-based modules (2-3 weeks to 6 months). The strategic approach for the development of knowledge system highlighting various issues is also suggested.

Keywords: Knowledge system, knowledge worker, vocational education

INTRODUCTION

The knowledge system (KS) is a newly developed approach, which has become very popular in developed countries. It aims at creating a knowledge-based society so that every worker becomes a knowledge worker (KW). A KW continues to work in the traditional field in which he has been working through generations; also, he is not required to migrate to a new place in search of job. With the introduction of modern technology, he will be able to earn more money per unit time and efforts, and ensure proper marketing of product. By way of developing KS, the skills and competencies can be acquired in a much shorter time and by a large group of people.

Traditionally, fisheries have been associated with poor, illiterate and undernourished fishermen belonging to weaker sections of the society. For raising their standard of living, it is necessary that they should be taught specific trade, wherein directly related work can be best drawn through short-term vocational courses/vocational training programmes.
This development of KS (skilled) will also help in increasing production. In the present scenario also, the skilled KWs are required for the fisheries sector, especially for aquaculture as marine production has stagnated and the dependability on aquaculture has increased. Estimates show that by intensive aquaculture, 10 t ha$^{-1}$ yr$^{-1}$ productions can be obtained. Semi-intensive or mixed farming may generate a production of 5 t ha$^{-1}$ yr$^{-1}$ or income of at least Rs 100,000 from 1 ha area in a year, which is at least five times more than the agricultural production.

**DEVELOPMENT OF KNOWLEDGE SYSTEM IN FISHERIES**

The new economic policy, World Trade Organization (WTO) and intellectual property rights (IPR) have given fisheries a status of an industrial activity. Accordingly, two situations are emerging: first, there will be a need to upgrade the skills of the existing manpower and second, the development of manpower with new skills. The major areas in which development of new skills or upgradation of skills is required include capture fisheries in which computer application, remote sensing and information technology are the thrust areas. In fish processing, it is the need for the quality control of products to maintain standards for export purposes. For this, development, KS will be very much useful.

The KS involves skill-oriented education system including specific on-the-job training for skill development and acquiring competency to do quality work efficiently. This will help to narrow down the gap between knowledge given and skill required. To develop KS, vocational education programmes should be launched in the form of short modular courses rather than long-term formal education programmes.

**PRESENT STATUS OF VOCATIONAL EDUCATION IN FISHERIES**

At the higher-secondary stage, fishery education is still in infancy; five areas have been identified to launch +2 level Vocational Education Programme (VEP) in fisheries. These include Inland Fisheries, Fish Seed Production, Fish Processing Technology, Fishing Technology and Marine Fisheries, for which curricula have been developed by Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE). Currently, six states, viz., Tamil Nadu, Orissa, Kerala, Karnataka, Andhra Pradesh and Maharashtra, are running some of these courses. Steps are being taken to introduce this programme at the pre-vocational level classes (IX-X) in the form of short-term modules.

PSSCIVE, a constituent of the National Council of Educational Research and Training (NCERT), has taken up several projects in vocational fisheries education and to support manpower preparation at the middle level of operations. The projects include:

- Identification of job opportunities (Table 1)
- Development of competency-based vocational courses
- Development of instructional material
- Organization of teachers' training programmes
- Development of short-term occupation-based training modules in inland and marine fisheries sectors including fish processing technology
Table 1: Job opportunities in fisheries sector

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the course</th>
<th>Wage employment</th>
<th>Self employment</th>
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<tbody>
<tr>
<td>1.</td>
<td>Inland Fisheries</td>
<td>Field Assistant/Field Technician/ Farm Assistant/Laboratory Assistant/ Seed Production Assistant/ Hatchery Operator/ Feed Technician/ Marketing Assistant/ Gear Technician/ Extension Assistant/ Survey Management Assistant/</td>
<td>Fish farming/ Ornamental fish production/ Spawn production/ Pituitary banks/ Feed manufacture/ Fish marketing/ Net making/ Gear operation/ Seed collection/ Bund breeding</td>
</tr>
<tr>
<td>2.</td>
<td>Fish Seed Production</td>
<td>Field Assistant/Field Technician/ Farm Assistant/Laboratory Assistant/ Supervisor/ Assistant/ Manager/ Seed Production Assistant/ Fish Breeder/ Hatchery Operator</td>
<td>Fish breeding/ Seed production/ Ornamental fish shop /Farm/ Pituitary banks/ Seed collection/ Bund operation/ Backyard prawn hatchery/Low-cost prawn hatchery/ Fish feed supply (live/processed)/ Brood fish supply/ Ornamental fish supply</td>
</tr>
<tr>
<td>3.</td>
<td>Fishing Technology</td>
<td>Gear Technician/ Fishing Hand/ Field Technician/ Purchase Assistant/ Survey Assistant/ Extension Assistant/ Boat Construction/ Repairing Supervisor/ Diesel Mechanic/ Engine Driver/ Skilled Carpenter/ Skilled FRP Worker/ Skilled Ferro-cement Worker/Oilman</td>
<td>Net and accessories supply/ Contracts for net repairing/ Fishing/Net manufacturing/ Boat yard/ Diesel engine repair shop/ FRP moulding units/ Ferro-cement moulding units</td>
</tr>
<tr>
<td>4.</td>
<td>Marine Fisheries (Capture)</td>
<td>Deck Assistant/Refrigeration Assistant/ Net Operation Assistant/ Engine Room Attendant/Marketing Assistant/Craft and Gear Maintenance Assistant/Laboratory Assistant/ Shore Assistant</td>
<td>Fish trading/Net mending/ Manufacturing/Raw material supply</td>
</tr>
<tr>
<td>5.</td>
<td>Marine Fisheries (Capture)</td>
<td>Farm Assistant/Mariculture (Cage/Raft/ Pen/Rope/Seaweed/ Pearl) Assistant/ Field Man/ Laboratory Assistant/Seed Production Assistant/ Hatchery Operator</td>
<td>Ornamental aquaculture/ Broodstock/Fish seed supply/ Feed supply</td>
</tr>
<tr>
<td>6.</td>
<td>Fish Processing Technology</td>
<td>Fish Processing Assistant/Fish Curing Assistant/Packaging Assistant/Product Development Assistant/Laboratory Assistant/ Quality Control Assistant</td>
<td>Peeling/Grading/Dressing/ Ice supply/ Fish byproducts (Sardine oil, Shark fins, Chitosan, etc.)</td>
</tr>
</tbody>
</table>
Identification of job opportunities and the development of competency-based vocational curricula are undertaken by constituting working group meetings comprising subject experts, vocational teachers/school teachers and professionals from the field/job market. Each vocational course not only highlights job opportunities and job description, but also provides competencies expected by any employer from a skilled worker. The curricula contain objectives of the course, examination scheme, syllabus, list of equipment and reference books, and list of collaborating institutions to help running the vocational courses in schools.

**APPRAOCH FOR DEVELOPING KNOWLEDGE THROUGH VOCATIONAL EDUCATION PROGRAMME IN FISHERIES**

Globalisation has changed the scenario in fisheries sector also. In totality, there is an urgent need for manpower laced with latest technologies even at lower level of operations in the sector. This means that there should be a major thrust for the preparation of modern workforce. Keeping this in view, there are some issues, which are to be given immediate attention to develop manpower through the implementation of vocational education programmes in a better way. The issues are given below:

Manpower forecasting or the qualitative and quantitative assessment of manpower is the basis of any development programme. This important task should be taken up by professionals engaged in the development and introduction of the programme in fisheries. On the basis of demand, the type of courses for training programmes should be taken up at institutions and private agencies including non-governmental organisations (NGOs).

Vocational education is to be developed as a collaborative model as general academic education is less expensive than the vocational stream. Hence, professional institutions, industries, private enterprises and other organisations should come forward to provide training facilities to students during the course as school-industry linkage, on-the-job training (OJT) and apprentice training after passing out.

Knowledge system and knowledge society directly deal with the beneficiaries and students using the latest information technology approaches and new software for which on-the-job training is to be provided in the field. It can cover a large number of people in a short time. By repeated training and experience, need-based knowledge keeps on increasing on a regular basis. They use contemporary systems and methods to ensure high quality product and sustainable production. Care is taken that new products do not throw people who are already engaged in the field out of employment.

Development of modular courses for non-formal education system in fisheries is the restructuring of vocational education programmes through multi-entry and multi-exit system by developing modular courses. Professional institutions may consider these for awarding certificate, diploma or associate diploma as the prerequisite for entering vocational pass-outs in degree programmes for providing vertical mobility, and also for enabling upgradation
of skills of people already working in the area.

There is a need for the introduction of the component of information technology in all fisheries related courses.

Traditional artisans may be provided with some training by professional institutions/NGOs to bring about qualitative and quantitative changes in work and products through modern technology.

Multimedia and audio-visual learning material to train students/traditional workers in different trades should be developed for providing training on information technology, use of computers, entrepreneur skills, etc.

Establishment of special fishery schools based on the three models, viz., school-industry model, school model and industry-based model, which are being operated in some states of the country as detailed below is needed.

- In school-industry model, theory part of the vocation is transacted in school, and for the practical part and OJT, linkage with professional institutions/industries is established. This model is working very well in the vocational institutions of Chandigarh and Maharashtra, and in other vocational areas.

- In school model, theory and practical courses are transacted in the school itself. The schools running these courses have equipped workshops and laboratories.

- Industry-based models have the theory and practical transactions conducted by the industrial experts at the industry itself, though enrollment of students is done in the schools, and teaching of language and General Foundation Course are done in the school.

The government should create facility for institutional training-cum-production centres. For example, for fish culture programme, each centre may be of 10-15 ha area and in these institutions, people will take on-the-job training on fish culture as well as entrepreneurship development. The trainees can manage 1-ha farm under the guidance of experts and produce 10 t of fish valued at Rs 400,000. During the period of two years, fallow land may be converted into a mixed farming system or integrated system along with horticulture, cereal production and fish culture. Gradually, the trainees will raise an income of about Rs 200,000 from the farm and become self employed. In this way, a new set of KWs will be prepared.

In brief, the immediate focus is to be shifted to develop a KS in fisheries by the involvement of professional institutions including the Indian Council of Agricultural Research, fisheries colleges under state agriculture universities, state departments and NGOs to launch a massive technical and vocational education programme through formal and non-formal systems. Also, strategies suggested in the paper may be reviewed by the concerned organisations and used for the implementation of the programme nationwide.