



TRAINING IN FISHERIES EXTENSION



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TRAINING IN FISHERIES EXTENSION

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TRAINING PROGRAMME

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DEVELOPING LINKAGES BETWEEN RESEARCH, EXTENSION & FARMERS

----- Arun G. Jhingran
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Inland fishery occupies a strategic position in the economic development of India. Realising its importance, the country is in the process of modernising its inland fisheries programmes which, in turn, depends largely upon application of improved practices based on science and technology.

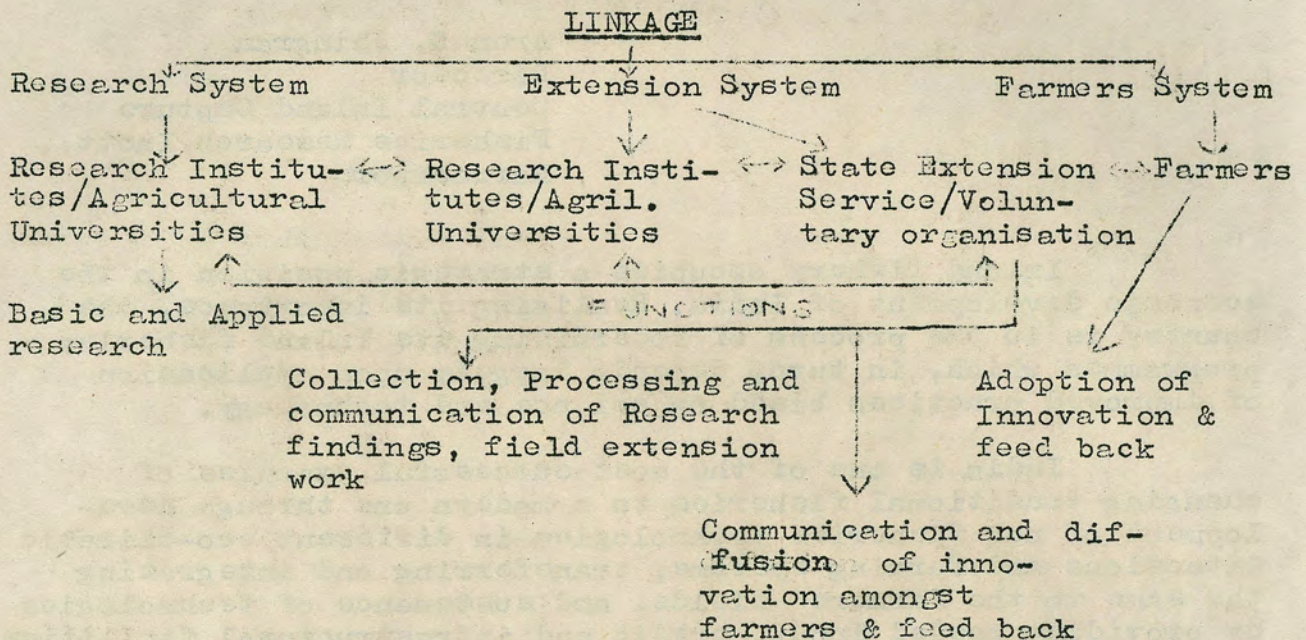
India is one of the most successful examples of changing traditional fisheries to a modern one through development of new fisheries technologies in different eco-climatic situations and farming systems, transferring and integrating the same to the farmers' fields, and sustenance of technologies by providing needed input, credit and infrastructural facilities.

Today, extension service in India has a net work of a number of large professional extension workers at National, State, District, Block and Village levels. But still there is a wide gap between the available technologies and its adoption by the fish farmers. The challenge to bridge this gap will largely depend upon effective linkages between research, extension and farmers.

THE LINKAGES BETWEEN RESEARCH, EXTENSION & FARMERS

Following systems approach, India has developed a series of integrated and communicable linked systems to generate and diffuse farm innovations which, in turn, involve three systems :

- a Research system : responsible for generating and evolving new aquacultural technology and innovations.
- b Extension system : responsible for transfer of new technology, facilitating its adoption and also bringing back the field problems to the research systems (feed back)
- c Client (Farmers) system : the ultimate users of technology.

Figure - I

In brief, these three systems and their role in the fisheries development process, and the nature and methodology of linkages have been discussed below :

THE RESEARCH SYSTEM

The Indian Council of Agricultural Research is the apex national body which coordinates research and education. It functions through national grid of cooperative research in which the role of Central Institutes and Agricultural Universities is well-established as equal partners. ICAR is directly involved in fundamental and applied research in Fisheries through its 8 Fisheries Research Institutes covering areas which stretch beyond state, region or specific location. Research is also conducted at the Fisheries Faculty of the Agricultural Universities as well as public, quasi-public and private institutions.

The complex mechanism of Indian Research System has proved to be an effective instrument in solving intricate problems and has made an impressive breakthrough in fisheries research and technology.

THE EXTENSION SYSTEM

Alongwith creating a highly productive research system, India has also established an extension service at national, state, block and village levels.

The fisheries extension service was initiated in the country with the formation of Fisheries Extension Unit at the Central Inland Fisheries Research Station, Calcutta in 1952. Presently, besides skeletal extension service in each Fisheries Research Institute, bigger extension services operate in all the states through their Fisheries Departments. The Ministry of Agriculture, Govt. of India coordinates the extension programmes like the Fish Farmer's Development Agency demonstrating modern aquaculture techniques to the fish farmers in selected states. The ICAR implements four major extension projects viz., National Demonstrations, Operational Research Project, Lab to Land Programme and Krishi Vigyan Kendra where scientists carry out demonstrations and on-farm testing of research findings in rural areas.

To sustain fisheries advance and to impart stability to yield, a continuous flow of economically viable technologies from the laboratories to the ultimate users, the CICFRI is involved in issuing self-explanatory extension pamphlets; organising short term ad-hoc training courses for operatives, core personnel, financiers; maintaining advisory services; participating in exhibitions; organising fish farmers' days; organising demonstrations; and utilizing mass media etc.

THE CLIENT (FARMERS) SYSTEM

The ultimate purpose of extension system is to provide useful and timely technological information to farmers. The fish farmers, particularly in a big country like India, differ in their socio-personal, socio-psychological, economic and communicational characteristics and behaviour which have to be taken into consideration for transfer of technology. In West Bengal, about 33% of the fish farmers are having their own water areas whereas 67% of the fish farmers practice fish culture in leased out pond. If the benefits of research can be transmitted to the farmers, the aquaculture can play a greater role in creating job opportunities besides producing protein diet.

ESTABLISHING LINKAGES BETWEEN RESEARCH, EXTENSION & FARMERS

The scientists, technologists, policy makers, planners and the administrators realized that the prosperity of the country lies in the hands of large majority of the country's

population which is the major manpower resource and that they agreed to support their development. Along with such development in the rural areas, a number of new organisations were established and the existing ones were reorganised. As a result, new systems for the socio-economic as well as technological development emerged. Thus, it is felt that the strategy of increasing the productivity of the vast masses of fish farmers is possible only through regular transfer of technology by establishing proper and effective linkages between research, extension and farmers. Several approaches and methods tried for this have been given below :

- 1 The Extension service at different levels serves as linkage between research and farmers.
- 2 At Research Institute, Agricultural University, Department of Fisheries, Dept. of Extension perform the function of linkage between the Research Institute/ Agricultural University and Extension service.
- 3 Some Research Institutes/Agricultural Universities have their own Farm Advisory Units. This provides mechanism for close contact and interaction with extension workers and fish farmers.
- 4 Through training programmes organised by Research Instt./Universities for extension workers and farmers.
- 5 By including extension personnel and farmers in research and other committee.
- 6 Through annual and other periodical joint workshops of research and extension personnel.
- 7 Through rural fairs and exhibitions at the Institute/ Univ. farms and also at Block and village levels.
- 8 Through demonstration of Lab to Land Programmes, Operational Research Projects, Krishi Vigyan Kendra programmes.
- 9 Through Fish Farmers' Days organised in rural areas.
- 10 Through screening of films on fisheries.
- 11 Through group discussion with the fish farmers.
- 12 By inviting progressive farmers as visiting lectures.
- 13 By forming Fishermen Cooperative Societies/ Fish Clubs.

CONCLUSION

A well-organised Extension System in the field of Agriculture has given encouraging results in increasing agricultural produce, but in the field of Fisheries in general and Inland Fisheries in particular, the modern farming technologies developed in India could not be propagated to the remote villages since at present this linkage is not as strong as expected, thus, efforts are being made to make it more effective and also to develop an integrated communication strategy.

HISTORY OF EXTENSION ACTIVITIES

----- U. Bhaumik
C I C F R I
Barrackpore

The term 'Extension Education' was first coined and used in the year 1873 by Cambridge University. It was a particular type of educational innovation and its purpose was to take the educational advantages of University to the people at large where they lived and worked.

The American Extension Movement also started from Universities and large public libraries and the first Director of Extension was appointed at Chicago in 1882 who incidentally was an English man named Moulton from Cambridge University who also documented the World's first treaties in Extension during 1885. The term 'Agricultural Extension' was first officially adopted in USA by passing the Federal Smith Lever Act of 1914.

The Extension education in India has passed through several phases. In 1908, Gurudev Rabindra Nath Tagore, under his scheme of Rural Development work, started youth organisations in the villages of his 'Zamindari'. He tried to create a class of functionary workers who could learn to identify themselves with the people. In 1921, he established a Rural Reconstruction Institute at Santiniketan.

In Gurgaon district of Punjab, the Rural uplift movement on a mass scale was first started by Mr. F.L. Brayne. Under this programme a village guide was posted in each village who was to act as a channel through which the advice of experts in various departments could be passed on to the villagers.

In 1903, Sir Daniel Hamilton formed a scheme to create model villages, in an area in Sunderbans (Bengal), based on cooperative principles. He organised one village of this type and set up one credit society which functioned upto 1916. In 1924, he organised a Central Cooperative Bank and Cooperative Marketing Society and established a Rural Reconstruction Institute in 1934.

Rural Reconstruction work was also initiated by the Christian Missions. The activities of these Missions can be accounted under three heads viz. Education, Medical Service and Rural Reconstruction.

The father of the nation, Mahatma Gandhi was also a social and economic reformer who made people know that India lives in village and that the common man's uplift is the uplift of the country. For emancipation of villagers he formulated an 18-point programme, which included the promotion of village industries basic and adult education, rural sanitation, uplift of backward tribes, uplift of women, education in public health and hygiene, propagation of national language, love for the mother tongue, economic equality organisation of peasants, labourers & students, and so on.

The idea of starting Etawah Pilot Project was conceived and born in 1947. It was put into action with headquarters at Mahewa village about 17 miles from Etawah (U.P.) in 1948. Lt. Col. Albert Mayer of USA was the originator of the project. The main objectives of this project were to see what degree of production and social improvement, initiative and cooperation could be obtained from an average area.

Adarsh Sewa Sangh- this plan of Rural Reconstruction was put into operation in 232 villages of Gwalior, falling in the Jagirdari of Col. Shitole. It aimed at increasing per capita income of villagers.

The Indian Village Service was founded by Mr. Arthur T. Mosher of New York and Shri B.N. Gupta in 1945. The objectives of this organisation were to assist village people to realise the best in their own villages by developing individuals, volunteer leaders and local agencies and enabling them to be effective in helping themselves and others. The Sarvodaya Programme was a Gandhian concept and evoked great enthusiasm in Bombay State. The main features were simplicity, non-violence, sanctity of labour and reconstruction of human values. It aimed at raising the standard of living, scientific development of agriculture, promotion of village industries, spread of literacy etc.

The Firka Development Scheme of Madras State was Government sponsored and aimed at the attainment of Gandhian ideal of Gram Swaraj by bringing about not only educational, economic, sanitary and other improvements in villages, but also by making the people self confident.

After the partition, in 1949, the constitution of India pledged to the people : social, economic and political justice, liberty of thought, belief, faith and worship,

equality of status and opportunity and to promote among them all fraternity, assuring the dignity of the individual and the unity of the Nation. The main aim was to create a welfare state. This created the need for community development. In 1951, India prepared its first 5 year plan. As a part of total planning the scheme of Community Development Project initiated on October 2, 1952. Since then various agricultural extension programmes are in practice in the country.

FISHERIES EXTENSION

The formation of the Fisheries Extension Unit at the Central Inland Fisheries Research Station, Calcutta (which is presently functioning as Central Inland Capture Fisheries Research Institute, Barrackpore) in 1952 was perhaps the maiden attempt of creation of an organised fisheries extension service in the country. In 1956 the extension service was upgraded to the status of a separate department under the Union Ministry of Food and Agriculture and ten more Extension Units were established in the country by 1962. But the organisation was not continued for long. At the end of third Five Year Plan Fisheries Extension was made almost totally a state subject and all the Central Government Extension Units were closed down in 1967. Though the above extension programme helped the vulnerable sections of the community in various ways, yet the objective of the extension works, by and large, remained unfulfilled.

PRESENT STATUS OF FISHERIES EXTENSION

Presently, besides a skeletal extension service at CIFRI in April 1972, bigger extension services operate in all the States in their Fisheries Departments. While the Ministry of Agriculture of the Govt. of India coördinates the extension activities in the country in general, the newly set up Fish Farmers Development Agency and Comprehensive Area Development Project in some selected states, are engaged in demonstrating the modern aquaculture techniques to the local fish farmers. These agencies also arrange for training and infrastructure needed for development of aquaculture. An Extension training centre of CIFE at Kakinada (A.P) imparts training to the State Fisheries Officials of various categories through regular training courses. The Krishi Vigyan Kendras and Trainers' Training Centres are also been meeting the requirement of training fish farmers and the trainers of the fish farmers. The Agricultural Universities and some Voluntary Organisations have also the responsibility of Fisheries Extension.

EXTENSION AT CICFRI

While the Fisheries Extension is a state responsibility, the CICFRI is involved in issuing self explanatory extension pamphlets on technologies developed at the Institute, organising ad-hoc short term training courses for operatives, core personnel, financiers, maintain advisory service, participating in exhibitions, organising fish farmers' days, supplying extension materials to appropriate authorities, organising demonstrations on scientific technologies at selected centres etc.

INLAND FISHERIES EXTENSION IN INDIA

Public Sector

Union Ministry of Agriculture

Private Sector

Central Section
Institutions

Fisheries Depts. of States and
Union Territories

Voluntary organi-
sations

CIFRI

CIFE

TTC/KVK

Agricultural
Universities

Extension
Scientists

Extension
Scientists

Extension
Scientists

Fishery
Officers

Comprehen-
sive Area
Develop-
ment Pro-
ject

Fish Farm-
ers Devel-
opment Age-
ncies (Cen-
tral scheme)

Communi-
cation
Services

Extension
Workers

Extension
Workers

Extension
Workers

Extension
Workers

Extension
Workers

NATURE AND ROLE OF FISHERIES EXTENSION

----- U. Bhaumik,
C I C F R I
Barrackpore

With the advancement in aquaculture technology the need for a extension service for transfer of technologies from the research organisations to the field has assumed great importance. This has to be introduced in the system through favourably acceptance and adoption by the people. The entire superstructure of fisheries extension rests on the desirable change in behaviour of fish farming community, both in thoughts and practice.

MEANING OF EXTENSION EDUCATION

The word 'Extension' is derived from the Latin roots, 'tensio' meaning 'stretching' and 'ex' meaning 'out'. Thus the term 'Extension Education' means that type of education which is 'stretched out' into the villages and fields beyond the limits of schools and colleges to which the formal type of education is normally confined.

NEED OF FISHERIES EXTENSION

The need of extension is obvious especially for the rural economy, with its major component of fisheries, to keep pace with the brisk changes characteristic of modern times. In other words, the rural people should know and adopt useful research finding from time to time and also transmit their problems to the research workers for solution. The research workers neither have time nor they are equipped for the job of persuading the villagers to adopt scientific methods and to ascertain from them the rural problems. Thus, an agency is required to bridge the gulf between research workers and the people at large, to play dual role of interpreting the results of research to the fish farmers as well as of conveying the farmers problems to the research organisations for solution. The agency is termed as 'Extension' and the personnel manning this agency, are called 'Extension personnel'. Three kinds of inter-

related services are essential in the process of rural development. To equip the prospective extension personnel for their job, it is necessary for them to be trained adequately in the formal 'Teaching institutions'.

RESEARCH

TEACHING

EXTENSION

To be successful, an extension worker should know not merely what to teach but how to teach people. In other words, it is not enough if he is equipped with the technical knowledge in subject matter fields; he should have the ability to successfully communicate his ideas to the people, taking the personal, social and situational factors into consideration.

SCOPE OF EXTENSION

Extension education is a science which deals with creation, transmission and application of knowledge designed to bring about planned changes in the behaviour complex of people, with a view to helping them live better by learning the ways of improving their vocations, enterprises and institutions.

The following nine areas of programme emphasis indicate the scope of fisheries extension work.

- i Efficiency in fisheries production.
- ii Efficiency in marketing, distribution and utilization.
- iii Conservation, development and use of natural resources.
- iv Management on the farm and in the home.
- v Family living.
- vi Youth development.
- vii Leadership development.
- viii Community development.
- ix Public affairs.

PHILOSOPHY OF EXTENSION EDUCATION

The philosophy of extension education has been described and interpreted in different ways by different authors. Kelsey and Hearne (1955) state that philosophy of extension work is based on the importance of the individual in the promotion of progress for rural people and for the nation. Extension educators work with the people to help them to develop themselves and achieve superior personal well-being. Together they establish specific objectives, expressed in terms of every day life, which lead them in the direction of overall objectives. Some will make progress in one direction while others will do in another direction. Progress varies with individual needs, interests and abilities. Through this process whole community improves, as a result of cooperative participation and leadership development.

According to Ensminger (1962) the philosophy of extension can be expressed in the following lines:

- i It is an educational process. Extension is changing the attitudes, knowledge and skills of people.
- ii Extension is working with men and women, young people, boys and girls to answer their needs and their wants. Extension is teaching people what to want and ways to satisfy their wants.
- iii Extension is helping people to help themselves.
- iv Extension is 'learning by doing' and 'seeing is believing'.
- v Extension is development of individuals, their leaders, their society and their world as a whole.
- vi Extension is working together to expand the welfare and happiness of people.
- vii Extension is working in harmony with the culture of the people.
- viii Extension is a living relationship, respect and trust for each other.
- ix Extension is a Two-way channel.
- x Extension is a continuous educational process.

Mildred Horton has described four principles which make the philosophy of extension education. They are :

- a The individual is the supreme in democracy.
- b The home is the fundamental unit in a civilization.
- c The family is the first training group of human race.
- d The foundation of any permanent civilization must rest on the partnership of man and land.

OBJECTIVES

The fundamental objective of extension is the development of the people. The general objectives of fisheries extension are :

- i To assist people to discover and analyse their problems, their felt and unfelt needs.
- ii To develop leadership among people and help them in organising groups to solve their problems.
- iii To disseminate information based on research and/on practical experience, in such a manner that the people would accept it and put it into actual practice.
- iv To keep the research workers informed of people's problems from time to time, so that they may offer solution based on necessary research.

The major objectives of extension may be categorised as follows :

- a Material - increase production, income.
- b Educational - change the outlook of people or develop the individuals .
- c Social and cultural - development of the community.

CONCEPT OF EXTENSION PROCESS

The basic concept of extension work is constant and continuous changes for betterment. Extension is a never ending but a continuous process. It all starts with a problem. It has five essential phases.

- a Situation and Problem : When a problem is encountered, fact and figures are collected, surveys made and situation concluded. This will lead to 'What is 'and' what ought to be'.
- b Objectives and solutions : When study is over and all is known about the problem, ways and means are to be thought of and objectives defined to overcome the problem.
- c The objectives defined should express the behavioural changes in people as well as economics outcomes that are desired. The knowledge of improved techniques and methods must be utilized and the solutions offered should result in satisfaction.
- c Dissemination : Not only the problem is to be solved by helping and assisting the farmers but they have to be educated as to how it is tackled. For this purpose, a number of different methods of communication are to be used to stimulate learning and grasping.
- d Evaluation : After the above three phases and solving of the problems, the entire operation (planning and implementation) should be evaluated to determine as to what extent the objectives were so achieved.
- e Reconsideration : After evaluation, a full review of the entire operation is to be made to assess gains and losses versus effort and expenditure.

IMPORTANT STEPS IN EXTENSION

Keeping in view the psychological and behavioural patterns of the fish farmers and their needs, they have to be motivated for changing towards improved practices.

The foremost step, therefore, is to plant the seedling of new idea (practice) in their brains and nurture it till they receive full information and act to reach the goal.

The important steps in this direction are :-

- 1 Attract : Use diverse methods - speech, visuals, example etc. to attract their attention.
- 2 Inform : While attracting attention, they ought to be informed in simple and clear manner about improved practice.

- 3 Interest : Keep them interested to sustain their curiosity.
- 4 Stir : The information and interest should be aroused to the extent that they are stirred substantially.
- 5 Demonstrate : Use the principle of 'seeing is believing' and 'doing is learning' by arranging suitable demonstrations.
- 6 Convince : If the practice is profitable, the farmers will be sure and certain through above steps about its success.
- 7 Activate : This will initiate them for action on the same lines.
- 8 Achievement : Since the new practice is established on facts and figures, the results should be positive and the farmers will gain.
- 9 Contentment : Farmers' success and achievement through their own efforts, will definitely be a source of full satisfaction and contentment.

INFORMATION STAGES IN EXTENSION

Keeping in view the psychological and behavioral patterns of the farmers and their needs, they have to be motivated for changing towards improved practices.

The foremost step, therefore, is to plant the seedlings of new ideas (practices) in their brains and ensure that they receive full information and act to reach the goal.

The important steps in this direction are :-
 1. Attract : Use diverse methods - speech, visual, oral, etc. to attract their attention.

2. Inform : While attracting attention, they ought to be informed in simple and clear manner about improved practices.

TRAITS, ATTRIBUTES AND OBLIGATIONS OF FISHERY EXTENSION PERSONNEL

— J.G. Chatterjee
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Barrackpore

The extension personnel plays an important and necessary role in the field of extension and when it is specific to the fisheries field, the personnel may be called as fisheries extension personnel. Extension is an effective educational process. It is nothing but working through and for the people. It is out-of-school educational process in which the peoples are helped to understand themselves their possibilities, their environment and capabilities for raising the standard of living through increasing their production and income.

Extension work is the job of professionals who need to be recruited with defenite qualifications and given adequate specialised training before being put on the job. Their job charts also deserves to be defined very carefully and revised constantly to incorporate timely changes.

PRINCIPLE OF EXTENSION

Before discussing about qualification, qualities etc. of an Extension worker, it is worthy to speak something about the principles of Extension, they are as follows :-

- 1 Extension work starts from there where the people are and with what they have and have not.
- 2 Extension work depends upon needs of the people which are determined by themselves.
- 3 People learn by doing - 'Secing his believeing and doing his learning'.
- 4 Extension works with and through the people.
- 5 Extension workers clearly identifies themselves with the rural people.
- 6 Spirit of self help is essential for democratic living.

QUALIFICATIONS OF EXTENSION PERSONNEL

While recruitment is done for Extension Workers, certain qualifications deserve to be kept in view. These qualifications may broadly be grouped into three categories, such as experience, training and characteristics as suggested by Kelsely and Hearne (1963).

1 Experience

- a The fishery Extension personnel should have some rural back ground because of the ease of adjustment with the rural atmosphere.
- b Experience in working with the public in a related field is helpful as extension work involves lot of public relations activities.
- c Teaching experience is helpful because extension is nothing but teaching adults and young.
- d Ability to organise village people and stimulate leadership among them.

2 Training

- a Bachelor's degree is desirable
- b Special courses in Fisheries Extension work is highly essential.
- c High technical ability in a broadfield is to be valued and given due weightage.
- d Basic knowledge of the physical, biological and social sciences that are significant to life in the villages.

3 Characteristics

There are some personal characteristics highly valued in a person in dealing with others. The list of such characteristics/qualities/traits is long. However, some of the important ones are listed below :-

- 1 Abounding faith - in the importance of the work.
- 2 Unlimited patience - in overcoming village inertia.
- 3 Infinite tact - in meeting trying situations.
- 4 Endless good nature - in the face of all trials.
- 5 A saving sense of humour - when nothing else will meet the situation.

- 6 A large vision - of the work to be done.
- 7 Ability to lose gracefully - and to rebound after each defeat.
- 8 Indomitable courage - in standing for the right.
- 9 Grim determination - to see the work completed.
- 10 Contagious enthusiasm - in inspire local leadership.
- 11 Unquenchable optimism - in spite of all discouragement.
- 12 Unreserved belief - in the importance of Farm family to the nation.
- 13 Teaching ability.
- 14 Sympathetic attitude towards associates.
- 15 Effective speaking and writing.
- 16 Integrity and dependability.

DUTIES OF AN EXTENSION PERSONNEL

Kelsely and Hearne have given a set of duties for extension workers in USA. Under Indian conditions these has been enumerated as :-

- 1 Represents the community development organisation in the block in carrying out educational programmes to improve rural life.
- 2 Studies the people, their agricultural and rural life to ascertain its problems and possibilities.
- 3 Develops with the people of the Block a long time: and current agricultural/fisheries educational programmes based on major problems and needs of farmers.
- 4 Develop rural leadership.
- 5 Assists local organisations with their educational programmes when their objectives coincide with theirs.
- 6 Promotes friendly relationship and coordination of activities of their fisheries development.
- 7 Keeps informed of field problems and keeps upto date professionally through conferences, reading and in-service trainings.

- 8 Assists local leaders by supplying supplementary materials, visiting farms and homes, providing helpful literature.
- 9 Arranges for help of specialists.
- 10 Helps to evaluate work done by obtaining and analysing records and preparing statistical and narrative reports.
- 11 Assists people in block in organising local youth clubs, in the selection and training of local leaders and in the development of club programmes with particular emphasis on fisheries programmes.
- 12 Develops or aids in maintaining the necessary organisation of rural people to determine and carryout the block development programmes.
- 13 Maintaining a public office where rural people and others may call or write to for information on all problems relating to agricultural and rural life.
- 14 Develops interest and cooperation of various organisations and individuals in the solution of farm, home and community problems.
- 15 Provides information to individuals and groups other than these regularly organised.
- 16 Encourages the interest and cooperation of various organisations and of rural people in the development of boys and girls through club work.
- 17 The extension worker should always search for new methods for early and easier achievement of his targets.
- 18 He should be resourceful enough to satisfy the village needs by obtaining the assistance of the various development departments and agencies responsible for village development.
- 19 He should adopt the scheme/technology which is practically feasible, economically viable and socially acceptable.
- 20 Visit to farmer's pond is a must for a Fisheries Extension personnel.

Summarily, besides requisite qualifications, training and experience, Extension worker must have sincere willingness and determination to work hard, ability to grasp and disseminate ethical knowledge on importance of extension work, thereby involving people as a whole. For this purpose tactfulness and patience are ~~of must~~ must for achieving target.

METHODS, TOOLS AND TECHNIQUES OF FISHERIES EXTENSION

— B.K. Banerjee
C I C F R I
Barrackpore

With the advancement in aquaculture technology, the need for a extension service for transfer of technologies from the research organisation to the field has assumed great importance. The entire superstructure of fisheries extension rests on the desirable change in behaviour of fish farming community by which communicated messages are finally accepted and practised. To meet this challenge the change agents require proper understanding of the communication process and skills to be used for effective communication. Moreover, today to a large extent, the success of communicator is measured on the basis of his abilities to educate, persuade and convince the fish tradition bound fish farmers in adoption of the recommended technologies.

COMMUNICATION - MEASURING AND CONCEPT

Before considering the several extension methods in detail it is necessary to have an idea of 'Communication'. The word 'Communication' stems from the Latin Word 'Communis' which means common. In other words communication can be defined as a process of transferring idea, skill or attitude, knowledge from one person to another satisfactorily. In brief effective communication requires the ability and skills in transmitting information in an intelligible manner, treating the message keeping in view the type of audience and channels and to collect the response to know whether message has reached and understood in the proper perspective.

KEY ELEMENTS OF COMMUNICATION

Researches conducted in the area of communication have indicated that there are eight important components which should be taken care off while designing the communication strategy as mentioned below.

i	Source	v	Objective
ii	Message	vi	Treatment of message
iii	Receiver	vii	Feed back
iv	Channel	viii	Evaluation

- i Source : The source is the originator of the message. It may be an individual or several individuals working together or a team working in an institution or organisation. The main responsibility for preparation of the message lies with the source.
- ii Message : The message is the stimulus that source generates and transmits to the receiver. Messages are composed of having a certain meaning. Symbols may be verbal and nonverbal such as facial gestures, body movement or picture. Message contains information.
- iii Channel : A channel is the means by which a message travels from a source to receiver
- iv Receiver : Persons who are going to be effected by the message.
- v Objective : Purpose of communication
- vi Treatment of message : The research findings of different disciplines of agricultural, animal and fishery sciences are available in the form of research reports, project files, r e p o r t s and articles etc. These findings much reach the consumer if the purpose of research is to be served. But most of our research results ended up in the library or researcher's file. There is no proper communication and cooperation between research workers and field extension workers and these two p reasons alone contribute largely to the ineffectiveness of most research investigations and creates chronic weakness in fisheries. So the 'message' should reach the fish farmers into simple understandable forms and this design or method of handling or presenting the message to the user of technologies is known as 'treatment of message'. In other words, the conversion of research reports/papers, project files etc. in understandable way, in the form of leaflet, folder, popular article, demonstration, radio talk etc. If the nature of research finding is about a new variety, the style of treatment may be a result demonstration, a leaflet or a folder. If the research findings are about method of fertilizer-feed application, handling of new equipment etc. then the style of treatment may be method demonstration. For a research finding of wider applicability popular article or feature story or pamphlet may be the answer. If it is of immediate value to the farming community covering an area of a state and if it is of a few pages, then radio talk in regional language will be the answer.

The following points must be considered before the treatment of research findings :

- 1 Educational objective : What behavioural changes are expected and to what degree ? It is change in knowledge or skill or attitude ?
- 2 Educational objective : What is the area where the treatment material will be distributed ? Is it for the area surrounding the Research Institute or region or district or state or nation as a whole ?
- 3 The people to be reached : It is for everybody, or for farmers or for extension workers etc ?
- 7 Feed back : It is a response by the receiver to the source's message. Positive feed back inform the source that the intended effect of a message was achieved while negative feed back indicates that the source intended effect of a message was not achieved.
- 8 Evaluation : Measuring the effectiveness of message : The prime concern and objective at the present state is that research findings do reach the fish farmers. But between research and its consumers there are a chain of intermediaries viz. agencies - government, semi-government, private and other organisation which can not be ignored. The successful implementation is assured on the basis of the following facts.
 - a The benefit of recommendation to farmers is high
 - b The cost of practice is low.
 - c Practices are simple
 - d The benefit to farmers is reasonably immediate.

FISHERIES EXTENSION METHODS

The knowledge and its mass adoption in the field can be bridged by effective extension. An extension personnel has to educate the farmers and persuade them to adopt new practices. The methods employed are classified as under :-

- 1 Audio-Visuals : Perception provides a basis for thinking and provide suitable scope for perception. Learning is a process in which the concrete and the abstract interact. An understanding of this dynamic relationship between concrete experience and the generalisation helps in

in effective concept building. The aid of audio - visuals make learning more realistic and dynamic.

The audio - visual materials can be broadly grouped as :

- a Audio - materials : recording, radio, public address equipments.
- b Visual materials :
 - i Literature - leaflets, newsletter, circular letters, bulletins, news articles, wall news papers, folders, news stories, pamphlets etc.
 - ii Symbolised - charts, graphs, maps
 - iii 3 dimensional models - specimens
 - iv 2 dimensional a) projected films, strips, b) non projected - photographs, flannel-graphs, posters and pictures. c) Field trips and demonstration.

ACCORDING TO USE

Extension methods can be classified according to use into 3 groups depending on the nature of contact :

- i Individual contact : Farm visit, home visit, office calls, correspondences, telephone calls, personal letters and demonstrations.
- ii Groups contact : Group discussions, meetings, tours, demonstrations, leaders, meetings, dramas, conferences etc.
- iii Mass contact : Publications, news stories, circular letters, radios, exhibitions, posters, films, film strips etc.

ACCORDING TO FORM

The extension methods may also be classified according to forms which are :

- i Written : Bulletins, leaflets, news articles, letters, wall newspaper etc.
- ii Spoken : Meetings, visits, telephone calls, office calls, radios etc.

- iii Objective or visual : Result demonstrations, exhibitions, posters, movies etc.

Once an improved practice is accepted by farmers as a result of use of variety of extension methods, passing on information from one neighbour to the other by through personal visit or otherwise is an important consideration in extension teaching and is known as indirect influence.

SELECTIONS, USE AND EFFECTIVENESS OF METHODS

For the selection of extension method, it is fully recognised that one method compliments the other and combination of several methods according to particular situation is always more effective than any single method.

A study was made in agriculture to find out the adaptability through combination of methods which indicated that the percentage of adoption was 40 when one method was used, 52 in 2 methods, 82 in 5 methods, 86 in 6 methods, 80 in 7 methods, 93 in 8 methods and 95 in 9 methods.

Research studies in relative effectiveness of different methods in agriculture indicated that the percentage of adoption was 29.47 in individual contact method, 26.73 in group contact method, 32.95 in mass contact method and 10.85 in indirect influence.

Imparting theoretical knowledge of facts and subject matter may be an easy task but getting people to understand, accept and apply new practices is rather difficult. Because statistics reveal that people generally remember 10% of what they hear, 20% of what they see and hear and 70% of what they see, hear and do. In fisheries extension, greater emphasis has to be laid on practicals.

Merits and demerits

The more important advantages and limitations of the 3 categories of extension methods may be summarised as follows :

INDIVIDUAL CONTACT

Merits :

- i Useful in contacting the 'stay at home' type of people
- ii For teaching complex practices
- iii For selecting local leaders, cooperators, demonstrators

- iv To increase confidence of Farmers in Extension
- v To get first-hand knowledge of farm and home conditions.
- vi The farmer feels a sense of personal importance which is conducive to bring about the desired changes.
- vii Enhance effectiveness of group methods and mass media. Effectiveness of group responsibility depends on willingness of individuals to share in it.
- viii It is individuals, not groups, who learn, who make choices and accept responsibilities.

Demerits :

- 1 Relatively expensive because it is time consuming
- 2 Low coverage of farmers
- 3 Possibility of extension worker being charged with favouritism.

GROUP CONTACT

Merits :

- 1 Enable face to face contacts with large numbers at a time.
- 2 Facilitate sharing of knowledge and experience and thereby strengthen learning.
- 3 Meetings are adaptable to almost all lines of subject matter.
- 4 Satisfy basic urge of people for social contacts
- 5 Less expensive than individual contacts, due to saving of time.
- 6 More effective in stimulating action than mass contacts
- 7 Group influence facilitates individuals to accept changes.

Demerits :

- 1 Wide diversity in interests of audience creates a difficult learning situation.

- 2 Holding meetings may become 'real objective'
- 3 Pitfall of working with caste groups etc.

MASS CONTACT

Merits :

- 1 They reinforce individual and group contacts by complementing or supplementing them.
- 2 They reach much larger and different audiences
- 3 They save time and expense in reaching large numbers.

Demerits :

- 1 Less intensive and less effective than individual and group contacts in bringing about changes in practices.
- 2 Lack the advantage of 'social contacts' or 'Personal touch'.
- 3 Recommendations being general may not apply to special situations or individual needs.
- 4 Difficult to evaluate the results.

CONCLUSION

Teachers in extension methods all over the world have concluded that the principles and techniques fundamental in extension methods are applicable to any country, community, locality or village. However, adjustments or variations in the selection and use of methods have to be made to fit existing conditions and situations.

Due to effective extension services, the State of West Bengal has made marked improvements in fresh water fish culture sector. Fish farmers of the State took up composite Fish Culture in 1957 and by 1960 it has become a household name and achieved an average production of over 4000 kg/ha/yr as against 5000 kg/ha/yr under traditional method. So, similar efforts are urgently needed in the country as a whole.

MOTIVATION FOR ADOPTION AND INNOVATION IN FISHERIES
EXTENSION

— B.K. Banerjee
C I C F R I
Barrackpore

Motivation is the will to do and the will to do well. It may be self directed or one may be motivated by others and by the environment. What motivates the self and how can one motivate the others? Since the entire emphasis of motivation is on one's or other's action or good performance, it is worthwhile to examine what performance (which is essentially behaviour) depends upon. Performance depends upon two factors :

- 1 Competence which comes from knowledge, skill and experience and is an acquired character.
- 2 Motivation or willingness to do the job well.

Self motivation is the ability to change one's behaviour to strive for better performance and the motivation of others is the ability to influence the behaviour of other people in such a manner as to get them to do what we expect them to do. The entire stress is one change in behaviour, thus it is worthwhile to understand human behaviour.

BEHAVIOUR

Behaviour is need based and goal oriented. The basic unit of behaviour is an activity. In fact, all behaviour is a series of activities. As human beings, we are always doing something : walking, talking, eating, sleeping, working, and the like. Why do people engage in one activity and not another? How can we understand, predict and even control what activity or activities a person may engage in at a given moment? To predict behaviour one must know what motives, needs of people evolve a certain action at a particular time.

MOTIVES

People differ not only in their ability to do but also in their will to do or motivation. The motivation of people depends on the strength of their motives. Motives are needs, wants, drives or impulses within the individual. Motives are directed towards goals, which may be conscious or subconscious.

GOALS

Goals are outside an individuals; they are sometimes referred to as 'hoped for' rewards towards which motives are directed. These goals are also called incentives, which may be tangible rewards such as praise or power.

MOTIVE STRENGTH

All individual have several needs and all of them compete for their behaviour. The need with the greatest strength at a particular moment leads to activity. Satisfied needs decreases in strength and no longer motivate behaviour to seek goals to satisfy them. In the figure 1 motive B is the highest strength need, therefore, it is this need that determines behaviour.

PROBABILITY OF SUCCESS

People are not highly motivated if a goal is seen as almost impossible or virtually certain to achieve. Goals should be set high enough so that a person has to stretch to reach them but low enough so that they can be attained. Thus, goals must be realistic. The degree of motivation and effort rises until the probability of success reaches 50 per cent, then begins to fall even though the probability of success continues to increase. This relationship could be depicted in the form of a 'bell shaped' curve as illustrated in fig. 2.

HIERARCHY OF NEEDS

We have seen that behaviour at a particular moment is usually determined by the strongest need. It is, thus, significant that one must have some understanding about the needs that are commonly important to people.

An interesting frame work that helps explain the strength of certain needs was developed by Abraham Maslow. According to Maslow, there seems to be a hierarchy into which human needs arrange themselves as illustrated in Fig. 3.

Maslow postulated two conditions. The first stated that the lower order needs must be satisfied to some extent before the higher order needs become activated. The second is the notion that a satisfied need is no longer a motivator of behaviour.

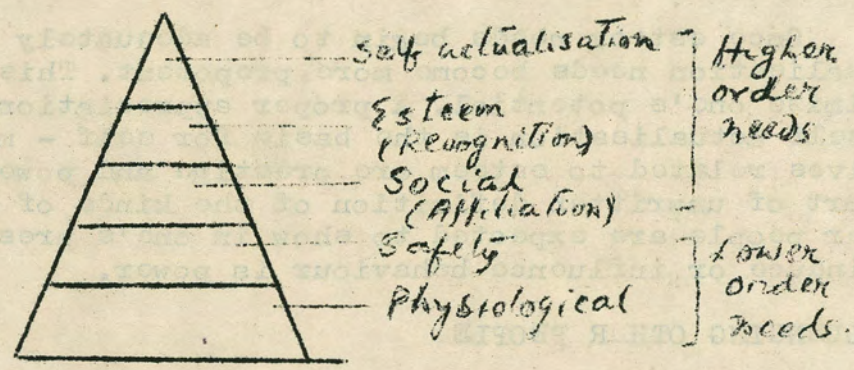
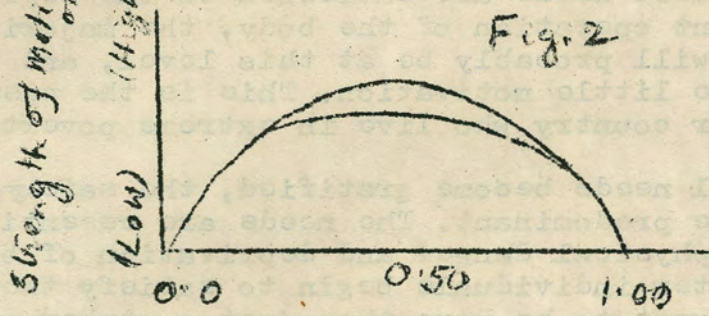
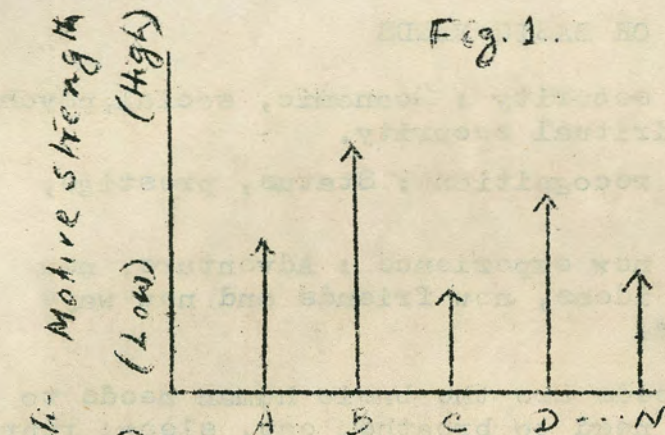


Fig. 3. Maslow's hierarchy of Needs

CLASSIFICATION OF MOTIVES OR BASIC NEEDS

- i The desire for security : Economic, social, psychological and spiritual security.
- ii The desire for recognition : Status, prestige, achievement.
- iii The desire for new experience : Adventure, new interests, new ideas, new friends and new ways of doing things.

The physiological needs are the basic human needs to sustain life itself - the need to breathe, eat, sleep, reproduce etc. Until these basic needs are satisfied to the degree needed for the sufficient operation of the body, the majority of a person's activity will probably be at this level, and the other needs will provide little motivation. This is the case with those people in our country who live in extreme poverty.

Once physiological needs become gratified, the safety, or security needs become predominant. The needs are essentially the need to be free of physical danger and deprivation of basic physiological needs. After individuals begin to satisfy their need by they generally want to be more than just a member of their group. They feel the need for esteem - both self - esteem and recognition from others.

Once esteem needs begin to be adequately satisfied self-actualisation needs become more prepotent. This is the need to maximise one's potential. A proper appreciation of the concept of self actualisation is the basis for self - motivation. Two motives related to esteem are prestige and power. Prestige is a sort of unwritten definition of the kinds of conduct that other people are expected to show in one's presence. The ability to induce or influence behaviour is power.

INFLUENCING OTHER PEOPLE

There are many elaborate techniques of influencing others viz. education, advertising, fashion dress, speech, habits etc. Rewards and punishments of various kinds are the usual techniques for motivating and coercing people into definite lines of action. Praise, flattery, persuasion, threats, commands, gossip, rumour, propaganda are few of the uses of the language that are designed as ways of influencing the behaviour of others.

Influencing involves : (i) Suggestion (ii) Conditions, (iii) Techniques of influencing others and (iv) Effective speaking.

i Suggestion : It has three characteristics : a) the idea enters the mind from without (b) the idea may tend to produce actions and (c) the idea accepted uncritically.

ii Conditions : There are a number of conditions that are conducive to an effective state of suggestibility. Indirect suggestions are more effective than the direct. But conditions may differ in experience, reputation of a man, strength, social position etc.

iii Techniques of influencing others :

- a Capturing attention
- b Sympathetic induction of attitudes.
- c The 'yes' technique
- d Use of newness
- e Recognition of limitation
- f Appeal to the basic needs and wants.
- g Making appeals vivid
- h Breaking down defences

iv Effective speaking :

A person who wants to influence others through speech can be effective by taking following points into consideration.

- a Preparation in the subject
- b Thinking of the audience
- c Speaker should look at the audience while speaking
- d Speak the language of the audience
- e Avoid extraordinary examples
- f Speech should be informative and brief

ACHIEVEMENT

Some people have an intense need to achieve, others perhaps the majority, do not seem to be as concerned about achievement. A high need for achievement may be acquired by studying the characteristics of the people with a high need for achievements.

The characteristics of these people are :-

- a They are moderate risk takers - not gamblers or conservative people.
- b They are more concerned with personal achievement than with rewards of success.
- c They want concrete feed back.
- d They like to take personal responsibility.
- e They tend to be innovative.
- f They usually demonstrate some inter-personal competence.
- g They are not completely content.

IMPORTANCE IN EXTENSION

Motivation is necessary for mobilising the village people and the extension workers both, if extension programme is to succeed. For successful development programme, the extension workers are to be properly motivated which in turn motivate the village people.

To increase motivation for launching successful programme, we are concerned with how all the conditions associated with the various needs arouse and how the needs may be fulfilled by allowing people to form groups whose objectives are in line with the goals of the organisation.

Value aspects of Extension : Motivation has two value aspects viz. a) intrinsic and b) extrinsic.

a Intrinsic values : These are what a learner does for the sake of engaging in the activity itself. This is to be desired in learning and it is more immediate.

b Extrinsic values : These are when an incentive or goal is artificially introduced into situation to cause it to accelerate activity.

To a considerable extent, they are the product of a learning experience caused by the reward or punishment.

STEPS IN EXTENSION TEACHING BASED ON MOTIVATION

In order to bring about that desired changes in the behaviour of people, the extension teacher should organise activities so that there will be repetition of the desired behaviour. This conscious attention to organisation of teaching activities in a sequence greatly increases the efficiency of learning. The extension teacher, therefore, plans and arranges situations and activities whereby the thing to be learned is called to the attention of the prospective learner, his interest developed, desire aroused, conviction created, action promoted and satisfaction ensured.

- 1 Getting the attention of the learners : In addition to supplying information to those desiring to learn the new/better ideas, the extension worker creates a desire for information on the part of those who are indifferent to improvements in fisheries.
- 2 Stimulating the learner's interest : Once the attention has been captured it becomes possible for the teacher to appeal to the basic needs or urges of the individual and arouse his interest in further consideration of the idea. The teacher, in easy stages reveals to the learner how the new practice will contribute to the learner's welfare.
- 3 Arousing the learner's desire for information : The teacher is concerned with the continued stimulation of the learner's interest in the new idea or better practice until that interest becomes desire or motivating force sufficiently strong to compel action.
- 4 Convincing the learner that he should act : Action follows when desire, conviction and the prospect of satisfaction make it easier for the person to act. The extension worker sees to it that the learner know what action is necessary and just how to take action.
- 5 Getting action by the learner : Unless conviction is converted into action the teaching effort is fruitless. It is the job of the extension teacher to make it easy for the learner to act.

6 Making certain that the learner obtains satisfaction from his action : The end product of the extension teaching effort is the satisfaction that comes to the farmer as the result of solving a problem, meeting a need, acquiring a new skill or some other desirable change in behaviour. Follow up action by the extension teacher helps the learner to evaluate the progress made and strengthen satisfaction.

There are many psychological and social drives that are necessary to keep the individual in equilibrium to perform his normal behaviour. The Extension workers must have the knowledge of the basic psychological and social drives of the people with whom he has to work. This will help him to formulate the programmes and make effective approaches in changing their attitudes.

ADOPTION AND DIFFUSION OF INFORMATION IN COMMUNICATION

----- P.K. Pandit
C I C F R I
Barrackpore

Extension is the injection of a new idea and acceptance of the same by major percent of people. One of the most important function of Extension is to bridge the gap between Research Institutes and farmers in the matter of introduction of improved methods in fisheries. An extension worker's job does not end with merely informing the farmer about the improved practices on fisheries development. He should ensure practical application of the new innovation of research and field trials by the fish farmers. The efficiency of the worker can be measured :

- a. by the speed or quickness with which the gap is bridged between what is known and what is done by the farmer.
- b. by the number of new practices adopted
- c. by the number of fish farmers and communities that adopt the new practise.
- c. by the number of new practices adopted

PROCESS OF ADOPTION AND DIFFUSION

'The adoption process is the mental process through which an individual passes from hearing an innovation to final adoption, where as diffusion is the spread of a new idea from its source invention or creation to its ultimate users or adopters' (Roger 1968). This definition indicates that diffusion is a process related to adoption of an innovation in an entire social system such as village or block etc. While adoption is sequence of thoughts and actions which an individual goes through before the adoption of a new idea. Wilkening (1956) opined adoption of a innovation is a process composed of learning, deciding and acting over a period of time. The term diffusion has commonly been used by social and cultural Anthropologists to describe the process of spread of a new idea from one culture to another culture.

STAGES IN THE ADOPTION BEHAVIOUR

The adoption of a new practice is not a single unit act but a complex pattern of mental activities. The adoption behaviour of an individual fish farmer is a process composed of a number of successive stages. The commonly adopted five stage model is given below :

- 1 Awareness - An individual becomes aware of some new ideas such as Induced Breeding, Composite fish culture etc. but he lacks details about them.
- 2 Information - At this stage the person wants to know what it is, how it works and what potentiality it has, previously unknown to him.
- 3 Evaluation - At this stage the person makes a mental trial of the new idea or practice and asks himself - can I do it, will it yield better than what I am doing presently - will it increase my income.
- 4 Trial - If the person inclined to switch over towards the new idea he will try it in a small scale (experimental use).
- 5 Adoption - This is the final stage in the process which is characterised by large scale, continued use of idea, and most of all, by satisfaction with the idea.

Among the five stages of adoption the awareness stage and trial stage will form very important steps in the adoption of a new technology. These five stages are not necessarily rigid. One can jump from one step to another if he has confidence in extension worker. On the recommendations of the extension officer one may jump from 'evaluation' to 'adoption' stage.

ADOPTION PROCESS Vis - a - Vis INNOVATION - DECISION PROCESS

Rogers and Shoemaker (1971) have used the term 'Innovation - decision process' in preference to 'adoption process' and have conceptualised the following four stages (or functions) :-

- 1 Knowledge - The individual forms a favourable or unfavourable existence and gains some understanding of how it function.

- 2 Persuasion - The individual forms favourable or unfavourable attitude towards the innovation.
- 3 Decision - The individual's activities and choice which leads to adoption or rejection of the innovation.
- 4 Confirmation - The individual seeks reinforcement for the innovation - decision he has made but may reverse his previous decision if exposed to conflicting messages about the innovation.

SOURCES OF INFORMATION AND CHANNEL

The integral part of adoption process is the communication of information of various stages. Different sources and channels are used, which are classified as below :-

<u>Sources</u>	<u>Channels</u>
1 Mass media (Radio, Newspaper, Magazines)	a Posters
2 Govt. Agencies (Extn.worker)	b Meeting
3 Neighbours and friends	c Exhibition
4 Salesmen and Commercial agencies	d Film show
	e Printed matter
	f Demonstration

Some factors related to adoption of practices : The adoption practices in fisheries, like other field of extension, is guided by the following factors :

- 1 Social factors - Community standards and social relationships provide the general framework wherein the process of change occurs and they account for the difference between one community (or group) and another.
- 2 Personal factor - Why some people adopt new ideas and practices more quickly than others in part to himself, Age, education, psychological characteristics, values and attitudes have influence on the adoption of new practices.
- 3 Situational factors - Reasons why farmers adopt farm practices more quickly than another relate to the situation in which they find themselves when alternative courses of action become known.

CLASSIFICATION OF ADOPTERS

It is found that people do not adopt new ideas at the same time. Some people adopt ideas immediately after introduction, others wait a long time, while some never adoption an idea.

- 1 Pionners (Innovators) - These are the people to adopt a new idea much ahead of other people. They are very few.
- 2 Early adopters - younger than those who have a slower adoption rate but not necessarily younger than the innovators. They are quickest to use trial ideas in their own situation. They have large farms, higher education, high income, more formal activities in the community, read newspaper, journals, bulletins etc. They may be regarded as 'Community adoption leader'.
- 3 Late adopters - They are slightly above average in age, education and farming experience. They take few journals and have medium high social and economic status. They are less active informal groups than early adopters. They attend extension meetings and demonstration but have limited resources than early adopters and innovators. They value highly the opinions of their neighbours and friends.
- 4 Laggards (no changers) - They are the last people to adopt new practices. They are less educated, aged and have least participation in formal organisations, Cooperatives and Govt. programmes.

PRACTICAL APPLICATION

One of the most important functions of an extension worker is to diffuse new ideas and practices among the fish farmers. It is their task to expedite the progress of getting ideas from their source of origin to those who can use them. Diffusion process may be seen analytically as going through the following stages :

- 1 Disseminating information.
- 2 Maximizing interaction.
- 3 Facilitating behavioural change and action.
- 4 Provide service and support for integration.

TO BE EFFECTIVE IN THE PROCESS

- 1 One must fully conversent about the techniques to be used at the different stages and how to mobilise them effectively.
- 2 He must also know in which stage in the adoption process the individuals are. Information sources can be used most effectively when there is an understanding of the inter-relationship between source and function, the needs of individuals at given stages of adoption process and the requirements for keeping them continually moving toward final adoption.
- 3 The most effective fishery leader must know how to use all of the communication channels available to them.
- 4 From the stand point of energy expended and effective use of resource, it may be better for the educator to depend on the later adopters being influenced by personal communication from respected fellow farmers rather than try to reach them directly, even though the former approach may take longer time.

COMMUNICATION OF INNOVATION

—— P.K. Pandit
C I C F R I,
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DEFINATION AND IMPORTANCE

The term communication originates from the Latin word 'Communis' which means 'to make common, to share, to impart, to transmit'.

Communication is the process of transferring an idea, skill or attitude from one person to another accurately and satisfactorily. It is a process of social interaction, i.e. in a communication situation two or more individuals interact. Communication can occur even without words. Our four senses like audio, smell, touch and vision help in this process. When a message is sent from source to a receiver and produces a specific mental or physical response communication occurs. The main purpose of communication is to influence the behaviour of people exposed to the communication. From the dawn of history this process has been going on. Symbols, gestures, sound and later words, in the form of languages, were used for communication.

Communication - Communicator - relationship :

The communicator and the receiver are the important persons in communication. As the communicator is the person who puts the process of communication into operation, he is the source or originator of the message. He is the sender of the message to reach an audience in a manner that results in correct interpretation & desirable response.

A village level officer, like VEW or Panchyat person, is the communicator and one whom he sends the message is the receiver or audience.

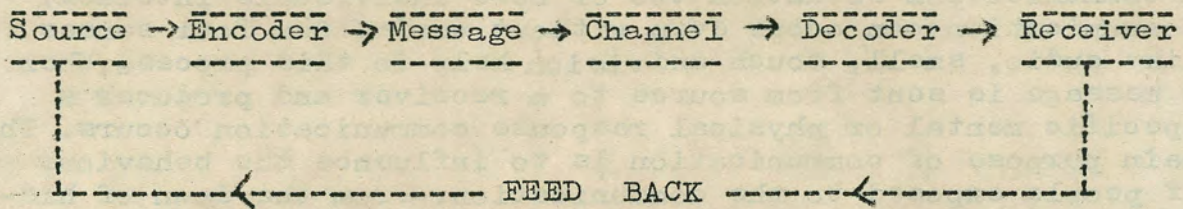
Components of communication process :

- i Communicator - one who provides initiative to the process of communication.
- ii The objective - the purpose of communication.
- iii The audience - the receiver of the message

- iv The message - the content of the communication.
- v The channel - the method or means used to get the message to audience.
- vi The treatment - the way of putting the message across within a channel.
- vii Feed back - knowing the reaction of the audience to the message.
- viii Evaluation - measuring the effectiveness of the message.

Key elements of communication :

Different models have been developed by different persons. One model is given below:-



The following are the communicator and communicatee relationship :-

- a ,Orientation - the term is used as equivalent to attitude'.
- b Empathy - The process through which we arrive at expectations and anticipation of the internal psychological state of a man.
- c Feed back - The return process is called as feed back.
- d Physical interdependence - The function of the source and receiver are physically interdependent although the functions may be performed at different points in time and space.
- e Credibility - It is the degree of which a communication source is perceived as trustworthy and competent by the receiver.
- f Interaction - It is the mutual and reciprocal influencing of each other behaviour.
- g Homophily/Heterophily - One of the fundamental principles of human communication is that transfer of new ideas most frequently occurs between

a source and a receiver who are alike/similar or homophilus, those who are unlike/not similar or heterophilus. A communication is likely to be effective when the source and receiver shares common meaning, attitude, belief and a mutual language.

Feed back in communication :

In a communication process each person is both an encoder and a decoder. He receives and transmits the message. However, a person will decode a message and interpret it in accordance with his own experience and then encode a response accordingly. So, each is constantly communicating back to the other. The return process is called feed back and plays an important role in communication. Feed back provides the course with information concerning his success in accomplishing his objective.

Application of communication concepts :

Communication must be planned in advance. The guidelines are :-

- 1 Know your purpose - a careful analysis of the situation and a clear statement of objectives are required.
- 2 Know your audience - the type of individuals can be thought of a key person, their experience, values and expectations.
- 3 Know yourself - your communication skills and habits? Your strength and weakness in communication? How can these be emphasized or corrected.
- 4 Plan your approach - plan the treatment and structure of the content coded and channelled taking into consideration, timing, location, style and clarity.
- 5 Aim at lashing satisfaction - encourage response, preferably related to be desired behavioural changes.
- 6 Evaluate - is your audience doing more effective job as a result of your communication ?

Needless to say, a good extension worker should be a good communicator. To be a good communicator, one should thoroughly understand the nature of the elements of the communication process and manipulate them effectively to achieve his objectives.

PROGRAMME PLANNING IN FISHERIES EXTENSION

— D.D. Halder
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Programme planning is the process of bringing about planned change. It is a deliberate and collaborative process involving change-agent and client system, which are brought together to solve a problem. A good programme meets the needs and interests of the majority of the people and motivates them to make necessary changes. The elements of people's needs become a central concern of planners for rural development.

EXTENSION PROGRAMME

According to Kelsey and Hearne (1949) 'An extension programme is a statement of situation, objectives, problems and solutions'. USDA (1956) defined 'An extension programme, which is arrived cooperatively by the local people and Extension Staff. Leagans says 'An extension programme is a set of clearly defined, consciously conceived educational objectives derived from an adequate analysis of situation, which are to be achieved through extension teaching'.

COMPONENTS OF PROGRAMME PLANNING IN FISHERIES

The components of programme planning in fisheries are complex. The components are : Fish farmers - their needs, their interests, useful technology, the educational process, analysing situations, making decisions about what to be done, determining action, projecting the desired shape of things into the future, etc. It involves the study and use of facts and principles, knowledge, imagination and reasoning ability.

PRINCIPLES OF PROGRAMME PLANNING IN FISHERIES

To develop an useful and effective programme in fisheries, the following principles should have to be kept in mind as suggested by Kelsey and Hearne (1955).

- i Extension programme planning selects problems based on an analysis of the facts of the situation.
- ii It selects problems based on the needs and interests of the local fish farmers.
- iii It determines priorities; defines objectives and solutions which offer satisfaction.

- iv It has performance with flexibility.
- v It has balance with emphasis.
- vi It has a definite plan of work.
- vii It is an educational process.
- viii It is a continuous process.
- ix It is a coordinating process.
- x It involves local people and their institutions.
- xi It provides for evaluation of results.

NATURE AND SCOPE OF PROGRAMME PLANNING IN FISHERIES

The objective of India's National Extension Service is to develop in village people of the ability to make a better living and to live a more satisfying life as individuals, as family members and as citizens of their community, State and Nation. The first step in any systematic attempt to promote rural development is to prepare an useful programme. The term programme indicates focus, priority and design. The programmes must be based on the fish farmer's needs to make it significant and on their interests to make it effective.

Programme planning is basically a process of making decisions that will carry into the future. Decisions have to be made about what the present situation is, how it could and ought to be changed and what means can be used to accomplish the new and more desirable situations.

STEPS FOR MAKING A PROGRAMME IN FISHERIES

Keeping the working definition as objective the programme planning phase consists of the following steps in preparing, executing and evaluating extension programmes in a continuous cycle.

- 1 Collection, analysis and evaluation of data : Good planning depends on the collection of adequate and reliable data and a scientific elaboration and interpretation of the same. The extension personnel must have adequate knowledge of fish farmers produce, resources available and their utilization, population, occupations, nutrition situation, transport facilities, schooling facilities, soil conditions, financial positions, credit facilities, labour facilities, poaching and poisoning occurrences, marketing facilities etc. The Extension personnel should develop local leadership in such a way that the villagers and the local institution are able to recognise and select problems for action on a priority basis.

Facts and outlook (trends) at National level and State levels should also be considered in this context in addition to those pertaining to the local level.

- 2 Determination of objectives : The basic objectives of the programme are determined by the villagers in consultation with the extension personnel. The village fish farmers must have very clear understanding of the projects so that they are able to set up appropriate objectives, should specify the behavioural changes in people, besides the social and economic changes aimed at.
- 3 Definition of problems : In the process of programme planning at the family, village or block level, it is desirable that village activities are properly classified. This will give an opportunity to the planner and the participants to assess their potentialities and capabilities for executing the programme.
- 4 Finding solution to problems : It is of real importance that the Fisheries extension personnel have a clear understanding of the village problems relating to fisheries and keep themselves equipped for offering solutions to the problems of the fish farmers present to them. They must consult their superior officers on problems they are not able to handle themselves. The solutions offered should be practicable and economical and should result in satisfaction and learning.
- 5 Selecting problems to be tackled : All the problems can not be tackled simultaneously, even though the solutions for them are known. Therefore, it is necessary for extension personnel and the village institutions concerned in the fisheries to select problems and concentrate their efforts on projects on a phased way. This will result in appreciable achievements and convince the village people about the utility of the programme.
- 6 Annual plan of work : A plan of work is the listing of activities by which the objectives already decided upon are to be achieved. It includes the methods of executing the programme such as demonstrations, discussions, meetings, family contacts by the extension personnel etc. It indicates the places, timings and persons responsible for carrying out the programme along with the methods of evaluating the process.

- 7 Carrying out the plan : The success of a programme depends on how well it is carried out. The extension personnel should take immediate steps to phase every activity in a proper perspective and arrange all things in time at block or village level. Proper arrangements for the supply of fish seed, feed, manure and fertilizers, credit, audio-visual aids, literature and training should be made much in advance. Efforts should be made to select best type of local leaders to make the programme success.
- 8 Continuous checking and evaluation of results : Successful evaluation gives a correct direction to a programme. It is required to keep adequate records of each activity as a basis of future evaluation. Evaluation of activities should be undertaken jointly by extension personnel and local institutions.
- 9 Review of process and projection of plans : At the end of each cycle of the programme planning process, the situation should be reconsidered in view of the changes in the social and economic levels of the people so that the whole process may begin again with new or modified objectives.

Programmes are tools for doing more effective work. A proper adjustment of time and energy spent in preparing a programme has always to be maintained with the actual implementation of the programme in the field. It should be noted that evaluation, decision, planning and action take place continuously in varying degrees throughout all steps of the programme planning process.

FISHERIES EXTENSION ADMINISTRATION

— P. DAS

National Bureau of Fish
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Allahabad

The present state of aquaculture development demands a transformation of the bureaucratic administrative set-up created to carry out law, order and regulatory functions to an effective dynamic developmental administration with driving force giving direction to change.

The concept of administration has undergone momentous changes in recent times. According to Griffin (1959) administration is a generalised type of behaviour to be found in all human organisations. Administration is a term used to describe an aspect of life in a social organisation. Thus administration is integral part of all human life. According to Newman, the administration is 'The guidance, leadership and control of efforts of a group of individuals towards some common goal'.

The essence of fisheries administration is the ability of the administrator to plan fisheries projects for smooth functioning of the organisation and achieve the agreed upon objectives well within the available allotment of personnel, time and resources. The fisheries administration has to perform three important functions :

- i To educate farmers about the scientific fisheries technologies and to enthuse them to apply the same.
- ii To solve new emerging problems in fish farming .
- iii To ensure supplies and services required for fish production efficiently.

In order to perform these functions satisfactorily the following specific jobs are to be considered.

1 Planning : Planning, in essence, is a decision making process. It broadly means studying the past and the present in order to forecast the future. It also includes determination of the goals to be achieved, what should be done to achieve them, how it should be done and who should do it etc.

2 Organising : Organisation is defined as a system of structural interpersonal relations - individuals are differentiated in terms of authority, status and role with the result that personal interaction is prescribed - anticipated reactions tend to occur, while ambiguity and spontaneity are decreased. An organisation deals with overall plan of arrangements designed to operate a given enterprise with a basic pattern of decision of work of functional assignments, of delegation of authority and of span of control. Above all, it must provide for consistency of direction and flexibility at all levels.

3 Staffing : Any organisation for its effective functioning needs qualified staff to meet its demands and objectives. It is axiomatic that an organisation is no better than the personnel who make up the staff. The process of staffing, therefore, is operative in all organisations whether they are large or small.

4 Directing & supervising : Direction is an essential step in administration and is concerned with the way an executive issues instructions to his subordinates or indicates what should be done.

The directions always following with supervision. The main function of supervision is counselling and guidance.

5 Coordination : Fisheries strategy emphasises the need for effective intra and inter-departmental coordination between different agencies involved in this programme. Coordination in administration deals with synchronising and unifying the actions of a group of people. The coordinated operation is one where the activities of the employees are harmonious, drove nail and integrated towards a common objective.

6 Communication : Communication is the blood stream of organisation and as stated by Pfiffner 'it is the heart of management'. In extension administration communication is of two types (a) downward and upward (vertical) and (b) across or side (horizontal).

In addition to the above mentioned six job areas, the other areas like budgeting, service & supply, reporting and evaluating are also important and influence the success or failure of an organisation.

The administrative machinery needed for fisheries development work has many ramifications stretching beyond the confines of routine type administrative organisation.

Characteristics of traits desirable in fisheries extension administrators

Fairness : It is a characteristic, the achievement of which takes much more than the wish and the intention to be fair.

Initiative : It means simply the capacity for assuming responsibility and for carrying a job for efficient completion. It also means the ability to carry through an undertaking without detailed guidance.

Tact : The influence of a tactful suggestion is often far greater than the impact of a bluntly worded order.

Enthusiasm : It is an intense and eager interest and devotion to a course of action. It must combine interest, knowledge and a desire for achievement.

Emotional control : Through control of emotion the administrator minimizes the likelihood of saying the untactful thing and committing the unfair act.

Intelligence : It is the ability of the individual to think clearly and rapidly.

Integrity : It is the normal fact of leadership. It plays a vital role.

Loyalty : Loyalty is fidelity or constancy which is important for the success of the mission.

Knowledge : An intimate knowledge of the work to be done by the subordinates is extremely important to the immediate superior.

Flexible and adaptable : To be flexible and adaptable the supervisor must be able to put himself in the situation of others.

Vision : It means simply the ability to look into the future and to anticipate events before they occur.

Good judgement : Exercising good judgement means to make decisions, to draw conclusions on the soundness of the matter.

Physical vitality : The physical vitality demanded by the job of the extension administrator is very high to keep pace with the situations.

Broad knowledge and interests : To possess these means to be well informed, to have good general training and perhaps most important of all is intellectual curiosity.

Resourcefulness : The administrator who is always prepared for an emergency has the quality of resourcefulness.

Cooperative : The administrator with cooperative nature seeks from & extends to others, assistance in carrying out plans.

Common sense : The administrator possessing this quality recognises the practical aspects of all situations.

Background : It is desirable that extension administrator has the same background as those of extension subordinates/ personnel.

Ability to teach : It is important to the extension administrator, as a large part of every administrator's work, is extension teaching.

The problem of fisheries development demands concentrated and concerted efforts on the part of all concerned i.e. teachers, research workers and extension personnel. A proper and harmonious blending of thinking and doing by all these three inseparable wings is a must to achieve a balanced development in fisheries. I do expect that this batch of senior administrators of the fisheries extension would, after this training, take appropriate action for effective fisheries extension in the state.

CREDIBILITY OF COMMUNICATION FACETS IN FISHERY EXTENSION

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Motivation of the tradition-bound fish farmers of the country, particularly in easter part, whose experience has stood the test of time, through education process demands a band of well groomed and committed extension personnel backed by sound technologies and use of required communication channels.

Investigations on the level of adoption of scientific fish culture vis-a-vis various communication channels were carried out by the scientists of the extension Division, CIFRI, the summery of which is as below.

The level of adoption of scientific carp culture technology (composite fish culture) by the fish farmers in a sample of 100 was found to vary between 50 and 95%. The credibility of different communication channels was found to be as below :-

Mass media	40.69%
Personal cosmopolite	34.60%
Personal localite	14.86%
Training	9.85%

In the total extension effort the role played by the various sources were as below :

- a Mass media (in percent) : Publication 9.43, demonstrations 9.22, Radio 8.22, Newspaper and magazines 8.13, Films, slides etc. 3.25, Fish Farmers' Days 2.21 and Exhibition 0.20.
- b Personal cosmopolite sources (in percent) : Cooperative society 10.77, scientists of CIFRI 9.55, voluntary organisation 4.04, FEOs/AFOs 3.42, Panchayet 3.42, Input dealers 1.08, VLWs 0.92, DFOs 0.79 and Bank officials 0.58.
- c Personal localite sources (in percent) : Friends 6.51, Neighbours 4.38 and Relatives 4.04.
- d Training 9.85 (in percent)

The acceptance and rejection processes have also been found to be related with age, qualification, occupation and experience in traditional fish farming.

Age : The study revealed that the younger generation of the age group below 30 yrs were the best acceptors of the innovation (46%) than the middle aged group between 30 and 40 (41.46%). Fish Farmers above the age group of 40 (12.20%) appeared to be conservative in adopting the new technology.

Qualification : The educational qualification also was found to have bearing in the adoption process. Fish Farmers with qualifications from middle school to higher secondary level were the best acceptors (70.73%) followed by the group who studied upto primary level (26.83%). The data for graduate farmers were very scanty in the present study and thus, does not reflect the correct picture.

Occupation : The primary occupation of the farmers also was found to play a role in the adoption process. Farmers with traditional fish culture as primary occupation were observed to adopt the modern innovation more quickly (73.17%) followed by a group of other entrepreneurs (19.51%). The tradition bound agricultural farmers' rate of adoption was slowest, being 7.32% only.

Experience : Professional experience also was observed to influence the adoptive process. Data revealed that farmers with experience of traditional fish farming between 5 and 10 years adopted the technology more quickly (43.91%), followed by farmers with experience over 10 years (41.46%). The new farmers with experience below 5 years were slow in adoption (14.63%).

The above observations indicate that the extension personnel in the country need intensify the effort to bring about cooperative movement among the fisherman where ever feasible in addition to other effort. The training effort definitely need be intensified at village level.

The role of publications in regional languages, the demonstrations in villages in farmers' ponds, radio and newspapers showed their effectiveness in popularisation of modern aquaculture technologies.

The creditability of the scientists of the Extension Section of CIFRI was found to be high in comparison to the state extension personnel in the locality who are the backbone of National Extension Service in the country. This need be heightened through extension training.

The results of the above maiden study on the efficacy of different fishery extension communication processes will be very useful in formulating fishery extension projects by various concerned organisation in the country.

CONCLUSION

Today, we have in the country a large number of autonomous and private organisations and agencies which are involved in bringing socio-economic transformation in the rural areas besides the extension service. What is needed at the moment is a coordinated and integrated approach in the task in addition to knowledge about communication process itself. For optimum use of all the Mass Media, Group and Individual contact channels the communicator has to take into account the factors associated with each & every element of communication process and evolve his own strategy. In other words a media-mix strategy has to be evolved by the communicator keeping in view the type of message, characteristics of audience and relative effectiveness of the channel for dissemination of the concept of integrated farming system aiming at overall fishery development in the country.

ROLE OF OPERATIONAL RESEARCH PROJECT IN DEVELOPMENT OF
AQUACULTURE

———— M. Sinha
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INTRODUCTION

Balanced growth of research and extension systems is an important pre-condition to any sound economy. Imbalance in technology development (research) and its popularisation (extension) would create a wide gap between what can be achieved and what is achieved in the farms. The much talked about 'green revolution' has been achieved in this country through only about a quarter of the technology developed which has so far reached the farmer.

Majority of the farmers who use new technologies, adopt new varieties, but very few follow the complete package of practices. The reason for partial adoption of new technologies have been the subject for large number of studies in social sciences. Ineffective extension systems and fault on the part of farmers have been pointed out as the main reasons. The fact that the recommended technologies may not be appropriate to farmer's condition, though given less importance, but may be the most important likely reason for partial adoption of the technology. The knowledge of technological gaps and the necessary modifications to make the technology suitable to the farmer's conditions is very essential and one of the important aspects of any fruitful extension system.

The ICAR has initiated its own transfer of technology projects to serve the extension needs. It has four such projects, viz. Krishi Vigyan Kendra, Lab to Land Programme, National Demonstration, Operational Research Project.

Operational Research Project takes care to know the technological gaps and suggests necessary modifications. It can be defined as an extension approach to popularise productive technologies among the farmers with an element of scientific observation for feed back to the research workers regarding modifications necessary to make the technology fully suitable to the farmer's conditions.

Thus, ORP is not a final demonstration of the final technology. It is, in fact neither a final demonstration nor an experimentation with technology. It aims at improving the

production base of all the available natural resources. Here the focus is on the rational use of resources available with the farming community by utilising scientifically developed technologies, with necessary modifications, making it suitable for local conditions.

2 ORP ON AQUACULTURE - INITIATION AND OBJECTIVES

Operational Research Project concept was initiated by ICAR in 1975 in different areas. This project taken up in the area of aquaculture was named as 'Operational Research Project on Composite Fish Culture' and was initiated in April 1975. The objectives of this project initially were :-

- i To find out the fish production potential of large water bodies.
- ii To find out the economic viability of composite fish culture in large water bodies.
- iii To maximise production through Composite Fish Culture and to demonstrate its technique to fish farmers.
- iv To provide working opportunities to educated unemployed youth of the area who could undertake fish farming as a profession after receiving necessary training.

In 1977, the aspect of integrating aquaculture with compatible combinations of livestock rearing and horticulture were also included under this project and the following additional objective was brought under the fold of this project.

- v To integrate fish culture with other compatible combinations of horticulture and live-stock raising.

3 AREA OF WORK

With the abovesaid objectives in view work under this project was first initiated in Anjana Fish Farm, Krishnanagar, villages Shaktinagar and Asadan in Krishnanagar Block I and villages Hanskhali, Chitrashali, Arangsarisa and Bally Dewanganj in Chapra Block of Nadia District of West Bengal. In February, 1982, the main area of operation of this project was shifted to village Chandirampur in Block Haringhata, Dist. Nadia. Some farmers in Krishnanagar (Distt. Nadia) and Barrackpore (Dist. 24-Parganas) were also adopted under the Project from time to time.

4 ACHIEVEMENTS

i That high fish yields can be obtained from large water bodies, through composite fish culture, has been demonstrated under the Project, in water bodies ranging from 1.5 to 2.15 ha in Anjana Fish Farm of West Bengal State Fisheries. In a series of demonstration conducted during the period 1975 to 1981, the productions obtained ranged from 2654 to 4290 kg/ha/yr as against the earlier obtained production of 462 kg/ha/yr from these water bodies.

In six demonstrations held under the project during the period 1982 to 1986, a technology to utilise large water bodies for fish culture without use of supplementary feed was developed and demonstrated. Cowdung and Rock phosphate were only used as fertilizer in these demonstrations. Average fish yield obtained was 1064 kg/ha/yr.

ii The cost of production per kg of fish in large water bodies through composite fish culture ranged from Rs. 2.94 to 3.06 (inputs only). In case of demonstration without use of supplementary feed it ranged from Rs. 1.31 to 3.25 (weighted average Rs. 1.91). These costs of production are well comparable with the cost of production of fish in small ponds through Composite Fish Culture and thus amply prove that fish culture in large water bodies is economically viable both with or without the use of supplementary feed.

iii Fiftyfive demonstrations were held in the area, during the period 1977-85 on Composite Fish Culture in farmer's ponds, ranging in size from 0.1 to 0.3 ha. Total water area covered was about 51 ha. Fish productions obtained ranged from 2000 kg/ha/10 m to 4056 kg/ha/yr. The productions obtained from these ponds earlier through traditional methods, ranged only from 500 - 700 kg/ha/yr.

iv Various training programmes on Composite Fish Culture, induced breeding of Indian and Chinese carps including maintenance of brood stock, spawn and fry rearing were organised by the project in the project area. Besides the training programme, demonstrations on different aspects of pond management were organised in the project villages to make the fish farmers of the area aware of different steps in methodology of scientific fish breeding and culture. Advisory service to the fish culturists of the area was also rendered by the project.

v The concept of integration of livestock and horticulture with fish culture was attempted for the first time in India under this project. Technologies for integrating pig, poultry and duck rearing with fish culture were evolved, standardised and demonstrated in farmer's ponds under the project.

The system of integrated farming evolved and demonstrated under this project is based on recycling of excreta of fixed number of animals in fish ponds so as to eliminate the use of pond fertilizers and fish feed. The excreta of animals in this system acts as a substitute to fish feed and fertilizers. It reduces the input cost considerably and increases the overall animal protein production. The expenditure incurred on raising of animals is largely offset through the sale proceeds of animal meat and eggs with major share of input for fish culture obtained as a bye-product.

The number of demonstrations held under the project of fish-cum-pig, fish-cum-duck and fish-cum-poultry culture were thirteen, twentynine and twentythree respectively. Productions obtained ranged from 4000 - 7600, 2895-4056 and 3940 to 5000 kg/ha/yr respectively in ponds ranging in size from 0.1 ha to 0.5 ha.

5 IMPACT MADE

Fish production, through the adoption of technology of Composite Fish Culture in small as well as large water bodies, has increased manifold from the demonstration ponds of State Fisheries Department and farmers of the area. This has convinced the fish farmers of the area about the production potential and economic viability of the technology and as a result large number of fish farmers are presently engaged in fish culture. Many landless fishermen of the area have also taken up fish culture in ponds taken on lease and have thus become fish culturist from fish catchers.

After being fully convinced through demonstrations under this project, the West Bengal Fisheries Department formulated a scheme for adoption of Composite fish culture technology in farmer's ponds in villages throughout the State. Initially the scheme was initiated in 91 ponds but subsequently it was extended to 584 ponds. Average yield achieved in this scheme was above 4 t/ha/yr. This scheme has helped a lot in popularisation of Composite Fish Culture in the State.

Five farmers, trained by this Project in induced breeding of fishes are presently established fish breeders of the area and have undertaken seed production as their main profession.

The unemployed youth of Shaktinagar village have grouped themselves in a cooperative society, 'Shakti Mandir Fishermen Cooperative Society', which is affiliated to Nadia District Fishermen Cooperative Federation. This society arranges the harvesting and sale of fish on commission basis. Various inputs required in fish culture are also supplied by this Society to the farmers and Government Agencies on competitive rates.

Fish-cum-livestock farming did not only increase fish production but also cut down the cost of fish culture operation considerably. In India it has a special significance as it can play an important role in improving the socio economic status of a sizeable section of weaker rural community especially the tribals who traditionally rear small livestock (pig, duck, poultry etc.) and can take to fish-cum-livestock farming with little assistance.

The technologies of fish-cum-livestock farming have been adopted by many farmers of the Project area who are making good profit out of this venture. Twenty tribal families of Asadan village (Krishnagar Block I, Dist. Nadia) have also adopted these technologies.

6 CONCLUSION

As is evident from above, the project has helped in popularisation of Composite Fish Culture technology throughout the state. It has worked out a technology of fish culture in large water bodies (beyond 1 ha) with only cowdung and Rock Phosphate as input besides fish fingerlings. Though the production obtained through this technology is not as high as through other technologies but is definitely economically viable. This technology is of use in development of fish culture in large water bodies where providing supplementary feed to fishes, an essential ingredient of Composite Fish Culture technology, is cumbersome and quite expensive and thus not advisable when development of large number of such water bodies in the country is envisaged.

Observing the resource of livestock waste available with certain farmers, the project successfully worked out a technology of utilising the same for fish culture which is capable of giving high fish production at low cost.

The aforesaid account clearly indicates that this Operational Research Project has been able to fulfill all its objectives and has played a vital role in development of aquaculture in the State of West Bengal during later part of seventies and early eighties.

FISH FARMERS' PERCEPTION OF THE PROBLEMS IN COMPOSITE
FISH CULTURE AND MEASURES SUGGESTED BY THEM FOR INCRE-
ASING THE YIELD OF FISH

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One of the basic conditions of successful extension work is to work with the problems identified by the people as their own problems. For rapid dissemination of the technology of composite fish culture in ponds which is very profitable, it is necessary to identify the problems in composite fish culture as perceived by the fish farmers and adopt necessary measures suggested by them for increasing the yield of fish. For successful extension work, it is also necessary to fix up priorities of problems and solution.

METHODOLOGY

The study was conducted in Haringhata block of Nadia district, West Bengal. There are 9 gram panchayats in Haringhata block and from each gram panchayat 2 villages were selected at random. A list of fish farmers on the basis of available ponds in the 18 selected villages was prepared. Composite fish culture with exotic carps being a recent technology, fish farmers adopting atleast one exotic species of fish in any of the three years under study (1976-77, 77-78 and 78-79) were included in the list. Two hundred fish farmers were selected at random from the list which formed sample of the study.

With the advancement in the technology of fish production, fish farming is no longer a caste occupation. Many people irrespective of caste, are coming forward to adopt the new technology. For the purpose of the present study they have been designated as 'Fish Farmers'. In respect of fishery technology, they generally do rearing of fish. Many of them are crop farmers also.

The respondents were asked an open ended question to mention three important problems which they were facing in composite fish culture and rank them. The problems ranked 1,2 and 3 were given weights (scores) 3,2 and 1 respectively. The total rank score for each problem was obtained by multiplying the frequency the problem was ranked first, second or third, with the respective weightage and adding them up. The problems were then arranged in descending order of importance on the basis of their total rank score and finally ranked.

The respondents were further asked an open ended question, to suggest three important measures, which in their opinion, would help in increasing the yield of fish. These were ranked on the basis of frequency of the respondents reporting.

FINDINGS AND DISCUSSION

The problems perceived by the fish farmers and the measures suggested by them are presented in Tables 1 and 2 respectively.

TABLE - 1 : Problems in composite fish culture as perceived by the fish farmers

<u>Sl. no.</u>	<u>Perceived problems</u>	<u>Total rank score</u>	<u>Rank order</u>
1	Scarcity of seed of exotic carps	318	I
2	Lack of information about the technology of composite fish culture.	230	II
3	Lack of pure seed of indigenous carps	159	III
4	Non-availability of credit for fish culture	134	IV
5	Lack of contact with competent fishery extension personnel.	110	V
6	Lack of facility for soil and water testing	99	VI
7	Poisoning in the fish pond	59	VII
8	High price of Mohua oil cake	34	VIII
9	Diseases of fish	32	IX
10	Poaching of fish	25	X

TABLE - 2 : Measures suggested by the fish farmers in increasing the yield of fish

<u>Sl. no.</u>	<u>Suggested measures</u>	<u>Frequency</u>	<u>Rank</u>
1	Supply of seed of exotic carps	151	I
2	More exposure with the technology of composite fish culture	114	II
3	Supply of pure seed of indigenous carps	85	III
4	Provision of credit for fish culture	77	IV
5	Provision of soil and water testing facility	52	V
6	More contact with competent fisheries extension personnel.	50	VI
7	Control of poaching and poisoning of fish	39	VII
8	Local availability of fish feed and other inputs at reasonable price	17	VIII
9	Control of fish diseases	15	IX

In composite fish culture, the exotic carps are the new items of technology and it is natural that the fish farmers would be interested in their cultivation. In comparison to the needs of the fish farmers, the supply of seed of exotic carps is extremely limited. This may be the reason for the fish farmers perceiving 'scarcity of seed of exotic carps' as the number one problem in composite fish culture. Tripathi (1979), Lakshmanan (1979) and Ranadhir, Tripathi and Barua (1979) also reported 'scarcity of seed of exotic carps' as one of the important problems of fish farmers in composite fish culture.

Field experiences indicated that, of the three exotic species of fish, seed of Silver carp had the highest demand, followed by Grass carp, Common carp had the least demand.

'Lack of pure seed of indigenous carps' was perceived by the fish farmers as the third important problem in composite fish culture. It was reported that seeds of indigenous carps were available, but they were in many cases mixed with undesirable and predatory fishes which hampered composite fish culture. Further, it was difficult to obtain pure seed of Catla, Rohu and Mrigal separately in required number. This made it difficult for the fish farmers to release them in ponds in specified numbers as required in composite fish culture. Hence, there was demand for pure seed of indigenous carps also.

For solving the problems of 'scarcity of seed of exotic carps' and 'lack of seed of indigenous carps', supply of pure seed of exotic carps' was ranked first and 'supply of pure seed of indigenous carps' was ranked third in order of importance. The findings indicate that top priority has to be given in induced breeding of fish to produce sufficient quantities of fish seed of both exotic and indigenous carps.

As supply of seed of carps from Govt. fish farms and cooperative fisheries are limited and private dealers charge high rates, training in induced breeding shall help the fish farmers to produce fish seed according to their own requirement in the village and make them free from the uncertainty of getting fish seed at the time of need. Along with the spread of the technology of composite fish culture, training in induced breeding may be a good source of employment for the rural youth also.

Fish farmers perceived 'lack of information about the technology of composite fish culture' and 'lack of contact with competent fishery extension personnel' as the second and fifth important problems in composite fish culture. Dasgupta (1979) reported 'lack of extension activity' as an important problem in composite fish culture.

Adequate information about a new technology and interaction with competent extension personnel are basic requirements in bringing about desirable change in human behaviour in any programme of planned change.

The fish farmers desired 'more exposure with the technology of composite fish culture' and this was the second important measure suggested by the fish farmers in increasing the yield of fish. For this purpose, demonstration, publication and training in composite fish culture are to be given adequate emphasis. The fish farmers desired to have 'more contact with competent fishery extension personnel', which suggests need for training of the fishery extension personnel. According to Pillay (1979) well organised extension services were of crucial importance in aquaculture development, particularly in small-scale rural programmes. The technical competence and personal quality of extension personnel were of special importance in effective extension work.

'Non-availability of credit for fish culture' was perceived by the fish farmers as the fourth important problem in composite fish culture. Das (1976), Tripathi (1979), Lakshmanan (1979), Randhir, Tripathi and Barua (1979) and Dasgupta (1979) reported non-availability of credit as a problem in the adoption of composite fish culture by the fish farmers. High yielding technology is, in general, capital intensive and this holds good in respect of the technology of composite fish culture also. It is, therefore, logical that fish farmers shall feel the need of credit in adopting the technology of composite fish culture.

To solve this problem, the fish farmers suggested 'provision of credit for fish culture' for purchase of variable inputs like Mohua oil cake, fish seed, fertilizer, fish feed etc. and also for excavation and re-excavation of ponds. They further suggested that the procedure for obtaining credit should be simple and less time consuming. Hamlich (1979) suggested that availability of credit would be a key element in the implementation of future plans for aquaculture development.

'Lack of facility for soil and water testing' was ranked as sixth important problem in composite fish culture. Randhir, Tripathi and Barua (1979) also reported 'lack of facility for soil and water analysis for application of chemical fertilizer' as an important problem in composite fish culture.

In the present study, the respondents were not only fish farmers but also crop farmers. The need for soil testing for efficient use of fertiliser and higher production

of crops is now-a-days known to many farmers. The farmers, with their ability to transfer learning from one situation to the others, have also perceived that soil and water testing of their fish ponds shall enable them to identify the problems relating to soil and water of the pond and adopt correct management practices including liming, fertiliser application, supplementary feeding etc.

For a high investment technology like composite fish culture, the need for soil and water testing of the pond cannot be over emphasised and it was natural for the fish farmers to suggest 'provision of soil and water testing facility' as a measure for increasing the yield of fish. The facility of the soil testing laboratories in the country may also be extended to the fish farmers for soil and water testing of their fish ponds. This may require some reorganisation of the soil testing laboratories and communication of this facility to the fish farmers.

The problems of 'poisoning in the fish pond' and 'poaching of fish' were ranked as seventh and tenth by the fish farmers. These two social evils are acting as impediments in the spread of the technology of composite fish culture.

These two problems are to be solved at the local level by educating the villagers and by soliciting the assistance of the village panchayats. Where these two problems are acute, the fish farmers may resort to harvesting and selling of fish at frequent intervals rather than allowing the size of fish to grow big.

The 'high price of Mohua oil cake' was perceived as the eighth important problem in composite fish culture. Here is the need to train the fish farmers in correct and efficient use of Mohua oil cake, till cheaper substitute is found out.

The fish farmers expressed the desire that 'fish feed and other inputs should be available locally and at reasonable price'. High price and non-availability of critical inputs at the local level may retard the pace of adoption of a new technology. In the development of infra-structural facilities in the rural areas, very little attention has been paid to the needs of the fish farmers which now deserves serious attention, if the yield of fish is to be rapidly increased.

In respect of supplementary feed of fish, the present recommendation is to use rice or wheat bran alongwith groundnut, mustard or sesamum oil cake. All these are locally available and the farmers are to be made aware of them and trained in their proper use.

'Diseases of fish' is quite an important problem and was ranked ninth. This reflects the need for training of the fish farmers on the prevention and control of diseases of fish.

ROLE OF FISH FARMERS' DEVELOPMENT AGENCY IN THE FISH
REVOLUTION OF WEST BENGAL

----- P.C. Chakraborty,
Jt. Director,
Department of Fisheries,
Govt. of West Bengal.

Fish comes next to rice in the daily diet of the people living in the State of West Bengal. But there exists a wide gap between the demand and supply of fish in the State. The Govt. of West Bengal has been endeavouring to bridge this gap by utilising all available resources in Fisheries sector. The population of West Bengal according to 1981 Census is 54.5 million and the annual requirement of fish has been estimated to be around 8.0 lakh tonnes. Against this, production of fish in the State during 1986-87 was 4.70 lakh tonnes of which 4.12 lakh tonnes were produced from Inland Fisheries. The table below gives an account of the Inland Fishery resources of the State.

Sl. no.	Type of Fishery -----	Area in hectare -----
1	Pond	2,76,201.90
2	Sewage fed Fishery	4,082.96
3	Paddy cum Fishery	32,930.00
4	Reservoir Fishery	16,738.80
5	Beels (Ox Bow Lake)	41,781.65
6	Rivers	1,72,586.63
7	Canals	80,085.71
8	Brackish water fishery	2,10,000.00

Besides, West Bengal has a short coast line spread over two maritime districts of South 24-Parganas and Midnapore. The State has 777 square kilometer of inshore area, 1813 km² Off-shore area and a continental shelf of 17049 km².

Fish culture in Bengal is an age old practice. But the production of fish through traditional method of culture was poor. The supply of fish in the market used to come mainly

from the capture fisheries - like rivers, beels (Ox-bow lakes), canals and partly from the marine sources. But production of fish from capture fisheries dwindled gradually due to siltation of river bed, construction of dams, pollution etc. The Fisheries Department under the circumstances decided to augment the production of fish particularly fast growing herbivorous carps through intensive farming in impounded water bodies. With this object in view, the department established a Research Station at Kulia, near Kalyani in the district of Nadia, for standardisation of carp culture techniques. At that time, the induced breeding technique for production of quality carp seed was invented by the scientists of Central Inland Fisheries Research Institute. The techniques for raising carp seed through nursery and rearing management practices have also been standardised. And finally, the production of table fish from impounded water bodies could be increased from 500-600 kg per hectare water area to 4,000 kg per hectare through intensive fish farming, popularly known as composite fish culture. The technique has been standardised through adoptive trials in large number of village ponds in different districts of the State. Later, the Govt. of West Bengal popularised the technique through practical demonstration at grass root level.

During early seventies though composite fish culture technique became very popular to the fish farmers but most of them could hardly follow the technique for want of adequate training and financial input required, towards pond preparation, stocking material, fertilisation and feeding of the stocked fish etc.

At this stage with a view to accelerating intensive fish farming in the tanks and ponds of rural areas and to create employment opportunities for the vast rural mass, a package of schemes under F.F.D.A. is to select suitable beneficiaries, arrange lease of tanks on long term basis of vested/private tanks, train the fish farmers and arrange for loan towards reclamation/renovation if necessary and arrange the cost involved from commercial and other financial institutions with subsidy from the Government.

In 1973, F.F.D.A. was first set up in West Bengal as a centrally sponsored scheme.

From 1980-81 the pattern of F.F.D.A. was changed and it came under World Bank aided programme. Till 1980-81, 5 F.F.D.As. were functioning in five districts namely F.F.D.A. (Fish Farmers' Development Agency) was introduced. The schemes aim at adoption of technology of fish culture in the farmer's pond. The main objective of the

Burdwan, West Dinajpur, Malda, Murshidabad and Birbhum. With the change of F.F.D.A. Pattern, six more F.F.D.As. were established in the six districts of the State to accelerate fish production in the State through improved technique of fish culture from impounded water bodies owned by large number of fish farmers. A total target for development and culture of fish under 11 F.F.D.As. was fixed at 34,000 hectares during a period of five years from 1980-81 to 1984-85.

Later on World Bank aided F.F.D.A. programme was extended to the remaining five districts of the State. The districts are Gooch Behar, Jalpaiguri, Darjeeling, 24-Parganas (South) and 24-Parganas (North). The target of water area to be covered under the scheme during 1985-86 and 1986-87 was 10,000 hectares and 7,500 hectares respectively.

F.F.D.A. in each district operates under the direct supervision of Managing Committee headed by the Collector of the district as Chairman, the Additional District Magistrate (L & R) as Vice-Chairman, a representative of the Directorate of Fisheries, West Bengal, a representative of the participating Banks, Assistant Registrar of Cooperative Societies posted in the District, District Panchayet Officer, District Fishery Officer and others are the members of the Managing Committee and the Chief Executive Officer of the F.F.D.A. acts as Member Secretary of the Committee. The Chief Executive Officer (normally an officer of the West Bengal Fisheries Service) carries out the day to day activities of the F.F.D.A. as per decision of the Managing Committee and looks after the progress of work as per target fixed for the district. The Chief Executive Officer has a separate office with one Training Superintendent of the rank of District Fishery Officer, 4-5 Fishery Extension Officers to assist him in technical matters and other office staff for smooth functioning of the office.

The expenditure involved under different items for execution of the F.F.D.A. Programme is borne by the Central and State Govt. on 50 : 50 basis excepting the base staff and the contingencies. The expenditure on the said two items is borne by the State Govt. exclusively.

To achieve the target an annual action plan is prepared in each district with block-wise and Bank-branch-wise allocation for the year. Thereafter identification of beneficiaries who may be individual fish farmers, groups of fish

farmers, members of Fishermen Cooperative Societies are done for execution of the scheme. Beneficiaries may be pond owners or lease holders for 10 years to carry out fishery activities including development of water bodies. Oral lease holders are also assisted under the programme to take up improved culture techniques in the ponds. After identification of beneficiaries loan, applications are invited from them and after processing of the applications, those are forwarded to the Banks for sanction of loan to the extent of 75% of the project cost clubbed with subsidy upto 25% subject to a maximum of Rs.3000/- per hectare to be released by the F.F.D.A. Beneficiaries are imparted a Short Training Programme for 15 days on improved fish culture techniques at the grass root level.

The F.F.D.A. executes a package of programmes consisting of four schemes which are as follows :-

Scheme No. I	Fish Culture operation	Project cost Rs. 12,125.00
Scheme No. II	Fish culture operation including reclamation upto one feet.	Project Cost Rs. 22,800.00
Scheme No. III	Fish culture operation including reclamation upto two feet.	Project Cost Rs. 33,600.00
Scheme No. IV	Fish culture operation with reclamation upto one metres.	Project cost Rs. 44,400.00

The achievement made year-wise under the F.F.D.A programme in the State is given in the following table :-

Year	Target of water area	Water area covered	No. of Beneficiaries
-----	-----	-----	-----
1980 - 81		67.51 ha	639
1981 - 82		100.83 ha	942
1982 - 83	34,000 ha	1834.32 ha	9213
1983 - 84		11138.46 ha	44987
1984 - 85		15119.77 ha	37902
1985 - 86	10,000 ha	10347.69 ha	58522
1986 - 87	7,500 ha	6703.77 ha	---
TOTAL	51,500 ha	45312.35 ha	1,52,205 +

As per terms and conditions World Bank is likely to discontinue its assistance under this programme from 30th September, 1987, after which F.F.D.A. will continue again as a centrally sponsored scheme.

On the basis of progress made under F.F.D.A. programme for development of Fisheries in Fresh Water Sector, the Govt. of India has decided to develop another unutilised but potential sector - Brackishwater area by setting up of another agency, Brackishwater Fish Farmers' Development Agency (B.F.D.A.) as a Centrally sponsored scheme from the 1987-88.

ROLE OF FISH PRODUCTION GROUPS IN THE DEVELOPMENT OF AQUACULTURE IN WEST BENGAL

— R.N. Roy
Deputy Director
Department of Fisheries
Govt. of West Bengal

Fish culture has been in vogue in Bengal since times immemorial. But the aquaculture practices, which were learnt empirically through generations largely remained in the hands of a few fish farmers and a little science was incorporated therein until recently. This led to stagnation in the state of art of fish culture through a number of technologies in aquaculture relevant to fresh and brackishwater are existing. The economic benefit of these technologies have not percolated to the level of the fish farmers on account of inadequacy of extension services.

With a view to making available a package of services to the farmers at his end, to bridge the present extension - cum - resources availability - cum - management gap the Fish Production Groups came into being in September 1976 in West Bengal. The locally, existing village clubs have generally taken the lead in sponsoring such units but new units are also not uncommon.

BROAD FEATURES OF FISH PRODUCTION GROUPS

- a Minimum water area : Minimum 4 ha water area should be brought under each FPG. However, it might be less in exceptional cases like tribal areas.
- b Membership with qualifications : Members must have some background history of trials in aquaculture. They may either own tanks or be related to owners and nominated by them - full member. Where their is skill in fish farming or fishing, but ownership condition is not fullfilled, an enthusiast can become associate member. But, in both the cases they must be local people with daily contacts amongst all members who must be homogenous.
- c Model resolution indicating activities : A draft has been prescribed regarding objects, targets, duties, liabilities etc. The main object is to reach the

target production of 1.5 tons/ha per year within a period of 2 years from formation. This is considered as take-off stage in West Bengal.

- d Registration with the District Fishery Officer :
For maintenance of discipline, a system of accreditation with State Fishery Directorate with renewal terms has been prescribed.
- e Activities of the fishery extension staff vis-a-vis the FPG : The FPG has two classes of objects,
- i Fish production with specific target through promotion of mutual aids.
 - ii Extension training centre for fish farming with facilities of (A) regular group training by extension officials and (B) subsidised demonstration centres.

The FPG has been encouraged to create its own fund through service charges and open bank account and also start inputs supply service wherever possible. It has been particularly advised to specialise in business of seed raising and thus raise the nucleus fund quickly. A number of FPG has done very well in this job. Seed raising skills are thus being formed on cluster basis throughout the state. A few FPGs are also purchasing ownership rights of tanks even.

The second stage of training is restricted to only one or two selected members of each FPG, who show better technical ability and can become resource persons of the FPG. On nomination from each FPG, such trainee is given 4-week training covering both theoretical and practical aspects of aquaculture at District/State level Govt. Fish Farms.

f Demonstrations : Previously demonstration centres on composite fish culture was hold without proper linkage. The subsidy rate was very high which encouraged lobbying in selection and consequential delay. Mostly the results were not satisfactory and spread effect was not up to the mark.

With organised forward and backward linkages on the two aspects of training and production all the year round and reduced subsidy, the FPGs become the main channel for all types of demonstrations from seed raising onwards. The results have been found to be better and the spread effect much improved.

g Aquasupport, management and protection : Aquasupport is a crucial item towards development of aquaculture. FPG plays important role in supplying of required inputs viz. fish seed, lime, manure and fertilizers, feed, fish toxicant etc. to move for commercial venture.

On management, group members move around and pull up slow members and help them out. Smallness of an FPG is a boon in this regard.

Protection of fishpocess serious problem in West Bengal where about 90% of the population are fish eaters. The emergence of the FPG as socio-economic pressure group in the village has curbed the propensity to poach fish or damage the crop in other ways.

h Marketing : Marking of fresh harvested fish has taken different shapes in different areas according to local situation. Common facilities in marketing has been developed at each FPG for the benefit of the fish farming community.

The Fish Production Groups are fully under the Fishery Directorate and linked all the year round with sole purpose of training, demonstration, production, marketing as well as credit. There are good reasons to have greater faith in the role of groups in development of aquaculture in this state.

SCOPE OF LAB TO LAND PROGRAMME TO ALLEVIATE RURAL
POVERTY

— D.J. Roy
Zonal Coordinator, LLP,
Zone-II (ICAR),
B.C.K.V.V.
Mohanpur, Nadia.

INTRODUCTION

In the history of Agricultural Extension, the Lab to Land Programme is a significant land-mark launched by the ICAR on the eve of its Golden Jubilee Celebrations. The ICAR decided that the most important activity during the Golden Jubilee Year (1979-80) will be massive efforts for transfer of technology from laboratory to the farmers' fields - designated as Lab to Land Programme. It was proposed to adopt farm families comprising of small and marginal farmers, share croppers, landless labourers and other communities in the rural settings representing the lowest socio-economic strata in the backward villages.

In order to implement Lab to Land Programme, Agricultural Universities, ICAR Institutes, Voluntary Organizations and Government Department actively participated. In a limited span of time, this programme has been successful and helped to motivate large number of less resourced and weaker sections of farming community to adopt new farm technology. This helped them in raising their employment level, increasing the farm productivity, income and level of living. Thus, the special feature of the programme is that the scientists and farmers are directly coming in contact of each other which increases the feed-back from farmers to the scientists.

It has been observed that in India only 15-20 percent of the total technologies evolved at the research stations are adopted by the farmers on their fields. While, in the developed countries, the extent of adoption by the farming community is as high as 80 to 90 per cent. In order to bridge the existing wide gap between the research and extension system, this special programme of Lab to Land has been launched in the country since July, 1979. The programme was initially sanctioned for only one year, i.e. during the ICAR Golden Jubilee Celebration year, 1979. But due to spectacular response received

from the participating farm families in the adoption of modern farm technologies, the programme was extended upto May, 1982 as phase-I, June, 1982 to May, 1984 as Phase -II and thereafter it was further extended upto May, 1986 as phase-III.

Phase IV Programme started from June 1986 and from 1st October 1986 this scheme has been included in the Seventh Plan.

SCOPE OF THE PROGRAMME

The Lab to Land Programme aims at transfer of proved and viable low cost agricultural technologies to the adopted farm families in order to improve their over all socio-economic condition; The main objectives of the Programme are as under :-

- 1 To motivate less resourced farmers to adopt new farm productivity and ultimately to improve their economic condition.
- 2 To transfer available farm technology to the weaker sections of the farming community.
- 3 To develop close contacts between scientists and farming community, so as to identify constraints in raising farm production.
- 4 To train small and marginal farmers and landless labourers in the use of improved farm technologies.
- 5 To strengthen feed back mechanism in order to promote need based applied research.

Compare to gigantic general extension programme Lab to Land Programme is miniature in nature but of first line extension system. Under technical programme it adopts few fvillages in clustered form and by successful demonstration of transfer of technology it add multiplying effect in the area. By virtue of viability in nature the effects sustained and add to the rural prosperity in the long run.

STRATEGY FOR IMPLEMENTATION OF PROGRAMME

For effective implementation of the programme, each participating institution has nominated a Local Coordinator responsible for implementation, monitoring and evaluation of the programme in the territorial jurisdiction of the institution.

At each Lab to Land Centre and sub-centre, an interdisciplinary team of scientists, specialists from various disciplines was constituted for undertaking transfer of technology work with the adopted farm families to provide them required guidance.

The transfer of technology efforts comprised of series of activities identified and organised by the team of scientists constituted at each centre/sub-centre. The major activities were as under :-

- 1 Selection of village for the implementation of the programme.
- 2 Selection of farm families from small/marginal farmers and landless agricultural labourers.
- 3 Completion of resource inventory, i.e. bench mark survey.
- 4 Development and implementation of farm plans for improving the farming system, unique to the selected region with the utilization of available resources.
- 5 Planning and laying out crop demonstrations on adopted farmers' fields, through assistance of critical input.
- 6 Training to farmers, farm women, farm youths, landless labourers and extension workers in the use of new technologies.
- 7 Communication of information related to new technologies through various media like posters, leaflets, magazines, film shows, field days, kisan melas, exhibitions, extension fortnights, group discussions, correspondence courses, cattle camps, etc.

Survey work do reveal the prevailing status on different resources and practices, the socio-economic position of the area. A clear analysis of various situation on human resources, land, soil, water and climatic parameters; also the prevailing practices in Agriculture and other allied vocational areas including market situation would indicate the potentialities and scope of introducing new improved technologies.

No technology in the stock of scientist is fool proof. Different technologies given to different class of farmers react differently. The trial of introducing

technologies for 2 years in a particular area would offer enough feed back to the scientist. The ultimate adoption of technologies by the farming community are largely dependent on its acceptance and diffusion in other adjoining area. Of-course acceptance of technology depends not only by the virtue of successful practical demonstration in the field but also on other important components like training extension mechanism of communication through different media and on economic analysis. The cost benefit ratio of the produce through new technology must also follow market absorption. Then only there will be long perspective standing technology for the area.

RURAL POVERTY AND LAB TO LAND PROGRAMME

Lab to Land Programme is specially designed for weaker section of farmers who are backward, small, marginal and even landless. The economic situation of the area is obviously below poverty line. Under this situation, it is a tough challenge for the scientific community to design their war strategy on sample basis. This is most important objective. While general extension programme cover extensive area through mass mobilization of resources by well organised network of large extension agencies like State Department of Agriculture/Animal Husbandry/Fishery, DRDA, Credit Institutions, ICAR extension system is most modest one with limited resources of man and money. The ICAR Research extension programme is on small sample basis and by working continuously for two years in a cluster area, scientists demonstrate the success and failure of transfer of technologies to these special group of economically backward farmers. The real success of few technologies add to the economy of farmers, and better living condition. The scientist made them conscious of hygiene and health particularly for children and women folk and offer them opportunities for gainful utilization of leisure time. Based on the trend of improved economic and social status, a model of technologies are recommended for the area which could be introduced in the greater plan of development by different rural agencies.

LAB TO LAND CENTRE IN ZONE-II F AND FEW HIGHLIGHTS OF INCREASED PRODUCTION AND INCOME GENERATION PROGRAMME

The Lab to Land Programme is implemented through Agriculture Universities, ICAR Institutes and many voluntary and State organisation in Zone-II comprising

West Bengal, Orissa, Andaman, and Nicobar Islands. There are two Agriculture Universities, six ICAR Institutes, one Central Agricultural College and seven Voluntary and State Organisations connected with the Lab to Land Programme in Zone-II. Within this organisations there are 10 Krishi Vigyan Kendras (KVK) and one Trainers' Training Centre (TTC) where this transfer of technology programme has been fully integrated with the training components.

1 Central Rice Research Institute (ICAR), Cuttack

Rice Production Technology

- a In rainfed up-lands replacement of local Biali variety with HYV, MW-10, Annapurna and Neela in the paddy grain from 0.75 T/ha to 3.5 T/ha.
- b In medium irrigated lands the adoption of new CR varieties CR-1030, CRM-25 and CR 2.60-321 increased the paddy yield from 2.5 to 4.0 T/ha.
- c In water logged flood affected low lands adoption of CR 1018, CR 1016 and CR 260-171 increased paddy yields from 2.0 T/ha to 4.5 T/ha.
- d A total of 58 scientists participated in LLP in third phase.
- e Extensive adoption of rice-groundnut rotation in rainfed area in Cuttack District, greatly enhanced the income of the Farmer. Purchase of groundnut by Orissa Oilseed Growers Federation at Rs. 4.50/Q further helped the farmers in getting remunerative price for their produce. The average income was Rs. 2000-3000/- per farm family adopted.

2 Orissa University of Agriculture & Technology (OUAT)
Bhubaneswar, Orissa - Keonjhar Centre

Different Scientific cropping system developed according to land situation

Introduction of suitable cropping system in different lands situation viz.

a Medium irrigated/low land

Rice - wheat - green gram/vegetable

Rice - Mustard - Rice
 Rice - Mustard - Wheat - Green gram/vegetable
 Rice - Tomato/cauli flower/cabbage - pumpkin/bhindi

b High land

Tomato/Bean - Cauliflower/Tomato - Reddish Bhindi

c Rainfed

Rice - Niger/Mustard.
 Arhar + Rice/Groundnut.

- By adoption of the cropping pattern, the income of farmers has been 1½ times - 2 times and with vegetable, it becomes three times.
- In vegetable intensive cultivation income of farmers was estimated to 10,000/ha under best management with net return of Rs. 15000-20000/-
- Rabi irrigated mustard (Var : YSB-9, Kranti, Pusa Bdd and PLM-514 gives yield of 100 qt/ha and is comparatively more profitable than wheat cultivation in the area.
- In Rabi 85-86 a cluster of 100 ac demonstration of mustard in Siba Narayanpur Goda village under LLP has made a sensational impact in the area for farmers as well as for State extension workers

3 O.U.A.T., Krishi Vigyan Kendra (KVK) in Baliapal Centre Balasore district.

Assessment of knowledge gap in adopted farmers before and after introduction of Lab to Land Programme

A systematic approach was made in 4 adopted villages. Four important operation items in scientific cultivation of H.Y. Paddy, Jute and groundnut were assessed on adopted farmers, the knowledge gap varies from 87-96% in paddy, 36 to 73% in Jute and 26-50% in groundnut. Accordingly training and implementation programme was formulated.

Reduction in knowledge gap was estimated after Lab to Land programme with critical input assistance shown in different items :-

Practices	Pre-exposed gap	Post-exposed gap	Differences
1 Seed treatment	96.30	58.90	37.40
2 Transplanting	95.96	62.96	33.00
3 Balance use of fertilizer	88.36	27.37	60.99
4 Plant protection	87.76	57.76	30.00

4 Central Inland Capture Fishery Research Institute, (CICFRI) Barrackpore			

Improved fish Culture Result

	Past av.	Present av.	Range	
			Max.	Min.
1 Induced breeding (spawn)	Negligible	2 lac/Ft. @ Rs.10/per 100 fingerlings av.income Rs. 2000.00	7-	1 lac
2 Nursery pond management	20-30%	60%	80	50%
3 Rearing pond management	Not existing	70%	90	60%
4 Composite fish culture	100 kg/ha/ yr	3000 kg/ha/ yr	5700-2200	
5 Poly culture of brack- ishwater fish & prawn	250 kg/ha/ yr	700 kg/ha/yr	1100-270	
6 Brackishwater paddy-cum- fish culture	Fish } Prawn }	Sep: 700 kg/ha/yr	930-650	
	Paddy : 200 kg/ha/yr	2600 kg/ha/yr	2700-2500	
	paddy-sep :			
	2900 kg/ha/yr			

5 Jute Technological Research Laboratory, Regent Park,
Calcutta.

Employment generation programme for landless
Farm women

Introduction of handloom and hobby loom amongst landless farm women in Hooghli district after proper training in the technologies right from fitting the loom, adjustment and

production of potato bag from jute yarns, blankets from texurised jute and polypropylene blended yarns, sling bag from jute cotton yarns, fluppy asans from texurised jute yarns.

Employment of eight person per unit from loom could be generated with average net income from Rs. 6-7/day.

6 Krishi Vigyan Kendra, Ramsai, Jalpaiguri

Poultry farming for Self-reliance amongst Farm ladies

42 demonstration conducted with small unit of 50-100 bird by landless farmers. No significant regular income was there through rearing of a few deshi birds earlier.

A regular income of Rs. 200/- p.m. from egg and sale of bird was demonstrated in the scientific managed small high yielding bird unit.

7 Bidhan Chandra Krishi Viswa Vidyalaya, Mohanpur, Nadia.

Kavoor '01' (Amorphalus) programme in waste land and upland

Production ranges from 300-400 qt/ha, which fetch Rs. 30-40,000/- both sale of products and seed production.

Net profit ranges from Rs. 15,000-20,000/ha. One Farmer got Rs. 20,000/- from sale of seed from 1.5 Ac.

8 Krishi Vigyan Kendra, Nimpith, 24-Parganas (S).

Land shapping programme in Sunderban

A successful technology evolved by which a part of monocropped land is made into small tank and the earth used to raise the rest of land average 9" high which facilitate :

- a Double cropping
- b Tank irrigation facilities
- c Composite fish culture integrated with duck

CONSTRAINTS IN TRANSFER OF TECHNOLOGY

— P. Chatterjee
ICAR Lab to Land
Programme, Zone-II,
B.C.K.V.V.
Mohanpur, Nadia.

There are four sets of basic activities involved in the task of transfer of technology. Each set of activity is performed by a system which is interlinked with the others for running the process. The four systems are (i) Research/Technology Production System, (ii) Extension System consisting of change agents, (iii) The Client System (iv) The Support System.

In an investigation, change agent system and client system were considered for the analysis of constraints in the Transfer of Agricultural Technology in South Bengal.

The change agent is the person or unit brought into the system to help resolve the conflict, induce change, diagnose problems etc. In the original thinking of the process in planned change, the change agent was conceived as a 'free' agent from outside the system.

The client system is usually the person or unit in need of and desiring the changer. The person with communication problems or the department with personal turnover would be examples of client system.

CONSTRAINTS ANALYSIS

In the change agent system, attitude towards transfer of technology was the dependent variable and technological gap was considered as the dependent variable for the client system. The independent variables were the constraints perceived by each system.

In connection with constraints analyses for both the change agent and client systems in the transfer of technology, Correlations were computed with respect to the Government and Non-Government organisations to find the constraints which were significantly related with the dependent variables.

CHANGE AGENT SYSTEM CONSTRAINTS

Correlation Analysis revealed that out of 53 constraints identified earlier, 18 were negatively and significantly correlated at 1% or 5% level with the attitude towards transfer of technology of the change agent system (i.e. at least one category of organisation). These 18 variables are detailed hereunder :-

- 1 Lack of incentive for technology transfer work.
- 2 Lack of dignity in technology transfer work.
- 3 Lack of career advancement in transfer of technology work.
- 4 Difficulty in procurement of inputs.
- 5 Lack of free and informal communication amongst staff in the organisation.
- 6 Lack of influence in the Government Department by the organisation.
- 7 Complicated office procedure.
- 8 Lack of prompt decision by the Head of the Organisation.
- 9 Interference with the normal work of the change agent.
- 10 Lack of clear cut responsibility in transfer of technology work.
- 11 Lack of clear cut instructions in transfer of technology.
- 12 Tension in the organisation.
- 13 Weak administrative structure of the organisation.
- 14 Lack of stability of the organisation.
- 15 Insufficient training of the change agent in the transfer of technology.
- 16 Lack of technical know how.
- 17 Lack of training aids in the organisation.
- 18 Affect social life of the change agent

CLIENT SYSTEM CONSTRAINTS

Correlation Analysis revealed that out of 67 constraints identified earlier, 40 were significantly correlated at 1% or 5% level with the technological gap of the client system (i.e. at least one category of organisation). These 40 variables are detailed hereafter :

ECONOMIC FEASIBILITY ANALYSIS OF AQUACULTURE PROJECTS

----- S. Paul
C I C F R I
Barrackpore

A sound and effective plan for national aquaculture development depends upon a number of appropriate investment projects that are viable and contribute to national economy. A poorly identified and prepared project may often result in waste of scarce national resources. The following considerations should govern our choice of project selection :-

- 1 Capital costs
- 2 Internal rate of Return on Payback period
- 3 Biotechnical feasibility
- 4 Nutritional effect
- 5 Employment Effect
- 6 Foreign Exchange Effect
- 7 Requirements in supporting services, such as infrastructure, training, extension, credit etc.

PROMOTIONAL POLICY FOR AQUACULTURE

Aquaculture being relatively infant industry as compared to agriculture deserves to be studied closely and its success will be dependent upon the following factors :-

- 1 Research and Extension of its results to user class
- 2 Education, Training and Extension Programmes :
The responsiveness of the recipients of technology can be quick if information on input use of improved technology is disseminated properly with anticipation of likely economic benefits.
- 3 Institutional Credit : Capital requirements generally being higher in respect of new technology need to be met by institutional arrangements.

4 Marketing Arrangements : Unless aquaproducts are sold efficiently producers have no incentive to adopt scientific techniques of production. Most of the demand promotion, marketing related facilities and services such as preservation, storage, processing and distributional channels. /the improvements can be achieved through

5 Input Supply Sub. Systems : These sub systems need to be geared to suit the requirements of producers. All visible constraints in input supply should be removed.

6 Legal Measures : Learning rights should have a development bias. Further, marketing legislation should regulate markets.

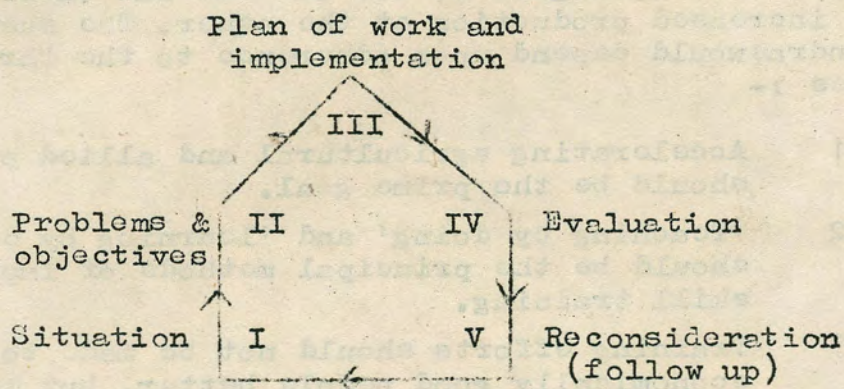
What is needed is an integrated plan for aquaculture development.

KRISHI VIGYAN KENDRA-AN IDEAL EXTENSION PROGRAMME FOR RURAL DEVELOPMENT

— A. Chattopadhyay,
Krishi Vigyan Kendra
Kakdwip

Extension is an informal education and its purpose is to change the attitudes and practices of the people with whom the work is done.

Extension is a continuous process designed to make the rural people aware of the problems and of indicating to them the way and means by which they can solve them.



Extension is a joint democratic enterprise between the farmers and the extension workers. Extension means transformation, diffusion of technical knowledge to the farmers. It is diffusion of technical knowledge from the research centre or from college to the actual farmers.

BASIC CONCEPTS OF KRISHI VIGYAN KENDRA

1. The Kendra will impart learning through work experience and hence will be concerned with technical literacy, the acquisition of which does not necessarily require as a precondition for the ability to read and write.

- 2 The Kendra will impart training to only those extension workers who are already employed or to the practising farmers and fishermen. In other words, the Kendra will cater to the needs of those who are already employed or those who wish to be self-employed.
- 3 There will be no uniform syllabus for a Kendra. The syllabus and programme of each Kendra will be tailored to the felt needs, natural resources and the potential for agricultural growth in that particular area.

BASIC PRINCIPLES OF K.V.K.

The above Kendras are the grass-root level vocational training institutions designed for bridging the gap between the available technologies at the one end and their application for increased production at the other. The success of these Kendras would depend upon adherence to the three basic principles :-

- 1 Accelerating agricultural and allied production should be the prime goal.
- 2 'Teaching by doing' and 'learning by doing' should be the principal methods of imparting skill training.
- 3 Training efforts should not be made to make economically good people better, but the poor ones good so as to raise the living condition of the poorest of the poor.

The main idea is to influence the production system with social justice by creating a favourable condition for the have nots. The Kendra, therefore, should select in each area such means of economic growth which are most likely to give major benefits to the weaker sections of the society.

MAIN OBJECTIVES OF K.V.K.

The Krishi Vigyan Kendra provides a strong training support for bringing about production breakthrough in agriculture and fishery. The main objectives of the Kendra are as follows :-

- 1 Planning and conducting survey of the operational area in order to prepare the resources inventory with special reference to identify the training needs of the farming community.
- 2 Planning and conducting production oriented, need-based short and long duration training courses both on the campus as well as in the villages for various target groups with priority on the weaker and the poor.
- 3 Developing and organising non-formal educational programmes by way of field days, farm visits, etc. as the follow-up information support to training courses.
- 4 Organising Farm Science Clubs, both in rural schools and in the villages in order to induce in younger generation a liking for and an interest for agricultural and allied sciences and for scientific farming through supervised projects.
- 5 Developing and maintaining the campus farms and demonstration units on scientific lines as the facilities for providing work experience to the trainees as also disseminating the latest technical know-how.
- 6 Providing practical training facilities of the Kendra to the teachers and the students of vocational agriculture of the higher secondary schools.
- 7 Imparting some general education to rural illiterates and school drop-outs in order to make them not only good farmers but also better citizens.
- 8 Providing added training facilities in the areas for home-making and nutrition education for rural community.
- 9 Gradually enlarging the training facilities to encompass other important areas such as home crafts, cottage industries etc. consistent to the requirements of the Integrated Rural Development in collaboration with concerned organisations.

- 10 Implementing all such schemes of the ICAR and other related organisations which intend to strengthen the training programmes of the Kendra.

These are relatively generalised institutional objectives of the Kendra. The specific objectives, nevertheless, may be many and varying depending upon the agro-eco-system of the area and the needs of the clients, the resources, available and the thrust required for increasing the economic status of the targeted groups.

Thus, each Kendra may develop its specific objectives geared to the immediate as well as long-term needs of the operational area. The objectives well thought-out and clearly stated should form a basis for internal as well as external performance evaluation.

LEADERSHIP OF RURAL AREAS

— N.C. Basu
C I C F R I
Barrackpore

In recent times leadership has assumed transcendental importance. Leadership is an universal phenomenon. Not only in human being but even among animals, birds, there are always some leaders and followers. The ability to get the mission accomplished through leadership abilities is a factor that is stressed in all types of human endeavours. Leadership can not be reduced to a simple little formula. Leadership is an extremely complex social phenomenon. Every society and organisation has always had and always will have leaders. Leadership is thus so universal and vital for the functioning of any human group and organization that it is necessary to have correct understanding and appreciation of functions and principles that under grid the concept of leadership.

A leader is the person who has the know-how required at a particular point in a group's development and who is in a position where he can use this know-how to help the group achieve the goals.

1 LEADERSHIP STYLES

There are three ideal type leadership styles. These ideal type help us to locate every leader.

1 Autocratic Leadership Styles

Practically all policies and procedures are determined by the leader. The activity steps should be communicated by the authority, one unit at a time, so that future steps are in the dark to a large degree. The leader should take considerable responsibility for assigning the activity tasks and companions of each group member. The dominator should keep his standards of praise and criticism to himself in evaluating individual and group activities. He should remain fairly aloof from active group participation except in demonstrating.

ii Democratic Leadership Style

Wherever possible, policies should be a matter of group decision and discussion will active encouragement and assistance by the leader. The leader should attempt to see that the activity perspective emerges during the discussion period with the general steps to the group goal becoming classified. Whenever technical advice is needed the leader should try to suggest two or more alternative procedures from which choice can be made by the group members. The division of responsibility should be left upto the group and everyone should be free to work with whenever ~~he~~ chooses. The leader should attempt to communicate in an objective, fact minded way for his praise and criticism of individual and group activities. He should try to be group member in spirit but not do much of works (so that comparison of group productivity can be made between groups).

iii Laissez-Faire Leadership Style

In this the leader should rather play a passive role in social participation and leave complete freedom for group or individual decisions in relation to activity and group procedure. The leader should make clear the various materials which are available and be sure it is understood that he will supply the information and help when asked. He should do a minimum of ~~taking~~ the initiative in making suggestions. He should make no attempts to evaluate negatively or positively the behaviour or production of the individuals or the group as a group, although he should remain friendly rather than keep himself aloof.

2 LEADERSHIP TRAITS AND SITUATIONAL APPROACHES

Typically the leader was seen to be someone possessed of unique traits. There is a degree of validity in the notion of the leaders as significant agents in human destiny, it produces an over emphasis on the traits of the leader at the expense of other factors in the situation, including followers and prevailing circumstances which shape the leaders action. The more contemporary functional view looks upon leadership within a situation as a property of the group rather than are individual attribute. The situational approach is oriented to the demands made on leaders for leadership function.

To summarize, the study of leadership requires attention to the leaders, followers and the situation in which they interact. Their process of interaction constitute leadership in the broad sense of an influence relationship in groups.

3 PRINCIPLES OF LEADERSHIP

There is a hardcore principles about leadership behaviour that must be understood and appreciated in order to be effective as leader.

- i Leadership behaviour may be learned, one need not have to be 'born on the purple' in order to be a leader'.
- ii Effective leadership in a group is not concentrated in one or a few persons but is wide spread throughout the group.
- iii Leadership is what an individual does while a member in the group.
- iv Leadership must be accepted by the members and members must recognize that he has the know-how.
- v A leader in one group will not necessarily be a leader in another group.
- vi A leader in a group under one set of circumstances may not be the leader of the same group in different situation.
- vii Leadership skills may be learned and improved upon by almost by any one.
- viii Leadership is more than having a pleasing personality, wearing right kind of clothes.

4 DIMENSIONS OF LEADERSHIP

A group has two major tasks :

- i To accomplish the purpose for which it exists.
- ii To maintain itself as good working group.

Leaders need to be sensitive to the needs of the group and not only to the task but also to keep the group as good working team.

Task oriented behaviours is termed as 'Initiating Structure' and group maintenance behaviour as 'Giving Consideration'.

A A leader high on 'Initiating Structure'

- i Emphasises quality and quantity of work.
- ii Defines and specifies the roles of workers.
- iii Suggests new approaches to the problems.
- iv Emphasises meeting dead lines.
- v Always first in getting things started.

B A leader high on 'Giving Consideration'

- i Finds time to listen to others.
- ii Is interested as others on persons.
- iii Appreciate the good works of others.
- iv Involve others in the process of decision making.

A successful leader is slightly above average on these dimensions.

5 LEADERSHIP AND EXTENSION WORK

Leadership may rightly be called the sheet - anchor of successful Extension Work. It is impossible to think of effective extension work without involvement of village leaders in planning, executing and evaluating village extension programme.

The task of Extension worker in this sphere is four fold :-

- i Understanding and appreciating the phenomenon of leadership.
- ii Identifying and locating village leadership.
- iiii Developing leadership in village people
- iv Understanding and making use of group-processes and group dynamics.

6 IDENTIFYING LOCAL LEADERS

The following five methods have been found to be useful and practical for this purpose.

- i Careful observation : Required intimately associated with village people over a sufficiently long period to locate the real leader and not to be misled by imposters and hypocrites.

- ii Discussion method : Group discussion will enable to find out a man who has got the real insight into the village problem and their solutions. It gives encouragement and assurance to potential leaders to express himself.
- iii Socio-metric method : This is a group measurement for revealing graphically the attraction and repulsion bonds between people. A thoughtout questions to be asked of a representative group and then tabulation of the responses to see where name appear for leadership. This method can also be used in identifying various cliques and factions operating in a community and then can help extension worker.
- iv Election method : The results of various democratic elections are by and large fairly good indicators of who are leaders in the village. This group should be helped to elect right persons for right job by clearly stating to the group the right position required as will kinds of job each person must be qualified to do.
- v Seniority and past experience : Age and experience are always given due consideration in our traditional society. The role of aged and experienced people in providing leaderships and legitimization can never be under emphasised. This guidance and help should always be utilized in Extension work.

It is thus identifying and locating real village leaders needs lot of time and patience. In order to locate the existing and potential leader we have to go to every caste and stratum. This is essential for the effective democratic involvement of all sections of the society in our development.

7 METHODS OF LEADERSHIP TRAINING

It has already been stated that these are two types of leadership available, those who are already in leadership position and those who have potentialities of leadership, but so far, did not get an opportunity to learn and exercise leadership qualities.

While arranging training we have to keep in mind both these categories. We have to improve upon the existing leadership through proper training and to develop leadership in those who have potential for same.

- i Observations.
- ii Reading.
- iii Talking and discussion.
- iv Field Trips.
- v Apprenticeship.
- vi Training camp.
- vii Giving responsibility

8 GROUP AND GROUP DYNAMICS

As stated earlier understanding and making use of group processes and group dynamics is an important task of the Extension Worker. There are three major dimensions of group :-

- i The individual member.
- ii The internal force of the group.
- iii The external force of the group.

Individual Members

A social group is a collection of two or more individuals in which there are psychological interactions and reciprocal roles based upon durable contacts, distinctive patterns of collective behaviours and structural organization of leadership and followership. Individuals bring to the group certain interests drives, motivations, perceptions, expectations attitudes and values. Man has certain motivation that move him to act. Four such motives are : security, response, recognition and new experience. He expresses these drives through a many socially accepted channels but group provide opportunities for satisfying these motives.

Classification of Groups

- i Primary Social Group : Primary Social Group are those in which there is intimate face to face interactions involvement of large portion of one's personality and a definite we feeling on the part of the members.
- ii Secondary Social Group : Secondary social group in which there is little intimacy and limited involvement of the individuals personality. They are relatively temporary, and involve less fact to face contact. These may be large amount of social distance among members.

- iii Formal and informal group : Those group which have a membership roll, possibly a constitution, bye-laws or some procedure for electing bearers.
- iv In group and out Group : This classification points out the importance of the attitude of members towards their own social group and toward other social groups.
- v Locality Group : Considers locality as one bond for holding groups.
- vi Involuntary Group : Considers bondage by birth
- vii Voluntary Group : Considers choice of the members to form a group.
- viii Delegate Group : Considers member representative of and chosen by groups.

Each member has what might call reference groups status. These influence the attitudes and thinking of the group members. A leadership function is to help members of a group analyse themselves objectively.

Internal forces

An understanding of several elements or parts which influence the group process is basic to group leadership.

- i Goals or objectives : Group goals definitely exert influence over group members and motivate them and direct their behaviour. The members who most fully set up goals and objectives of the group are most strongly motivated to have the group achieve its goals usually there is a closer relationship between understanding of goals and objectives and participation by its members.
- ii Means : These are methods which help the group attain its ends or objectives. After goals are decided upon, methods of reaching these goals must be considered.
- iii Norms : Every group establishes standards or norms, sometime called the 'rule of the game'. All groups have these norms or standards which apply to behaviour of people in a group. Norms do exert a powerful cohesive effect upon individuals. It is through norms that we have a feeling of solidarity as a direct result of the group process itself. A norm is really a product of inter - action in a group; a

norm, once established, increases the power of a group as a motivator and controller of the individual members.

Sanctions

The ordering of behaviour so that it will conform to the group's structure is carried out through certain acts which are called sanctions. These have the effect of the providing rewards or punishment.

Roles

Members of a group differ in the roles they play. Some roles are formally defined such as those President, Secretary etc. But actions of the members are not presented in written document. There are three major kinds of these informal roles in any group.

- i task roles (contribute to the purpose of group formation)
- ii maintenance roles (contribute to the maintain of group)
- iii non functional roles.

These roles are really leadership functions which may be preferred by any group member.

Power

This is a process whereby control is exerted over others. Power has two components :

- i Authority (to control the actions of other)
- ii Influence (to control over others by human relation skill, superior knowledge etc)

Communication

This is the process by which we convey or impart to other, ideas, belief and sentiments. Language is the Chief form of social interactions between human. Group are more productive which have a more production communication process.

Participation

The number of times people participate and the direction are important. Research has found that in many groups, participation in the form of speaking is concentrated among only a few members. How to spread participation so that all members take part is a constant concern of leaders. Participation by all group members seems to result in less resistance to change, low drop-out of members and greater satisfaction within the group.

Atmosphere

Group atmosphere or climate is the pervading mood, tone or feeling that exists in a group. The atmosphere may be of ~~four~~ suspicion, completion or on the other hand can be friendly or warm. The style of leadership used by the leader will determine to a great extent the type of atmosphere. In groups which have a warm, permissive, democratic atmosphere, there is a ~~greater~~ work motivation ~~and~~ ~~satisfaction~~. The resources of the group can be more adequately tapped. When all individuals feel free to contribute and discuss ideas as the group moves. At any rate to have all members share in leadership function is a worthy object.

10 IDENTIFICATION

This is a social psychological feeling towards a group which implies a common bond or sympathy. The individuals uses natural expression 'We'.

There seems to be greater identity when (1) Member are brought together because of an urgent problem. (2) They go through a crisis together, (3) They have a rewarding experience together, (4) The member feels the group activity relates to his personal goals, (5) The member feels he has influenced in what the group does.

External forces

There are outside forces which influence its operation. Group are influenced by the culture of that area in which they exist. The outside forces influence the decision made by the groups and how they accomplish their goals.

EXPANDING HORIZONS OF FISHERIES EXTENSION

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I. In the chapter on Rural Development, India's 7th Plan (1985-90) for the first time includes formation of informal groups. The summary (Economic times, 13.11.85) States: Cost effectiveness and minimisation of leakages should be the two guiding principles of implementation of anti-poverty programmes. For formulation also, there would be people's participation at grass-root level. And, in view of limited absorptive capacity of the poorest households, the Plan emphasises the need for taking up group oriented activities for beneficiaries to the extent possible through the promotion of informal groups etc. so that the economics of scale inherent especially in provision of services are fully realised while group initiative and efforts of the poor are promoted. Half the plan period is now over. Inadequate political will and absence of firm official guidelines have left these intentions only on paper. Meanwhile, the World Bank's India 1986 Report (Business standard : 24.6.86) States : the 7th Plan tacitly admits that India's bureaucracy has neither the answer to all questions, nor possesses the keys to future course of economic development, while India's extension services remain vulnerable to various pressures. The Report adds that much will depend on the initiatives of the more dynamic forces of the Society. Net result : We are just jogging with 3.5-4% annual growth. China provides a striking contrast. II. In Mao-era the production team, the lowest level farmer group with 30-40 families under each formed the basic infrastructure in its rural economy. Golbraith, visiting in 1973, eulogised the organisation. An FAO team in 1975, in its report entitled 'learning from China', found its basic features worth emulation. In post-Mao-era, the small group idea has been reinforced: (1) 72 items of unreasonable burden on the team have been cut out. (2) Teams have been made smaller in size (average 35 reduced to 31 households), but number increased (4.7 million in 1976 to 5.4 million in 1980). (3) As basic accounting units, teams increased in number and brigades and communes reduced. (4) Team retains its final accounting and distribution duties, but can contract work quotas to smaller specialised groups for larger jobs and to individual households for odds-and-ends jobs. (5) Teams permitted to diversify into promotion of various associations covering industry and commerce apart from agriculture. (Socialist Modernisation, Foreign Language Press,

Peking 1984). An October 1986 report in South China Morning Post says, in 1985 smaller size production cooperative of the rural poor were promoted in food processing, live stock and service trades and numbered 0.86 lakh with 6.9 lakh families. The average comes to 8 families per unit. The trend towards smaller groups continues. With such firm restructuring at the base level, it seems no wonder that 12% annual growth is assured. We had over emphasized class-struggle. Premier Zhao told G.K. Reddy of the Hindu in October, 1982.

- III. The Japanese miracle is well known. It is the world leader in productivity in action. The root of its strength lies in very good team work and group effort. (The Incredible Japanese: Rustomjee and Sapre, 1980 p.9). An individual's loyalty to his organisation is fanatic (p. 4), team size smaller (p. 121), bonuses are group bonuses (p. 106), and concept of democracy is not majority rule but consensus with harmony. (p. 132). World leader in cooperative, its success is accountable primarily to production being assigned virtually exclusively to small sized producers associations with participative direct democracy activities of the next higher tier i.e. Cooperative association is limited to marketing and solution of disputes. (Rustomjii p. 76, Fisheries Cooperative Association Law Art. 78). Result: higher bargaining power of producers (IPFC, Kyoto, p. 26). Absence of such scrupulous division of power in other countries largely account for failure of cooperatives there. I. V. S. Swaminathan in his 'National Food Security System' (1977) stated that yield demonstrations of improved varieties in farmers' field were 3 to 6 times the average yield. To improve productivity he mentioned three important policy requirements. He has repeated them in late 1986 (Development International, May-June 1987) and in talks in India in 1985 and 1986 : (1) A package of economically viable technologies to be demonstrated in farmers' fields. (2) A package of services to be made available to the farmers at their end , to bridge the present extension-cum-resource-cum-management gap. On the last gap, he stated that the level of management was crucial to efficient production. He divided management into two major groups. First, what the individual farmer can do to improve management by greater attention to non-monetary inputs. Second, what a group of farmers alone can accomplish. Citing examples, he stated that while under condition of large holdings prevalent in Western Europe and USA the need of group management did not exist social engineering leading to community endeavour was basic to improve efficiency of small farms in countries like India, a package of public policies like land reforms, water management consolidation, marketing etc. which can help farmer to utilise the new technology.

IVb. Item 2 constituted the extension agent's job. Promotion of group management was crucial. He mentioned the institution of Production Team of China as worth adaption.

Va. The West Bengal Fish Production Group Project 1980

Fish ponds in West Bengal suffer from a number of handicaps. They are multi-owned, multi-used and burdened with public easement rights. Poaching is also a problem. The World Bank Inland Fisheries Project 1979 envisaged participation also by groups and posed a challenge to the Administration. The Small Farmers Development manual 1978 (FAO, Bangkok) reached them in 1980 and provided primary inspiration for experimenting on formation of small production groups composed of co-owners and skilled fishermen. The Manual was a practical handbook on Production Groups in agriculture and allied sectors. It was based on the Chinese experience and several thousand field experiments held in eight non-socialist countries for three years 1973-76 on Small Farm Development. In at least two districts in West Bengal there was a tradition of community management of such multi-owned and multi-used ponds. Good village clubs were already their managers here and there. The Chinese experience also suggested that improvement of management with traditional inputs should precede injection of credit. (Later informations indicate that Benor of World Bank, Indo-Pacific Fishery Commission and Pre-Cooperative Project of the Phillipines support this order of things). Complementary schemes were framed to develop such Fish Production Groups/Clubs as :-

(1) a centre for demonstration and training in management and advanced technology

(2) a service agency - a source of quality inputs live or otherwise and quality services of nets and skilled manpower.

(3) an advance action programme to precede qualifying for World Bank Loan - a cluster of 10 ha of water area of small ponds to be raised in 2 years from 600 kg/ha to 1500 kg/ha through own resources, and matching, nursery and rearing units. The loan will raise output smoothly to 2.5 tons/ha and slippages and loan defaults guarded against through cluster approach.

Vb. Based on the ideas of the FAO manual about one thousand FPG's came up. The project was extended to coastal areas. The World Bank inspected a few in 1985 and was im-

pressed. Later reports seem to indicate that probably due to inadequate political will want or stoppage of supportive policy level decisions, FPG's are neglected and the Project languishes. Never the less, there are a number of success stories to form models for resumption.

VI. The spectrum of Fishery Extension has been expanding in recent years with introduction of institutional finance. But a final seal has been given on the widened limits of duties in 1980 at the Indo-Pacific Fishery Commission's 19th Symposium at Kupto (Japan). The subject matter of the Symposium was 'Development of Small Scale Fisheries'. Over 90% of fishery output came from small scale sector, and 90% were small fishermen. Fishery henceforth will mean Small Scale Fishery. The Symposium laid down that development of Small Scale Fishery needed a comprehensive, integrated approach. Not only technology but also management, socio-economic activities and participation of fishermen/fish farmers form integral parts of the subject and therefore, extension activities. A whole new world of priorities for action with backward and forward linkages have opened up. VII. New symbiotic relationships between Government extension agency and fish producers have to be forged. The first 30 pages of the symposium volume are the reports and recommendations. They overflow with ideas. I quote only two examples. Research, it says must no longer be limited to biologic matters but include the entire spectrum of socio_economic activities (p. 11). Extension services, it says, must help formation of producers' associations (p. 19).

... pages of relation among the