

Department Of Fisheries

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Ramna, Dhaka



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3.1 *Aquaculture Extension Sub-strategy.doc*

BACKGROUND

Policy Framework

The Aquaculture Extension Strategy (AES) is one of a number of sub-strategies currently being developed under the National Fisheries Policy. Others include HRD, Open Water and Marine.

The AES focuses on pond aquaculture, but also covers other forms of culture fisheries such as shrimp and the production of fish in cages and pens. It does not cover open water or artisanal fisheries, which also require extension services, as these will be the subject of further sub-strategies.

Ultimately there will be a set of **Strategies and Action Plans** that will direct the management of the department:

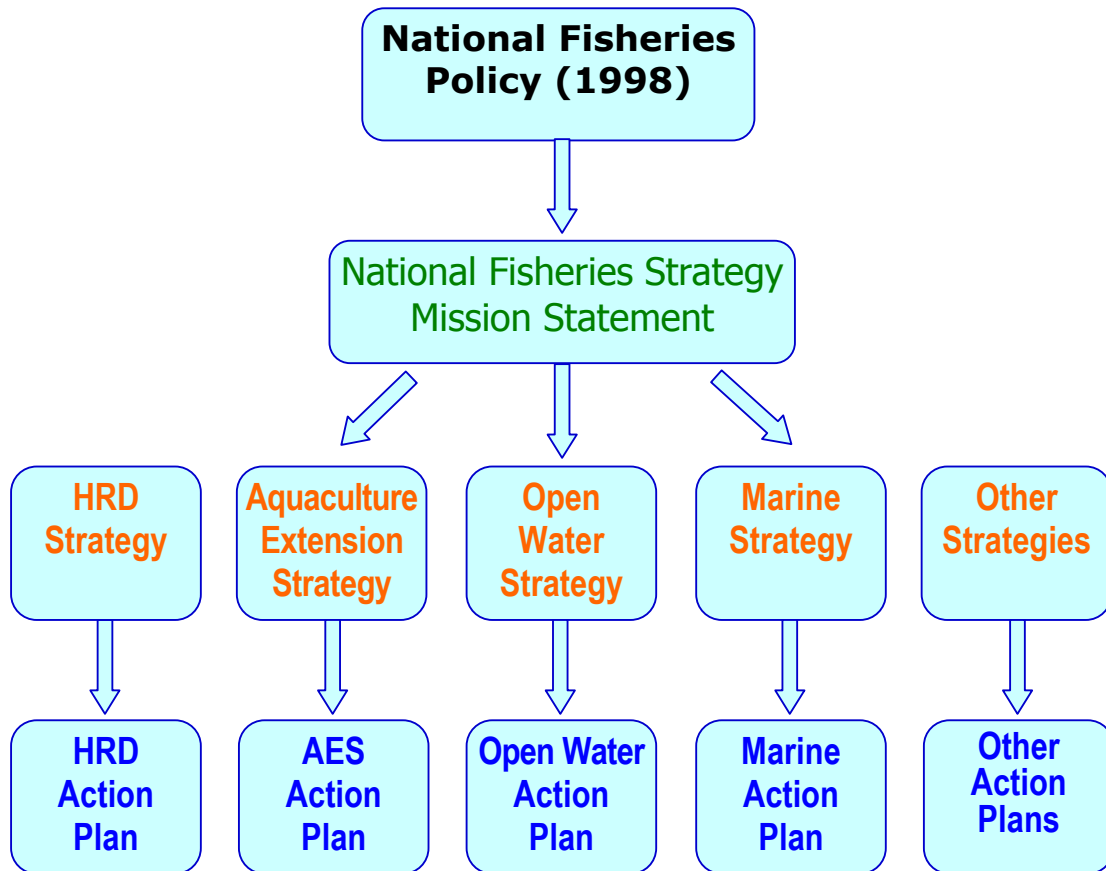


Figure 1: Policy Framework

Other Strategies and Action Plans will include Research and Development and Marketing and Quality Control

APPROACH

The approach to developing the AES was three-fold:

1. A review of the key documents that lay out the principles upon which the Government of Bangladesh and its cooperating partners are planning and implementing their development activities and the identification of those principles and objectives that relate to aquaculture extension.

2. An extensive consultative process involving all stakeholders in aquaculture extension to clarify the current problems and agree on means of overcoming these.

The stakeholders consulted, through workshops and discussions between October 2000 and February 2003, included:

- Farmers
- GoB funded DoF Project Directors
- GoB local government staff
- NGO staff
- DAE and project staff
- University lecturers
- BRDB

Many stakeholder workshops were conducted



A large number of farmers and community groups were consulted

- DoF staff at all levels
- Donor funded DoF aquaculture extension projects
- Private sector entrepreneurs
- Rural credit organisation staff
- Research professionals
- School teachers
- Youth Department

3. The summarising of the findings of 1 and 2 under seven agreed themes to provide an agreed Aquaculture Extension Strategy and the basis for the subsequent development of an Action Plan upon which the Department of Fisheries can develop its aquaculture extension activities in a rational manner.

DOCUMENTS PROVIDING GUIDING PRINCIPLES

The Government of Bangladesh and its cooperating partners are planning and implementing their development activities according to the principles laid out in a number of key documents, these include:

International Level	
	Millennium Development Goals
	FAO Code of Conduct for Responsible Fisheries (1995)
	The Rio Declaration and Agenda 21 (1992)
National Level	
	The Constitution of the Government of Bangladesh
	The 6th 5-Year Plan (Draft)
	The National Strategy for Economic Growth, Poverty Reduction and Social Development (Draft)
	Various Acts of Parliament defining pyramidal structure of local Govt.
Cross-Sectoral Level	
	Comprehensive Food Security Policy (Draft 2000)
	National Rural Development Policy (MoLGRD&C 2001)
	Environment Policy & Implementation Plan (MoEF 1992)
	The National Environmental Management Plan (1998)
	National Water Policy (MoWR 1999a)
	The Bangladesh Water and Flood Management Strategy (1995)
	The National Water Management Plan
	National Land Use Policy (MoL 2001)
	National Energy Policy (1996)
	National Women Development Policy (1997)
Sectoral Level	
	National Fisheries Policy (MoFL 1998)
	The Fisheries Sector and Future Developments Study (2003)
	National Agricultural Policy (MoA 1999)
	Livestock Development Policy (MoFL 1992)
	National Forestry Policy (MoEF 1994)
Sub-Sectoral Level	
	The Draft Aquaculture Extension Strategy (2003)
	The New Agricultural Extension Policy (1996)

STAKEHOLDER VIEWS

During extensive stakeholder consultations in the preparation of the AES, the key challenges facing today's extension service and the key requirements for developing an improved service were consistently identified as being:

Key Challenges

1. Project to Programme Approach

Much of the planning and implementation of extension has been through development projects. This has in many ways been necessitated through the funding mechanisms for the Department. However, the limited duration of the projects has led to a stop start sort of development.

The Projects have also had a range of objectives, which has led to difficulties for field staff (and farmers) who have had to contend with several different projects with different targets and objectives. This has meant that the project with the biggest resources has often received most attention. A new strategy is necessary so that a coordinated approach can be adopted with a common overall goal for all extension activities.

2. Top Down Approach to Bottom Up Approach

Government extension management has tended to be top down, despite the move in recent years both in Bangladesh and in many other countries, towards a more people-oriented, decentralised approach leading to planning and implementation that is much closer to the people and therefore more relevant to their needs. How best to identify the needs of the people and ensure that all of the community are involved has to be a main priority of the strategy. Recent new approaches have helped this to become achievable.

3. Sole Extension Provider to Multi-Extension Source

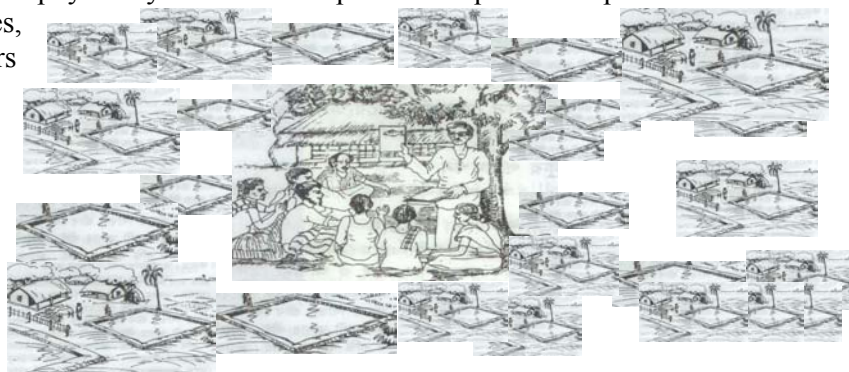
Historically the Government has been the main extension provider. However, DoF, with limited manpower, cannot physically reach all the potential aquaculture producers. As with many other countries, alternative providers

have started to share this responsibility.

Here these are the NGOs, private enterprises and local community members who exchange their information with

fellow farmers. The

Department of Fisheries has an important role to play in encouraging, co-coordinating and monitoring these initiatives.



Key Requirements for an Improved Service

1. A Systematic Approach

The AES encourages coordination and participation throughout the extension cycle in a systematic way:

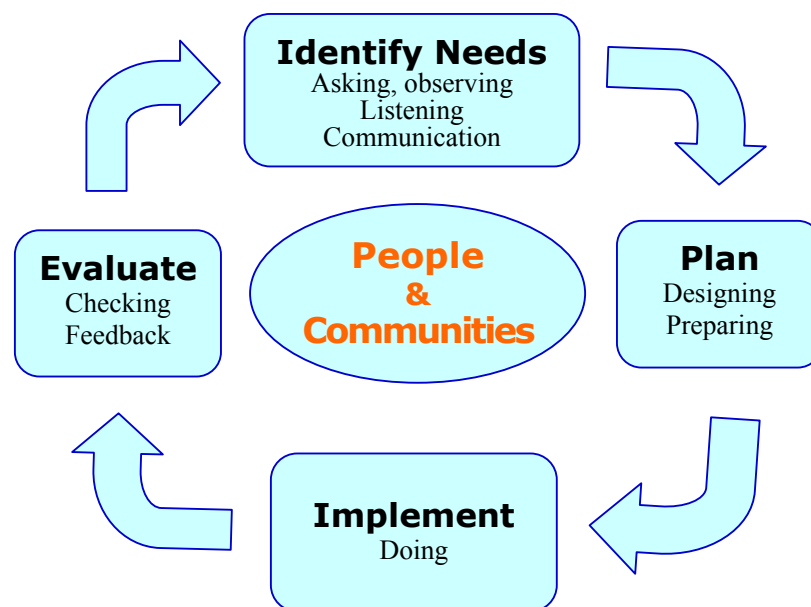


Figure 2: Extension Cycle

2. Coordination

There is an overwhelming desire among those working in the aquaculture sector to have better co-ordination and direction of extension activities at all levels. This Strategy for Aquaculture Extension is therefore essentially about people and how all providers can work together in a coordinated way to ensure that aquaculture in Bangladesh develops as an effective, sustainable livelihood option for all.

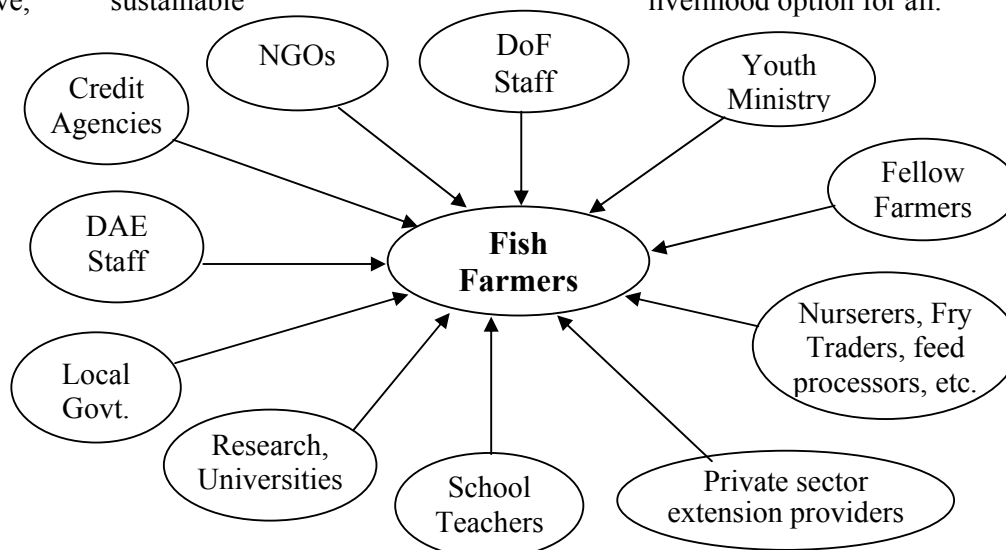


Figure 3: Extension Providers

3. Change in Attitude

For this new strategy to be implemented there has to be a change of attitude and practice within. This will involve:

i. Being People-Centred:

*“Extension is with the people
and for the people”*

Md. Shahidul Islam,
Deputy Director (Aquaculture)
Department of Fisheries
Bangladesh



Most who read and work with this document will agree with the above statement, but to put it into practice will require a significant attitude change within the Department of Fisheries and other relevant Government agencies. There is already a move towards change and this document encourages that move further.

ii. Responding to Need: Extension should be flexible and evolve in relation to target groups' needs and demands.

iii. Working with all categories of fish farmer: This strategy emphasises the need for extension workers to identify all categories of fish farmer and, more importantly, to work with them. This must include:

A poverty focus: Vulnerable groups and smaller pond owners need to be included in extension programmes related to aquaculture.

A gender focus: The role of the whole family in aquaculture must be acknowledged. Female members of households should be particularly encouraged to develop their skills in aquaculture techniques.

iv. Working together: For extension to succeed and to cover the numbers of potential farmers there needs to be an integrated approach by all service providers. This also require a greater cohesion and empathy between them, be they government, NGOs or the private sector.

v. Providing a Quality Service: Furthermore, we need to look at extension work in terms of its economic and environmental sustainability. Overall, the AES plans for the long term and offers the vision of a high quality service that, through the extension cycle, is continuously improving.

STRUCTURE OF THE AES

Objectives of the AES

The Aquaculture Extension Strategy (and Action Plan) have been developed within a hierarchy of objectives, with the objectives of the 1998 National Fisheries Policy as the *Development Goal* the objective statement for the AES as the *Purpose*, the objectives of the components of the AES as the *Outputs/Results* and the objectives of the Action Plan being the *Activities*.

Components of the AES

With people at the centre of the strategy, the AES shows how we can incorporate the other key issues identified by the stakeholders during the consultative process. The resulting seven components form the basis of the AES and the subsequent Action Plan:

- Peoples' Participation
- Extension Approaches
- Coordination, Collaboration and Linkages
- Decentralisation
- Environment
- Human Resource Development
- Monitoring and Evaluation

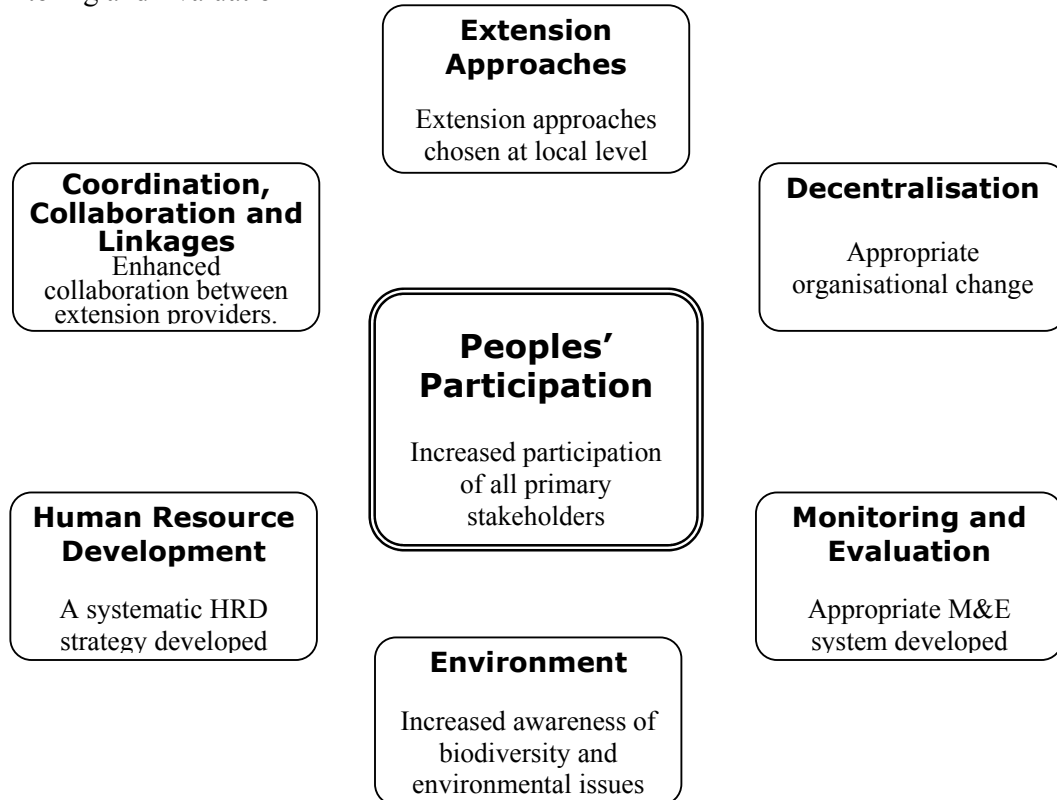


Figure 4: The AES concept with peoples' participation at the centre

AES OBJECTIVE STATEMENT

Objectives of the National Fisheries Policy (Development Goal)

1. *To enhance fisheries production and development*
2. *To alleviate poverty through creating self-employment and improvement of socio-economic conditions of fishers*
3. *To meet the demand for animal protein*
4. *To achieve economic growth and increased foreign currency earnings by exporting fish and fisheries products*
5. *To maintain an ecological balance, conserve biodiversity and improve public health*

Objectives of the Aquaculture Extension Strategy (Purpose)

The provision, by the Department of Fisheries and partners, of an efficient, effective need based extension service to all categories of farmers to enable them to increase aquaculture production to an optimum sustainable level by using appropriate aquatic resources.



PEOPLES' PARTICIPATION

Objective: Increased participation of all primary stakeholders (farmers and communities) so that they move from being passive beneficiaries of the various service providers to clients who are actively involved at every stage of the extension cycle.

Peoples' Participation relies on **communication** between the people/communities (who must be able to express their **needs**) and the range of service providers (who should respond to these). However, at the same time, **national needs** cannot be ignored and it is an important role of Government agencies to reconcile these two sets of priorities.

Peoples' Participation contributes to the whole process of extension and development. Full participation will encourage ownership of the process and subsequently improve the chances of appropriate delivery of extension services and the successful adoption of improved practices. All categories of people (stakeholders) are included ensuring that the extreme poor and disadvantaged groups also benefit.

The objectives of peoples' participation in extension are to:

- Ensure demand driven extension,
- Create an environment where the people can be empowered to voice their needs,
- Improve co-operation and co-ordination among community members,
- Develop mutual trust and accountability between farmers and service providers,
- Improve cost-effectiveness,
- Gain farmer participation in extension activities,
- Utilise indigenous knowledge,
- Reduce poverty,
- Mainstream gender,
- Improve livelihood status,
- Improve knowledge, skills and attitudes of producers and service providers,
- Strengthen the institutional frame work of extension,
- Enhance GO-NGO-Producer linkages,
- Establish integrated extension approaches.

Activities at different levels

Peoples' Participation is fundamental to all stages of the extension cycle:



Design level:

- The needs of farm households, in particular key problems they face in fish farming and homestead activities, should generally be the starting point for extension planning. Resultant extension messages and activities should be based on needs, problem and potentials identified at farm level. Some however must reflect national needs.
- The use of PRA techniques at the design level should be promoted to ensure effective participation of moderately and extreme poor people in project planning and implementation. (FGD, Physical maps, Social maps, Transects, Wealth ranking, Venn diagrams, Seasonal diagrams, Matrix ranking and scoring, Problem census).



Planning level:

- The needs of communities should be articulated in the local plan through support from local CBOs and officers from local government and line ministries.
- Partnership meetings should be organised on a regular basis at Upazila level between the related departments and service providers for better planning and co-ordination of extension activities.
- Inter agency linkages should be strengthened through effective co-ordination committees which have representatives of the farming community as active participants.

Implementation level:

- There should be a clear understanding of every body's role in extension activities. This includes the roles of different service providers and, within government, a review and redefinition of job descriptions and a move to integrate projects into a coherent programme.
- There should be a move to ensure group formation involves the poorest sections of the community to enhance equity issues.
- Full involvement of women should also be encouraged to enhance gender equity.
- Training of field level extension staff and farmers should be needs-based.
- Follow-up, evaluation and further planning should be co-ordinated at all levels.



How to develop peoples' participation in extension activities

- By empowering producers, communities and CBOs.
- By rapport building.
- By increasing awareness.
- By participatory approaches (PRA).
- By needs-based extension planning.
- By appropriate staff training and follow-up.
- By ensuring that indigenous knowledge is utilised.
- By involving producers in the evaluation of extension activities.

Poverty and Gender

Key to the principle of Peoples' Participation is an emphasis on poverty and gender issues. This reflects objectives of the National Fisheries Policy and other key Government policies and plans for government intervention such as the draft National Strategy for Economic Growth, Poverty Reduction and Social Development.

Poverty

Poverty Reduction is a national priority. Currently however, extension often bypasses the poorest as they don't have sufficient resources to adopt the best technical practices. They are also less able to take risks, as a small loss can be crucial to their livelihoods. Therefore approaches and messages that are more appropriate to their circumstances must be developed. Recent research into ways of reaching this segment of the population show that significant results can be achieved if the right approach is used.



Gender

The role of women in aquaculture is often



portrayed as one where men make the decisions and the women's involvement is limited to feeding the fish. This has however been challenged and instances where women are involved in the decision-making or are in charge of the ponds are becoming increasingly common. Extension therefore needs to recognise their varied roles and be aware not only of structures and attitudes that limit their participation but also opportunities to ensure they form a significant element of the client base. Appropriate approaches must be employed to encourage women's participation in aquaculture. This may include target groups only of women and packages of topics that are relevant to their needs.

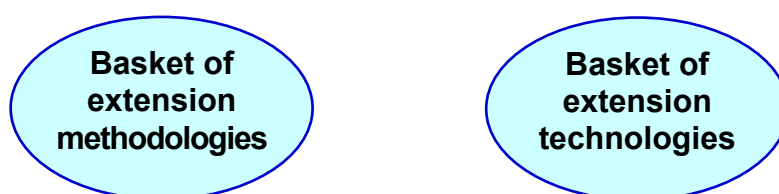


EXTENSION APPROACHES

Objective: Extension methodologies and technologies planned, coordinated and implemented at local level to ensure appropriate services are delivered according to the needs of farmers and the resources available in the locality.

A variety of approaches will be used in the country based on local conditions (technical and social) and available resources. Extension workers need to be familiar with a range of techniques for extension from individual to group approaches and have a clear idea about the power of mass media in extension campaigns. In the case of new technologies, demonstration areas will be set up at farmer's levels and those involved given extension training in ways of disseminating the message learnt. Extension approaches will be chosen by the Upazila and District teams to ensure appropriate methods are practised according to the needs of clients and the resources available in the locality.

“There is not one right method for extension, each must be appropriate for its own objectives”



Clients and extension agents will choose from the baskets what is most appropriate to their circumstances.

Key Principles:

Several key principles will be adopted to ensure that extension is effective:

- **Awareness Raising:** Farmers cannot demand what they are not aware of. A key element of extension provision is first raising awareness amongst potential clients in an effective way and with careful management of their expectations.
- **Facilitation:** Established group dynamics and group management/motivation “norms” should be adopted to increase the motivation of farmers and the adoption/practice of advice.
- **Training:** Adult learning and internationally accepted training “norms” should be adopted to ensure effective transfer and adoption of information.
- **Management:** Effective management of extension through the “extension planning cycle” will ensure smooth running, effective management, monitoring and evaluation and continual improvement of the extension process. A decentralisation of the extension management functions will ensure local relevance of the process.
- **All Categories:** All categories of farmers should be served by the department. This will involve addressing specific production system and regional needs and tackling gender and poverty issues. The use of livelihoods approaches will facilitate this process.
- **Client and Beneficiary:** Approaches must acknowledge that Government field staffs are working with a range of producers from those who are highly commercial to those that

are landless poor. At one end of this range field staff will be providing primarily technical services (possibly on a cost-sharing or fee-for-service basis) with the producers as **clients**, at the other end they will be providing primarily social development services with the producers as **beneficiaries**.

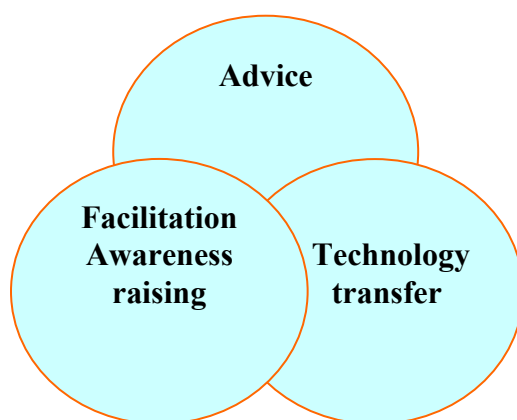
- **Stakeholder Participation:** Stakeholders must be fully involved in planning, decision making, and monitoring and evaluating of all activities.

Key Elements of DoF Extension Approaches

Framework:

The “extension cycle” is used as a framework for extension management. The focus is on planning, implementation and monitoring carried out at Upazila level to include elements of awareness raising, direct delivery and working with partners.

Extension is a balance between:



Extension is carried out by, with or through a variety of agencies and partners:

- Department of Fisheries staff (S/UFO, AFO, FA),
- Local or village level, for example the local extension agent for fisheries (LEAF), IPM farmers.
- NGOs (local, national and international),
- Department of Agricultural Extension staff, Dept of Livestock Services and other local government agencies,
- Research organisations and universities,
- Private sector extension providers.

There will also be the other (secondary) extension agents:

- Input suppliers, fry traders and nursery men,
- Local small NGOs, school teachers, *kishori*, PTI instructors, TTC instructors, CBOs, LEAF Clubs, Ansar and VDP, religious committees, Youth Development Training Cell.

The DoF should support, co-ordinate and monitor all aquaculture extension activities:

The DoF can support other extension providers with technical advice and staff training. In addition, the Department should co-ordinate and monitor the activities of these various agencies to ensure optimal use of their various attributes and geographic coverage and the quality of their provision.

Funding arrangement will be rationalised:

A strengthened Extension Cell will not only co-ordinate extension approaches and technologies, but also rationalise funding of extension activities. This will include moving away from project-by-project funding arrangements for development activities and allowances to a co-ordinated programme approach. A range of possible funding mechanisms will have to be explored, including the Upazila ADP and the Upazila fisheries office travel allowance budget head.

The strategy will lead to an extension service that moves away from the current approaches which tend to have:

- Technology led solutions, little or no needs assessment carried out.
- Training according to Project Documentation.
- Top down management, instruction given to Upazilas by projects.
- Top down materials and approaches, project directed.
- “ad hoc” planning according to various project proformas. Little or no co-ordination amongst projects. Poor use of resources.
- Multiple M+E systems according to projects. Information not standardized so it is difficult for senior management to know what is going on.
- Little revenue funding for development activities.



COORDINATION, COLLABORATION AND LINKAGES

Objective: Enhanced coordination of and collaboration/linkages with the different service providers involved in providing extension in the field in order to improve the quality and coverage of service delivery.

The vast range of activities in the fisheries sector means that there are many different institutions and agencies involved. All of these have a role to play and their activity should be encouraged, however these activities should be co-ordinated so as to ensure that their specific role is known and overlap of responsibilities is avoided. Some of this is done informally, however in some instances a more formal arrangement may be required through a Memorandum of Understanding between the two parties. The AES encourages the formation of partnerships and linkages to make the best use of all institutions supporting extension in the field either directly or indirectly through the provision of information.

With peoples’ participation and decentralisation being central to the AES, local government will have a key role in coordinating field level extension activities. While they are not themselves a field extension service, it is their legal responsibility to co-ordinate, plan and implement local development and Union Parishads have a specific standing committee on “Fisheries and Livestock”.

Potential Collaborating Partners and Linkages

Research and Education	Bangladesh Fisheries Research Institute, BARC, International Institutes, Universities, NGOs , In-Service Training Institutes, Primary and Secondary schools (particularly in rural areas), Youth Development Ministry Rural Training Centres,
Extension and Community Mobilisation	NGOs, Faith organisations, Local Government organisations, especially the UDCC, Private extension providers (e.g. farmers), Community based organisations, Private entrepreneurs and farmers.
Supplies and Marketing	Hatchery and nursery operators, Vendors, Marketers, Feed mills, processors, fry traders.
Legal Support	Deputy Commissioners, Upazila Nirbahi Officers, Union Parishads, NGOs.
Departmental and Ministerial Policy and Planning	DAE, DLS, SWD, NGO Bureau, MoL, MoE&F, MoWR (BWDB), LGED, BRDB etc.

Future Guidelines:

- Inter-ministerial and inter-departmental coordination and linkages should be developed and strengthened at all levels from the ministerial levels through to Union Parishad.
- It should be recognised that collaboration is necessary to reach the large number of producers with the limited number of field staff available and that a significant amount of such collaboration is already taking place.
- Collaboration between public, NGO and private sector service providers should be increased to ensure the optimal utilisation of all available resources with quality control safeguards in place.
- The DoF should encourage linkages and further develop relations with Universities and Research bodies and demand-led research should be encouraged.
- The DoF should engage in the debate on changing school curricula. (Where Agriculture/aquaculture are no longer compulsory subjects in the secondary curriculum).
- The Government, NGO and private sector roles in aquaculture extension should be defined and developed.
- The establishment of CBOs should be encouraged and these then linked to financing and extension.
- Stronger links should be established between policy planners, field workers and users of extension services.
- GoB and Cooperating Partner inputs should be linked to promote a programme approach to extension providing a long term and coherent commitment to development of the sector.
- Successful joint-ventures should be publicised through DoF notice boards, circulars and newsletters.
- A resource list of extension materials should be developed and distributed to all District/Upazila extension personnel.
- Assessment of skills and techniques of partners should be introduced to encourage Upazila, District, Division and HQ staff to build linkages and partnerships in their working communities.

Case Study: The Department of Agricultural Extension Education, Bangladesh Agricultural University:

The current focus is towards a better understanding of practical extension techniques by graduates, who study the theory and practice of rural extension for one year. This period includes a one week field trip to analyse Upazila administration and the roles of GO/NGO extension staff. In addition the curriculum has become more flexible in recent times given the need for greater understanding of social issues such as gender, poverty, rural youth and sustainable livelihoods.

The vision of this Department is one of increased practical understanding of the issues surrounding extension and to this end a Memorandum of Understanding is being developed between Government Departments and NGOs and the Extension Education Department at BAU. This will create a mechanism for ensuring practical Upazila level extension and social issues are explored on the graduate courses.

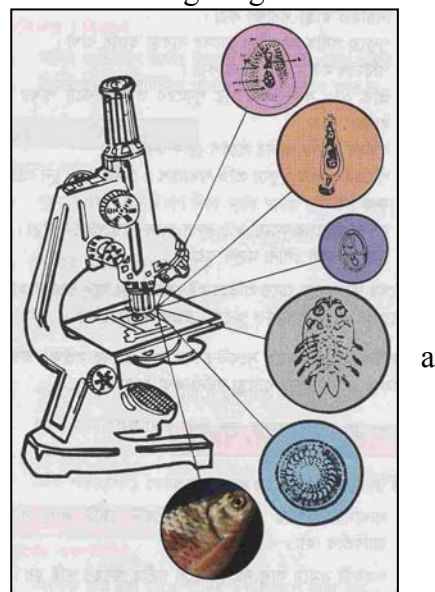
Links with Research and Education

Research: Extension Links

The provision of information derived from targeted and meaningful research is essential for extension if technical problems are to be solved and new technologies generated. The links between research and extension need to be strengthened so that research undertaken is based on the actual needs and problems faced in the field.

The field testing and evaluation of research results must also be done in closer collaboration with field staff and farmers to ensure that the results are relevant to their needs.

A means of achieving this may be the establishment of research trust fund by the DoF, which is used to fund contracts for research into problems that have been identified from the field and ideally by farmers working together with Upazila field staff.



Education: Extension Links

The information and skill needs of the extension providers are constantly changing. Initially extension was technology driven and so technical training was seen as the priority.



Now this is balanced by the need for training in social skills such as PRA, group formation and promoting local participation. The curriculum therefore has to be constantly updated to reflect current needs. This can only be possible by developing a strong link between the education establishments and the extension providers.

A principle role for DoF in the future is likely to be as a secondary trainer of field staff of the NGOs and other field trainers. Links should be established to both local and international education institutions to ensure that the field staff are up-to-date with current information to pass on during this training.

Research: Education Links

There is also a need to ensure that there is a strong link between the Universities and Research Institutions, to ensure that the most up to date information is being taught.

DECENTRALISATION

Objective: Organisational change within the Department of Fisheries allowing decentralisation of planning, implementation and monitoring

of extension activities to ensure a needs-based service to primary stakeholders (farmers and communities).

Decentralisation is the devolution of responsibilities, authority and resources (including funding and personnel) from headquarters to District and Upazila levels. The rationale for such initiatives is that it is desirable to move the level of decision making closer to those most directly affected by the programmes and services planned and implemented by the government. It should also increase the confidence and motivation and therefore effectiveness of field staff through increased involvement in all stages of the extension cycle

There must be active commitment to reform within DoF, in order to meet the challenges of the AES which includes the need for further decentralisation of planning, budgeting and implementation of activities to ensure a better service for all its clients. Planning and implementation should be focused at the Upazila level using bottom-up, participatory approaches (and not an amalgamation of project plans into a national plan which often does not answer clients needs).

Decentralisation does not imply that the Upazila can determine its activities at will; these must still be within guidelines and approaches set by the department. The Upazila will, however, be seen as the pivot for extension service delivery while Districts, Divisions and Headquarters will focus more on monitoring and supervision.

Guidelines for the implementation of a decentralised extension service:

Administration: Senior officials at each level (Upazila, District, Division and Headquarters) should be responsible for the management of their team members at that level. Administrative power needs to be adjusted based on the needs at each level of authority. Subsequently, Terms of Reference will change for most of the roles at Upazila, District and Divisional levels within the organisation. This will require:

- Agreement for the redefinition of roles and responsibilities of the departmental and its staff.
- Restructuring of the Department to provide more coherent management and support of field staff. The role of the Extension Cell will be crucial.

Finance: Without sufficient recurrent funds and the ability to use them effectively at the lower levels of the organisation, the objectives of the AES cannot be achieved. However, there will still be a requirement for some degree of centralisation of funds. Therefore, it will be necessary to:

- Investigate channels for the decentralised funding of extension, eg, achieving increased revenue funding of line ministries at Upazila level or contributing to Upazila Annual Development Programme funds.
- Establish a mechanism to co-ordinate the distribution, utilisation and monitoring of funds.

Planning and implementation: To establish a “bottom up” planning and implementation system it will be necessary to:

- Promote the organisation of the local community organisations to strengthen their ability to influence local planning through expressing their needs.

- Assess the resources available within the target area.
- Increase the ability of local communities to demand “quality” services.
- Respond better to local needs of the community expressed through local CBOs and local Parishads (Upazila, Union, and Village).
- Establish a mechanism whereby community needs can be heard and incorporated into a development programme according to local priorities (local forum e.g. revised UAECC, improved problem census exercises).
- Establish the authority and the capacity of staff to plan and implement a devolved programme.
- Involve UNOs throughout the planning phase at the Upazila level.
- Strengthen and establish co-ordination of all local service providers, particularly at Upazila level.
- Establish linkages with other decentralised institutions.
- Create more ownership by the local community of extension activities through linkages with, for example, the Village Parishad.
- Train field staff in participatory planning and community facilitation.
- Improve coverage of extension services by establishing partnerships with secondary extension providers.
- Facilitate experimentation and innovation leading to the dissemination of better and locally developed or adapted practices.
- Establish a monitoring system to ensure quality and accountability to both the client and the department.
- Formalise a Management Information System for monitoring of field activities.



PRA for participatory planning



Needs based training in the field

HUMAN RESOURCE DEVELOPMENT

Objective: A systematic Human Resource Development strategy developed and implemented so that the staff of the Department of Fisheries and its partners are able to meet the challenges of implementing the AES.

The best resource the DoF has is its staff, however, the implementation of the AES will change the roles of all DoF staff. They will thus require training to give them the knowledge, skills and attitude necessary to take on the new approaches and demands placed on them. The roles of the Upazila staff will be changed most fundamentally as they are given responsibility for planning, co-ordination and implementation, but the roles of the middle level and senior managers will also change as they become responsible for coordinating and monitoring the activities of their field staff and formulating policies and strategies to support them.

No matter how well-trained DoF staff are, there will never be enough of these to provide aquaculture extension and training to all producers across the country. Their partners in extension must also be trained so that they can assist in this process. This task will fall both on the academic institutions that provide primary training and from where it is hoped many of the secondary extension staff will come and on the Department of Fisheries which already has extensive experience and a core of excellent trainers.

Human Resource Management and Human Resource Development:

It is important to make the distinction between these two terms:

Human Resource Management (HRM) is an approach to management that recognises the value of employees as the principle resource through which the objectives of an organisation will be achieved. This involves the development and change of organisational structures and systems so, in this context, is a function of inter-ministerial civil services agencies and wider public sector reform processes.

This is beyond the scope of this sub-sectoral strategy, but includes a number of issues that will affect the implementation of the AES, including:

- Appropriate staff selection and recruitment procedures.
- Control of the placement and movement of staff so that specific skills are not lost through inappropriate transfers.
- Basing promotions on merit and not on length of service.

Human Resource Development (HRD) is a part of HRM and focuses on the development of the knowledge, attitudes and skills of the workforce through organisational and individual learning and career management. This is a vital component of the implementation of the AES.

The HRD strategy for aquaculture extension must:

1. Take a systematic approach to training management:

- Identify and clearly define the technical, social, management and organisational skills required by the DoF for it to achieve its goal as the basis for a HRD plan.
- Define and set clear job descriptions for all levels of extension staff to create a better understanding of their duties and responsibilities. The organisational goal and vision must be reflected in these job descriptions.
- Regularly assess job performance according to the job descriptions through interview, questionnaires and performance appraisal. Identify “training gaps”. Prioritise staff training needs on the basis of identified ‘Gaps’ as well as the trainee population.
- Define interventions/courses: A comprehensive training proposal including contents should be prepared by the assigned person on the basis of prioritised needs for the extension staff and extension partners (Training will not always be through formal courses. In some instances other methods, such as distance learning or attachments, may be more appropriate).
- In line with the AES, training will be given in facilitating local planning to run a decentralised extension service that works in partnership with other service providers. It should also stress the importance of listening, observing and seeking out the farmers’ real development needs. However, development of the systems and skills necessary to manage such a service should not be overlooked.
- Identify funding: Ideally a strengthened Training Wing would move away from project-by-project funding arrangements for training activities and allowances to a coordinated programme approach. A range of possible funding mechanisms will have to be explored.
- Monitor and evaluate all interventions/courses: The success of any intervention depends on a proper monitoring and evaluation system, this includes training.
- Review and adjust the interventions/courses on the basis of evaluation.

2. Address training management issues, including:

- The introduction of performance appraisal.
- The introduction of a reward and recognition scheme.
- Clear definition of the roles of Training Wing and Training Centres.
- The establishment of a training management strategy.
- The definition of a needs assessment methodology.
- Achieving full compliance by all training providers, including projects, sections and external agencies.

ENVIRONMENT

Objective: Increased awareness amongst all stakeholders of both the impact that aquaculture can have on biodiversity/the environment and the impact the environment can have on aquaculture so that they can participate in the identification and mitigation of adverse effects.

Aquaculture/Environment Interactions

Impact of aquaculture on the environment

- Loss of biodiversity through careless brood fish collection, breeding and escape into the wider aquatic environment and through less emphasis on the culture of indigenous species including small indigenous species (SIS).
- Introduction of exotics and genetically modified species which may escape during floods, damage to ponds or through other means.
- Destruction of the environment during the construction of aquaculture facilities.
- Spread of disease from intensively farmed fish or shrimp.
- Eutrophication of water.

Impact of the environment on aquaculture

- Loss of habitat through siltation.
- Loss of production through pollution from industry or agricultural chemicals.
- Shortage of clean water (or brackish water for *bagda*) due to drought or water management practices.
- Excess rainfall leading to flooding or dilution of brackish water for *bagda*.

Major factors affecting environmental impact of aquaculture

- The type of aquaculture system.
- The degree of intensification.
- Species and strains/varieties characteristics.
- Location and site factors.
- Operational and farm management practices.

Approaches

Information Needs

There is a need to gather quantitative information on the two-way impacts, based on optimal use of natural resources for aquaculture, to develop effective planning and management methods, including cost-benefit analysis in the broad sense that considers social and environmental, as well as financial, aspects.

Information should be collected and collated for:

- Policy makers.
- Researchers.
- Local level planners.
- Private sector entrepreneurs.
- Extension workers.
- Farmers.

Legal aspects

The conservation of the environment is theoretically enforced through many laws and policies, however many people in the rural areas are unaware of them. As part of the extension strategy the public should be made aware of these to ensure that the aquaculture does not adversely affect the environment or if it is adversely affected what rights producers have. Issues include:

- Aquaculture development is intrinsically dependant on water quality and quantity.
- A balance needs to be found between the continuation of existing pond/farm activities and the conservation of existing natural resources.
- There are often issues over water availability for various uses.
- Aquaculture involves production from both private and public resources.
- Concerns about the necessity of producing fish and fishery products suitable for consumption in the domestic and foreign market.

Awareness

It is felt that the level and extent of awareness among farmers, related entrepreneurs, extension personnel, researchers and policymakers about environmental impacts need to be substantially raised in order to ensure sustainable aquaculture development. Awareness should be raised about:

- The environmental interaction between natural resources and aquaculture technologies and management systems.
- Monitoring and evaluation of environmental impacts.
- Maintaining product quality.
- Maintaining production sustainability, i.e. interrelationships between production technology, social and economic aspects and environmental aspects.

Policy Background

The National Fisheries Policy (1998) states that: ‘Fish production has declined due to environmental imbalances. Adverse environmental impacts can be expected due to improper implementation of fish culture and management practices. The following policies will be taken in this regard:

- Shrimp and fish culture will not be expanded to the areas which damage mangrove forests in the coastal region,
- Biodiversity will be maintained in all natural water bodies and in marine environment,
- Chemicals harmful to the environment will not be used in fish/shrimp farms,
- Environment-friendly fish-shrimp culture method/technology will be used,
- Control measures will be taken against activities that have a negative impact on fisheries resources and vice-versa,
- Laws will be formulated to ban the disposal of any untreated industrial effluents into water bodies.’

The AES also draws upon other sources for guiding principles for the conservation of biodiversity and the promotion of environmentally sustainable aquaculture. These shall include, but not be limited to, the FAO Code of Conduct for Responsible Fisheries (Aquaculture Development) (1995) and The Convention on Biological Diversity (1992), both of which have already been ratified by the Government of Bangladesh.

The principle of environmental sustainability shall also be pursued through working in close partnership with other agencies and stakeholders including relevant Government Ministries and Departments, Academics and Educational Institutions, NGOs, public and private sector organisations and the international community.

Small Indigenous fish Species (SIS)

Over 15% of the 260 freshwater fish species in Bangladesh are small indigenous species suitable for polyculture ponds. Over the past decade there has been a gradual change in aquaculture management practices from the removal of such species, by poisoning ponds prior to stocking carp, to their active promotion in the aquaculture systems.

SIS are typically eaten whole thereby providing a rich source of animal protein, essential fatty acids, vitamins, minerals and trace elements. In addition, during the food insecure monsoon months the poorest section of the community usually has access to seasonally fallow wetlands where SIS can be caught.

However, SIS are very sensitive to environmental change or degradation and depend on the connectivity between their dry season sanctuaries and wet season breeding areas. Rapidly increasing prices of these species reflect lower availability due mainly to the habitat destruction and resultant reduced availability of SIS in the river and floodplain systems of Bangladesh, but also due to the use of pesticides in rice fields (25% of which are seasonally flooded).

The more widespread adoption of IPM technology by marginal farmers will have multiple benefits and increased incomes from the typical integrated agriculture production systems as pesticide use is reduced by 80% and SIS are an additional crop. Further, the promotion of SIS friendly aquaculture will help maintain breeding stocks of these important species.

PLANNING, MONITORING AND EVALUATION

Objective: *The establishment of a monitoring and evaluation system involving participation of all stakeholders to ensure the quality of the service, a targeted output and learning from experience.*

As responsibility for planning and implementation is decentralised to the field level, it will be important to establish a good Monitoring and Evaluation (M&E) system to ensure the “Quality” of the service and a targeted output. The responsibility for this becomes one of the main tasks for the middle and senior managers of DoF. However, through participatory evaluation the local community will also become involved in ensuring that the services are achieving the goals established under the objective statement for the AES.

The Objectives of a Monitoring and Evaluation System

As an integral part of the AES, M&E involves the combination of a set of interrelated activities that provide a system capable of providing important information in three broad areas:

Process: Ensuring that activities are carried out according to a needs-based plan (e.g. target focus, extension approaches, training and human resource development).

Performance: Ensuring that strategy targets are realised and quality of work is assured.

Impact: Ensuring that the livelihoods of target groups and beneficiaries have improved as a result of the programme interventions in a sustainable, socially acceptable and environmentally friendly way.

The Purposes of Monitoring and Evaluation

Monitoring and evaluation have inter-related but distinct functions:

Monitoring is an integral part of daily management. It is an on-going, largely routine process. The primary role of monitoring is to provide information by which management can identify and solve implementation problems and assess progress in relation to what is planned. Monitoring information is collected, recorded, reported and analysed at different levels to track the procurement, delivery and use of inputs as well as the progress of activities and achievement of planned outputs.

Evaluation provides periodic assessments of the relevance, performance, efficiency, effectiveness, sustainability and impact of the strategy in the context of its stated objectives and planned outcomes. Evaluation is divided into two components 1) Programme (delivery and effectiveness of the strategy) and 2) Impact (e.g. change in livelihoods of project beneficiaries or increased production). Evaluation information is used to identify necessary modifications to the strategy and provide analytical inputs into the decision making process to improve future direction.

The stated objective of the AES is to provide an efficient, effective need based extension service to all categories of farmers to enable them to increase aquaculture production to an optimum sustainable level by using appropriate aquatic resources. **The extension cycle** provides a framework for M&E at different stages identified as needs assessment, planning, implementation and evaluation (See figure 2), that should result in progressively increasing quality of service provision.

The Essential Elements of an M&E System

The development of a successful M&E system requires answers to the following questions:

Why monitor and evaluate

Determine who the end users of the data and information are and specify their information needs and frequency. Use stakeholder analysis in this process and ensure that planners', implementers' and farmer' needs are addressed.

What to monitor and evaluate

Determine activities required to implement the strategy and identify expected outputs and outcomes.

How to monitor and evaluate

Determine what tools will be used. These will include appropriate indicators, methods and techniques (Participatory M&E, PRA, focus group discussions, interviews, workshops, surveys, and meetings) and data recording tools (questionnaires, forms, records, logbooks, minutes and registers).

Where to monitor and evaluate

Decide at what level different M&E activities are required: farmer, Upazila, District, Division, HQ.

When to monitor and evaluate

Determine the frequency of monitoring, recording and reporting for different activities and the timing of baseline and impact assessment studies and other evaluation work.

Who will implement the Monitoring and Evaluation system

Determine the number of officers required to implement the M&E plan and with what resources. Determine what training is required, for whom, with what resources and when.

Prerequisites for a successful M&E system

For M&E to serve the needs of the AES some key changes need to be implemented:

- A baseline of fisheries resources in each Upazila needs to be established.
- Revised Job Descriptions should reflect the increased importance of this task for middle and senior staff.
- Local communities should be involved in evaluating the effectiveness of the service and providing feedback from the primary stakeholders.
- A system to monitor utilisation of resources from manpower to money should be introduced.
- Process monitoring should verify that interventions are designed realistically and implemented as planned.
- Beneficiary impact monitoring to ensure that all categories of producers are being helped should be introduced.
- As shown in the Extension Cycle (Figure 2) the results from M&E should feed back into further planning activities.