

CAPACITY BUILDING IN FARMER'S WATER MANAGEMENT: THE FAO EXPERIENCE ^[1]

Alice van Keulen ^[2], Martin Smith² and Daniel Renault²

1 RATIONALE

Among increasingly scarce resources, water is becoming a constraining factor in agricultural production and in sustaining life in urban and rural areas. Food security is inextricably linked to water security and can only be achieved through a concerted action to raise water productivity, maximizing crop production in both rainfed and irrigated agriculture. The gains from more effective water management are considerable. A range of techniques and technologies are available that will ensure a more effective use of water for agricultural production, both in rainfall and in irrigated agriculture. Investments are required, but more importantly: advise, technical guidance and financial support to the users to make sure that the initial constraints linked to the introduction and management of new water management techniques and technologies are adequately addressed.

Putting farmers in charge of water development and management has proved effective to achieve efficient and sustainable water management systems and to increase water productivity. This is evident in the transfer of management of irrigation systems to the immediate beneficiaries and through the formation of water users association, where users assume direct responsibilities in operation and maintenance of the irrigation system.

1.1 Definition

Farmers' Water Management is the process in which individual farmers and farmers institutions set objectives for the management of their water resources; establish appropriate conditions, and identify, mobilize and use resources, so as to attain these objectives.

This definition of Farmers' Water Management (FWM) applies to all types of water-control systems, including irrigation, drainage and flood control systems and associated activities that resort under the responsibility of farmers, either as individuals or cooperating in a specially established water users interest group.

1.2 Objective of capacity building in FWM

The objective of enhancing the capacity of farmers in water management is to intensify in a sustainable manner agricultural production through improved water control by farmers, with the goal to improve food security and farm income and raise livelihoods in particular for the small-holder.

1.3 The means: Participatory Training and Extension

One of the means that has been used and developed by FAO-AGLW in this program is the Participatory Training and Extension (PT&E) which is a training and extension approach that is based on a participatory analysis of the constraints and opportunities and based on the outcome of this analysis the introduction of new and appropriate technologies. Group based extension and training activities that enhance farmers' capacities and skills, as well as capacity building of the staff involved in the extension activities go hand in hand.

Participatory Training and Extension is a tool to reach the goal of improved Farmers' Water Management involving and supporting farmers. In order to support farmers and increase their capacity in FWM they need training and support for the introduction of technologies.

The main objective of PT&E is to empower farmers in order to develop, modify and diffuse appropriate and sustainable new technologies.

The programme for Participatory Training and Extension in Farmers' Water Management (PT&E-FWM) ^[3] was developed within the framework of the FAO- Special Programme for Food Security. It has been implemented and tested in several countries (Zambia, Nepal, Cambodia and Bangladesh). Learning from the successes and mistakes of the first pilot projects, the programme has evolved over a number of years in a more improved and definite format.

The PT&E-FWM programme incorporates the concept of the Farmer Field School (FFS) introduced under the Integrated Pest Management (IPM) programme. The FFS approach has enjoyed remarkable success as it showed that farmers can become experts at analyzing specific problems related to their farming activities and make informed decisions about necessary interventions. The PT&E-FWM programme is also partly based on staff training methodologies developed under the Farmers' Water Management Training programme in Indonesia.

2 WATER SCARCITY AND NEED FOR SUSTAINABLE WATER USE

Water and food security are strongly connected. Many of the nearly 800 million chronically undernourished people live in water-scarce regions or in regions where water infrastructure has not been developed. In these areas limited access to water often plays a major constraint to improving food production.

Global population will continue to expand. The increase in population and changes in food preferences will result in a strong demand for additional food production. It is expected that much of the increase in crop production will come from irrigated lands, as irrigated agriculture is much more productive than rain-fed agriculture - irrigated agriculture contributes nearly 40 percent of world's food production on 17 percent of cultivated land. But agriculture already counts for 70 percent of the freshwater withdrawals in the world - for developing countries this figure is even as high as 85 percent - and is seen as the main factor behind increasing global water crisis.

The key to increase world's food production without deepening the global water scarcity is improving the efficiency in the use of irrigation water. At irrigation scheme and farm level, irrigation efficiency can be sometimes as low as 30 percent. The gains from introducing effective water management and improved irrigation and water-control techniques and technology can be tremendous both in terms of water saving as well as in increase in productivity and stabilisation of erratic food production.

3 FARMERS' FOCUS

Although irrigation is crucial in increasing world's food production, many governments have found it increasingly difficult to finance the cost of irrigation operation and management. This has led to rapid deterioration of infrastructure, poor management and subsequent wastage of water and advancing waterlogging and salinity. Poor system performance and the governments' inability to do something about it have spurred the efforts to increase farmers' participation in irrigation. One of the most noted effects of farmers' participation in irrigation is the reduction in government staff and expenditure requirements. However this does not motivate farmers to participate. Their participation must result in direct benefits.

By working with farmers and other stakeholders to identify and resolve agricultural production constraints in irrigated agriculture - whether they are of a technical, institutional or policy nature - and to demonstrate ways of increasing production opens the way for improved productivity and broader food access. Working with farmers to understand and, where possible, solve the problems that prevent them from producing more food is crucial. When farmers are involved in and responsible for development and improvements in water management, global experience has shown a number of tremendous benefits. In the first place building or introducing improvements in irrigation systems that are wanted, supported and owned by the users themselves provides the best assurance for sustainability. Further involvement of farmers in system management might lead to more equitable organisational arrangements and water distribution. Finally there might be secondary effects from farmers training and organisation. It can increase local capacity to co-ordinate input supplies, credit, marketing etc. and increase their negotiation power and ability to deal with governmental and non-governmental organisations involved in rural development.

Farmers' participation in irrigation does not eliminate the role and responsibility of the government and governmental organisations and agencies in irrigation. Water users groups will need to be mobilised, organised and trained while technical support in design, operation and maintenance of the systems is needed as well. These are all tasks that need to be implemented by governmental organisations. Further it is neither always feasible nor desirable that entire, mainly large-scale, irrigation systems come under farmers' responsibility and management.

Constructions are possible that farmers' are responsible for secondary and tertiary units while the responsibility of the main infrastructure remains with the governmental agency. Further farmers' participation in irrigation is only possible if a strong but flexible and transparent legal framework exists.

4 FARMERS' WATER MANAGEMENT (FWM)

Giving special attention to farmers and their water management has proven highly instrumental in improving system performance and increasing water productivity. Water Management is not limited to the process of controlling the supply of water to and from the crop in the right quantity and time. Water management needs to be considered in a holistic manner as a range of human, agronomic economic and legal aspects that determine the process of water management. Good management involves setting well-defined criteria and standards that are determined by the specific objectives of the user. Similarly water management is determined by the objectives set by the water manager, who may opt for maximal production, minimize water for optimal production, and may set standards for equity in water distribution and maintaining good quality.

At individual or farm level, FWM comprises of setting the objectives and establishing the conditions and organizing the resources to meet the farm level objectives. Farm level FWM objectives are related to the specific farm objectives as set by the individual water manager and may relate to e.g. risk avoidance, maximizing agricultural production, attaining self-sufficiency etc.; are constrained

and influenced by the available farm resources; and may be restricted by the FWM at group level. Farm level water management relates to the water control techniques (irrigation methods, field drainage and crop water management techniques) managed by the individual farmer on his/her own field and farm.

At group level FWM is organized by farmers, who jointly manage a hydraulic unit and share water from the same water source. This source may include a joint groundwater resource, river or dam, but also may include a tertiary unit or part of a larger irrigation system, where the main system is managed by an irrigation agency.

The need for joint management comes forth out a communal consensus to optimize available water resources and ensure the sustainable use of the system and resources. Individual objectives in water management may lead to conflicts in particular under conditions of scarce water supply.

Good maintenance of the system is often a first condition for sustainable water supply. FWM at group level comprises setting objectives to satisfy the individual FWM objectives, but also safeguarding the interests of all users on equal basis. FWM at group level is influenced and constrained by the physical, social, economic and legal environment as is illustrated in above figure. The water users group will establish the conditions and organize the resources to meet the joint objectives, controlling processes, maintaining and rehabilitating the system to enhance its capacities and perform monitoring as to ensure that the objectives are continuously met.

In contrast to the governmental managed systems, in 'farmers' managed systems', the users and immediate beneficiaries set the objectives and establish the management structure and procedures. There is ample evidence that shows that communal management of water will lead to considerable better performance and sustainability of the water. Management of water by a group of farmers may lead to conflicting interests of individuals and there is a strong need to formalize obligations and rights of each individual user. A more formal arrangement with well defined rules and regulations and an organizational structure may be required for such water users groups.

Formation of Water Users Associations (WUA) with an accepted legal structure is therefore actively promoted in many countries, in particular where the devolution of irrigation management has become an official policy.

5 PARTICIPATORY TRAINING AND EXTENSION (PT&E)

In many countries, the 'transfer of technologies' model has been the prevalent practice for developing and spreading technological innovations. It is based on the assumption that transfer of technology and knowledge from scientists to farmers will trigger development. In this model it has been the researcher's task to identify, analyze and solve farmers' technical problems and the extension workers' task to transfer the results as messages to the farmers. The results have been disappointing. The adoption rates of technologies remain low in most cases and the performance of researchers' technologies is often disappointing under farmers' management. Three main reasons were identified for these disappointing results:

- ??Specific constraints of farmers have not been taken into account;
- ??Social, cultural, organization and power issues at community level are neglected, and
- ??Local people's vast knowledge is not recognized or valued.

It was obvious that more effective approaches needed to be developed. Since the 1970s, efforts have been made to improve the impact of research and extension. All have striven for the greater involvement of farmers in the process. The first effort was through the use of on-farm trials. The technologies were still developed by the researchers and adoption rates still did not increase. In an attempt to explain farmers' continued non-adoption of technologies, the farming systems' perspective was developed. This identified farm-level constraints to adoption. Input supply was improved and often fertilizer was given out free to give farmers a taste of the benefits. Still there was little adoption of the technology packages as the approach failed to address the diversity of farmers' socio-economic and institutional environments.

In the late 1980s, it was realized that most technologies developed by researches alone were inappropriate for smallholder farmers. Farmer participatory research became the approach to adapt technologies to farmers' conditions and by the 1990s, to develop technologies together with farmers. Farmers were now seen as partners in research and extension, and the key players in the innovation process. The understanding that the main key to agricultural development is to enhance the farmers' management and problem solving capacity and the farmers' capacities to develop, modify and diffuse new technologies and techniques themselves from farmer to farmer led to the development of Participatory Extension.

PT&E is a tool to reach the goal of improved FWM involving and supporting farmers. In order to support farmers and increase their capacity in FWM they need training and support for introduction of technologies. In turn, staff involved in the programme need to be

prepared for their task and thus their capacity needs to be build simultaneously.

Thus, group based extension and training activities that enhance farmers' capacities and skills, as well as capacity building of the staff involved in the extension activities go hand in hand.

The main objective of PT&E is to empower farmers in order to develop, modify and diffuse appropriate and sustainable new technologies.

PT&E is participatory in terms of:

- participatory identification of needs and introduction of technical solutions, resulting in
- training and activity plans;
- use of participatory training methods;
- participatory methods for M&E of the programme and revision of plans and activities.

Table 1 Comparison of "Transfer of Technology" and "Participatory Extension" Approaches^[4]

	Transfer of Technology	Participatory Extension
Main objective	Transfer of technology	Empowerment of farmers
Analysis of needs & Priorities	Outsiders	Farmers facilitated by outsiders
Extension messages content	'commandments' messages package of practices	Principles Methods Basket of choices
The 'extension menu'	Fixed	According to choices
Farmers behaviour	Listen to messages Act on commandments Adopt, adapt or reject package	Use methods Apply principles Choose from basket & experiment
Outsiders' desired outcome	Widespread adoption of package	Wider choices for farmers Farmers' enhanced adaptability
Main mode	Extension agent to farmer	Farmer to farmer
Roles of extension agent	Teacher Trainer	Facilitator Searcher for and provider of choice

6 KEY ISSUES IN CAPACITY BUILDING ON FWM

The majority of participants of a Participatory Extension and Training Programme in Farmers' Water Management are adults, both women and men farmers. We consider therefore as essential in order to facilitate this capacity building activity to have a good understanding on:

- how adults learn
- how the role of the facilitator in this process should be
- how the different participatory learning techniques can be applied

6.1 Adult Learners

Adults have a wide experience and have already much knowledge and skills. Learning something new (experiencing) is not just achieved in an instant. Referring back and making use of the knowledge and skill is the basis of the adult learning process. It may sometimes be necessary to review the existing knowledge/skill (analyzing) as well as test the new ideas. The new learning will have to be internalized (processing) by making it relevant to one's self. It may have to be shared with other people as part of the process. Only after this can the learning be applied when confronted with a similar situation (generalizing).

6.2 Role of the facilitator

The role of the facilitator and his relationship to farmers contrasts significantly from that of the instructor or trainer. The instructor imparts knowledge to farmers who adopt a passive role of merely receiving information. On the contrary, a facilitator creates conditions for farmers to learn, by arranging opportunities for the farmers to observe and interpret differences in conditions and crop performances, to carry out simple tests and exercises, and through discussions. The facilitator encourages farmers to adopt an active role in the learning process.

In the PT&E in FWM the facilitator has direct contact with the farmers to assist them in taking decisions for the introduction of new technologies. Next, the facilitator also has the role of technical resource person explaining new technologies. Normally the field extension agent is the principal Farmer Field School facilitator, whereas the specialist in Farmers' Water Management (district engineer, irrigation agronomist) assists in providing technical guidance. Only in exceptional cases does the Technicians and FWM specialist perform the role of facilitator.

Box 1: The facilitator

- The attitude of a facilitator is:
- To accept that there is no monopoly of wisdom or knowledge on the part of the facilitator;
- To listen to farmers and respect their knowledge, experiences and perceptions;
- To give farmers the confidence to share their knowledge and experiences;
- The role of a facilitator is:
- To be responsive to farmers' needs and flexible in organizing the training and extension activities;
- To create suitable conditions and activities from which farmers can learn;
- To increase farmers' knowledge, skills, problem-solving ability and capacity for innovation so that the facilitator becomes redundant.

6.3 Participatory learning techniques

A variety of participatory learning techniques are used in PT&E in FWM. These techniques include: plenary introduction, brainstorming, small group discussions, plenary discussion/presentation, practical (field) activities, field walk/field observations, role plays, field trials and field tours.

7 ELEMENTS OF A METHODOLOGY FOR CAPACITY BUILDING IN FWM

Setting up target groups

The farmers are the main target group of the PT&E-FWM programme. In order to reach the farmers effectively, a team of support staff needs to be trained on how to work with the Participatory Training and Extension Approach. So the support staff form the second target group of the training programme.

7.1 Farmers

The selection of collaborating farmers needs to be given due attention in order to have a lasting impact on the training and demonstration programme. In the selection of farmers, care is taken to have an appropriate representation of the different irrigation blocks, the different social groups, women farmers, land tenure and literacy. The first selection of the farmers is made by the facilitator of the Farmers' Training and may be influenced by the project mandate. Farmers are explained about the set-up and purpose of the extension programme and volunteers are asked to join the programme. In case there is an existing Water Users Association, the selection will often be made among the members of this Association.

7.2 Support Staff

The composition of the group of support staff may differ for each country where the programme is implemented. In each country the composition of Ministries, Departments and Institutes and their set-up, mandate and organizational structure might be different. In general the support staff consists of Support Units within the Extension Service and the Technical Support Service, like irrigation

agents and crop husbandry agents. When staff of the private sector (for supplies, credit and marketing) and NGOs (for community development) provide support to the programme, they should be included in the training programme.

7.3 Developing a consistent set of training elements

For successful and sustainable introduction, use and improvement of water control techniques and technologies farmers should be encouraged to analyze their problems, search for solutions, monitor and evaluate the selected and implemented techniques and technologies, and adjust them according to their constraints and opportunities. Farmers Training (FT) aims to ensure continued farmers' participation and a sustainable implementation of this process.

Box 2: Objective of the Farmers Training (FT)

Objective of the Farmers Training (FT)

To put farmers in charge of the analysis and definition of the constraints, development opportunities and technologies through a participatory appraisal of priorities and their potential. Consequently, farmers' capacity is enhanced through the development of their skills in:

- the design, implementation, operation and maintenance of water control??establishing community capacity for joint management;
- ??• the intensification of irrigated crop production through improved agricultural practices;
- and
- raising income through farm diversification.

FT forms the central element of the PT&E programme and is split up in two phases i.e. the Farmers Seasonal Planning (FSP) and Farmers Seasonal Training (FST). The FSP focuses on problem identification, selection of techniques and technologies to be tested and preparation of a seasonal work plan. During the FST the seasonal plan will be implemented and the selected techniques and technologies will be introduced, used and evaluated. The training sessions will be according to farmers' needs and requirements and follow closely the various agricultural seasons.

To ensure sustained support to the implementation of the FT, a support structure needs to be created. Through an intensive and well-structured Staff Training (ST) programme an appropriate support structure is established. The programme that focuses on the support staff within the PT&E is the In-Service Training Programme (IST-P).

Box 3: Objective of the Staff Training (ST)

Objective of the Staff Training (ST)

The specific objective of the staff training is to develop the institutional capacity to provide support to the implementation of the farmers' water management programme. More specifically the training aims:

- ?• to introduce the concepts of participatory extension approach in farmers' training;
- to enhance the technical knowledge and skills of staff of technical and extension agencies in the various irrigation technologies;
- to enhance the skills of staff of technical and extension agencies to facilitate Farmers' Training;
- to develop an appropriate programme and work plan with the concerned staff at different levels;
- to monitor progress and constraints and adjust the programme to new requirements.

In most PT&E-FWM programmes the extension staff, who are already in close contact with the farmers, will be responsible for the implementation of the FT. For the implementation of the FT, the extension staff needs to have sufficient technical knowledge and master the required facilitation skills, to be able to assist the farmers in their analysis of the problems in water management and the implementation of solutions. Technical staff from district, provincial or national level can provide this training. In order to be able to support the extension staff, the technical staff also needs guidance. The ST entails training for both extension and technical staff and is therefore divided in Technical Staff Training (TST) and Extension Staff Training (EST).

The TST focuses on training of provincial and district irrigation and agricultural officers who will be responsible for the training of the extension staff. The EST focuses on training extension staff who will be responsible for the implementation of the FT.

7.4 Farmers Seasonal Planning

The first and most important phase of the FT is the establishment of an overall FWM plan. A representative group of farmers and members of the Water Users Association will select, through a participatory process of problem identification, the FWM techniques and technologies that they would like to introduce and improve during a predetermined number of seasons. The number of seasons normally equals the time span of the project or programme. A list of the selected FWM techniques and technologies forms the FWM plan, which sets the overall targets for the FT. The FWM plan is made during the first Farmers Seasonal Planning (FSP). Based on the FWM plan the farmers will also prepare a farmers seasonal plan for the coming season. This plan spells out in detail what activities will be carried out during the coming cropping season and is in line with the FWM plan.

The farmers' seasonal plan might include:

- ?a cropping plan for the crops that have been selected to be studied during the agricultural season;
- ?a crop water management plan, including experiments for field irrigation techniques and irrigation scheduling; and
- ?the structural improvements to be carried out on the irrigation, drainage or flood system.

The farmers' seasonal plan will further include an assessment of the inputs and support required to strengthening the WUA. In general, five sessions, scheduled over a five-week period, prior to the agricultural season, will be sufficient to formulate and agree on the FWM plan and the first farmers' seasonal plan.

During the succeeding FSPs the farmers will evaluate the implementation of the farmers seasonal plan. Based on the evaluation, farmers will update the FWM plan and prepare a new farmers seasonal plan for the next season. The succeeding FSPs can be shorter than the first FSP. In general, two sessions, scheduled over a two weeks period, prior to the next agricultural season, will be sufficient to update the FWM plan and to agree on the farmers' seasonal plan for the next season.

The main characteristics of the FWM plan and the farmers' seasonal plan are presented in Table 2.

Table 2 Comparison between FWM Plan and Farmers' Seasonal Plan

	FWM Plan	Farmers' Seasonal Plan
Contents	List of selected FWM techniques and technologies to be introduced during the project.	Activities for a season, including FWM, crop management, curriculum of FST, etc.
Objective	To guide FWM improvements in the irrigation scheme	To guide activities for a season in the PT&E – FWM
Time span	Project period, 2-3 years	One season
Developed during	First FSP	Each FSP
Adjusted during	Subsequent FSPs	FST

7.5 Farmers Seasonal Training

In the second phase of the FT, training and related development activities are implemented over one cropping season as determined in the FSP. The techniques and technologies to be introduced or improved as determined in the FSP form the topics of the Farmers Seasonal Training (FST).

Through the participatory training and extension approach, these techniques and technologies are introduced, following a step-wise procedure.

The topics of each meeting are related to the development stage of the crop, and associated farm management and water control practices, at that particular time. During the training sessions the farmers normally conduct a number of on-farm trials (studies) as well as demonstrations of alternative technologies which have been selected during the FSP. The activities are highly practical, involving careful observations of factors affecting farm performance and joint examination of possible solutions. During the training farmers will identify the underlying causes of their management problems and test possible solutions that fit their particular physical and socio-economic situation. Through utilizing the skills developed in local analysis farmers are enabled to adjust input recommendations or technical packages to suit local conditions.

Existing groups and communal management systems of water and land resources will be strengthened in order to ensure sustainable irrigation system management. Where appropriate new Water Users' Associations (WUA) will be formed to manage and operate the irrigation system.

7.6 Staff Training

PT&E is based on participatory learning and associated facilitation techniques. The specific facilitation and learning techniques that are used for the FST and FSP are also used for the Staff Training (ST). In this way the support staff learns how to use these facilitation and learning techniques. In general, support staff have received technical education and have less experience in participatory training and extension. Therefore, at the start of the ST a lot of attention will be paid to training the support staff in participatory training and extension approaches and facilitation skills. As the support staff becomes familiar with these approaches and skills the focus of the ST will slowly shift more towards the technical content of the subjects.

Extension staff works at district or community level and are the ones responsible for the Farmers' Training. It can be seen that by organizing one TST many farmers groups can be trained in the field.

In addition to the TST and the EST, a Staff Field Training (SFT) is organized. The SFT is organized during the agricultural season in the field to monitor and evaluate the progress of the field activities and to address any problems encountered. Both technical and extension staff participate in this field training.

7.7 Technical Staff Training

Normally, a team of national consultants carries out the technical staff training with help of selected resource persons at central level. For each training session the specific objectives need to be set. The TST includes organizational issues, facilitation skills and technical training. The technical staff in their turn is responsible for the implementation of the training of the agricultural extension staff. Therefore, adequate attention needs to be given to provide guidelines for the training of the extension staff.

Each of the training sessions needs to be based on a detailed time schedule and an appropriate balance between lectures, group activities, practical exercises and field demonstrations needs to be worked out. The topics of the training sessions are related to the expected field activities during the agricultural seasons.

In general two TST sessions are organized for each agricultural season. The first TST, which is held before the Farmers Seasonal Planning, will focus on the FSP and the technical issues related to expected field activities. The second TST will be held shortly after the FSP in which the FWM and seasonal plans are evaluated and a planning is made for the seasonal activities. The curriculum of the TST is based on the evaluation reports of previous Farmers Training, Extension Staff Training and Technical Staff Training sessions and on the mandate of the programme. The length of the TST is about 4 to 5 days and is scheduled just before the beginning of each EST.

7.8 Extension Staff Training

The agricultural extension staff will be involved directly with the implementation and day-to-day follow-up of the PT&E programme at field level. The Extension Staff (EST) is aimed at transfer of knowledge in FWM techniques and technologies and agricultural practices for irrigated crops through participatory training and appraisal techniques. The training will be organized and implemented at district level and facilitated by the technical staff of national, provincial or district level.

Similarly to the TST, the specific objectives need to be defined for each training session and includes organizational issues and a mixture of facilitation skills and technical training. The topics of the training sessions are related to the expected field activities during the agricultural seasons.

Also two EST sessions are organized during each season. The first EST focuses on the implementation of the FSP and relevant technical topics. During the second EST, just after the FSP a detailed seasonal plan will be worked out and training on technical issues and/or facilitation techniques can be added.

The curriculum of the EST is based on the evaluation reports of previous FT and EST sessions and on the mandate of the programme. The length of the EST is also about 4 to 5 days and the sessions are scheduled just before a FT session.

7.9 Staff Field Training

The SFT normally coincides with a monitoring mission of the National Team. Both technical and extension staff participate in the SFT. The SFT is a mixture of monitoring and evaluation, field visits and training conducted at field level. The main purpose of the SFT is to monitor and evaluate the progress of the field activities and address technical and/or organizational constraints encountered during the implementation of the PT&E programme. The SFT can also be used to update the technical knowledge of

staff on certain topics relevant to the agricultural season.

7.10 The training cycle

The Farmers Training has a cyclic character. During the first FSP the farmers prepare the FWM plan and based on this the farmers prepare a Farmers Seasonal Plan for the first agricultural season of the project. The Seasonal Plan is implemented during the first season and facilitated by the Farmers Seasonal Training. Just before the following seasons, the farmers evaluate the implementation of the first Seasonal Plan, update the FWM plan and prepare a new Seasonal Plan for the next agricultural season during the succeeding FSP. This process will continue as long as the project/programme lasts.

To guide this process the support staff is trained to facilitate the Farmers Training (FSP & FST) during the Staff Training (TST & EST). The output of the Farmers' Training forms the input for the successive Staff Training to enable the support staff to provide tailored support to the farmers.

This process repeats itself each season. The cyclic nature of the ST and how it is integrated with the FT is depicted in Figure 1.

8 CONCLUSION: IMPORTANCE OF A MULTI-ACTORS APPROACH IN CAPACITY BUILDING

In general a single agency is not capable to deliver all the required support functions. An appraisal of the agencies and institutions, both governmental and non-governmental, active in the project area needs to be undertaken to assess the type of support that they can deliver. In most countries the following agencies could be engaged in the programme to fulfill the four basic support functions.

- Extension Departments or Units maintain direct contacts with the farmers for transfer of knowledge. Therefore it is sensible that the extension agents are directly involved as facilitators of the Farmers Seasonal Planning and Farmers Seasonal Training. As such, the Extension Department or Unit plays a key role in the PT&E programme.
- The Irrigation Agency usually has the responsibility for technical designs, construction, operation and maintenance of the irrigation infrastructure.
The major function other Irrigation Agency in PT&E will be to provide continuous technical advice and guidance to the extension staff and provide technical training.
- The Agricultural Agency will also be responsible for providing various technical advice and guidance services in relation to agricultural inputs such as agricultural research and agricultural extension
- NGOs are often involved in community development at village level. As they have experience in working with the farmers, their support to the programme is to develop and strengthen Water Users Associations. Also when additional extension staff or extension skills are required, NGOs may be included in the training and extension activities.
- Supply of agricultural inputs such as seed, fertilizer and mechanical equipment is increasingly provided through the private sector.
- Banks or NGOs that implement credit programmes may be involved for the supply of credit systems to enable farmers to acquire the agricultural inputs.

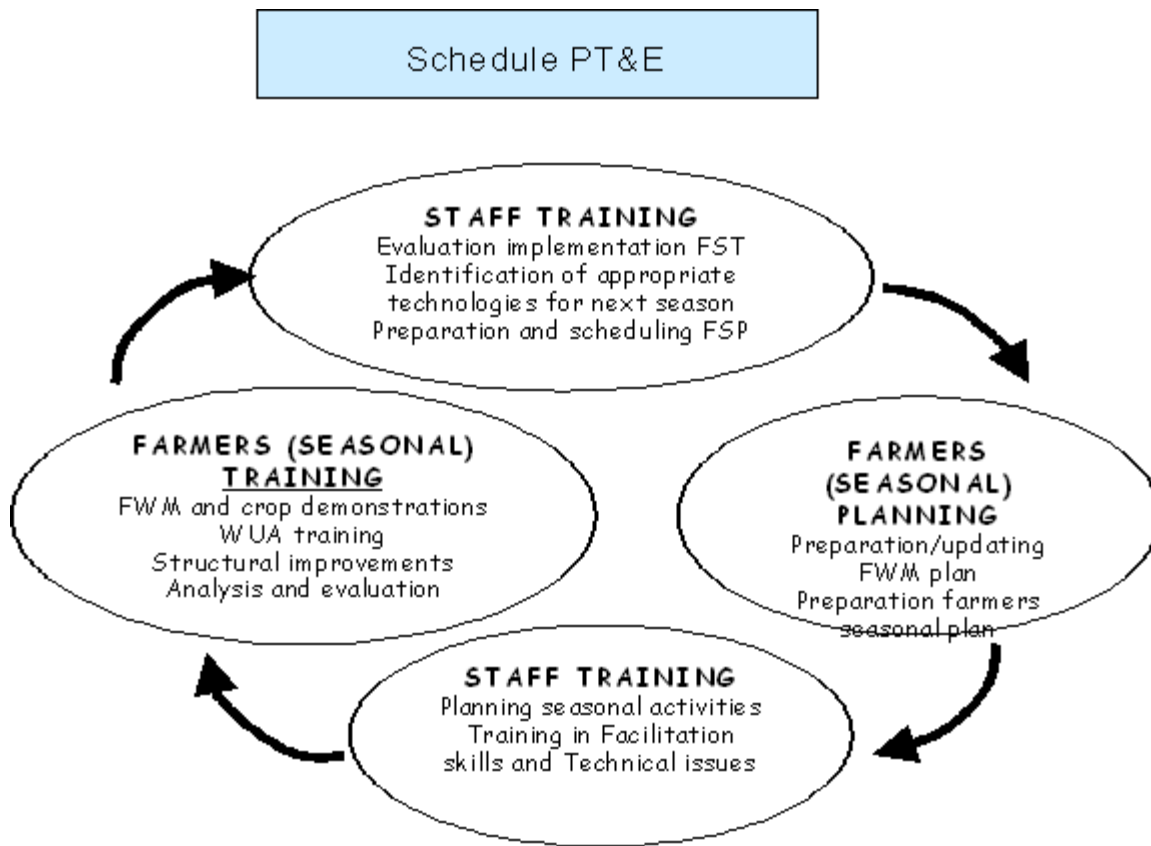


Figure 1 Seasonal cycle of PT&E-FWM

The various agencies will have, in general, a decentralized structure at central, provincial, district, sub-district and village level, where staff will be allocated specific tasks. Support services to the programme will be along established lines of command and procedures.

An analysis of the institutional structure needs to be made to evaluate the present tasks and responsibilities of the staff at each level. Existing organograms can be used in support of this analysis. The combination of organograms of the different ministries, departments and other organisations involved can give a clear overview for the assignment of support tasks and responsibilities.

8.1 Defining the roles and tasks for staff at provincial, district, communal and/or village level

This step includes the definition of the roles and tasks for the various staff of each of the agencies to be assigned to the implementation of the PT&E-FWM. The task description for each person involved is specific for that person from that agency, on that level. For instance the Village Extension Worker has direct contact with the farmers and conducts the farmers training, so among others, the following specific tasks might be included

- to advise on the problems the farmers have with the existing irrigation techniques
- to plan and conduct the Farmers' seasonal Planning and Farmers' training;
- to prepare the necessary training and extension materials; and
- to advise on the procurement of the necessary agricultural inputs (seeds, fertilizers).

The Technical Staff, such as the Provincial and District Irrigation Engineers and Agricultural Officer is less involved in the training of farmers, but more responsible for assisting and advising the Village Extension Workers. Tasks of, for example, the District Irrigation Engineer might include:

- to provide technical guidance in the implementation of the various irrigation improvement works proposed by the farmers in their Farmers' Seasonal Plan;
- where appropriate to prepare terms of reference for surveys and designs to be made for the irrigation improvement works and advise on tendering procedures for construction works that are beyond farmers capacity;
- to advise on the quantities and procurement of the various construction materials for construction works to be carried out by

farmers; and

- to advise and assist in the preparation of the necessary training and extension materials on Irrigation.

For a successful development of the PT&E, the support staff needs to be motivated during the whole cycle of development and implementation. Clear arrangements should be made in advance for incentives like field allowances, travel and training facilities.

8.2 Establishment of a Co-ordination Unit

Adequate attention needs to be given to co-ordination of the activities in the implementation of the PT&E to ensure timely inputs and contributions from all participating parties.

Once the Districts have been selected, the establishment of a Steering and Co-ordination Unit is recommended to ensure the essential co-operation between the different agencies and to provide overall guidance to the National Team. The Steering and Co-ordination Unit consists of Provincial and District representatives of the involved departments and agencies. The Steering and Co-ordination Unit should advise on the proposed activities and monitor progress, results and constraints encountered. On the basis of these discussions the Coordination Unit should provide advice on the implementation of the Programme.

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[1] Paper No 129. Presented at the 9th International Drainage Workshop, September 10 – 13, 2003, Utrecht, The Netherlands.

[2] Land and Water Development Division (AGL), FAO, Viale delle terme di Caracalla, 00100 Rome, ITALY, E-mail contact person: daniel.renault@fao.org

[3] Details of the implementation methodology and various training materials are available upon request on a CDROM FAO-AGLW CD 14 or can be accessed on our dedicated web page <http://www.fao.org/ag/agl/aglw/farmerwatertraining/default.htm>

[4] Adapted from: Pretty, J.N; Chambers, R., "Towards a learning paradigm : new professionalism and institutions for agriculture", Brighton : Institute of Development Studies, 1993