
CAPACITY BUILDING IN IRRIGATED AGRICULTURE

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Introduction

Capacity building contributes to a better functioning of staff and institutions and therefore to the society in which these institutions operate. Capacity building includes both human resource development (training) and institutional strengthening (RAWOO, 1993).

In this paper, first the work field of irrigated agriculture will be presented and an overview is given of activities that are supportive to capacity building. Subsequently, the activities of ILRI on training and institutional strengthening are discussed, followed by two examples of capacity building programmes in Indonesia and Pakistan. Finally, some new priorities in capacity building are mentioned.

Irrigated Agriculture

In irrigated agriculture, one can distinguish between many institutions. The institutions influence the performance of those involved, e.g. farmers, the private sector, and governmental agencies, in a direct or indirect way. These institutions can be responsible for a specific part of the water system or for one of the levels in the water hierarchy, or they may represent an interest group. The institutions typically differ in perspective and approach.

Basically, a water system for agriculture consists of an irrigation system and a drainage system. Water is an input in agriculture, but it is also used for drinking water and sanitation, industry, traffic and nature. Some of the users are concerned with the quality of water. Others are more interested in quantity and water depth issues. Requirements for water are time and place specific. Thus, people rely on water to fulfil different needs; they built their institutions around them.

Water control systems in agriculture are organised at different levels: field or farm level, outlet or village level, main system level, and even watershed level.

Both users and managers have to deal with issues, which are not only technical in nature, but also socio-economic, legal, organisational and cultural. Users are usually farmers. Farmers depend on water control systems, but at the same time are involved in production systems, agricultural service systems, and markets. Moreover, they are confronted with taxes.

Institutes concerned with irrigated agriculture find their target groups and problem fields in the above domains. Changes in one element of the complex system will affect others. In irrigated agriculture the sources land and water become increasingly scarce. This requires the participation of all involved in working out sustainable solutions to problems. In general, thus far investments in water control systems for agriculture did not result in sustainable conditions.

Capacity Building

Capacity building could play an important role in the development of sustainable irrigated agriculture. Even more so if capacity building programmes are tailor-made to an institution, its conditions, and to the problems it faces. In order to achieve this, capacity building must be built up from different elements. Main elements are *human resource development* and *institutional development* (RAWOO, 1993).

Human resource development takes place through *training*; it is an activity which is directly concerned with the capability of individuals. Training can be offered through regular or tailor-made courses, as well as through programmes of distance learning. On-the-job guidance, co-research and attachment training are other ways of training people. They can be most effective. Usually they are less formal. In these latter approaches, learning-by-doing is prevalent. Also, the content of the training can be more easily adopted to the demand (DGIS, 1998).

Problems with training include problems of quality and ensuring long-lasting effect. The training process passes through individuals who do or do not pick up new information and skills. After they have returned at their duty stations, they may or may not apply what they have learned. Trainers can usually not control the after-training situation, as the trainer is not in contact any more with the trainee. This is even more a problem if the trainee has to go overseas to follow a course. Institutional development helps to overcome this last problem (see below).

The development of *training infrastructure* helps to create appropriate training conditions and tools. Training infrastructure includes buildings, computers, vehicles, and class room equipment. The risk exists that the tools provided do not function under the local conditions, are not intensively used, or are badly maintained.

Through *project/programme support*, assistance is given in a more integrated way. It helps an institute to perform a certain task. The support usually combines advice, physical support and training. This is a most delicate process, as the transfer of

knowledge should be well-balanced and responsibilities should gradually move towards the host organisation.

Another element of capacity building is *institutional co-operation*. Institutes are working together in several fields (research, advisory services, and training), and attention is given to methods of problem solving and organisational aspects (RAWOO, 1983). Usually the relation between institutions is long term and includes exchange of staff and support to attend international meetings. Long term relations allow trainers to learn in more detail the actual training needs in sister institutes, which contributes to the value and effectiveness of trainings.

Ideally, *institutional support* consists of a package of activities (grants, training, specific projects) to improve the functioning of an institution. This can be done only after an overall strategic vision of the institution's expected role and development has been formulated. In practice funds for inter-institutional co-operation are often channelled to a few institutions only, with the risk of creating over-dependency on external financing within these institutes (Schute, 1989).

Networks are increasingly important in capacity building programmes. In networks, information is transferred and contacts are made with relevant individuals and institutions. It can lead to the formation of peer groups of researchers and managers. Networks can link similar institutes in different regions, or institutes covering complementary issues.

A programme for capacity building can consist of several of the above mentioned activities. In the process of development the relative importance of the capacity building components may gradually change.

ILRI activities in capacity building

ILRI is involved in capacity building programmes since its establishment in 1955. An important activity is the implementation of regular and tailor-made training courses in the Netherlands and overseas. In addition most of the ILRI projects contribute directly to strengthening of research institutions through capacity building activities (ILRI, 1996, 1997).

ILRI's staff operates in research, training and advisory work. This gives an additional value to each of the activities and facilitates the more integrated approach required for capacity building.

Because of the experiences in advisory work, ILRI research focuses on local problems in developing countries. Research is implemented in close co-operation with the host institutes and invariably concentrates on land and water development issues.

Human resource development

ILRI offers training courses on a regular basis, like the 16-weeks International Course on Land Drainage (ICLD), and shorter courses, like the course on computer applications in irrigation (ICCAI), the course on drainage (ICMALD), and the course on execution and maintenance of drainage systems (ICDEM). ILRI also offers tailor-made courses, like the ICIW, on institutions in water management (in preparation), and the ICWIS, on water management in irrigation systems.

ILRI also organises refresher courses in overseas countries for the nearly 1000 alumni of the ICLD. And ILRI organises courses that are tailor-made to the needs of projects. These projects allow also for research guidance and on-the-job-training in the respective institutes. In special cases, attachment training can be organised at specialised institutes in Wageningen or elsewhere, depending on the support required.

Institutional development

Most projects implemented by ILRI focus on the strengthening of drainage-related research and education. Long-term co-operation exists between e.g. research institutions, like the Drainage Research Institute (DRI), Egypt; the Central Soil Salinity Research Institute (CSSRI), India; and the International Waterlogging and Salinity Institute (IWASRI), Pakistan. Each institute is linked to ILRI through a Memorandum of Understanding (MOU). Institutional development can only have result if it concerns a long-term relation.

In some countries ILRI supported more than one single institute at the time. In Egypt, for example, different activities have been developed with different institutions over the last decade:

- in co-operation with the Drainage Research Institute and EPADP: co-research, fellowships for training, organisational support, library support, computer hardware development, drainage machine introduction, networking;
- at the same time: support to the Advisory Panel on Water Management and Drainage.

In India support is given to CSSRI through:

- co-research, fellowships for training, library support, physical infrastructure development, and networking support,
- strengthening of institutional co-operation between CSSRI and Indian universities working on the same issues of waterlogging and salinity but under different conditions.

Since 1988, ILRI works together with IWASRI, Pakistan. The following activities are developed:

- co-research, fellowships for training, library support, networking, institutional support;
 - guidance to the process of formulating a National Research Agenda (NRA);
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- assistance to the co-ordination of the research programme of the National Drainage Programme (separate from IWASRI).

Similar forms of co-operation are in preparation with institutes in other countries, like with the Wuhee University at Wuhan, China; with the Faculty of Agriculture of the San José University, Guatemala; and with Spa Saniiri at Tasjkent, Uzbekistan. Starting-up activities can be multiple, like assistance in project management, library support, curriculum development, etc.

The Indonesian example

In the period from 1986-1994, the Indonesian government implemented an on-farm water management development programme at farmers level in Java, West-Sumatra, Aceh and South Sulawesi (FAO, 1993). For this purpose, the government of Indonesia received support from FAO, which contracted ILRI to render technical advice to the Indonesian government. It was a capacity building programme focusing on a new approach to deal with farmers in irrigation management. The programme was effectuated in the water management sections of the Department of Agriculture at all three levels: central, provincial, and district.

The programme used the rehabilitation of village and tertiary irrigation systems as a tool for institutional development. The new approach was a participatory way of local development of irrigation systems: the improvement and management of irrigation systems was based on requests, needs, commitments, and possibilities expressed by local communities. Water management sections at district levels and "line agents" at the sub-district and village level were facilitators in this process.

The programme included training of staff at all levels of the water management sections of the Department of Agriculture. The objective of the training was to improve the staff performance in co-operation and development activities. The active role of staff in the process lead to a two-way learning system: higher-level staff trained and guided the sub-ordinates, and by implementing the programme all officers learned from the experience gained at lower levels.

Training methods were adapted to the needs of the different levels. Farmers were trained through extension activities, short training sessions, and farmer-to-farmer visits. The training of the district officers existed of a combination of formal classroom training, in-the-field guidance, and workshops. In these sessions they exchanged field experiences and discussed interim reporting issues. Central and provincial staff participated in workshops and on-the-job training. Training issues were presented according in an order parallel to the development of the irrigation system.

The programme enhanced co-operation with local universities (responsible for training materials and lecturers), the Agriculture Extension Service, the Irrigation Department, and local government agents. The most intensive and decisive co-operation was realised at the sub-district level: the lowest level of governmental representation in

Indonesia. Civil servants at this level are usually well-acquainted with farmers needs and conditions.

Important elements in the capacity building programme for Water Users' Associations at local level were:

- respect for local initiatives;
- use of informal leaders;
- local commitment;
- co-ordination at a strategic level, the sub-district level;
- involvement of line agents of other services;
- training attuned to the project activities.

Through training and development, 670 farmers' organisations and related government agencies in the sub-sector were trained with attention to their specific functions. The project also succeeded in strengthening the relation between the line agents of three departments: irrigation, agriculture and local government. The number of staff who in this way gained practical experience in irrigation system development with farmers after 8 years was: 28 people at provincial level, 122 people at district level, and 673 at sub-district level. Through the programme, central government level officers were better able to formulate adequate policies on water management at local level.

The Pakistan example

The International Waterlogging and Salinity Institute (IWASRI) in Lahore, Pakistan, developed from a more technical-oriented research institute into a research institute with a focus on operation and maintenance of drainage systems by users. This change was supported by the Netherlands Embassy. The initial programme of co-operation between IWASRI and ILRI was formulated in 1995. This programme had 2 goals (IWASRI/NRAP, 1997):

1. to develop guidelines and procedures to realise the direct role of farmers in the operation and maintenance of drainage systems;
2. to develop institutional linkages for IWASRI to ensure the incorporation of non-technical issues in research on drainage, waterlogging and salinity.

In order to reach the first goal, three types of activities were developed:

- social impact assessment in large scale drainage systems;
- action research in a farmers' implemented drainage system;
- advise to national services and consultants on the involvement of farmers in the planning, implementation and operation and maintenance of drainage systems.

To achieve the second goal two types of activities were developed:

- the organisation of "Expert Platform Meetings" on participatory methods in drainage;
- an inventory of expertise available in Pakistan on non-technical issues related to farmers' participation on drainage, waterlogging and salinity.

Social and technical research programmes were formulated. This approach clearly strengthened the institution's capacity to undertake research in socio-technical aspects of drainage. Another objective was to strengthen local institutions in water management.

The action research took place in an area suffering from waterlogging and salinity near Bahawalnagar, Punjab Province (IWASRI/NRAP, 1997). This gave the opportunity to develop a process with farmers' participation from the very start. The farmers had the intention to contribute directly to the improvement of their lands.

An NGO was contracted to take care of socio-cultural aspects. The NGO contributed to site selection, communication with the farmers, and the strengthening of a Community Management System (CMS) at village level. IWASRI staff was responsible for the technical aspects. Line agents were involved to advise on operational aspects and training. In every stage of the project an effort was made to have the community involved as much as possible, both in sharing information, decision making, and the execution of the work.

Close observation of the progress made and of the impact of the project on the community helped to adjust the programme and contributed to a better understanding of the social and institutional aspects related to the implementation of drainage systems.

A site of about 100 ha was selected where waterlogging and salinity was considered a major obstacle for development. Because of unfavourable soil characteristics, a complex subsurface system had to be constructed to drain off excessive water and salts. Tailor-made training modules were developed to assist farmers. Farmers formed a Farmers' Drainage Organisation (FDO) to take care of operation and maintenance. The drainage system made it possible to pump up groundwater and to use it for supplementary irrigation or to evacuate it from the area. In spite of the efforts to obtain full participation of the farmers, farmers' involvement appeared difficult. One reason is believed to be the attitude of farmers, who wished the project to take care of all that needed to be done. This supports the idea to insist from the first moment onwards on initiatives by local institutions.

A lesson learned formulated after the initial phase of the project is that this kind of projects has to start with an awareness programme to stimulate communities or social groups to take the initiative. Farmers themselves should start reclaiming their land; they should apply for support if they cannot do by themselves whatever needs to be done. Solutions will have to be small scale and tailor-made to the needs and potential of the local community.

Priorities in Capacity Building

From the examples it may be clear that capacity building is an integrated approach directed towards the improved functioning of the institutions in society. It consists of a combination of activities designed for the specific needs and local conditions.

Policy

Capacity building programmes should be effective and functional. The goals to be achieved will be based on the analysis of institutional constraints (DGIS, 1998; NEDA, 1998). To realise such programmes, long-term commitments will be needed. Because funds are usually limited and the capacity to adopt change is equally limited, such an intensive approach is possible only for selected areas (region or countries), or on a defined sector. One could choose between the most promising, the most deprived sector, or the sector with the highest impact on society.

Programming

The focus must be on a more integrated approach. This asks for a longer duration of the programme and for phasing in steps, with specific benchmarks and approaches. Indicators are needed to check progress and to adjust means and approaches when appropriate.

Tools

Participatory approaches imply that initiatives lay with the future users of the systems and the "owners" of the institutions. More attention needs to be put on decision-making processes in which information management and institutional networks will get full attention. Interval-guidance may be a means to guarantee the "distance" required, leaving the initiative at the proper side of the co-operation.

Capacity building will become increasingly more important in irrigated agriculture as a means to improve the performance of water control systems. A close co-operation between institutes in Wageningen, like those present on this workshop, can contribute effectively to future capacity building in irrigated agriculture.

Suggested reading

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