DFID Natural Resources Systems Programme

Policy Brief Theme 2

Practical ways forward for participatory land and water management

DFID Projects R7830 and R7839 were designed around the 'on-farm water management' (OFWM) idiom that was popularised in the 1970s. The OFWM approach was built on the diagnosis that irrigation problems lay 'below the outlet' with typical top-end – bottom-end distribution problems leading to inefficiency and inequity in water use. This resulted in the advocacy of water users associations (WUAs) formed amongst farmers served by a group of outlets.

The formation of WUAs is governed by the Government of India Command Area Development (CAD) policy guidelines on **participatory irrigation management (PIM)**. In general these guidelines specify a two-tier system in the form of a WUA covering a group of outlets or a `minor' and a Distributary Level Committee (DLC). In Bihar there are DLCs and Village Level Committees (VLCs). Typically these committees involve and focus on the interests of land-owning farmers.

Our aim was to facilitate the formation of institutions and the development of strategies for sustainable and socially acceptable land and water management through community participation. This required innovation in the following areas:

- The development of participatory processes that would involve wider constituencies in land and water management than under the existing WUAs, and the development of new institutional arrangements
- Development of tools to facilitate/support this participatory process.

Participatory process and institutional arrangements

Social development and technology evaluation, adaptation and development activities that had targeted the poor and socially disadvantaged built both the interest and confidence of these individuals to engage in discussion of water management issues.

Once this capacity accumulation was in place the use of established tools for participatory technology development supported by tactical/ strategic demonstration and communication activities (as an alternative to purely subsidised or incentivised approaches) enabled ideas to be developed.

We found that by involving a wider constituency of stakeholders [self-help groups (SHGs) and other interest groups] as well as the formation of outlet management groups (OMGs):

- Innovative ideas came forward that led to increased agricultural production and diversification
- Such innovative ideas were more implementable as the newly included groups had higher personal stakes in the outcomes (being generally poorer)
- The process could become self-sustaining because it depended on a `bottom-up' rather than on a 'top-down' process.

As has been shown elsewhere we found that OFWM approaches that ignore problems caused by erratic and unpredictable main canal system management can only have limited success. At the beginning of this project a continuous dialogue between the ICAR Research Complex for the Eastern Region (IRCER) staff and canal managers was necessary to achieve timely release of water.

Our experience suggests that it is vital to establish linkage and dialogue between water users and canal managers through: firstly, developing an institutional mechanism for dialogue between the two and, secondly, need-based technical back-stopping arrangements to achieve the desired output.

In these interventions IRCER played both the technical back-stopping and the strategic, research/ facilitating roles.

Development of tools to support participatory technology development

The project developed:

- An effective method to construct cadastral maps, using a differential global positioning system (GPS), a hand-held laser range-finder, and a geographic information system (GIS) database to capture directly observable characteristics of plots (using survey forms on Palm hand-held computers that were integrated into the GIS)
- A simple interactive operational economic tool to analyse the options for conjunctive use of canal and groundwater
- An interactive decision-support tool based on a water-balance approach and linked with the GIS at the distributary level to illustrate various water management options and their effect on spatial and temporal water availability in the command area.

Feedback to date suggests that these tools have value, not only in awareness and capacity building and in knowledge sharing to support OFWM decisions at the distributary level, but also in that the tools provide essential information that can be used to assist main canal management decisions.

> These tools provide an interface at which the main canal technocrats can engage because they relate to their perceptions of expertise in science and engineering, while at the same time being readily communicable to and understood by less-educated stakeholders.

These may be considered **dialogic** tools in that they facilitate more democratic dialogue.

Technical innovations

Conjunctive water use

Recognising the potential benefits of increased yield in rice and wheat through optimisation of rice transplanting time (25 June–15 July) a shift in crop establishment has been achieved. This was possible in part because water was released from the main canal at an appropriate time. The project found evidence of an increase in the number of pumping hours and an enhanced groundwater market. These are indicators that suggest a change of practice to support growth in adoption of conjunctive use of groundwater in the command area.

Given the current management of water, areas within the irrigated command and on higher land have remained uncultivated. Recognising the opportunity to raise high-value crops, members of SHGs have leased areas of this land to raise vegetables. This diversification in crop production depended on the use of readily available groundwater resources.

Based on this success, key demonstrations and further low-cost interventions were undertaken:

- About 75 farmers raised the bund height around their fields from 7.5–15 to 25–30 cm in order to store and use rainwater. As a result they reported that they were able to manage with 1 or 2 fewer irrigations from the canal, and that soil remained moist for longer than usual.
- Water users installed low-cost wooden gates on the outlets of RPC-V. These gates not only reduced water congestion in the outlet commands but resulted in a 25–30 % water saving.

Multiple use of water bodies

SHGs (2) and individual farmers (at 7 locations) diversified their use of water by growing fish in previously unused ponds and unutilised seasonally waterlogged areas.

Following very limited demonstration and awareness building, these farmers experimented with rice–fish culture, and achieved a fish yield of 500–700 kg/ha (equivalent to 4–5 t/ha of paddy). This was harvested from the previously under-utilised, water-congested areas and provided them with additional income. Approximately, 1.2–3 t/ha of fish was harvested from waterlogged areas or abandoned pits that were previously unused.

> The results of these interventions produced an overwhelming response and their benefits are beginning to spread through word-of-mouth. Villagers are enthusiastically taking up these interventions and about 20 farmers/groups are adopting them.

Research approaches

The project involved interventions that were not within the capacity of any single organisation involved in the partnership. In this way the project provided a learning platform for partners with different perspectives to share and contribute to a common objective. Beyond the project team, partnerships between actors with varying focus

and capacity have become key to achieving lasting livelihood improvements.

Effective relationships within the project team required considerable time to develop (much more time than most projects are able or willing to invest). The convergence of approaches and the development of new ideas within the project was a notable achievement of this process. As working relations developed, the project team was able to move forward more effectively.

As an example, encouraged by the International Water Management Institute (IWMI) the project explored how water balance models could be used to develop tools that met the needs emerging from the participatory technology development (PTD) process and dialogue about linking the main canal management and OFWM. The development and testing of these tools formed part of the PTD process itself, and represents an important innovation in the research approach, away from a linear technology development and transfer paradigm.

This learning on the research process has already been assimilated in the development of similar IRCER projects that focus on integrated land and water management issues.

Policy implications

- The participatory process developed and demonstrated in the project involving wider constituency of stakeholders (such as WUA, SHG and other interest groups) can be used to support and strengthen effective implementation of PIM through the CAD guidelines
- Institutions and mechanisms for improved linkage between the main canal and OFWM need to be addressed by concerned authorities at appropriate levels and facilitated through sensitisation workshop meetings and consultative workshops supported by the appropriate dialogic decision-support tools
- Subsidies and incentives are not necessarily essential for the adoption of effective OFWM interventions in the command when such interventions are supported with effective communication, dialogue and the process of participation
- Multiple use of seasonally waterlogged areas (including such areas that are near the canals) to enhance water productivity will require a definitive policy from the Canal Department to lease such lands to SHGs or other interest groups
- The dialogic tools developed by the projects require a GIS component to be effective. A key issue is the need to develop cost-effective ways to produce GIS maps that can be supported by potential clients
- This project has shown how different partners learn and jointly shape their approaches to achieve a common objective. This learning process is expected to feed into the development of future programmes by different project partners in land and water management.

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