

Stocktaking of agricultural water investment in India

A review of selected World Bank-supported projects



FAO INVESTMENT CENTRE

BEST PRACTICES IN INVESTMENT DESIGN





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BEST PRACTICES IN INVESTMENT DESIGN

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ACRONYMS AND ABBREVIATIONS

AC	Apex Committee
AgSS	Agricultural Support Services
AM	Aide-Mémoire
AP	Andhra Pradesh
AP II	Andhra Pradesh Irrigation Project II
AP III	Andhra Pradesh Irrigation Project III
APCTMP	Andhra Pradesh Community-Based Tank Management Project
APERP	Andhra Pradesh Economic Restructuring Project
APFMIS	Andhra Pradesh Farmer Management of Irrigation Systems
APIP	Andhra Pradesh Irrigation Project
ARD	Agriculture and Rural Development
ATMA	Agricultural Technology Management Agency
AWM	Agricultural Water Management
CADP	Command Area Development Programme
CAE	Country Assistance Evaluation
CAS	Country Assistance Strategy (World Bank)
CCA	Cultivable Command Area
CDF	Centre for Development Finance
CMC	Contract Management Committee
CSS	Centrally Sponsored Scheme
DC	Distributory Committee
DoA	Department of Agriculture
DWR	Department of Water Resources
ERR	Economic Internal Rate of Return
FAMIS	Farmer Managed Irrigation Systems
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
FLD	Front Line Demonstrations
FMIS	Farmer Management of Irrigation Systems
FOT	Farmer Organization and Turnover
FYP	Five Year Plan
GB	General Body
GDP	Gross Domestic Product
GoI	Government of India
GoM	Government of Maharashtra
GoO	Government of Orissa
GoTN	Government of Tamil Nadu
IAMWARM	Irrigated Agriculture Modernization and Water Bodies Restoration and Management Project
ICR	Implementation Completion Report (World Bank)
IEG	International Evaluation Group
IFIs	International Financial Institutions
IFMR	Institute for Financial Management and Research
IMT	Irrigation Management Transfer
IWMI	International Water Management Institute
LDP	Livelihood Development Plan
MC	Management Committee

M&E	Monitoring and Evaluation
ME&L	Monitoring, Evaluation and Learning
MIS	Management Information System
MMISF	Maharashtra Management of Irrigation Systems by Farmers
MWSIP	Maharashtra Water Sector Improvement Project
NPV	Net Present Value
NREGS	National Rural Employment Guarantee Scheme
O&M	Operation and Maintenance
OR	Orissa
ORCTMP	Orissa Community Tank Management Project
ORWRCP	Orissa Water Resources Consolidation Project
PAD	Project Appraisal Document (World Bank)
PAP	Parambikulam Aliyar Project
PC	Project Committee
PDO	Project Development Objective
PIM	Participatory Irrigation Management
PLA/PLC	Project Level Association and Project Level Committee
PP	Pani Panchayat
PoPs	Package of Practices
PPMU	Project Preparation and Management Unit
PPPs	Public Private Partnerships
PWD	Public Works Department
RKVY	National Agriculture Development Programme (Rashtriya Krishi Vikas Yojana)
R&M	Rehabilitation and Modernization
SAU	State Agriculture University
SHG	Self Help Group
SPK	Samaj Parivartan Kendra
SSS	State Sponsored Scheme
TC	Territorial Constituency
TN	Tamil Nadu
TORs	Terms of Reference
TNIAMWARM	Tamil Nadu Irrigated Agriculture Modernization and Water-Bodies Restoration and Management Project
UTWMC	Uttar Pradesh Water Management Commission
TNWRCP	Tamil Nadu Water Resources Consolidation Project
UTWSRP	Uttar Pradesh Water Sector Restructuring Project
WALMI	Water and Land Management Institute
WB	The World Bank
WDA	Water Distributory Association
WRCP	Water Resources Consolidation Project
WRD	Water Resources Department
WSIP	Water Sector Improvement Project
WSRP	Water Sector Restructuring Project
WUA	Water User Association



EXECUTIVE SUMMARY

Context

Agricultural water management (AWM) has been recognized as a critical issue in India's food security, and has been one of the main recipients of public funds. It has also received a significant amount of international donor funds. The World Bank in particular has been channelling a large part of its agriculture and rural development (ARD) portfolio in India to AWM. Apart from the direct investment in irrigation projects, the Bank has been providing technical assistance and undertaking thematic, policy, and sub-sectoral studies. Over time, its engagement in the sector has shifted from an infrastructure-oriented approach to a holistic one, with greater emphasis on capacity building for State and non-governmental actors, as well as institutional support to farmers and water users organizations within the context of participatory irrigation management (PIM).

The report is part of a joint FAO and World Bank research effort that aims to take stock of World Bank-supported ARD projects in South Asia and which covers three closely related themes, namely: (i) Rural Livelihoods Programmes in India, (ii) AWM programmes in India, and (iii) monitoring, evaluation and learning (ME&L), including management information systems (MIS) design and implementation in the above type of projects in South Asia.

The findings are based on several studies including detailed literature and project document reviews covering the period 1995 to 2010. In addition, quantitative and qualitative data collection were conducted in three States in India (Maharashtra, Tamil Nadu and Orissa), as well as reviews of State level comparative institutional and policy analysis in the water sector and of agricultural extension activities in support of irrigation investments.

Lending for agricultural water management in India

The evolution of Bank AWM-related lending to India is marked by significant changes in the conceptualization of irrigation projects. One key trend was that of moving from new construction to rehabilitation of infrastructure. A second was transfer of irrigation management to farmers. A third trend was putting greater emphasis on capacity building and institutional development activities (including multi-disciplinary agricultural extension activities).

Such changes resulted from taking stock of the World Bank's earlier involvement in India. In particular, the stocktaking acknowledged that the rapid expansion of infrastructure had not been accompanied by appropriate creation or strengthening of local and public institutions capable of managing infrastructure efficiently. This led to a renewed emphasis not only on reforming States but especially on the "software"

of AWM investments. The focus on institutions (both State level government and farmer organizations) is still of relevance today in the context of Government of India (GoI) policies. The GoI's eleventh five-year plan (FYP) clearly states that more emphasis needs to be put on PIM with system maintenance and revenue realization being handed over to beneficiary groups or water user associations (WUAs).

Portfolio performance

In a cross-sector comparison, the World Bank's AWM project portfolio generally shows a moderate performance. A global review of AWM projects, in particular the Independent Evaluation Group (IEG) evaluation summaries in the period 1994 to 2004, indicates that "the majority of projects that perform poorly do so because of institutional problems"; "(i) poor coordination among implementation agencies, (ii) lack of capacity within main implementing agency, (iii) insufficient buy-in to sector reform and reorganization, (iv) neglect of complementary agricultural services and (v) weak commitment to cost recovery and/or user participation in system management and operation". In India, the same evaluations available for closed projects seem to suggest that the World Bank AWM portfolio fares comparatively better on most ratings.

An interesting observation about the Indian portfolio is that ex-post economic internal rates of return are consistently below estimates at appraisal. Moreover, it seems the more carefully such economic internal rates of return (ERRs) are calculated, the lower they become. This is the case of Andhra Pradesh Irrigation Project III (AP III) in India, the only project that had a more detailed estimation of benefits through surveys of treatment and control groups.

Regarding monitoring and evaluation (M&E), the main conclusion is that the quality concerning project design has improved over time, but that there are significant methodological and implementation shortcomings. Key issues include: (i) complex information and high number of indicators to be tracked, (ii) lack of adequate empirical strategies for establishing attribution of impact to project activities, (iii) delays and coordination problems in implementation of project M&E activities such as baselines and (iv) M&E information not being used systematically for project management decisions.

While there has been an increasing concern with attribution of impact, there are still major problems identified in how this is proposed in project design. In particular: (i) objectives and respective indicators are often badly specified (not easily measurable, time-bound or other), (ii) there is too little detail provided at design and/or implementation manual on the sampling strategy for impact evaluation, (iii) implementation arrangements are not conducive to efficient results in M&E.

Involving the water users

PIM as a strategy to improve sustainability of irrigation systems depends on functional WUAs that have the capacity to interact during planning, evaluation, rehabilitation or modernization processes and that are empowered to manage operation and maintenance (O&M). The lessons learned and problems identified in documentation of the sample projects mainly relate to the factors required to enable transfer of O&M responsibility to farmers with meaningful community

participation, including building awareness and capacity among government officials, farmers, and WUA officials about the PIM concept.

According to the World Bank, the most significant change in terms of AWM institutional arrangements in recent years has been the PIM movement and the development of WUAs, defined by World Bank-supported projects as institutions “formed for the purposes of irrigation operation and maintenance on units covering more than one administrative unit (village or municipality).” In the Country Assistance Strategy (CAS) for India, financial year 2005-2008, the support to the creation of WUAs is targeted as one of the strategic actions towards sustainable growth and use of water resources.

Key findings and recommendations

Self-sustainability of WUAs

Experience from the sample projects indicates that it takes at least three years of continued financial, technical and institutional support for WUAs to reach an acceptable level of self-sustainability. Thereafter, support should always be available to WUAs. To this end, permanent capacity needs to be built within government, for example in the Water Resources Department (WRD), to monitor WUAs and provide support and training as needed at any time. This has significant implications for future project design because shorter time-frames for intervention are unlikely to result in effective institutions. If WUAs in the project area are newly elected, weak or non-existent, then project fund allocation schedules should frontload funding for awareness of and capacity-building for participatory irrigation management among farmers, WUA officials and government officials. According to project completion reports, the disbursement of civil works contracts should be slowed down to reflect the time needed for WUAs to develop the capacity to plan and manage O&M.

The analysis of World Bank documentation brings forward several key messages on broader institutional and policy reform: broader institutional and policy reform – can it be achieved in project format? The experiences of the water resources consolidation projects in Orissa (OR) and Tamil Nadu (TN) suggest that extended policy dialogue with government stakeholders before project launch is essential to ensuring project success in implementing PIM and reorganizing irrigation departments. Building high-level interest, motivation and capacity for water sector reform takes time.

One of the most common lessons from older World Bank-supported projects is that a component on agricultural productivity enhancement for irrigated area needs to be integrated with PIM and institutional reform components from project inception. Project design can clarify the nature of interactions at senior and junior levels. However, implementation is influenced by many other factors including systemic difficulties in inter-departmental coordination. The importance of having good project management with a permanently posted team leader at project inception to coordinate hiring and overseeing consultants is emphasized.

Agricultural water management project portfolio

The World Bank has dedicated a substantial portion of its ARD portfolio in India to AWM projects and this review finds evidence that it has been able to steadily improve the performance of its projects through increasing focus on institutional arrangements and a greater emphasis on agricultural support services to areas under irrigation. While results from individual projects are mixed in terms of economic performance, according to most accounts the Bank portfolio has for the most part had a satisfactory performance mainly through some influence on State level institutions in the so-called “reforming States”.

The AWM sector is high on the GoI agenda and is likely to remain given concerns over food security and the specificities of a country with India’s population and this seems to not always be captured well in World Bank portfolio considerations as of late, namely those discussing sector underperformance.

World Bank-supported projects in AWM have become a small part of overall investments in the sector (namely those by GoI) and some re-positioning may be warranted. Being small is not a problem per se but also suggests that simply providing additional finance for similar type of investments or programmes with approaches close to existing Government projects is not always desirable. An alternative is for the Bank’s portfolio in AWM to evolve towards projects that foster innovation and a flexible environment for experimentation and continue to address issues related to the overall enabling environment for PIM.

The participatory irrigation management concept

The sentiment on PIM seems to have shifted recently and there is increasing pressure for finding new quick solutions. Still, this review suggests there is probably not enough evidence to argue for quickly dismissing such approaches. The concept of PIM is no longer as fashionable as it was in the 1990s and this is being made clear by both World Bank documents and other institutions that call for new ideas, namely through public private partnerships (PPPs). The World Bank’s efforts in the three States are consistent with international experience and previous work in India. It shows that some elements have been reasonably successful, particularly the formation of WUAs, and that they are functioning to a certain extent, though not always consistent with the PIM principles of democracy and transparency. Key constraints are similar to those identified elsewhere: lack of funding, lack of autonomy, lack of capacity and so on, i.e. all elements which could be improved in future Bank-supported projects.

WUA capacity building is a lengthy process and this is also consistent with findings of the qualitative research conducted as input to this report, and the available literature in general. Still, this is not often reflected in project design, and capacity building is often given insufficient attention in a context of pressure to disburse project funds over a short time period and quickly achieve output indicators to satisfy periodic performance reviews. Among the more recent projects in the sample, this lesson is only reflected in the Andhra Pradesh (AP) and OR Community Tanks Management Projects (APCTMP/ORCTMP).

There are several compelling reasons to try to improve the PIM concept and its implementation as opposed to fully abandoning it and searching for an alternative

approach. This study identifies at least three key reasons for such a strategy: First, there is diversity in WUAs performance and there are many successful cases even within a system that is overall not performing well. Second, WUA performance is heavily conditioned by overall system performance including engineering efficiency and agricultural support. Third, the qualitative research focusing on the structure and work of irrigation departments in five States highlighted that PIM is now better understood following years of projects and trainings, and that there is now a valuable body of knowledge accumulated over the past ten years that can and should be leveraged to improve the approach to PIM, which did not exist in India ten years ago.

Role of project format

The project format raises challenges for achieving significant results, specifically at the institutional level, and there is probably scope for more targeted, less ambitious interventions in terms of new institution building and infrastructure works. The project format is very challenging in AWM in India not only owing to difficulties in building capacity of WUAs, but also because it helps to support significant change in key implementing institutions at State level such as agricultural and irrigation departments. There is possibly an opportunity to have a more focused approach with less ambitious coverage targets that can allow a more detailed analysis of particular scheme level constraints of different types (such as in terms of institutions, engineering efficiency and agricultural practices) and be able to have more detailed and context-specific solutions being considered already at the project design stage.

Institutional challenges

On support to agriculture, the review concludes that despite some recent progress there is scope for major improvements namely on the technical packages offered and the coordination between departments at the State level. In particular, there is scope for the World Bank-supported projects to assist states in developing a policy framework for AWM, with particular attention to agriculture. Overall, farmers need solutions based on local context and this is not being implemented at present with an over-emphasis on top-down approaches and input delivery. It is possible for World Bank-supported projects to experiment more on innovative coordination and service delivery mechanisms such as creating a water unit/cell within the agrarian directorates, if not in existence, to be responsible for implementation with a mandate for convergence. Finally, there is a need to build capacity of extension staff both in participatory and facilitation techniques as well as in the contents of technological training packages offered to farmers.

Water service delivery should be an entry point for improving performance of irrigated agriculture. Water management at field level must be improved. Unless there is a reliable, flexible and fair irrigation service, WUAs would have little interest in performing O&M. Conversely, if government agencies continue to see WUAs merely as surrogate collection agencies and do not improve actual irrigation service delivery, the chances of WUAs achieving long-term sustainability are doomed. This means improving the irrigation service provided by irrigation agencies and introducing service-oriented management should be a top priority for future interventions. Agricultural support programmes should focus on water management and related agricultural practice.



Chapter 1 - Introduction

In late 2009, the FAO Investment Centre, in partnership with the World Bank, started a stocktaking of ARD projects in the South Asia region. The stocktaking had been initiated at a three-day inception workshop (New Delhi, October 2009) in which FAO and World Bank staff, project task teams, government officials, national M&E experts and other development partners participated.

The stocktaking, which is part of a wider research effort, covers three closely related themes, namely: (i) Rural Livelihoods Programmes in India, (ii) AWM programmes in India, and (iii) ME&L systems and MIS design and implementation in the above type of projects in South Asia. This report focuses on the second theme, placing emphasis on PIM, the main thematic area of current World Bank irrigation lending in India. It is meant to complement other work conducted by the World Bank, which is looking for options for sector policy reform and future AWM in India.

The findings that are discussed in the following pages are based on several studies¹ including detailed literature and project document reviews.

In addition, quantitative and qualitative data collection was conducted in three States in India (Maharashtra, Tamil Nadu and Orissa), as well as reviews of State level comparative institutional and policy analysis in the water sector and of agricultural extension activities in support of irrigation investments. It is important to appreciate that there are regional physical, social and economic differences between the states concerned.

The studies set out to: (i) help gain clarity on the evolution and perceived impact of the last 15 years of World Bank lending for investments in AWM in India; and (ii) bring out some of the lessons that were identified in the project documentation, with special emphasis on topics such as PIM and extension support.

To provide a contextual setting, the following chapter briefly presents the role of agriculture in the Indian economy, the importance of the irrigation sector and the participation of farmers in irrigation management. Chapter 3 provides an overview of lending for agricultural water management, discusses portfolio performance, and takes a critical look at the monitoring and evaluation of AWM projects. Chapter 4 discusses the involvement of the World Bank in PIM, the role of WUAs and of agricultural support services. Chapter 5 summarizes major documented lessons from AWM projects in India. The final chapter summarizes the key findings and recommendations of this stocktaking exercise.

¹ For more detailed information on the methodology refer to Annex 1.



Chapter 2 - Context

Agricultural water management in India

Agriculture in India is a major sector generating close to 20 percent of gross domestic product (GDP) and providing livelihoods for some 800 million people. The portion of agricultural lands provided with irrigation is about 30 percent, with significant variation from state to state, and significant fragmentation of land holdings. (WDI, 2009). AWM has been recognized as a critical issue in the country's food security, and has been one of the main recipients of public funds.

The planned development of the irrigation sector started with the First FYP (1951–56) whereby AWM received a substantial 23 percent of the total Plan expenditure². New projects were taken up in subsequent plans, but there were occasional overhauls with emphasis shifting to the completion of ongoing schemes during the Fourth and the Seventh FYP. Although irrigation has never again received the level of importance that was assigned to it during the 1950s, it still commands considerable resources from the National and State Governments: the allocations in the Tenth and Eleventh Plan were, respectively, 6.3 percent and 6 percent of total Plan expenditures.

AWM has also received a significant amount of international donor funds. The World Bank in particular has been channelling a large part³ of its ARD portfolio in India to AWM. Apart from the direct investment in irrigation projects, the Bank has been providing technical assistance and undertaking thematic, policy, and sub-sectoral studies. Over time, its engagement in the sector has shifted from an infrastructure-oriented approach

to a holistic one, with greater emphasis on capacity building for state and non-governmental actors, institutional support to farmers and water users organizations within the context of PIM.

The evolution of World Bank AWM-related lending to India is marked by significant changes in the conceptualization of irrigation projects. One key trend was that of moving from new construction to rehabilitation of infrastructure. A second one was transfer of irrigation management to farmers. A third trend was putting greater emphasis on capacity building and institutional development activities (including multi-disciplinary agricultural extension activities). Such changes resulted from taking stock of the World Bank's earlier involvement in India. In particular, there was a clear realization that the rapid expansion of infrastructure had not been accompanied by appropriate local and public institutions capable of managing infrastructure efficiently. This led to a renewed emphasis not only on Reforming States but especially on the "software" of AWM investments. The focus on institutions (both State level government and farmer organizations) is still of relevance today in the context of Gol policies. The Gol's Eleventh FYP clearly states that more emphasis needs to be put on PIM with system maintenance and revenue realization being handed over to beneficiary groups or WUAs. Such plans aim at covering the entire command area of all major and medium projects by WUAs by the end of the plan in 2012 (Gol, Eleventh FYP). In particular, it is clearly stated that:

"The participation of actual beneficiaries through PIM and the maintenance of village-level distribution channels through WUAs have been found useful. There is broad consensus that this has been a step in the right direction. This needs to be pursued more rigorously with genuine empowerment of WUAs"

(Gol, Eleventh FYP, p. 58)

² Source: Gol, Planning Commission of India, 2008, Eleventh FYP, Vol. III, Chapter 2, p. 46. Available at: http://planningcommission.nic.in/plans/planrel/fiveyr/11th/11_v3/11v3_ch2.pdf.

³ Exact estimates are elusive due to variations in the definitions of sectors and activities in the project documentation, but evidence from internal reports point to a gross estimate of around 50 percent of the ARD portfolio being directed to irrigation development.

Farmers' participation in irrigation management

The origins of PIM can be traced back to 1980-81 with the Command Area Development Programme (CADP) launched within the Sixth FYP, which adopted the formation of irrigation associations as one of the strategies for the improvement of the canal system. The 1990s were focused on partly turning over the management of irrigation systems to the farmers. The basic idea behind PIM was to improve the overall efficiency and equity of irrigation systems, generate sense of ownership among farmers, and to improve the irrigation revenue recovery rate.

The main push for PIM came with the Sixth FYP (1980-85) and the National Water Policy in 1987, when efforts were made to involve farmers progressively in various aspects of irrigation systems, particularly in water distribution and collection of water rates. In 1987, the Ministry of Water Resources of India issued guidelines for PIM, primarily for the centrally-sponsored CADP⁴. Between the 1970s and 1990s, the deterioration in the financial performance of irrigation projects was strong and nearly universal among Indian States⁵. Moreover, with the progressive expansion of irrigated areas, the resources required for O&M also expanded.

As highlighted in the study by Ashok et al. (2005), O&M budgets are usually at the discretion of each State and are normally given a lower priority compared to developing new potential. In addition, the composition of O&M expenditure in India shows that the share of maintenance and repair in total O&M has been declining steadily in comparison to administration and direction expenses. Finally, by the 1990s, when budget allocation and priorities shifted away from irrigation, neither national budget nor foreign

funding were able to guarantee the physical and financial sustainability of many irrigation systems (Meinzen-Dick et al., 2002). Overall, according to FAO and the International Water Management Institute (IWMI) (2007), the process leading to irrigation management transfer in India was part of a broader pattern of liberalization and privatization as per Government overall economic policies.

The National Water Policy of 2002 went further on stressing the importance of PIM as a way of covering O&M costs: "Management of water resources for diverse uses should incorporate a participatory approach: by involving not only the various government agencies but also the users and other stakeholders [...] Necessary legal and institutional changes should be made at various levels [...]". The key concepts driving PIM were to improve the overall efficiency of irrigation systems, generate a sense of ownership among farmers, improve the irrigation revenue recovery rate and ensure a more equitable water distribution among farmers.

These policy principles have been accompanied by the passing of a number of Acts which provided legislative back up for PIM implementation. These initiatives for policy and legal support regarding PIM received the support from several international donors including the World Bank, European Commission, USAID and Ford Foundation.

In particular, according to the numerous discussions held with various levels of stakeholders in five states, the World Bank-supported projects significantly influenced the introduction of a number of Acts regarding PIM at State level. These Acts focus mainly on issues regarding (i) election procedures, (ii) financial resources, and (iii) functions (conducting of meetings, maintaining records, audit, etc.) of the WUAs. Moreover, all of the Acts reviewed in five states aimed (with slight differences in wording) at giving "Farmers' Organizations an effective role in the management and maintenance of the irrigation systems for effective and reliable supply and distribution of water" (example from Tamil Nadu Act for PIM).

4 Report of the Committee on Pricing of Irrigation Water, 1992 – Planning Commission, Government of India, New Delhi.

5 The Report of the Committee on "Pricing of Irrigation Water" of The Planning Commission - Government of India (1992) witnessed the worsening of financial performance of irrigation schemes in India. Between 1974-75 and 1976-77 on the average, gross revenues (Rev) exceeded working expenses (WE) in as many as 4 States (Karnataka, Madhya Pradesh, Maharashtra, Uttar Pradesh). In addition, on average, almost 70 percent of the operation and maintenance budget was spent on employees' salaries and establishment expenditures, leaving just a residual part for works and actual maintenance of the infrastructure (Swain, 1998).

In order to improve the overall situation in irrigation management, it was considered crucial to involve and associate farmers in the planning, O&M of the irrigation conveyance system. The basic idea behind Farmer Managed Irrigation Systems (FMIS), and hence PIM, was to generate a sense of ownership among farmers, to improve the overall efficiency and distribution equity of irrigation systems, and to improve the irrigation revenue recovery rate.

The 1990s were focused on turning over the system to the farmers. During this phase came India's first FMIS Act in Andhra Pradesh in 1997. Subsequently, the Act was enacted in Tamil Nadu in 2000, 2002 in Orissa and 2005 in Maharashtra.

In World Bank-supported projects, the element of PIM is encompassed with the Farmer Organization and Turnover (FOT) component. FOT includes methodical procedures through which tertiary segments of the canal system such as minors and sub-minors are handed over to farmers for their O&M. This is undertaken through the creation of WUAs or Pani Panchayats (as known in Orissa). The World Bank-assisted irrigation projects in Tamil Nadu, Maharashtra, Orissa, Uttar Pradesh and Andhra Pradesh triggered the emanation of a number of Acts. The key purpose of these Acts was to give farmer organizations an effective role in the management and maintenance of the irrigation system.

The concept of PIM in India has evolved over the last few decades since first introduced. The first attempts considered PIM as something largely confined to take place "below the outlet", transferring operation and maintenance responsibility for tertiary level to WUAs. Given that the government could not undertake this task adequately, it was largely a token transfer of responsibility. Later on, PIM included greater emphasis on revenue collection, hoping that the sense of "ownership" would encourage WUAs to collect fees on behalf of government and keep a share for local level expenses. Finally, PIM became a much broader concept that can even involve WUA participation in decisions of water resources allocation at system level.

The Andhra Pradesh Farmer Management of Irrigation Systems (APFMIS) Act (1997) was the first of its kind in India and provided a legislative backup for PIM implementation with functional and administrative autonomy to WUAs in the State of Andhra Pradesh. The PIM experience in Andhra Pradesh has been an inspiration to other states in India: for instance, states like Tamil Nadu and later Maharashtra enacted exclusive legislations in later years based on the Andhra Pradesh experience. These FMIS Acts are detailed accounts of different key issues for WUAs such as: (i) election procedures and other institutional elements, (ii) financial resources, and (iii) functions (operations and maintenance of canals, conducting of meetings, maintaining records, audit, etc.) of the WUA.

On the face of it, India appears to have made rapid progress in adopting PIM. By 2005 ten states had enacted new acts or amended existing irrigation acts to facilitate PIM (Swain, 2008). In 2006 the Ministry of Water Resources reported the formation of more than 57 000 WUAs in 23 States of India, covering 10.32 million ha.

However, the results from PIM are mixed and context specific. Some of the reported benefits are not always clearly measured through rigorous impact evaluations and in some cases the available evidence suggests they were below initial expectations. In theory the expected benefits would include increased irrigated area, improved maintenance, fewer water conflicts, expanded crop diversification, improved interaction with irrigation department, increased lobbying activity for common benefit, and improved water rate collection (Singh, 1991; Maloney and Raju, 1994). In practice however, as studied by Huppert (2005), some of the reported benefits such as increase in irrigated area, rather than being a physical increase in new irrigated area, may be mainly due to revision of procedures for revenue records following the creation of WUAs and the tying of WUA maintenance grants to the area officially registered by the revenue department. The changes introduced with the reform altered the relationship between key stakeholders, increased transparency and limited opportunities for the

rent-seeking behaviour that was widespread before the reforms.

A 2008 review of PIM in India (Swain and Das) highlighted that, “the process is fraught with many difficulties due to heterogeneity of farmers, caste-class cleavages, physical system inefficiency, half-hearted support from the irrigation bureaucracy, lack of committed local leadership, inadequate capacity building, and lack of proper incentives” and concluded that “To achieve the intended benefits of PIM, an integrated and comprehensive reform is necessary”.

The difficulties of establishing an effective PIM programme should also be considered within the broader context of the general status of irrigation sector in India, which is characterised by deteriorating infrastructure as a result of under-investment in capital and O&M works, and inefficient management (Swain and Das, 2008). Beyond the frequent problems of design

and construction shortcomings, and despite the good intentions behind the PIM approaches, there is still surprisingly little evidence that water users can succeed in their intended roles in the management of the systems, or that the pricing and the collection mechanisms of irrigation fees can cover O&M costs. And so, India today faces the risk of erosion of a huge irrigation capital it built at a massive investment. Whether PIM approaches can revive India’s public irrigation systems is open to a debate that this report intends to make a contribution to. What is clear is that PIM approaches alone will not be sufficient to accomplish this enormous task. It will have to be a combination of (i) a WRD reform which would put much more focus on conjunctive use of water; (ii) WUA strengthening which eventually will lead to the WUAs to become involved in the management of both surface and groundwater; and (iii) an increasing role of PPPs for higher order irrigation infrastructure.



Chapter 3 - Lending for agricultural water management in India

World Bank lending for the agricultural water management sector

The World Bank's work and thinking on AWM changed considerably with its first sector strategy in 1993 on "Water Resources Management: A World Bank Policy Paper" (World Bank, 1993). From an almost exclusive focus on infrastructure development in the 1980s, the World Bank's strategy shifted to improving management of infrastructure and simultaneously went from a discrete to a multisectoral approach to investments (encompassing water utilities, irrigation, water resource management, land use, among others).

In 2003, the Bank strategy in AWM was complemented by another paper (World Bank, 2003) that added a stronger focus on institutions, emphasized the link between resource use and service delivery, and also reintroduced infrastructure investments in the agenda (namely modernizing irrigation investments). The 2003 Bank document interestingly includes very strong views on irrigation management, which are key elements of the proposed reform agenda. These include, among others, the "scaling up of user associations and ensuring that they are representative of all farmers". The document further recognizes that WUAs "have proved effective for increasing efficiency and productivity; for improving accountability, performance and responsiveness to farmers; and for improving the financial sustainability of irrigation systems" (World Bank, 2003, p.15). However, this document also states that "Global experience shows that water user associations are a necessary but not sufficient condition for improving irrigation performance. Equally important (and generally much more difficult) is reforming the way in which managers of the infrastructure (the irrigation departments in India) perform". These two strategic documents have

dominated most of the World Bank thinking on AWM as confirmed by the latest IEG report (IEG 2010) which indicates that "the 1993 and 2003 [sector] strategy papers...have helped inform issues of supply and improve the performance of utilities and user associations".

Water-related lending, and in particular AWM, has been a very important component of World Bank activity globally. Accounting for both dedicated and non-dedicated projects, in the period 1997-2007 almost a third of World Bank approved projects have been water related (IEG 2010). The Bank has lent more than USD 26 billion to irrigation, approximately USD 94 billion on all water and land projects and an estimated USD 118 billion on all water related projects⁶ (IEG 2010). This represents a significant part of total World Bank lending in the same period which reached almost USD 250 billion. Moreover, the largest borrowers in AWM for the World Bank are India and China, with the former topping the ranking for largest individual water-related projects.

Despite the high absolute USD value of commitments by the World Bank in AWM it is still a small global player in the sector along with the other international financial institutions (IFIs). According to another IEG review (IEG 2005), in the period of 1990 to 2000, IFIs represented only about four percent of global annual funds channelled to irrigation (both investment and operations and maintenance) with the World Bank accounting for around half of the commitments.

The lending portfolio trend has also been for smaller projects over time, in particular the

⁶ The definition for "water and land" projects used in IEG 2010 includes (i) irrigation, (ii) groundwater, (iii) hydropower or dams, (iv) floods, and (v) droughts. The definition of "water projects" includes "water and land", water supply and sanitation" and "environment". For example, watershed management falls into the environment category (USD 13 billion lent in the reference period). The figures are estimated on the high side given that they include non-dedicated projects. Only considering direct support to water, the total bank commitments were around USD 54 billion in the period 1997-2007.

Table 3.1
India – The World Bank performance ratings, closed AWM projects

Category	TN WRCP	OR WRCP	AP III Irrigation	AP ERP*
Principal performance ratings				
Outcome	Satisfactory	Satisfactory	Satisfactory	Whole project: Moderately satisfactory Irrigation: Unsatisfactory
Sustainability	Likely	Likely	Likely	Whole project: Likely; Irrigation: Unlikely
Institutional Development Impact	Substantial	Substantial	Modest	No rating given
Bank performance	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Satisfactory	Moderately satisfactory
If available from QAG/IEG				
Quality at entry	Satisfactory	Satisfactory	Satisfactory	Moderately satisfactory
Quality of ICR	Satisfactory	Satisfactory	Satisfactory	No rating given
Project at risk at any time	No	Yes	Yes	No

* **Note:** These ratings are for the APERP as a whole, including all the other components such as education, health, roads, and fiscal reform. The only irrigation specific rating in the consolidated ICR is for “Sustainability”.

amount of new irrigated land created. The IEG report on AWM was concluding already in 2005 that “...consistent with findings related to the project’s financial size, all the projects covering a very large area were designed before 1999. The change over time was substantial. After 1998, the average project area⁷ fell by two-thirds. “Projects designed to cover large areas are now rare”. This was also in line with a global trend of slowdown of irrigation expansion. For developing countries as a whole, the irrigated area more than doubled over 1965-2005; however annual rates of expansion of around 2 percent per year during the 1960s and 1970s slowed to hardly 1 percent in the 1990s. Besides having fewer opportunities for new systems, many countries face constraints to expansion, particularly from social and environmental concerns, and during the 1990s, prices of key commodities were also at such levels that irrigation investments did not always present attractive returns. The

low productivity of many existing schemes, that were starting to dilapidate either due to lack of appropriate maintenance, or to inappropriate/insufficient drainage investment, prompted a change in investment policy in the sector, away from new infrastructure and toward programmes that improve the performance of existing schemes.

Portfolio performance

Ratings

In a cross-sector comparison, the World Bank’s AWM project portfolio generally shows a moderate performance. In the period of 1994 to 2004, around 74 percent of the Bank’s AWM projects (IEG 2006) had satisfactory outcomes. In addition, institutional development is rated substantial for around 43 percent of projects (relative to a 41 percent Bank average in the same period). However, a “likely” or better sustainability rating was only achieved by 56

⁷ The average dedicated project for the period 1994-2004 was designed to serve slightly more than 150 000 farm households, mostly defined as small family farms. Omitting the four largest projects, the average project area was 190 000 ha.

Table 3.2
Collection of water charges: cost recovery (%)

Project	Target	ICR: Actual/latest estimate	Baseline value
TN WRCP	not specified	0 due to drought	not specified
OR WRCP	not specified	66	12
AP III Irrigation (SRSP)	90	10	not specified
AP ERP*	90	40	not specified

percent of projects compared to a Bank average of 60 percent.

A global review of AWM projects (in particular IEG evaluation summaries) in the period 1994 to 2004 indicates that “the majority of projects that perform poorly do so because of institutional problems: (i) poor coordination among implementation agencies; (ii) lack of capacity within main implementing agency; (iii) insufficient buy-in to sector reform and reorganization; (iv) neglect of complementary agricultural services, and (v) weak commitment to cost recovery and/or user participation in system management and operation”

In India, the same results as available for closed projects (Table 3.1) seem to suggest that the World Bank AWM portfolio fares comparatively better on most ratings. In fact, it has almost perfect scores with the only outlier being the “unsatisfactory” outcome achievement rating and “unlikely” sustainability rating for the irrigation component of the Andhra Pradesh Economic Restructuring Project (APERP). The reason given for these good ratings in the Implementation Completion Report (ICR) is that the performance in terms of collection of water charges and availability of resources for O&M remained unaddressed. Surprisingly, the other three closed projects with “satisfactory” ratings also had gaps in collecting water charges and inadequate O&M resources (see Table 3.2). The rationale behind the “likely” ratings of the other projects revolve around the set-up of an enabling institutional framework to achieve these goals in the future, and that water charges were increased to rates that could potentially recover costs. Still, collection rates remained low across the board and this is not a unique feature of Indian projects. As per IEG 2010, “cost

recovery in Bank-supported projects has rarely been successful: only 15 percent of projects that attempted cost recovery achieved their goal.” Another interesting point raised on global Bank lessons on AWM is that there is difficulty in identifying alternative sources of finance for O&M and therefore sustainability of irrigation investments is at risk.

The positive opinion on Indian World Bank-supported AWM projects is an improvement on earlier reviews of India’s water sector (IEG 2002b) that found that about half of the irrigation projects completed during the 1990s had satisfactory outcomes, one third were judged to have substantial institutional development impact, and fewer than 20 percent were evaluated as having likely sustainability. A country assistance evaluation found that the selective and more relevant focus on reforming states had a larger impact on rural development institutions than the disparate and enclave projects of earlier years. There was also a need to move away from state-monopolized, mono crop irrigation to more diversified agriculture, and to give greater attention to increasing the productivity of the rainfed agriculture sector that accounts for much of the residual rural poverty. Allied with an early 2002 Planning Commission embargo of new works and the transfer of an increased portion of the budget responsibility to the individual states, these imperatives led to a reduced level of lending for irrigation infrastructure rehabilitation and modernization.

The “satisfactory” ratings on achievement of outcomes for the most recent World Bank-supported irrigation projects mainly focused on three elements: (i) passing of Acts, formation of institutions such as WUAs and

fostering substantial institutional development, (ii) infrastructure all being completed with quality, and (iii) economic efficiency as per the net present value (NPV) of project investment at the time of project completion. A detailed review of ICRs indicates that a significant weight has been put on institutional development as a reason for good ratings of World Bank-supported AWM projects in India in line with reviews of the Bank's global portfolio. For example in the case of the Orissa Water Resources Consolidation Project (ORWRCP), the ICR gives very strong emphasis to institutional development, mentioning that "WRD institutional capability has been improved by achieving a change of attitude in staff who now realize that close cooperation between, WUAs and the Department of Agriculture (DoA) is essential for higher productivity and increased income generation". Also in AP III it is mentioned that "WUAs are effectively involved in O&M and management of irrigation in about 253 000 ha area..."

Economic impact

While in absolute terms World Bank-supported irrigation projects in India reportedly achieve satisfactory economic returns (being an argument for good ratings), efficiency in economic terms is not usually considered an advantage in inter-sector comparisons (see also Annex 3). As per IEG, economic efficiency of the global AWM portfolio is lower than other Bank sectors and is declining. In the period 2002-2006, the average ERR estimated at ICR was of 22 percent, declining from 25 percent in 2002 to 17 percent in 2006. Out of 13 sectors and analysis of 2 908 projects across the Bank (including 550 rural sector projects, of which 161 are classified as AWM), the rural sector ranks fourth from the bottom as per average ERR, behind energy and mining (ERR above 40 percent), health, transport and information technology (all sectors with ERR above 30 percent). The IEG acknowledged that relative to other sectors, the rural sector was more assiduous in carrying out economic evaluations, but this did not seem to help its case. In 2006, IEG's analysis quickly led to some strong conclusions, namely that:

- "In the agricultural water subsector there is a particular need for more attention to project economic analysis to demonstrate growth impact and impacts of institutional reform and efficiency improvements. This is particularly important because its economic efficiency is less than most other sectors in the Bank." [IEG 2006, p. 42];
- "Clearly the estimates of project economic efficiency provide few incentives for the Bank to invest more in AWM" [IEG 2006, p. 43]⁸.

Still, it is important to note that the inclusion of estimated ERR for most World Bank-supported projects in AWM and rural sector makes the sector possibly non-comparable to other "less assiduous" sectors where ERRs are often not calculated for reasons such as difficulties in measuring benefits: the reported averages may suffer from selection bias. However, there are structural arguments for low economic efficiency of AWM projects globally. These include at the time of most reviews (including IEG 2006):

Lower commodity prices. IEG identified this as an issue comparing 2001-2004 ICRs for projects designed in 1994-1997 and highlighting declines in paddy and cotton prices.

Difficulty in measuring benefits. Benefits can be more difficult to measure given the increasing focus on rehabilitation versus new construction, which often may not lead to increased irrigated areas but simply improved quality of water delivery in existing areas⁹.

Delays in economic benefits. According to most reviews this is usually attributable to insufficient capacity for implementation and weak institutions in general. Also, this can be due to procurement problems, as in cases when procurement was administered separately from the main project implementation agency.

⁸ Naturally, this analysis only focuses on economic rates of return of the project without considering broader development objectives (including poverty alleviation). As discussed later in this report, there is evidence of poverty reduction impacts of irrigation investments.

⁹ The returns depend on the costs of rehabilitation versus new irrigation. Still the key point is that some of the benefits of rehabilitation are more difficult to measure such as, for example, the probability of a system failing in the "without project" scenario or capturing benefits of improved water delivery.

Table 3.3**Economic impacts and efficiency of World Bank-assisted AWM projects in India**

Project	ERR	ERR	Beneficiaries	Overall land	Newly irrigated	project	NPV a/
	PAD	ICR		benefiting	land	life	
	%	%	HH	ha	ha	years	Rs million
TN WRCP	17.0	b/ 13.3	721 122	649 010	244 541	30	1 406
OR WRCP	17.0	14.0	c/ 290 000	313 528	93 000	30	1 751
AP III Irrigation d/	23.9	2.0	266 111	318 000	228 000	40	(14 003)
AP ERP e/	38.0	24.0	2 500 000	3 000 000	400 000	20	11 592
UP WRSP	25.0	n/a	498 175	202 202	106 275	25	6 988
MH WSIP f/	20.4	n/a	233 400	670 000	146 616	25	7 668
TN IAMWARM g/	20.4	n/a	677 650	617 000	215 830	25	11 896
AP Tanks	23.6	n/a	n/a	250 000	170 000	25	7 885
OR Tanks	20.8	n/a	n/a	120 000	43 680	25	2 616
TOTAL			4 896 458	6 139 740	1 647 942		37 799
Average (simple)	22.9^f	13.3	816 076	682 193	183 105	27	4 200

Source: Project documents and authors' calculations

Notes:

Information and data used from latest available estimates (PAD, ICR or other as relevant).

PAD information is used when it is only source available.

a/ adjusted through Indian CPI to 2010 prices and using discount rate of 12%

b/ ERRs at ICR ranged between 7 and 35% depending on the scheme evaluated.

Out of nine SCC schemes, six had ERRs below or equal to 12%

c/ authors calculations based on land benefiting and reported average land size per HH in PAD

d/ data from IEG 2008 impact study. At ICR, ERR was estimated at 14.7, clearly above later IEG estimate.

IEG study conducts NPV over a 40 year period from 1989 to 2028.

Land benefiting from increased water supply was overestimated at ICR by 44 000 ha in 2004-05 when compared to IEG study

NPV (12%) at ICR was estimated at Rs 2.8 billion (30 year life assumed).

Appraisal estimate for NPV (12%) was of Rs 18.1 billion (2010 prices).

e/ ERRs in PAD for different schemes range between 34% and 99%, while in ICR between 14% and 54%.

The NPV at appraisal was Rs 15 900 million (2010 prices)

f/ ERRs in PAD also calculated for sample schemes varying between 17% and 55%. Land

Newly irrigated land includes 105 000 ha of fully irrigated and 41 500 ha of partial irrigated land

g/ ERRs in PAD also calculated for individual sub-basins and results in range of 13% to 30.2%

Unlike during the 1994-2004 period, commodity prices are (at present) very high. In the period from 2005 to 2010, average international prices for agricultural products in constant USD are between 30 percent and 70 percent higher relative to the 1999-2004 averages (when most ICRs were completed). Even if key prices for inputs such as fertilizer prices have risen dramatically between the two periods, given the labour intensive nature of agriculture, returns to irrigation investments would be higher at present.

Regarding the smaller benefits, the explanation is that lower investment costs in rehabilitation are less significant than the reduction in benefits. This is usually attributed to the counterfactual: in the case of new irrigation, the alternative is rainfed agriculture while in rehabilitation (which is most common in recent times), there is some marginal new irrigated area and much larger sections that benefit from improved quality of

water delivery to existing irrigated areas within a given scheme (which are normally associated with lower productivity gains). The key issue here is that, with some exceptions, most economic analysis in the study period does not take into account the probability of systems degenerating significantly because of lack of maintenance first and then rehabilitation. Such system malfunction leads to two main negative impacts on farmers: (i) loss of quality of water delivery and associated decrease in productivity and returns to farmer investments, and (ii) increase in risk of their annual investments in agricultural production because of higher variance of water availability, which results in lower investments by risk adverse farmers.

In the case of India, the desk review of World Bank AWM-related documents indicates that while ERRs are still above the usual 12 percent threshold, they are clearly below the

global portfolio average. Available ICRs indicate economic rates of return in the range of 13.3 percent and 24 percent (see Table 3.3 below), the latter being for AP ERP's irrigation component (which was part of a non-dedicated AWM project). Moreover, the lowest value is 2 percent and refers to the AP III irrigation project ERR estimated through primary data collection and analysis conducted by IEG (IEG 2008), three years after the ICR document was published.

Unfortunately, a large part of the World Bank India portfolio is made of projects for which ex-post ERR calculations are not yet available. Taking a simple average of the appraisal estimates for such a group of projects, yields an ERR of 22 percent which would be in line with the global portfolio. However, this is without taking into account that normally at ICR ERR estimates are lower (more on this subject below) which probably mean ERR of these projects is also below the Bank's global portfolio average.

As mentioned, an interesting observation about the Indian portfolio (in line with global World Bank AWM) is that ex-post ERRs (for example at ICR) are consistently below estimates at appraisal. Moreover, it seems the more carefully such ERRs are calculated the lower they become. This is the case of AP III in India, the only project that had a more detailed estimation of benefits through surveys of treatment and control groups (IEG 2008). The results can be shown in the following sequence: an ERR of 2 percent estimated in 2008 (IEG) versus an ERR of 14.7 percent at ICR (in 2005) and of 23.9 percent at appraisal (in 1997). The reasons for such differences lie in the changed parameters used for key drivers in evaluating economic returns of irrigation projects, namely: additional irrigated area, prices, yields and cropping intensity. In the case of AP III, the ICR (World Bank 2005) argued the following:

- Estimated area with improved irrigation supply lagged behind the appraisal estimate (achieving full irrigation in the targeted command area was at least three years behind);
- Productivity level for most crops was 3 to 40 percent below appraisal estimates.

To some extent, economic analysis also reflects the difficulty of combining institutional development (which takes more time) with economic efficiency (which would put pressure on quick disbursements and achievement of economic benefit targets). Moreover, a third factor that has not often been contemplated in economic analysis of projects at appraisal is how infrastructure can deteriorate very quickly and the need for rehabilitation works. Often the economic analysis assumes a constant flow of economic benefits with just regular O&M costs for a long duration of the infrastructure (20 to 40 years).

At a later stage, the IEG evaluation (IEG 2008) using a large survey with control and treatment groups, went further and estimated that actually yield increases were far below appraisal and, in particular for paddy, the most important crop, "impact at appraisal was almost twice what has actually been realized". In addition, the IEG report observes that one of the key command areas (representing 65 000 additional hectares under irrigation) was still expected to be completed by 2007 when ICR assumed it to be providing benefits from 2005/06 onwards. Finally, it noted that comparing yields of newly irrigated land with existing irrigated land showed similar levels. This indicated that the hypothesis of a transition period with yield increases for newly irrigated land was probably too optimistic to start with.

Overall, the four ICRs of AWM projects in India cite common reasons for lower than expected ERRs, including lengthy ramp-up times, delayed fund allocation and procurement, and most significantly, time and cost overruns in the construction of civil works. Other factors included: (i) political changes in Tamil Nadu and Andhra Pradesh which interrupted project implementation, (ii) weather vagaries during the project period, such as drought in Tamil Nadu and Andhra Pradesh and a super cyclone in Orissa, (iii) lower than expected diversification into cash crops, and (iv) lower economic prices for the key commodities (namely paddy).

Besides AP III Irrigation, a review of ex-post observations of yields (for example IEG 2002 and 2008) shows that there are significant

shortfalls between appraisal yield estimates and actual figures in most Bank AWM projects. In such reviews, differences measured typically ranged between 34 percent up to almost 100 percent higher yields at appraisal versus actual levels. It has to be said that “actual figures” normally mean ICR estimates which can be quite inaccurate as seen in the case of AP III. This is normally because of the lack of properly designed and well implemented impact evaluation of projects, which leads ICR teams to use just administrative data at best and direct limited number of observations for their calculations when nothing else is available. In particular, the latter can lead to significant bias because of the size of irrigation projects with high variance for most important variables across schemes financed under a project or even within scheme. Moreover, administrative data is not necessarily very accurate, especially if it does not include block level data which is often difficult to collect from the relevant officials.

Furthermore, the IEG suggests that ERRs for irrigation projects are consistently overestimated because the World Bank’s standard sensitivity analysis for checking the robustness of the ERR to risk is too simplistic (IEG 2006; IEG 2008, 42). The 2008 IEG report on the AP II and AP III irrigation projects strongly states that the World Bank’s method for calculating ERR is “far removed from best practice” as it does not take into account the possibility that multiple risks could occur simultaneously (IEG 2008, 42). Instead, the worst case scenario for only one variable is judged at a time, such as cost overruns in civil works or limited diversification. The IEG report claims that by using the Project Appraisal Document’s (PAD) own figures, if all adverse shocks occurred – which did happen in reality – then the ERR for the whole project falls from 24 percent to just 3 percent (IEG 2008, 42). In general, the implications of the analysis is that a more robust sensitivity analysis could screen out potentially unviable investments, and that planning should realistically take into account the combination of time and cost overruns with lower agricultural yields.

Most importantly, while World Bank-supported projects in AWM apparently do not seem to have been very successful at demonstrating strong economic returns, this report argues that given the poor available evidence, it is very difficult to be entirely negative about the economic efficiency of such projects. While the existing reports (especially the more rigorous AP II and AP III studies) seem to indicate returns being below initial estimates, most of the existing studies (namely ICRs) are based on somewhat anecdotal evidence and data which suffers serious sampling problems. There is still a lot to be done in terms of improving measurement of impacts through rigorous evaluations of projects in irrigation and some of the latest initiatives by the World Bank on this topic are welcome¹⁰.

In addition, while some of the existing studies question the economic returns of investments in agriculture, they also underline some of its poverty impacts although its interventions seem to benefit the larger farmers most. The IEG 2008 evaluation of the AP II and AP III Irrigation projects, reiterates the larger, non-poor farmers closer to the head reaches of irrigation systems benefited the most. In that evaluation sample, the bulk of direct benefits from higher farm income accrued to the top quarter of beneficiaries; even though indirect benefits from higher employment were more evenly distributed, the poorest receive fewest benefits. Nonetheless, despite the skewed distribution of absolute benefits, the greatest income growth from irrigation was experienced by the second wealth quartile, allowing a substantial impact on poverty. The study also found that the longer run poverty-reduction impact was greater than immediate impact because of the smoothing effect on incomes (IEG 2008, xvi).

The Water Working Notes’ “Poverty Analysis in Agricultural Water Operations” (World Bank, 2008) noted that agricultural water has the most poverty reducing impact when schemes are well managed and users are involved in management; infrastructure and management are designed with the needs of the poor in

¹⁰ One of such initiatives is DIME which has been promoting use of rigorous quantitative evaluations to assess impact of AWM projects (among other sectors).

mind; water allocation practices (head, middle, tail) and landholding distribution (large, small, marginalized) are equitable; appropriate production technology and crop diversification possibilities are available; support measures such as input supply, output markets and roads are in place; and when the needs of the landless and of women are understood and taken into account (World Bank, 2008, xiii). However, the impact evaluation of the AP II and AP III irrigation projects concluded the WUAs intended to ensure equity had limited capacity do so. The WUA membership was not representative of the population served, and that political factors influenced the expansion and durability of these community institutions (IEG 2008, xvii).

Monitoring and evaluation of agricultural water management projects

Greater concern over M&E

Based on available documentation, the main conclusion of this study in this regard, is that the quality of M&E project design has improved over time, but there are significant methodological and implementation shortcomings and the information is still not being used to inform decision-making.

One obvious example of the greater attention to M&E is the incorporation of dedicated components for Project Management¹¹ for all projects after the 1995 WRCPs. Funding for M&E includes staffing internal M&E units, supporting baseline surveys, engaging external M&E agencies, and developing MIS systems. The main texts of most of the PADs do not specify the budgeted amount of each sub-component, except for the AP and Maharashtra Water Sector Improvement Project (MWSIP). The AP III Irrigation project estimates the cost of the M&E component at USD 2.47 million, representing 0.5 percent of the total baseline cost of USD 434.06 million. MWSIP PAD estimates the cost of the M&E sub-component at USD 1.46 million,

representing 36 percent of the USD 4.02 million Project Management budget, and 0.4 percent of the total baseline cost of USD 351.38 million.

The Aide-Mémoires (AMs) also reflect increased priority given to the performance of M&E systems. Each AM highlights around five key priority actions to address major concerns of the supervision missions. While priority actions for earlier projects do not include much discussion on M&E, this has substantially changed in the more recent projects.

Regarding the older projects (namely WRCPs), AM comments relate mainly to delayed disbursements and procurement, staff vacancies, and weak project coordination. For example, in Tamil Nadu Water Resources Consolidation Project (TNWRCP), the available supervision AMs do not flag delays in the baseline as a major problem even if it was only completed two years before project close. Moreover, the TNWRCP ICR is limited to noting that the M&E system only involved "monitoring," not evaluation, and that the baseline was conducted in 2000 in the table "Key Performance Indicators/Log Frame Matrix."

The more recent projects are increasingly more careful in flagging problems with M&E, namely delays in hiring external agencies or filling internal M&E positions, delayed baseline studies, as well as delayed or missing reporting. In addition, the need for improving M&E starts being mentioned as a priority action in AMs and often appears at the start of the project. Some recent examples of this are:

¹¹ Other sub-components of Project Management components include establishing state level project preparation and management units, information education and communication (IEC) campaigns, and MIS systems.

- OR Tanks supervision missions started very early on to mention problems with baseline data collection delays due to late hiring of external agencies);
- AP Tanks project supervision missions note with approval the performance of the M&E system only in the three AMs covering the first sixteen months of implementation. During this time an external agency had been secured which conducted the baseline study on time, and the internal M&E and MIS units were doing well. For the subsequent two supervision missions, the AMs note with concern the deterioration in quality of the external agencies and the need to improve coordination between the internal and external agencies.

In parallel with the increasing focus on M&E, the role of external agencies in project M&E has changed over time. In the older projects, the role was to conduct baseline surveys and mid-term and final impact evaluations, submitting relevant reports to the implementing agency and the World Bank. This implementation arrangement changes from the MHWSIP project¹². In addition to the baseline and impact studies, the external agency was also given responsibility to collect its own monitoring information on physical and financial inputs and outputs of project activities, integrating into a project-level MIS system (Tamil Nadu Irrigated Agriculture Modernization and Water-Bodies Restoration and Management Project [TNIAMWARM] PAD 2006, 34). The PADs state that input from external agencies should include input on refining performance indicators and recommendations for corrective action. However, documents reviewed indicate that the dual system also poses challenges for coordination and can cause some confusion regarding the role of each agency and its staff. In addition, the success of project experiences with external M&E agencies is dependent on efficient procurement and available quality of such institutions.

¹² While specific evidence is not given, the "Lessons Learned and Reflected in Project Design" section of the AP Tanks posits that: "Concurrent and independent evaluation ... enhances project impact: This lesson has been incorporated through provision for an external monitoring and evaluation (M&E) agency that would concurrently monitor and report on field level project performance and also carry out periodic impact evaluations during the life of the project" (TN IAMWARM PAD 2006, 34).

Remaining challenges

Despite greater concern over M&E and the need to show results, the achievements in practical terms for World Bank-assisted AWM projects in India are still far from optimal (in line with other countries). Some of the key issues are: (i) complex information and high number of indicators to be tracked (both for process monitoring and impact evaluation), (ii) lack of adequate empirical strategies for establishing attribution of impact to project activities, (iii) delays and coordination problems in implementation of project M&E activities such as baselines, and (iv) M&E information not being used systematically for project management decisions.

Overall, most of these conclusions on the need for improved M&E are in line with IEG 2006:

"Evaluation of outcomes... shows that there is insufficient attention to monitoring and evaluation (M&E) of outcomes and impacts. Robust results relevant to the Bank's mission are lacking. The present level of M&E fails to provide adequate information to inform Bank management of progress toward strategic objectives—particularly poverty alleviation and the Millennium Development Goals—and needs to be overhauled. Much greater attention to indicators and evaluative frameworks is needed to unambiguously determine and attribute the development impacts of Bank lending. Better demonstration of the positive impacts on growth and poverty alleviation of rural development and AWM would also strengthen the sector's case for an increased budget for economic and sector work and lending preparation." (IEG 2006)

M&E design issues: information overload and lack of adequate empirical strategies.

"We have found time and again that M&E systems are designed which are immediately in overload. Too many data are being collected too often, and with not enough thought on how or whether they will be used!"¹³

¹³ Kusek and Rist 2008, 113

Definition and tracking of indicators

One very simple measure of the data load on an M&E system is to count the number of indicators to track performance in reaching project objectives specified in the PAD. The changes in the Logical Framework/Results Framework definitions and formats used in PADs over time move from traditional M&E of inputs and activities to more results-based M&E to assess outcomes and impacts. Accordingly, the composition of indicators shifted from a “checklist” of activities and reforms in the WRCPs to project and intermediate outcome indicators with quantified targets in the latest projects. While this makes it somewhat difficult to compare “indicators” across projects as the definitions vary, one can still observe a broad trend in the reduction of project development objectives (PDOs), outcome indicators, and output indicators.

The two WRCPs in the sample only included indicators that tracked the implementation of activities and reforms, without linking activities to outcomes. The AP III Irrigation project separated indicators tracking outcome/impact, outputs and inputs implementation respectively, but the number of indicators to be tracked remained high and the ICR notes that the project design did not occur within a logical framework. Over time, the number of objectives and key performance indicators decreased. In the PADs of the last four projects in the sample, from the MHWSIP (2005) onwards, a “results framework” is used, including how M&E information should be used for adaptive management, and a timeline for when progressive changes should take place.

Expectations on how much information needs to be tracked are not limited to the Key Performance Indicators. The first three projects (TN and OR WRCP and AP III) have Terms of Reference (ToRs) for baseline studies that include a suggested list of additional indicators, some of which differ from those in the tables of main indicators in the PAD. The environment, social, and resettlement plans also have their own individual indicators for most of the projects.

Moreover, the texts of some AMs contain additional lists of extensive indicators that field staff is supposed to track, even in the latest projects. For example, a supervision mission of the APCTMP, which demonstrates a thoroughly developed M&E design and implementation, includes a host of technical indicators for the fisheries sub-component of the Agricultural Livelihoods Support Services component.

The Second Implementation Support Mission of the APCTMP offers some examples of the high expectations of water users to track indicators and collect monitoring information, even while noting that participatory M&E should focus on only a few key indicators. To judge project impact, the mission suggests that WUAs should conduct detailed studies on water distribution and crop yields over the command area, plus annual water user surveys (APCTMP PAD, Annex 8, 2007, 2). While this information would allow more rigorous assessment of impact, farmers themselves may not have much use for such information. Some alternative indicators may be more do-able and useful for management committee members to distribute water. For example, equity in water distribution can be, and often is, simply tracked by the volume and timing of water received at the tail end. Even without volumetric measurement devices, tracking volume through simple level markers can provide evidence on the performance of the minor irrigation systems to be used by tail-ender farmers when negotiating water allocations for the season. While some monitoring activities and reporting did take place, attention to evaluation of impacts was missing until late in most projects, raising questions about the quality of impact conclusions. This is in line with findings under section 1.3 on the problems of ERR calculations given poor empirical evidence.

Impact assessment

The review shows there is an increasing focus on attribution of results with the importance of control groups noted in the last three projects in the sample. This is an improvement on the standard approach of simply calling for a baseline survey on key performance indicators to be compared to mid-term and end-of-project surveys:

- The TNIAMWARM PAD does not use the exact terminology of “control group” but the M&E section on “Baseline and other periodic surveys” recognizes that a high-quality impact assessment should compare indicators from both project and non-project areas, in a panel format (same households being interviewed):

“Periodic surveys will also be carried out throughout project implementation and post project completion in the same areas and if possible with the same households to allow for an accurate evaluation of project impacts on targeted beneficiaries. To enable comparative assessment of a “with/without” project situation, as opposed to the more standard before/after project situation, the impact assessments and analyses will collect and use statistically robust comparable data from selected non-project areas also” (TN IAMWARM PAD 2006, 34-35)

However, it took almost two and a half years after project start to get an external agency in place that would conduct a baseline survey.

- The text of both the AP Tanks and OR Tanks PADs on “Arrangements for Results Monitoring” is exactly the same, specifically using the terminology of “appropriate control” sites to attribute incremental impact in agricultural productivity to project interventions:

“The external M&E agency shall collect primary data about project implementation and impact through four data collection exercises: (a) baseline survey; (b) quarterly monitoring of implementation progress and outputs; (c) two outcome-focused impact evaluations (mid-term and final); and (d) systematic ‘panel data’ type evaluation of

project impacts through repeated monitoring of the same sample set of households from the beginning to the end of the project. For each data collection exercise, information will also be collected from appropriate ‘control’ or reference sites, in order to help assess the incremental impact of project interventions vis-a-vis generic growth influences over time” (OR Tanks PAD 2008, 31).

The AP Tanks baseline did take place on time with control groups surveyed. No major concerns were noted regarding its quality by early supervision missions. However, according to the AM of the fourth supervision mission two years into project implementation, “little progress” had been made on repeated monitoring of the same sample of households (AP Tanks AM Annex, June 2009, para. 42). The explanation suggested by the mission is deterioration in quality of the external consultant team, with inadequate skills and expertise to conduct an impact evaluation (AP Tanks AM Annex, June 2009, para. 42).

As of the OR Tanks, it took more than six months to finalize the contract for the external M&E agency. Although a request for proposals had been circulated well in advance of project effectiveness, apparently one of the bidders had a problem with the process hence delaying hiring and the baseline survey (OR Tanks AM, September 2009).

One of the key issues coming out of the review is that while there is increasing concern over impact evaluation, it seems that there is still some confusion on the objectives and usefulness of a project’s M&E system, which would require separate implementation arrangements. While some of the impact data for evaluating achievement of project objectives and assessing economic impact are extremely important for IFIs and government planning agencies, they are often not a priority for the users themselves. Water users and direct implementing agencies (often line ministry decentralized staff) would be most concerned with “operational data” such as quantity/quality and timeliness of water supplied throughout a scheme. M&E

systems therefore need to build on such type of “operational data” (which in an M&E system would be equivalent to outputs) to provide the basis for understanding why impact targets have been achieved. Such type of information can be collected at the lower levels of the system and by users and related agencies themselves. It may be counterproductive to use an external agency to conduct such tasks. On the other hand, external entities may be most suitable for handling survey work to assess outcome level indicators relating to productivity, improvements in food security (nutrition), etc.

While there has been an increasing concern with attribution of impact, there are still major problems identified in how this is proposed in project design. In particular: (i) objectives and respective indicators are often badly specified (not easily measurable, time-bound or other), (ii) there is too little detail provided at design and/or implementation manual on the sampling strategy for impact evaluation, and (iii) implementation arrangements are not conducive to efficient results in M&E. This is in line with World Bank experience in other AWM projects. For example IEG 2006 noted that out of 80 PADs for AWM projects, only 11 percent “were designed to have the tools that would allow rigorous impact assessment”. In particular, only 9 percent of projects that calculated ERRs used “without project” controls.



Chapter 4 - Involving the water users

The World Bank and participatory irrigation management

As outlined in Chapter 3, the World Bank has been heavily involved in AWM in India not only through projects, but also through technical assistance and studies. The World Bank's engagement in the sector has evolved substantially since the first comprehensive global sector strategy published in 1993¹⁴. One of the major changes has been from "infrastructure-oriented" approach to a more comprehensive one with greater emphasis on capacity building, agricultural and institutional issues¹⁵.

Within the international context, the investments in AWM in developing countries have been changing over time. During the early 1970s, the emphasis was on developing new infrastructure. Subsequently, there was a progressive shift to rehabilitation associated with the implementation of management, institutional and policy reforms. According to the World Bank (2006b), this change has been largely due to the stage of water resources development in a certain country: in a first stage, abundant water resources match with high returns to infrastructure which is therefore a predominant area for investment; in a *second* stage, some water resources are still available although the country experiences local water shortages; in the third stage, the management of the scarce water resource and of the existing infrastructure is the priority, with (i) demand management becoming more important than supply management, and (ii) rehabilitation more relevant than new construction. The shift in the investment approach of international agencies reflects the fact that in many countries (e.g. India) the irrigation sector is in the second or third stage

of the investment progression, with most or all resources harnessed, and investment in irrigated farming is increasingly in intensification rather than in area expansion (World Bank, 2006b)¹⁶.

This change towards the management of the resource instead of its development is accompanied by changing roles of AWM stakeholders. In particular, during the 1980s new approaches to irrigation (and more in general public) management emerged. They were aimed at redefining to a minimum essential (i.e. regulation and promotion) the role of the state and increasing the role for private sector and civil society. The division between public and private has been rewritten largely through decentralization¹⁷ and user participation processes (World Bank, 2006b).

According to the World Bank (2006b), the most significant change in terms of AWM institutional arrangements in recent years has been the PIM movement and the development of WUAs. The World Bank Institute (2000) defines WUAs as institutions "formed for the purposes of irrigation operation and maintenance on units covering more than one administrative unit (village or municipality)". In the CAS for India, the support to the creation of WUAs is targeted as one of the strategic actions towards a sustainable growth and the use of water resources. WUAs are groups of all individuals owning land within a given

14 World Bank. 1993. Water Resources Management. (Report No. 12335). Washington D.C.

15 See discussion on World Bank AWM portfolio and its evolution in "Water Management in Agriculture – Ten years of World Bank Assistance, 1994-2004" IEG, World Bank, 2006.

16 Besides, international agencies have also increasingly financed investment in small scale irrigation where poverty reduction impacts may be greater (World Bank, 2006).

17 Decentralization takes several forms in AWM: delegation of service provision functions to locally autonomous public bodies or to stakeholder organizations; involvement of users in planning and managing water projects; or handover of schemes to user organizations or a management company (World Bank, 2006). The movement toward decentralization is reflected in government investment patterns. In recent years, about 70 percent of World-Bank-financed water projects addressed decentralization of water resource management.

hydrological command area¹⁸. As the pace of land reform varies for the different Indian states, there is still an unresolved issue in limiting WUA membership only to land owners. Landlords owning large areas are not directly involved in O&M of their lands, which in practice is exercised by tenants, sharecroppers or labourers. Therefore, if only land owners are eligible for WUA membership, in some cases most actual water users would have no voice.

The World Bank Institute (1998) also defines PIM as “the involvement of irrigation users in all aspects¹⁹ and all levels of irrigation management”. The concept of PIM is closely connected to the one of IMT which “refers to the process that seeks the transfer of responsibility and authority for irrigation system management from the controlling government agencies managing irrigation systems (under the public sector) into the hands of non-governmental organizations, such as WUAs, or other private sector entities²⁰” (Svendsen *et al.*, 1997; FAO and IWMI, 2007; Van Vuren *et al.*, 2004).

According to FAO and IWMI (2007), IMT and PIM are interrelated concepts and while the IMT concept aims at replacing the role of the government, “PIM seeks to strengthen the relationship between water users and government by adding farmer participation to government management”. As pointed out by the authors, the two concepts “intersect at the ‘co-management’ stage of IMT, where, before a final transfer takes place, the government agency and the recipient organization agree to share responsibilities”.

¹⁸ There is much discussion as to what size can one expect an effective WUA to operate, on one hand larger associations allow the economies of scale for the required administration of the WUA and resource, on the other hand for cohesion and cooperation between users smaller WUAs may be more appropriate. WUA in tank commands may cover as little as 40 ha.

¹⁹ For example, planning, design of new irrigation projects or improvements and levels of irrigation as well as construction, supervision, financing, decision rules, operation, maintenance, monitoring, and evaluation of the system.

²⁰ IMT may include transfer of: (i) decision-making authority (or governance); (ii) ownership of scheme infrastructure (normally considered privatisation policy); (iii) water rights from government to WUAs (as in Mexico); and (iv) a part of the management responsibilities, such as water delivery, canal maintenance and fixing the water fees to WUAs (such as in Sri Lanka or Philippines) - while final approval of operation and maintenance (O&M) plans and budgets are subject to government approval (Van Vuren *et al.*, 2004) and also (Vermillion and Sagardoy, 1999).

IMT has been taking place worldwide and started being implemented from the 1960s in different geographical locations with reforms being pushed more quickly in the 1990s. In 2007, FAO acknowledged that IMT is a global trend: “more than 57 countries had embarked on some type of irrigation sector reform that has IMT. These represent 72 percent of the world population”. One of those countries is India, where there has been an evolution in thinking on irrigation management.

At this stage it is worth noting that terms such as IMT, PIM as well as “decentralization”, “privatization”, “public-private partnerships” among others can usually be differentiated according to degrees of (i) ownership and (ii) management by the public and private sector. The heterogeneity in IMT and PIM application in different countries means that one should carefully differentiate between theoretical institutional reform and reality on the ground. For example, FAO and IWMI (2007) provide an interesting cross-country analysis of transfer of authority by type of functions. It shows that while there were 31 countries (majority in the sample), which fully devolved operations or water delivery and a similar number in the case of maintenance activities, only 21 fully devolved financial responsibility for operations and maintenance to WUAs. Finally, only less than one third of countries transferred responsibility to finance future works of rehabilitation and modernization.

In addition, an often quoted evaluation of degree of authority transfer was “partially devolved” as opposed to “fully devolved”, which indicates there are substantial cross-country differences in terms of both what functions are devolved and exactly how. The latter includes questions such as types of legislation, different functions and institutional responsibilities, as well as to whom do you transfer authority. In most cases, irrigation management is usually transferred to WUAs but in some countries it also includes mutual companies (Spain or USA) or public utilities (for example France), among others. It is also important to highlight the commonly found rationale for IMT and PIM. As per FAO and IWMI (2007), there would be five main expectations normally held by stakeholders to promote IMT:

- (i) It will reduce the burden of costs, staff requirements and technical or management problems faced by government;
- (ii) It will lead to improvements in agricultural productivity and economic profitability of irrigation systems because this is the core concern of farmers, whereas it may not be an essential concern for bureaucracies;
- (iii) It will motivate farmers to pay for their irrigation system because they will be empowered to take over the authority to define what their irrigation services will be, who will provide them and at what costs these will be provided;
- (iv) Because of farmer interest in results, governance by farmer organizations will improve the accountability of irrigation systems management to farmers, and this will produce more efficient and equitable water delivery, canal maintenance and settlement of disputes;
- (v) Collective organization for irrigation management will probably produce collective action in related areas, such as in the group purchase of agricultural inputs, development of agribusiness ventures and marketing. It is expected that this larger collective action will promote development of more responsive support services and will create pressures to ensure more reliable provision of water to the system.

Such a range of reasons (from a stakeholder perspective) is at best confusing given the overlapping basic principles at hand. Still, it provides an interesting illustration of how even the conceptualization by stakeholders for the need for IMT or PIM can be somewhat convoluted. Basically, the key reasons could be summarized as: (i) lack of government financial and technical capacity to handle irrigation management (budget constraints essentially); and (ii) efficiency gains from handing over responsibility to users²¹. While the former seems to be more straightforward in a number of countries, especially in circumstances

²¹ This would group some of the often mentioned arguments in the literature: farmer commitment and willingness to pay being correlated with having authority over irrigation management; positive externalities triggered by collective organization for irrigation management.

where there is lack of funding, the latter is more complex. In fact, efficiency gains will be contingent on the specific institutional arrangements established to carry out IMT or PIM and how these fit the particular context of a country or region.

It is therefore not surprising that the international experience in IMT and PIM has shown mixed results. In some cases it has been recognized as pivotal in improving system performance and sustainability (e.g. Mexico, Peru) and others less successful. A review of irrigation evolution in South and South East Asia (Barker and Molle, 2005) attributed disappointing performance of institutional reforms (IMT; PIM) to their failure to improve water delivery service to farmers, which mainly resulted from design and operation constraints, not addressed by the reforms. A point supported by the assessment of 22 systems in the same region (FAO, 2006), which showed constraints on water service deliveries were not generally related to WUA strength, but probably due to management efficiency above WUA level. Such conclusion was also drawn in the FAO and IWMI (2007) review of worldwide experiences in IMT, which states: "after years of ongoing IMT processes in some countries, there is now evidence of the need to critically review the validity of the common reasons for embarking on reform processes in the irrigation subsector".

Overall, the results of the IMT process undertaken across the globe can be perceived as a mixture of successes and failure (FAO and IWMI, 2007). Some of the key constraints affecting success of IMT worldwide found in the literature include: (i) lack of political support in some countries leading to insufficient funding for reforms, (ii) lack of proper legal basis (including clear water service delivery agreements that effectively transfer responsibility for control over water) because in certain countries governments have tried to implement reforms with existing, inadequate regulations (in particular in terms of often unclear and incomplete legal responsibilities and nature of WUAs), and (iii) lack of managerial skills within WUAs leading to poor service delivery (FAO and IWMI, 2007).

In addition, some other factors often quoted as problematic in PIM implementation include: physical system inefficiency, socio-economic heterogeneity, capture of power (elections, meetings), and information, education, training and incentive gaps (capacity building). According to existing literature, the “ultimate success and sustainability of WUAs depend on some fundamental factors, such as cohesiveness, common interest and collective efforts of water users, effective leadership of office bearers of WUAs, capacity building of farmers and irrigation officials, political will of the party in power, bureaucratic commitment of irrigation executives, governmental patronage, legal support, financial viability of WUAs, proper monitoring and evaluation, and catalysing role of the change agents” (Swain and Das, 2008).

While there is on-going debate over the effectiveness of IMT and PIM, available empirical evidence from the above mentioned work supports the statement that it is not a panacea for more systemic physical and system management constraints. It is part of the system management but requires other physical, management and financial elements to achieve the desired objectives.

An assessment of water user association

As explained above, the heterogeneity of implementation of PIM/IMT not only across countries but within country, as well as the different challenges identified in the literature make a case for understanding more in detail the processes of WUA functioning and performance. In particular, it is interesting to understand to what extent “de jure” regulations on WUAs in India give rise to the expected institutional outcomes.

Findings from primary data collected

The supporting qualitative and quantitative surveys of WUAs (see summary methodological information in Annex 1) assessed the performance of a number of WUAs in World Bank-supported projects in three States (Orissa, Tamil Nadu and Maharashtra). The information

collected includes a quantitative survey of 120 WUAs randomly selected from the lists of all WUAs in two of these states for which sampling frames were available and in-depth qualitative research in 20 WUAs and villages across the three states.

In particular, the qualitative research purposefully selected best performing schemes as per discussions with State Irrigation Department officials and within such schemes there was a random selection of the WUAs while taking into consideration distribution aspects (i.e. covering head, middle and tail sections). This information seeks to contribute to evaluate how effectively WUAs have been promoted in these states and while confined to three states, the survey findings provide an indication of status and some of the issues facing WUAs in India.

Table 4.1 presents a summary of the key findings of the qualitative survey for the three states. The findings are further discussed in the following subsections in conjunction with results from the quantitative survey. The subsections also seek to briefly describe what was the expected outcome from the PIM reforms and associated implementation to provide a benchmark for the observed data.

Election procedures

As specified in the FMIS Acts, every WUA is to establish a management committee (MC), with its members to be elected by secret ballot with the aid of the officer appointed by the Irrigation Department²². In Tamil Nadu and Maharashtra, all member farmers of the WUA (water users within the command area), whose land is registered with the association, can vote in the elections. In Orissa, however this was not the case. The Pani Panchayat (PP) area is divided into chaks, which covers the area irrigated by one outlet. All landholders in a chak (chak members) elect three members from the upper, middle and tail reach of the outlet to form a committee.

The qualitative research findings indicate that election procedures for MCs broadly do not

²² In Maharashtra, the MC is referred to as the Director Body, and in Orissa it is referred to as the Executive Body.

Table 4.1
Summary of qualitative survey findings

Parameter	Tamil Nadu	Maharashtra	Orissa
Previously existing association for Irrigation Management.	Yes. Under the CADP, established by the State department.	Yes. Formed as a by-product of a socialist movement. People led.	None mentioned.
Elections held for the MC.	Usually not. If held, normally only for the post of President.	No.	Yes, as per the Act.
Farmer members eligible to vote.	All farmer members whose lands are registered with the WUA.	All farmer members whose lands are registered with the WUA.	Chak leaders and members of the committee vote. Large farmers invited by the MC to vote. Small farmers not even aware of the fact that they are members of the PP.
MC characteristics.	Large landowners, dominant caste. Held positions on the MC and Panchayat previously or currently.	Backward caste represented, small, medium and semi-medium landowners.	Large landowners, dominant caste. Mostly educated up to at least Class X. Majority draw income from non-farm sources as well. About 50% have political affiliations.
WUA and politics nexus.	None.	None.	None.
Role of women.	None.	None, except for all-women Pani Panchayat. Women encouraged by husbands.	Represented on the MC as per the Act. Role largely insignificant, excluding two WUAs. Women in this case, encouraged by husbands.
Bank accounts.	Yes. Joint with the Irrigation Department. Not functional in Kanchipuram.	Yes. In the name of the WUA.	Yes. In the name of the WUA.
Resources: water charges.	No.	Yes.	Yes.
Resources: farmer contribution.	No.	Yes.	No.
Resources: any other.	No.	No.	No.
Functions performed: Main.	O&M, informing farmers of release of water.	O&M, conflict resolution.	O&M, informing farmers of release of water.
Functions performed: Secondary.	Regulation of water.	Regulation of water.	Conducting of elections to executive committee.
GB meetings.	Yes, twice a year.	Yes, twice a year.	Yes, twice a year.
Records maintained.	Only register of water users.	Map of conveyance system and area irrigated housed in the AC office building.	Yes, all records as per Act.
Audit of accounts.	No.	Only AC accounts audited.	Yes. All WUA accounts audited.

Table 4.2
Share of WUA as maintaining voters' registers

State	Ayacut	Landlord	Voter
Tamil Nadu	23%	35%	83%
Maharashtra	43%	42%	70%
Total	33%	38%	77%

Table 4.3:
Length of period since last MC election

Period	Tamil Nadu	Maharashtra	Total
Days	62%	19%	40%
Weeks	12%	19%	15%
Months	2%	12%	7%
Years	12%	47%	29%
Never	10%	5%	7%
Don't know	2%	0%	1%

follow regulations as per the FMIS Acts even considering that WUAs were selected from best performing schemes. In Maharashtra and Tamil Nadu no elections were undertaken at all, with members being drafted into the MC.

In Orissa, it was found that elections did follow the procedures established in the Act. In addition, it was found that there were potential signs of elite capture of MC in Tamil Nadu and Orissa while much less in Maharashtra (where Director Body/MC members belonged to other backward castes). For example, the qualitative field work in Tamil Nadu indicated that members of the WUA MC at present also held positions previously (being drafted for a second time) and were often members (or had been) of the Panchayat. Moreover, it was found that presidents of WUAs were large landowners with considerably larger landholdings than the rest of their MC counterparts. While such a result may suggest elite predation at WUA level, it does not necessarily translate into an inefficient organization of the WUA. It can be the case that a more powerful person as president of the WUA may provide users with more lobbying power at higher levels of the scheme. Still, it raises questions on whether WUA management is mirroring existing institutions along political lines,

something which World Bank-supported projects explicitly sought to avoid through PIM.

The results of the survey of 120 randomly selected WUAs in TN and MH suggested similar results to those of the qualitative research. While in the majority of WUAs voter registers exist (see Table 4.2 below) and elections took place (see Table 4.3 below for details on frequency), secret ballot voting for MC elections occurred in less than half of WUAs surveyed, more specifically only 47 percent of WUAs in Tamil Nadu and less than 30 percent of WUAs in Maharashtra.

Financial resources

As per the FMIS Acts, WUAs should have a fund which includes resources obtained as grants from the government as a share of the water charges collected in the area of operation of the WUA; other funds granted by the state and central government for the development of the area of operation; resources raised from any financing agency for undertaking economic development activities in its area of operation; fees collected from water users and income from properties and assets attached to the irrigation system within its area of operation. The WUA should keep its funds in a nationalized bank, cooperative bank or any agricultural cooperative society. This fund is to be used towards meeting the expenses incurred

by the MC of the WUA in the administration of functions entailed in the Act.

According to the WUA Survey, 62 percent and 90 percent of WUAs in Tamil Nadu and Maharashtra respectively held a bank account. The bank account is shared mostly with the Irrigation Department (48 percent of cases) in Tamil Nadu and with the current or past MC members in Maharashtra (43 percent of cases).

While most WUAs have bank accounts, funding sources and revenue gathering are weak, which is consistent with the qualitative data and more generally with reporting of WUA financial status by officials of irrigation departments and in the literature. Moreover, only 20 percent of WUAs received financial support at time of establishment. Similarly only 17 percent and 20 percent of WUAs in Tamil Nadu and Maharashtra respectively reported having received government grants for rehabilitation and modernization (R&M) works. When queried about the adequacy of water charges, government grants and other fees and charges to cover operation and maintenance costs, only 14 percent of WUAs reported funding was adequate.

Collection of revenue is one of the main functions of WUAs, and is intended to be the basis for improving funding of operation and management activities. However, only 5 percent and 38 percent of WUAs in Tamil Nadu and Maharashtra reported collection of water charges. Where collection does occur the retention rate of charges for O&M activities is generally less than 30 percent of the revenue according to the survey data.

Qualitative research in Orissa, Maharashtra and Tamil Nadu seemed to confirm the lack of funds being available for WUAs to perform functions specified in the relevant Act. This finding is significant because the WUAs for this study were deliberately selected from the "best performing" schemes.

In addition, it is worth noting that water distribution is only an expense if the water master or equivalent is reimbursed for his/her efforts. Maintenance is primarily de-silting or

repair of earth embankments, so that this can be accomplished by individual labour or communal work days. Finally, the fee collection is only in the interest of the WUAs if they see some returns to this effort, i.e. in the form of more reliable and predictable water supply or more technical support. Just collecting funds for establishment costs above the outlet level without improvements in service is not satisfactory to most WUAs.

Functions

The main functions of the WUAs as stated in the FMIS Act across the States of Tamil Nadu, Maharashtra and Orissa include:

- (i) The preparation and implementation of an "operational plan" and "rotational water supply"²³ for the acquisition and distribution of water within the command area;
- (ii) O&M works;
- (iii) Water regulation and budgeting;
- (iv) Fixing and collecting of water charges;
- (v) Calling General Body (GB) meetings;
- (vi) Maintaining records (i.e. water distribution registers, tax collection registers, property registers, inventory registers, complaints registers, cash book and money receipt book), accounts and audit;
- (vii) Resolving disputes; and
- (viii) Promoting agricultural improvements (provision of inputs and implements) in coordination with State line departments (Agriculture, Horticulture, Livestock).

A major issue referring to the regulation of disputes among water users is the eviction of water encroachments. According to the review of the "State Water Sector Policy and Institutional Issues," among the states targeted, only in Tamil Nadu an ad hoc legislation is provided with the Tamil Nadu Protection of Tank and Eviction Encroachment (TNPTEE) Act (2007). The TNPTEE Act (2007) allows the Government to start boundary delineation, evict encroachments and create fences along the tank boundaries. It also

²³ "Operational plan" means a schedule of irrigation deliveries with details of the mode and duration of supplies drawn up for regulation of irrigation in any command area. "Rotational water supply" means a system of distribution of water to water users by turn, according to an approved schedule, including day, duration and time of supply.

Table 4.4
Water allocation and O&M plans (120 WUAs surveyed)

State	Allocation rights	Operational plan	Maintenance plan
Tamil Nadu	82%	73%	76%
Maharashtra	47%	64%	64%
Total	64%	70%	71%

Table 4.5
Criteria for irrigation duration

Irrigation time by	Tamil Nadu	Maharashtra	Total
Volume	11%	4%	7%
Land size	49%	44%	46%
Crop type	22%	42%	32%
Personal request	7%	7%	7%
Other	11%	4%	7%

gives the government the power to evict with a 21 day notice period²⁴. Finally also the regulation of the water resource is explicitly addressed in Maharashtra and Uttar Pradesh respectively, with the Maharashtra Management of Irrigation Systems by Farmers Act (2005) and the Uttar Pradesh Water Management Commission (UPWMC) Act (2008). Concerning water resource regulation, the MMISF Act (2005) deals with the regulation of (i) irrigation water (i.e. among WUAs), and marginally with (ii) inter-sectoral supply of water.

According to the MMISF Act of 2005 “Water from the canal system is usually to be supplied to the WUAs at various levels, from tail to head, on bulk basis measured volumetrically as per their water entitlements by a Canal Officer or upper level WUAs, as the case may be. The rates for supply of water to a WUA are to be determined on a volumetric basis measured at the point of supply. The Appropriate Authority has the power to levy the minimum charges as prescribed to a WUA if the water is not demanded or used for irrigation by the WUA in a season as per the Applicable Entitlement”.

According to the WUA Survey, 82 percent and 47 percent of WUAs, in Tamil Nadu and Maharashtra respectively, have the authority to allocate water through sluices and shutters. Of those WUAs, 70 percent had an operational plan and irrigation schedule, and 71 percent maintenance plans (Table 4.4).

Moreover, in Tamil Nadu and Maharashtra, 57 percent and 74 percent of WUAs respectively, reportedly measure the volume of flow of water mainly through height marker (around 80 percent) on canal rather than through volumetric devices (only around 20 percent). Tracking volume and timing of water received can be an effective way of assessing equity in water distribution. However, this appears to contradict the criteria for determining the length of irrigation by each farm, which is mostly based on land size (46 percent) and crop type (32 percent) (Table 4.5).

The qualitative survey focusing on “well performing” schemes reported a similar picture. Regarding registers’ keeping and in the case of Tamil Nadu, the only record available was the register of water user (with details of landholding size). In Orissa, the research team was informed that the Apex Committee (AC) office building housed maps indicating the jurisdiction of water conveyance system and area irrigated of each WUA. It was however, not present with the individual WUAs. In Maharashtra, except for

²⁴ The Public Works Department claims that “out of the 13 710 tanks maintained by Water Resources Department, 2805 tanks have been fully restored.” It also claims that, “the evictions are in various stages in respect of the remaining tank” (Public Works Department policy note 2010-2011).

Table 4.6
Share of WUAs having held meetings within past year

State	General	MC
Tamil Nadu	32%	65%
Maharashtra	25%	75%
Total	28%	70%

Table 4.7
Most frequent types of dispute resolution

Dispute Type	Tamil Nadu	Maharashtra	Total
Head, middle and tail TCs	45%	39%	42%
Irrigation and other uses	6%	12%	9%
Large and small farmers	25%	25%	25%
Domestic water use	5%	15%	9%
Non registered users	8%	4%	7%
Other	11%	4%	8%

Kolwan WUA, WUAs maintained all the records as required by the Act. In Jai Yogeswar there was even a complaint book to note the grievances of farmers. In Tamil Nadu, there was no auditing of accounts at any level, while in Orissa, AC accounts were audited, and not the individual WUAs. In Maharashtra, all WUA accounts were audited. On this point, WUA survey shows that 60 percent of WUAs in Tamil Nadu and 47 percent in Maharashtra do not undergo any type of audit - neither social nor financial. Instead, respectively 17 percent and 23 percent do undergo both. While there is some discrepancy between the survey and the qualitative field work results, the responses suggest that overall there is lack of consistent auditing of accounts.

The frequency of meetings, both of the general body and of the management committee, can be indicative of WUA activity and effectiveness. As shown in Table 4.6, there was a low frequency of general meetings for members over the past year, with only 30 percent of WUAs reporting having held meetings, which may indicate a low level of consultation with members. Interestingly, the qualitative research indicated that in general meetings were held in most schemes before the release of water, hence twice a year, with farmers being usually informed through word-of-mouth (or notices in the case of Orissa). The

results therefore suggest that while the seasonal meeting process (which precedes PIM and was practiced for a long time in most instances) is continued, the capacity to expand the process and deal with issues largely internal to the WUA (operations, water distribution schedules, labour requirements, etc.) is much less well established.

In the case of MCs, the share of WUAs that held meetings within the past year among those sampled was higher at 70 percent (65 percent and 75 percent in Tamil Nadu and Maharashtra respectively), which may suggest some level activity of these institutions.

Most (68 percent) of WUAs are involved with the resolution of disputes over water, which varied between 77 percent and 60 percent in Tamil Nadu and Maharashtra respectively (Table 4.7). The principal disputes are those between territorial constituencies (TCs) (42 percent) and large and small farmers (25 percent) which together account for nearly 70 percent of all disputes.

The main O&M problems are silting (21 percent), canal vegetation growth (16 percent), leakage (13 percent), waterlogging (12 percent) and broken bunds (Table 4.8). Almost half of WUAs (49 percent) (59 percent and 38 percent in Tamil Nadu and Maharashtra respectively) reported

Table 4.8
O&M problems

O&M Problem	Tamil Nadu	Maharashtra	Total
Silting	21%	21%	21%
Waterlogging	16%	9%	12%
Stalinization	1%	3%	2%
Flooding	8%	8%	8%
Leakage	14%	12%	13%
Unauthorized connection	3%	7%	5%
Broken bunds	12%	11%	12%
Canal vegetation growth	17%	15%	16%
Obstructed waterways	4%	11%	8%
Other	2%	3%	2%
Don't know	1%	1%	1%

Table 4.9
Typology of government repairs/interventions

Repair Type	Tamil Nadu	Maharashtra	Total
Desilting	3%	2%	3%
Lining canals	6%	2%	4%
Public works/irrigation	83%	93%	89%
Agriculture	3%	0%	1%
Other	0%	2%	1%
Don't know	6%	0%	3%

conducting repairs and improvements to the irrigation system.

Government support²⁵ is provided to WUAs, with 63 percent reporting support for system repairs (55 percent and 70 percent in Tamil Nadu and Maharashtra, respectively). However this support was mainly focused on public works, presumably rehabilitation of structure, rather than on the key O&M problems as listed above (Table 4.9). Less than half (47 percent) of WUAs reported consultation with the government/ministry prior to commencement of repairs (56 percent

and 39 percent in Tamil Nadu and Maharashtra, respectively).

On the question of whether setting up a WUA and associated investments impacted on the quality and quantity of water supply, in both cases there was a reported improvement, with an increase of 64 percent in quality of water supply and 57 percent in water quantity (Table 4.10 and Table 4.11, respectively). However, it should be borne in mind that less than half of the WUAs recorded a response to the question²⁶.

A closer look at the impact within the systems, by head, middle and tail, tends to support the beneficial impact of WUAs in terms of equity in water distribution. As indicated below more than half the WUAs reported an increase in quality of

²⁵ Government support mentioned here is to be distinguished from direct grants to WUAs as mentioned above in the text. The difference is that in this case Government paid for and undertook the repairs and this was not included in the WUA budget.

²⁶ Forty-seven and 44 WUAs of the 120 responded to the questions on water quality and quantity respectively.

Table 4.10
Quality of water supply response

Quality of water supply change	Tamil Nadu	Maharashtra	Total
Increase	59%	70%	64%
Decrease	15%	5%	11%
No change	22%	25%	23%
Don't know	4%	0%	2%

Table 4.11
Water quantity response

Water quantity change	Tamil Nadu	Maharashtra	Total
Increase	52%	63%	57%
Decrease	12%	11%	11%
No change	36%	26%	32%
Don't know	8%	5%	7%

Table 4.12
Quality of water supply response by location

Quality	Head	Middle	Tail
Increase	15%	30%	56%
Decrease	60%	20%	20%
No Change	27%	45%	27%

Table 4.13
Water quantity response by location

Quantity	Head	Middle	Tail
Increase	18%	14%	68%
Decrease	40%	40%	20%
No change	29%	50%	21%

water supply and quantity (56 percent and 68 percent respectively) (Table 4.12 and Table 4.13 respectively; further tables – Tables 4.14, 4.15 and 4.16 - are included in Annex 4).

The role of agricultural support services

Agricultural support services (AgSS) and funds are provided in India through complex, multi-layered hard to quantify systems that, in most cases, rely on public funding and are vulnerable to political influence. The GoI provides direct support to agriculture either through subsidies on fertilizers, indirect subsidies on fuel, price

support schemes and through funding provisions in the FYP. To a large extent the responsibility for implementation, and partially for funding, falls to the line departments of State Governments. It is found that while AgSS is key to achieving development outcomes of most irrigation development or rehabilitation initiatives, they are still to a large extent hampered by systemic problems, such as a top down mentality and excessive focus on output delivery. While there has been some progress towards decentralization and in some cases World Bank-assisted projects have piloted new multi-disciplinary participatory extension approaches, there is still a long way to go to reach a more effective delivery of AgSS (see also Annex 5).

Systemic limitations of the extension services

The two main weaknesses that are observed in the administration of the extension systems are (i) the top-down mindset, and (ii) the excessive focus on physical targets and outputs with limited attention to higher level results and impact.

The Centrally Supported Schemes (CSS), the main vehicle for the promotion of agriculture technologies amongst the farming community, usually employ front line demonstrations (FLD) in the farmers' field to educate farmers on recommended package of practices (PoPs). There are associated activities with the FLDs such as Field Days to encourage adoption of new technologies. The FLDs provide subsidies mainly in the form of agriculture inputs (seeds, fertilizers, pesticides and insecticides).

The problem with CSS is that their top-down design tends to bind the extension officers with a limited package that they can offer the farmers. In the formulation of the PoPs there is rarely any involvement of farmers, and the PoPs are developed under the controlled situations which would often fail to perform in the farmers' field situation. Furthermore, most interventions are very crop specific, and pay little attention to the ultimate objective of the farmer which is to increase the net return per unit of cultivable land.

The departments rarely collect results from demonstrations and do not collect data on the impacts of the schemes on the agriculture productivity enhancement and the adoption rate of technologies by the farmers. Instead, the orientation is normally toward completion of physical targets set for the various schemes, in terms of number of demonstrations, number of farmers trained, number of exposure visits etc. with no focus on the outcomes or impacts of these interventions.

Some steps are observed towards a more decentralized participatory approach; however this is in its infancy and is encountering similar problems to the WUAs mobilization and organization. Firstly, the departments are finding it hard to take on this new mindset, particularly as most extension workers are technically orientated

and don't necessarily have the social mobilization skills required for participatory extension, and secondly, the farmers in many cases are unable to form coherent, self-supporting groups.

One common theme in World Bank-supported projects is the targeting of farmer organizations or groups of farmers for interventions. In later projects, the PADs also mention integration with the Agricultural Technology Management Agency (ATMA), with the intention that the project would finance activities in AWM identified through ATMA planning process (the district Strategic Research and Extension Plan). The reality is that this has not yet happened due to the slow role out of ATMA, with the possible exception of the Andhra Pradesh Water Sector Improvement Project (APWSIP) project.

Outreach of AgSS in the surveyed areas

As part of the research for the present paper, a household survey was conducted in the states of Maharashtra and Tamil Nadu. One of the survey's objectives was the assessment of the quality and frequency of support services that rural households receive from central and state governments as well as from the private sector entities. Overall, the awareness level of respondents in regard to extension was high: 84 percent of households were aware of some government or private body that provided AgSS and about 9 percent had participated in extension activities in the year before the survey was carried out (although this included television programmes on agriculture which a significant number of respondents were exposed to). The distribution of these interventions tends to be concentrated in some villages while others completely miss out. Of the 120 villages surveyed, 38 percent reported that no services were received.

The ISEA report of the Maharashtra Water Sector Improvement Project (MWSIP) in 2004 concurs that visits of agricultural extension officers at the village level is minimal in most of the villages of the project area. The report highlights the need to introduce the concept of PIM among the farmers and make them aware of their rights, and to initiate such awareness programmes

in a decentralized manner at village level, with simplified concepts, intensifying extension service provision along with the physical asset improvements.

Quality and frequency of technical services

The performance of extension services, as evaluated by the WUA members that the qualitative research team visited, was variable. When it came to agronomic advice, the best performing projects were in Orissa, followed by Maharashtra, with farmers from Tamil Nadu being the least satisfied.

In Orissa, focus group discussions with the farmer members of the PPs revealed that the District Agricultural Officer (DAO) and the Junior Agricultural Officer (JAO) visited the villages frequently, and that the *Gram Sevak* from the *Panchayat* and the Village Level Workers (VLWs) transported seeds and fertilizers to the villages and provided demonstrations on cultivation techniques. Also, there was mention of training provided by the Water and Land Management Institute (WALMI) and the Agriculture Department on SRI on a more or less regular basis²⁷.

In Maharashtra, farmers mentioned that the field officers visited the villages, albeit occasionally. However, contrary to Tamil Nadu, they had no grievances with regards to the information or inputs they had received. In Maharashtra, the Agriculture and the Horticulture departments and the WALMI provided training on agronomic techniques only to the members of the MC of the WUA and not to non-member/non-office bearing farmers.

In Tamil Nadu, farmers stated that field officers from the Agriculture and Horticulture Department only rarely visited the villages. In six villages out of the eight surveyed, farmers stated that visits from field officers were few and far between, while earlier several agricultural officers used to

²⁷ However, it is important to mention here that such information was proffered usually by executive committee members of the respective PPs or *chak* members or leaders and not by farmers, except in the case of Basulei, where farmers stated that, "the DAO and JAO and VLW conduct trainings and we have been trained in SRI and benefited from these trainings." Also, when the farmers were questioned about the frequency of visits, the farmers were unable to provide an answer.

visit under the Training and Visiting Scheme²⁸. In the two most frequently visited villages, farmers mentioned that the field officer visited once in one or two months and provided information on drip irrigation and agricultural inputs.

Provision of agricultural inputs

A salient feature of the Indian AgSS is the provision of packages of technology which includes the exchange, or as is more commonly the case, the transfer of knowledge from extension workers to farmers, but also the transfer of agricultural inputs and occasionally of machinery.

The distribution of inputs can be fraught with difficulties, including low input quality, insufficiently stocked government shops and cumbersome procedures for obtaining inputs from said shops. Other complications related to timing are common, as news of subsidy schemes or particular information reach villages only after they have expired or are no longer relevant.

Farmers have apparently been expecting that extension work should be accompanied with free or subsidised inputs. Evidence from the fieldwork demonstrates a trend of expectations from WUA members of delivery of agricultural inputs. Extension workers are frequently regarded as gift-bearing figures of authority and not as facilitators of knowledge of new technologies or as incubators/mentors of self-sustaining farmer based institutions.

Planning of AgSS

With the movement towards "bottom-up" and participatory approaches, planning has moved steadily closer to the level of the farmers. However, planning in World Bank-supported projects for AgSS is considerably variable, indicating that there is not yet a firm understanding of how this should be integrated into projects and how to best assist farmers in understanding and continuing planning as a dynamic process.

²⁸ In Peruntholuvu the survey team was told that "...now there is only one [officer] and he rarely visits the village. The *Gram Sevak* used to stay in the village and advise us on irrigation and inputs, but now this is not the case."

In the Orissa WRCP, the AgSS planning appears to be completely top down; in the MPWSRP planning for the AgSS is to be done by a district level team of experts in conjunction with the WUAs; in the TNIAMWARM project the AgSS provision is planned on a sub-basin approach by the line departments with some farmer consultations; in the MHWSIP the AgSS is to be supported by multidisciplinary and multidepartment support groups at the scheme level with the project supporting agricultural development plans for the schemes.

In the two more recent tank projects in Tamil Nadu, planning is successfully undertaken at the WUA level by the farmers. The approach includes elements of PRAs and community mobilization and even though it appears to be a successful model, it is not clear how it could be scaled up to medium and large schemes.

Coordination

An AgSS component can be critical to the success of an AWM project, requiring careful coordination of the productivity enhancement and the support services activities.

Several issues can reduce the benefits from the AgSS component. Assumed increases in cropping intensity and crop yield are based on estimates of both improved water delivery and improved farming techniques. Even if service delivery reaches targets, if the agricultural productivity enhancement component does not perform well, these estimates of economic impact and return on investment are not valid. In fact, the desk review of AWM projects reveals that the performance of projects in terms of the economic rates of return are consistently lower than those anticipated during preparation. And while agricultural support is not one of the common reasons cited for the lower than expected returns (which are lengthy ramp up times, delayed fund allocation and procurement, and time and cost overruns in construction of civil works), ultimately the aforementioned delays have an impact at the coordination and timing of the activities at the farm level, with AgSS activities at times taking place before the provision of an adequate water supply.

The importance of the synergies -and the challenges of coordination- between irrigation and extension seem to be well conceived by the World Bank. For example, agricultural support to AWM has increased in response to calls in the TNWRCP to include agricultural support (which was not part of the original design, but included at mid-term). Over time, the amount allocated to AgSS has increased from approximately two percent in the ORWRCP and AP III to 13 percent for the latest generation tank projects in AP and Orissa. The one outlier is the TNIAWARM project, which has dedicated a massive 32 percent to AgSS, of which about 45 percent is dedicated to funding 100 000 ha of micro irrigation expansion.

In terms of the integration of components in the design, we notice that for the OR WRCP, UP WSRP, and MWSIP, agricultural intensification is subsumed within another component, while for the AP III, TN IAMWARM, AP and OR Community Tanks project, agricultural support has a dedicated component. Starting with OR WRCP, which was approved only six months after TN WRCP, a component on irrigated agricultural productivity was included in project design. These components bring in involvement of government ministries concerned with agriculture, agricultural engineering, agricultural marketing, horticulture and other departments depending on state institutional set-up. On top of institutional restructuring of public works or irrigation service delivery departments into holistic water resources management institutions, adding involvement from other agencies brings challenges to coordination at both the state and local levels.

Looking at how the challenge of coordination is handled in the more recent projects, for the TN IAMWARM component, "Agricultural Intensification and Diversification", seven line agencies and a new institution are each responsible for implementing project activities, to be coordinated by the ATMA's rolled out under the auspices of another project. For the two community tank projects, the component is called "Agricultural Livelihoods Support Services", to be based on a community-prepared Livelihood Development Plans (LDPs), with technical

support and oversight by relevant line department staff and the District Project Unit (DPU). The overall management of the project is through a newly created institution under the Societies Act, which is supposed to alleviate problems of inter-agency coordination across the board. The relative success of different arrangements is unclear, but the inherent risk of difficulties in inter-agency coordination applies to all projects.

There are obvious limits to the capacity of the project designers to impose in India an optimised institutional structure that facilitates coordination and the projects would need imaginative solutions to influence the coordination and dialogue of implementing agencies. The completion report of the APERP [1997–2006] mentions the need for regular dialogue between the Agriculture and Irrigation Departments and the WUAs to increase the economic returns to irrigation investments and to facilitate timely release of water. This coordination needs to be institutionalized as part of the command area policy and operational development process and it is difficult for project operations to bring lasting reforms in this direction. However, there is scope for incremental change through project operations.

The above mentioned project in AP did manage to influence the partial reorganization of the Irrigation and Command Area Development Department through the creation of a PMU to monitor the department's project activities and creating a Human Resources Development Unit to train developmental staff, office bearers of WUAs, non-government organizations, etc. in irrigation management.

A more simple recommendation for encouraging coordination on water resource management from the OR WRCP ICR "Lessons Learned" section is to conduct joint trainings for staff of both the WRD and the DoA. A similar approach has been rather successfully implemented in the TNIAMWARM project, where close coordination of the line departments and the university at the field level is increasing exposure. Simple strategies, such as convergence of demonstrations in a village, joint field days, joint field visits etc. appear to be much more successful in technology transfer as they reach a wider audience.

Another possibility is the creation of specific offices for project coordination, such as the Multi Disciplinary Project Unit in TNIAMWARM and the Project Implementation and Coordination Unit in the MPWSRP also promote convergence, as dedicated officers from the line departments are deputed. Unfortunately these disperse at the completion of the project, with no real mechanism for sustainability.



Chapter 5 - Lessons from World Bank-supported agricultural water management projects in India

A number of lessons, problems and related mitigation strategies can be taken from project documents. In this section these are organized according to those which pertain primarily to project design and project implementation respectively, while recognizing the interconnected nature of those aspects. The main focus is on documented lessons for project design, where the analysis covers the following topics: (i) institutional and policy reform, (ii) PIM, and (iii) AgSS. The implementation lessons relate to arrangements for procurement, financial management and overall project management. There are a number of interesting lessons on project M&E which given their importance and critical look in most World Bank documents have been included in a separate section of this report (Section 3.3).

On the design versus implementation type of lessons, a clear conclusion from analyzing project documents is that of the four lessons common among the projects with available ICR, only one relates to project design – the need for AgSS to be integrated at project inception. The other three address reasons for delays in project implementation, two of which relate specifically to land acquisition. Of these stated lessons, the one reflected in all later project design is the non-inclusion of a component on reducing electricity subsidies. Some lessons are also clearly State specific (such as those mentioned by the Orissa borrower).

Project design, broader institutional and policy reforms

According to the analysis presented below, design of all projects in the sample attempts to mitigate some of the common problems found in AWM projects in India, including the earlier WRCPs. While both earlier and later projects in

the sample utilize similar design strategies to address implementation problems, the PADs of the later projects often offer greater specificity, with a couple of departures from past practices, which this report also discusses²⁹.

Interestingly, some of the “lessons learned” presented in the borrower reports refer to project rationale, background and objectives that had been extensively and explicitly addressed in the PADs. The government could be re-emphasizing the importance of such aspects of project design³⁰. For example, in the WRCP ICRs, both the Tamil Nadu and Orissa governments cite basic PIM concepts as lessons that had been adequately spelled out in the PADs, but which were apparently new in both States³¹:

“Revision of water rates involve not only political will but with the explicit assurance of better performance of irrigation services and that the revenues so raised would be reinvested locally to upgrade the service” (TN WRCP Borrower’s Evaluation Report 2005).

“Sustainability of the project-financed improvements in irrigation and draining will depend on adequate O&M. For this, clear institutional arrangements are required and a secure system of funding must be identified and agreed. Studies show that farmers are prepared to pay, so long as they receive the

29 Of the five closed projects that were studied more in detail, the ICR of the UP WSRP was not available to the research team. In addition, lessons cited in the non-dedicated APERP were found to be quite general, emphasizing the need for government ownership, coordination, and strong monitoring and evaluation systems.

30 Another possibility is that the concepts were not well-understood by the government at project inception despite extended policy dialogue beforehand, and this points to a real evidence of learning within the implementing agencies on the basis of positive results.

31 The PIM concept was not completely new as some pilots had been conducted as part of the National Water Management Project (1987–1995). The TN WRCP ICR states that although participatory management was slow to take off, “the Government was now responding with enthusiasm” based on increased yield benefits. The Andhra Pradesh government similarly had implemented pilots under the AP II Irrigation project, and had already almost unanimously passed the FMIS act in 1997, evidence of understanding and buy-in of PIM transfer of O&M to water users.

services for which they are to pay” (OR WRCP ICR Borrower’s Evaluation Report 2005).

The analysis of World Bank documentation brings forward several key messages on broader institutional and policy reform. As an illustration of the importance of political will, an OR WRCP AM notes important conditions for a farmer turnover programme to really start:

“After the joining of the present Honourable Chief Minister who took considerable interest in the programme and is giving continuous guidance and leadership to the programme since then” (OR WRCP AM, Attachment 2, September 2003, para. 9).

Another example widely known in the literature is the “big bang” approach to PIM adopted in AP in the 1990s, which was also attributed to political leadership from the top. In AP, this led to the formation of around 10 000 WUAs within a year of legislation of the FMIS Act in 1997 although according to some authors performance of the WUAs has been poor, namely because of elite capture and political interference and, presumably, the inability of government agencies to actually communicate with and support such a large number of WUAs all at once (Swain and Das, 2008) (see more on this topic in Chapter 4.2 of this report).

Naturally, the issue of political will to implement reforms can only partly be addressed by project design that includes extended policy dialogue and engagement of government stakeholders in project preparation. The 2002 Country Assistance Evaluation (CAE) of WRM in India noted that political economy considerations are at the root of many problems in the sector and therefore the Bank should pay more attention to political will and commitment, and include political and civil leaders in the Bank’s dialogue on water reform (OED 2002, ix). Still, the review of project documents from closed Bank projects in India shows that this is very difficult to overcome in a project format. It may also be a reflection of the Bank’s increasingly smaller role in financing ARD initiatives in India *vis-à-vis* Gol and the private sector.

In a project context, delays in project implementation (in particular on components relating to institutional reform) are often attributed to changes in government and lack of sustained political will. One risk mitigation strategy suggested in later projects is greater emphasis on front-loading institutional reforms but this is also difficult to implement. In fact, the 2002 CAE notes that expectations to quickly change institutions and practices that have remained unchanged for decades is “an approach to institutional reforms that flies in the face of institutional realities and the political will such as they exist in India today” (OEG 2002, ix). As such, the World Bank strategy is to deal only with those states willing to commit to reform.

As per the documentation reviewed, both the experiences of TN WRCP and OR WRCP suggest that extended policy dialogue with government stakeholders before project launch is essential to ensuring project success in implementing PIM and reorganizing irrigation departments. Building high-level interest, motivation and capacity for water sector reform takes time. Interestingly, the text of the two ICRs is almost verbatim, and is also included in the borrower’s comments of the TN WRCP ICR.

The later UP WSRP and MH WSIP projects do refer to experiences elsewhere in India, including the TN and OR WRCPs, suggest that institutional reforms must be fully understood, and that “mindsets and behaviour of sector personnel, politicians, civil society, clients of the water utilities and the bureaucrats must be dealt with in light of the full complexity of the problems” (UP WSRP, PAD, 2001, 18-21). The conclusion from such reports is that reforms need careful nurturing and support for 12 to 18 years before becoming sufficiently entrenched, which cannot be achieved by stand alone investment for only 5 to 7 years. While also noting that institutional reforms need to be accompanied by physical infrastructure improvements, ambitious timetables of civil works disbursement without full understanding among government official and community buy-in reduces the impact of such investments.

Furthermore, in relation to project design and according to several IEG reports, a more robust ERR sensitivity analysis could screen out potentially unviable investments and planning should realistically take into account the possibility that multiple risks could occur simultaneously.

In sum, there is ample recognition from the Bank on the need for an enabling higher level institutional context and political will for reform in order to make irrigation projects work (at least in their current form). In seeking to overcome such problems there have been attempts at changing the sequencing of interventions and in particular putting more emphasis on initial institutional change. Still, this is and will remain a challenging issue with no obvious solution as it goes beyond the Bank's sphere of influence in many ways, in particular under a "project format".

Participatory irrigation management

PIM as a strategy to improve sustainability of irrigation systems depends on functional WUAs that are empowered to manage O&M. The lessons learned and problems identified in project documents of the sample mainly relate to the factors required to enable transfer of O&M responsibility to farmers with meaningful community participation, including building awareness and capacity among government officials, farmers, and WUA officials about the PIM concept. Project documents discuss "empowerment" of WUAs in terms of legal constitution, fiduciary rights and responsibilities, and the capacity to plan, implement, operate and maintain civil works. This section focuses on the lessons learned from Bank documents with Chapter 2.2 of the report providing more evidence from primary data and literature on PIM in India to support the final conclusions.

Building awareness and capacity of WUA and sequencing of interventions

In building awareness and capacity of WUAs, the message from ICRs is that initial expectations should consider it as a lengthy process that requires significant dedicated training and

adequate involvement of Government officials and beneficiaries. Project documentation reviewed also highlights the importance of good sequencing of interventions with WUAs from awareness raising to civil works and maintenance.

As per ICR findings, WUAs are not usually ready to independently manage O&M until three to five years post-formation. Some typical statements include:

OR WRCP ICR: "The project's experience shows that WUAs (PPs) need at least three to four years of support to be capable to operate manage and maintain minor and sub-minor canals" (OR WRCP ICR, 8 2005, 12-13).

AP III ICR: "WUAs need at least four to five years of financial and technical support to be able to operate, manage and maintain even minor and sub-minor canals" (AP III Irrigation project ICR 2005, 11).

The experience that at least three years of continued financial, technical, and institutional support is needed to enable WUAs to assume full responsibility to manage canals is often the most significant lesson for future project design as per project appraisal documents. If WUAs in the project area are newly elected, weak or non-existent, then project fund allocation schedules should frontload funding for awareness of, and capacity-building for, PIM among farmers, WUA office bearers and government officials. According to project completion reports, the duration of civil works contracts should reflect the time needed for WUAs to develop the capacity to plan and manage O&M. Still, in practice such "lessons" drawn at completion stage and incorporated in design documents did not always translate into appropriate time being spent on capacity building of key institutions (Box 1).

Regarding preparatory activities and sequencing of WUA formation and capacity building, two exceptions found in the sample are the AP and OR community tank projects. These have prioritized awareness, capacity building and

Box 1: Maharashtra WSIP – formation of WUAs

For example, the MH WSIP, effective as of September 2005, a year after the close of the OR WRCP, called for USD 112 million³² to be awarded to WUAs for minor level canal works by the end of the second year of the project period. The World Bank Implementation Support Mission that visited MH one year and five months after project commencement cited that elections of 98 percent of the 1 329 new WUAs to be formed under the project had just been completed

(MH WSIP AM, February 2007, 3). Only one round of training for office bearers had taken place and 979 WUAs had conducted joint walk-through surveys of works with WRD officials. Still, the mission noted with approval the plan to award 100 percent of work projects over the next few months. According to previous experience the risk of awarding civil works contracts to WUAs at this early stage was not just the possibility of fund mismanagement or low quality control. Without community participation in planning, full community buy-in is not assured and the expectation of user ownership and subsequent sustainable O&M is undermined.³³

participatory planning efforts at the start-up phase. The AM of the Second Implementation Support Mission of the AP Tanks project in April 2008, nine months after project effectiveness, noted:

“As per design project implementation till now has been mainly focused on training and capacity building of Water User Associations (WUAs) in tanks identified for rehabilitation under Batch 1 (500 tanks) of the project, preparation of Tank Improvement and Management Plans (TIMPs), and support for agricultural extension and marketing activities” (AP Tanks AM, April 2008, 1).

No civil contracts had been awarded to WUAs, nor was this noted as a big concern; instead the mission recommended implementation efforts in the near future to focus on strengthening project management, training programmes, and inter-departmental coordination. In fact, while observing that the participatory planning process had taken an extra three to four months, the AM stated that the experience gained would benefit the project

in the future and that it was a worthwhile and necessary exercise to get community buy-in (AP Tanks AM, April 2008, 1 and 3). Furthermore, project design included provision for a fixed 24-month cycle of technical support for each new WUA by Support Organizations (SOs), which was later extended by another six months.

One caveat is that WUAs for minor tank projects may be easier to mobilize and train versus those in larger canal irrigation systems with multiple levels of farmer management and responsibility. In tank systems the sluices are the single point of control of water volume and timing and therefore act as a focal point of management, and thus can be used as a starting point to dialogue between WUAs and government agencies. On the other hand, canal systems are more complicated because canal water levels and flows into the command area of a WUA are affected by decisions and actions at many upstream locations remote from the WUAs. However, if there were water service agreements (or even contracts) at the point of transfer of control over water where both the agency and the WUAs were involved in joint monitoring of water levels and timing, then the agency would make efforts to minimise deviations from the agreed service conditions, becoming closer to the management situation of a tank system.

In a similar way, both earlier and later PADs acknowledge that substantial time and effort is needed to raise awareness and build capacity about the PIM concept with public officials (in this case mainly from the WRD). The mitigation strategy posited in the earlier projects is extended policy dialogue before project commencement and sufficient fund allocation for such efforts.

32 As a comparison, an equal amount of USD 112 million was also allocated for the improvement of main canals and distributaries, to be implemented by experienced civil work contractors through quality-based selection (QBS).

33 Even assuming that MH farmers were more aware of the PIM concept due to the gradual reform approach taken in the 1990s, the 2005 Maharashtra Management of Irrigation Systems by Farmers (MMISF) Act delineated new fiduciary responsibilities to WUA officials. The same AM cites that 989 of the 1 329 targeted WUAs had opened Bank accounts, while 979 WUAs had conducted joint walk through surveys with WRD officials. A later AM of almost three years post project commencement also noted with concern low institutional capacity of WUAs. However, it is true that in a few cases even if a WUA was not formed, water users participated in planning. The TN IAMVARM AM two years after project effectiveness observed that: “Even though WUAs were not in place at the time of the sub basins plans preparation and during field visits carried out by the AEEs, it became clear from the discussions [with recently elected WUA management committees and farmers] that the water users were involved. They participated in walk-through surveys and meetings with engineers and subsequently had meetings to be informed about the proposed rehabilitation activities” (AM, Implementation Support Mission: 24 May-6 April 2009, para. 9).

However, as also discussed regarding project design, this does not seem to have been sufficient to fully change the mindsets of government officials and farmers that irrigation service delivery and O&M was the sole responsibility of irrigation departments, or to ensure understanding of responsibilities of both groups in the new system.

Part of the problem may be related to underestimating the time needed to simply raise awareness and understanding of the PIM concept, without which actions such as conducting elections, opening bank accounts or conducting joint-walk through surveys do not translate into management capacity. Initial trainings which focus on simply explaining the respective state FMIS acts are not sufficient and this is acknowledged by State Governments too (for example the TN WRCP Borrower's evaluation report calls for more frequent trainings for both government officials and WUAs).

Beyond increasing and front-loading the number of trainings, the later Community Tank projects offer specific suggestions for improving the quality of capacity-building efforts, including frequent review of training materials and more training of trainers (ToT) sessions. A significant departure from past projects is also the provision for a 24-month cycle of support for each WUA as discussed above. The later projects also mention the use of manuals on financial management and O&M, for example, as improving the quality of training. The OR Tanks project includes the following from the "Lessons learned and reflected in the project design" section:

"Meaningful community participation requires substantial capacity building. The tank improvement cycle developed during project preparation with clearly defined stages (identification, pre-planning, planning, implementation and post-implementation) provides a structured approach for identification of capacity gaps and sufficient time for these to be addressed through mobilization efforts, awareness generation, requisite training and other measures" (OR Tanks, PAD, 2008, 7).

Another suggestion for tweaking the modes of training, mentioned in the ICRs of both the OR WRCP and AP III Irrigation projects, refers to the experience that: "Farmer group visits to see and learn from the experience of successfully operating PPs is [sic] a very valuable form of training, often producing a better impact than other more formal training methods" (OR WRCP ICR, 2005, 12-13).

Need for improved funding mechanisms, namely for O&M

Global lessons from World Bank-supported projects on AWM indicate that most projects do not achieve cost recovery and that there is no long-term alternative to users funding O&M.

While participation in planning, implementation and monitoring of irrigation works is important, WUA participation is not complete or effective unless these institutions have secure and adequate financial resources to manage O&M. Before turning over management of O&M to farmers, top-level government commitment to prioritize public expenditure for maintenance of existing irrigation systems was solicited in the earlier projects. This included a policy commitment to increase water charges to the level that would cover O&M costs. While public expenditure for maintenance has improved, it is not always evenly distributed across irrigation schemes³⁴ and is subject to the fiscal situation of the state. Naturally, WUAs would not be very inclined to commit funds up-front in the expectation of Government public expenditure later on to support maintenance.

Despite the lack of evidence, in a number of projects there seems to be an unfunded expectation that somehow collection of water charges will improve in the future after project completion. In fact, some of the projects reviewed in this study have been rated "likely" based on this assumption and the fact that

³⁴ The ICR of the TN WRCP notes: "Recent overall expenditure on maintenance by WRO has corresponded with estimates made by international consultants of typical maintenance requirements. Indications are that this level of funding will continue. It would seem adequate if it was evenly distributed. However, there is a tendency to divert more resources to areas that have not had the benefit of WRCP. A further worrying tendency is to defer needed repairs in schemes assisted by WRCP in the hope that they will be included in some future project." (TN WRCP ICR 2005, 4-5).

they have achieved some improvement in the institutional framework. Furthermore, there seems to be a conceptual disconnect between the quality of the irrigation service and the expectations of increased revenue collection. Improving the quality of the irrigation service provided by the scheme managers is essential to increase users' capacity and willingness to pay.

Project review documents note that despite revisions of water user rates and improvements in water delivery, payment of water charges remains low and insufficient to cover O&M costs. The 2006 IEG review "Water Management in Agriculture: Ten Years of World Bank Assistance" concluded that expectations about the speed of cost recovery following management handover to user groups are unrealistic, particularly when civil works required for improving irrigation services take most of the project period to complete, if not longer (IEG 2006, 56). As mentioned above, external factors that reduce crop yields and farmer income such as droughts, flooding and changes in crop prices also contribute to low cost-recovery. Continued government allocation for O&M to cover the short-fall in cost-recovery from water charges is often needed to maintain service delivery.

Even if payment of water charges and the proportion to be transferred to farmer management had been sufficient to cover O&M, all project documents mention the problem of delayed transfer of funds to WUAs. This is often attributed to the complicated process of fund transfer. In many States water charges are collected by the Revenue Department along with other taxes. The bottleneck arises in the coordination and transfer of funds from the Revenue Department to the WRM Department. These funds are supposed to cover O&M charges of main canals. A portion of these funds are also supposed to be transferred to the WUA to cover O&M of minor and sub-minor canals. As noted in the PIM section, without adequate funding, WUAs cannot be expected to function properly given the "hardware" constraints.

While the later projects acknowledge this problem and attempt to clarify fund flow procedures in

project design, implementation remains difficult. For example, the October 2009 World Bank review mission of the ongoing TN IAMWARM notes with concern slow transfer of funds two and a half years after project effectiveness, and six years after a TN Revenue Department Government Order directing 30 percent of an Additional Water Cess (AWC) be transferred to WUAs. On paper, the decree operationalizes the lesson cited by the Government of Tamil Nadu (GoTN) at the close of the WRCP project that user charges should be reinvested locally to improve service: the AWC reimbursement to the respective WUAs is supposed to be in proportion to the amounts collected from the command area of each WUA (TN IAMWARM AM, Annex VII, October 2009, 38). However, the slow transfer of funds was attributed largely to delays in estimating and approving WUA-wise entitlements, which was also observed during the qualitative field work by the research team in Tamil Nadu, with the mission concluding that greater coordination was needed between the WRO and the concerned District Collectors.

Thus, many project documents state that government budgets should ensure that funds needed to pay for O&M should be available to WUAs through an upfront budgetary allocation with secure institutional arrangements for fund transfer (OR WRCP ICR Borrower's Evaluation Report Unedited, 2005, 41-42). While the later projects state that this would happen, implementation thus far is unclear. Secure funding would encourage water users to take over O&M responsibility, pay water charges, and potentially contribute other cash and labour when required. Without a better water service delivery and adequate funding, the goal of irrigation system sustainability through farmer management is compromised.

The most significant change in project design to address the need for adequate O&M funding is included in the 2008 OR Tanks PAD: "For tanks to be rehabilitated under the project, WUAs have been empowered to levy, collect and retain water charges for future O&M. This is an important departure from past practice and is expected to significantly improve WUAs access to financial resources for future O&M" (OR

Tanks, PAD 2008, 7). As of January 2009, the AP Government was considering a similar measure, which was strongly supported by the World Bank implementation support mission of the AP Tanks project. Again, this may be easier for community tank projects with smaller command areas. The UP PIM act passed in 2009 also allows WUAs to collect and retain a part of water charges for O&M purposes.

Nonetheless, an assessment conducted as part of the OR Tanks appraisal process concluded that WUA capacity to manage finances was weak. Thus, considerable handholding support for accounting functions was included in project design. Also, the project envisaged that WUAs would undertake only small, labour-intensive works such as de-weeding, jungle clearing, and small repairs to feeder channels. For rehabilitation works under the project, advance funds would be available and WUAs are to contribute 10 percent of the cost, with 5 percent cash up-front deposited into an O&M account for future maintenance (OR Tanks PAD, 2008, 63). As of around six months post-project commencement (one year after project approval), understanding about the function of the 5 percent cash contribution as a "corpus" fund for future O&M was not well understood by district officials and WUA members (OR Tanks AM, 2009). Again, two key related lessons from the review are that (i) the arrangements (roles and responsibilities) put in place are not well internalized by key stakeholders and (ii) they do not promote true decision-making power with the WUA in terms of how funds are utilized (it is mainly a variant of "joint responsibility" which is used). Such a situation contributes to lack of adequate incentives and resulting problematic performance.

Lessons on agricultural support services

One of the most common lessons from older World Bank-supported projects is that a component on agricultural productivity enhancement for irrigated area needs to be integrated with PIM and institutional reform components from project inception. The earliest

project in our sample, the TN WRCP, is the only one which does not include such a component at the beginning; however this was added during the course of the project. The ICR for this project posits the following lessons:

"The economic impact of an irrigation project will be improved by the inclusion of an agricultural component with strong agricultural support services at the outset. A multi-disciplinary approach to agricultural development should be continued. Investment in agricultural services should be flexible enough with government extension services and tied to marketing networks" (TN WRCP ICR, 2005, 13-14).

All subsequent projects reflect this lesson and do include AgSS in project design, albeit with different institutional arrangements. Although an AgSS component is deemed as critical to project success, the issues mentioned below can reduce the benefits from this component. As mentioned above, assumed increases in cropping intensity and crop yield are based on estimates of both improved water delivery and improved farming techniques. Even if service delivery reaches targets, the agricultural productivity enhancement component usually is expected to be the key for estimates of economic impact and return on investment to be valid.

One of the most common problems mentioned in the AMs and ICRs is inadequate fund allocation for agricultural support services. However, documented lessons indicate that even when allocation is available, component implementation suffers from delays in release of funds to the implementing agency of this component, generally the DoA.

Starting with OR WRCP, which was approved only six months after TN WRCP, a component on agricultural productivity was included in project design. These components bring in involvement of government ministries concerned with agriculture, agricultural engineering, agricultural marketing, horticulture and other departments depending on State institutional set-up. For the OR WRCP, UP Water Sector Restructuring Project

(WSRP), and MH WSIP, agricultural intensification is subsumed within another component, while for the AP III Irrigation, TN IAMWARM, AP and OR Community Tanks project, agricultural support has a dedicated component.

A more simple recommendation for encouraging coordination on water resource management from the OR WRCP ICR “Lessons Learned” section is to conduct joint trainings for staff of both the WRD and the DoA. While such initiatives have some merits they face the problem that staff from one line agency have little incentives to collaborate with those of others (because of separate career and promotion paths) except if there is a change to the institutional structure.

The AMs of the WRCP projects in our sample, TN and OR, mention that even though research on agricultural productivity, such as adaptive research trials (ART), may have been taking place according to project activities, corresponding on-farm demonstrations (OFD) and general extension services were weak, with a shortage of local field staff and equipment. Conversely, in AP III the link between research and extension was working better, with review missions giving credit to competent local extension officers.

The OR WRCP ICR noted that the impact of the agricultural productivity sub-component was limited due to the inadequacy of market opportunities, reducing income opportunities and crop diversification (OR WRCP ICR 2005, 5). Subsequent projects do include a provision for agricultural marketing and some call for WUAs to be an intermediary for aggregating products. While it could be viable in some instances, it is not clear why a WUA should also become an intermediary, given the already high financial and management constraints in terms of water management functions.

Project implementation issues

The success of any project is subject to the quality of project implementation and such problems are cited more frequently than design issues in World Bank documents that assess

the relative contributions to reduction of project impact. For example, of all of the lessons common across completed dedicated projects in the reviewed sample, only one relates to project design (recognizing the need for agricultural support services to be integrated at project inception). The others address implementation delays in completing works, transfer of funds, and project management as well as issues with land acquisition.

Review of global experience of World Bank-supported projects during the period 1994 to 2004 indicates that institutional problems are the main reason for poor project performance, including poor coordination and implementing capacity, insufficient buy-in to sector reform and reorganization, neglect of complementary agricultural services, and weak commitment to cost recovery and/or user participation in system management and operation.

Project implementation problems are not new and do not seem to have an easy fix. Referring to World Bank-supported agricultural projects in India prior to 1995, the PAD of the TN WRCP cites common problems as “delays in project mobilization and procurement, [low] quality of civil works, institutional weaknesses, and insufficient local funding.” Despite the mitigation strategies to address past concerns, project implementation problems persist.

Procurement, financial management, insufficient and delayed funds

All the ICRs mention delays in procurement and signing of works contracts, with corresponding delays in disbursement of project funds, as a major problem causing time and cost over-runs and preventing realization of planned project benefits. As mentioned in Chapter 3.2, the impact evaluation of the AP II and III Irrigation Projects conducted by IEG also concluded that construction delays are one of the biggest factors undermining the economic viability of irrigation investments (IEG 2008, xviii). The project documents in the sample mention the following factors as essential for timely completion of works: (i) simplify procurement process and provide frequent training in World

Bank procedures, (ii) ensuring Government commitment for adequate and timely release of funds, and (iii) improve financial management.

Most ICRs mention the need for simpler and more efficient procurement processes with frequent training in World Bank procedures in the prioritized "Lessons Learned" section. The major explanation for delayed release of funds, procurement and contracting mentioned in all project documents is inexperience of government staff in World Bank procedures, exacerbated by the turnover of middle-level staff. Yet the PADs of the closed projects claim that the respective state governments have prior experience with Bank procurement procedures and are undergoing training in the same, with close monitoring expected to ensure both the quality and timeliness of procurement (OR WRCP PAD, 1995, 33).

The AP III PAD also mentions the lesson from the AP II project that procurement of works contracts should follow a logical implementation sequence to facilitate timely realization of planned benefits and enable mid-project adjustments if necessary. The ICR of the AP III adds that in addition to trainings on World Bank procedures and realistic sequencing, delays can be reduced by simpler and more efficient procurement procedures within the government itself. As an example of how similar mitigation strategies are used across time, the UP WSRP PAD also claims to address this lesson by assessing procurement readiness and hiring a procurement expert with first-hand knowledge of World Bank procurement procedures before project effectiveness (UP WRSP PAD, 2001).

Still, most projects, including the earlier ones, claim satisfactory project readiness at the appraisal stage. For example, in the case of the TN WRCP, 70 percent of the procurement and contract packages over the seven year project length were supposedly allocated, with full needs provided for the first two years of the project (naturally such "front loading" potentially goes against some of the other recommendations in terms of having WUAs play a significant role in planning and decision-making). However, the ICR attributes the delays in implementation of these packages to the

formation of a new government immediately after project approval and very slow decision-making for awarding contracts. The ICR of the OR WRCP maintains that good project preparation allowed the quick start of the project and disbursement close to appraisal estimates in the first four years of the project. However, later delays are attributed to administrative weakness, lengthy procedures, slow decision-making, the paucity of reliable contractors, and State financial constraints.

As discussed elsewhere, inadequate and delayed public fund allocation negatively impacts project outcomes, such as the transfer of O&M responsibility to WUAs and increased agricultural productivity. This problem is mentioned in every project document and similar mitigation strategies are utilized in both the earlier and later projects. Nonetheless, the ability of project design to address these crucial recurring implementation problems - common throughout state bureaucracies – seems to be limited.

All projects solicit explicit government commitment to prioritize expenditure for institutional strengthening and maintenance of existing systems, with adequate and timely release of funds, as a pre-requisite for project approval. However, when state governments are facing fiscal difficulties, the commitment is not enough to assure sustained funding. For example, the OR WRCP ICR notes full and timely funding of WRCP components had been inadequate and late for the last five years of the project, ever since the 1999 super cyclone worsened the state's fiscal difficulties.

Later projects utilize the same strategy for addressing inadequate and delayed funds. The MH WSIP, approved one year after the close of the WRCPs, offers the following risk mitigation measures: government commitment and "more emphasis" on monitoring - measures which had been included in earlier PADs as well (MH WSIP PAD, 2004, 43). Soliciting government commitment is the starting point for proper budgetary allocation. Even if adequate, full and timely release of funds is dependent on financial management and disbursement procedures.

Similar measures across all projects include provisions for trainings and frequent monitoring through audits and reports, and call for continuity of professional financial specialists. To streamline clearance and decision making, empowered disbursement and contract management committees were formed. Despite these measures, the earlier projects note the recurrence of the fundamental challenges to improving financial management: low technical capacity, delayed and infrequent audit reporting and action plans, high staff turnover, slow decision-making, and poor coordination among line agencies (TN WRCP ICR, 2005, 7).

Changes in project design over time include dedicated project management after the WRCPs and more thorough financial management assessments and greater organizational clarity for fund transfer procedures. The creation of detailed Financial Management Manuals (FMMs), procurement and contract management guidelines also offer greater specificity and guidance to project staff.

The impact of all such measures is unclear: while there is some evidence of corrections to improve fund flows, certain situations such as a troubled state fiscal situation remain a systemic challenge. For example, just like earlier projects, the supervision mission almost a year and a half after project commencement of AP Community Tanks project noted as a priority concern the delay in transferring funds to implementing agencies of the agricultural livelihoods and support services component. A suggestion for improvement was raising the limit of advance funds provided to the various departments (AP Tanks AM, November 2008, 5). The mission seven months later expressed appreciation to the government for addressing this bottleneck by exempting the project from Department of Finance expenditure ceilings to allow quicker disbursement approvals (AP Tanks AM, June 2009, 1). Yet, another six months later in December 2009, the strained fiscal situation in AP was cited as the cause of delays in payment of bills particularly affecting the agricultural support component, leading the mission to solicit assurance of timely fund flow from the Principal Secretary of Finance (AP Tanks

AM, December 2009, 1).³⁵ Construction quality, staffing and coordination of implementation agencies. Without reliable service delivery of irrigation water, farmers have little interest in covering O&M costs or managing distribution, reducing the sustainability of the irrigation system. Despite improvements, many AMs continue to note with concern the low quality of irrigation infrastructure works.

To address this problem, some ICRs suggest that state governments should not only provide detailed ToRs and implement QBS of contract bids, but should also build capacity for ensuring quality control within the implementing agency. The PAD for AP III cites a lesson from AP II that appraisal missions should review the implementing agency's ability to control construction quality, which was indeed conducted in later projects.

Further measures to ensure higher quality works include the lesson cited in the TN WRCP Borrower's evaluation report that frequent review meetings with construction agencies help keep agreed milestones. The lesson on the use of OK cards³⁶ as a means of standardizing quality control measures during the AP III Irrigation project has apparently been used for schemes under the TN IAMWARM project, as mentioned with approval by a World Bank review mission. These were also seen as successful in other projects related to water management (for example the ICR of Karnataka Watershed Development Project).

The problem of vacancies for key posts and high staff turnover within implementing agencies is frequently mentioned in both AMs and ICRs. Most documents simply state that this should be minimized, but do not elaborate on the reasons contributing to the difficulties in attracting and retaining staff. An exception is the discussion in

³⁵ Regarding the direct interaction of World Bank staff with the top-level Principal Secretary, 2002 CAE raised the question of whether or not heavily supervised Bank-supported projects substituted for lack of ownership among the government. Given that the Bank is there to give support and to insist on correction of implementation issues, when Bank involvement ceases the CAE cites that the state fails to support adequate budget to support staffing over the long-run. (OED 2002, 20, para. 69).

³⁶ A checklist for officials, contractors and farmers for inspection of civil works.

an AM of the AP Tanks project in 2009, around two years after project commencement:

“A critical area identified for critical action” is improvement in working conditions and infrastructure, such as office space and computers, particularly for contracted employees “so that staff morale and teamwork does not suffer”.

Moreover, dissatisfaction was expressed by contracted employees at the delay in payments, and opportunities for higher remuneration elsewhere. Thus, the mission recommended reviewing salaries in line with market rates (AP Tanks AM, June 2009, para. 6). Discussions with State officials as part of this stock-taking have also suggested that as project-based positions are often temporary and do not fall under promotion patterns within the civil service, the incentive for regular staff to accept such a project related post are weak and other opportunities remain more attractive.

As mentioned above in the discussion of lessons and problems regarding support for agricultural services, lack of coordination between line agencies is both a project design and implementation issue. Project design can clarify the nature of interactions at senior and junior levels. However, implementation is influenced by many other factors including systemic difficulties in inter-departmental coordination. Indian bureaucracies are known for being large and unwieldy. Personalities, mindsets and behaviour of relevant officials can stymie cooperation, just as political will for reform can encourage change. Institutional weakness and poor communication can also hamper coordination. Even if meetings occur between higher-level officials at the state capital, local bureaucrats in the DoA and WRD, for example, may not necessarily coordinate their activities for water conservation techniques over the crop cycle.

Both earlier and later projects use similar mitigation strategies to avoid poor coordination, including professionally staffed project management teams, steering committees with representation from different line agencies,

advance planning, improved information and communication flow, awareness campaigns, capacity-building trainings and frequent monitoring.

In addition, staffing problems also include delays in hiring consultants for capacity-building training on PIM and WUA management, monitoring and evaluation, technology modernization, and research. Without corresponding institutional strengthening activities, infrastructure investments may not be sustainable.

The importance of having good project management with a permanently posted team leader at project inception to coordinate hiring and overseeing consultants is emphasized. The “Lessons Learned” section of OR WRCP suggests that the selection and contract-signing of key consultants should actually precede credit effectiveness.³⁷

The value added of extension in agricultural water management projects

One of the most frequently quoted lessons in the World Bank-supported project documentation under review³⁸ is that a component on agricultural productivity enhancement for irrigated areas needs to be integrated with PIM and institutional reform components from project inception³⁹. This can allow for better planning and coordination of AgSS, and for improvements in the systems of marketing and public procurement of agricultural inputs, in order to maximize the benefits of the irrigation investments.

37 “Selection of key consultants and corresponding contract signing should precede Credit effectiveness. Where consultancy support is of a flexible nature, it is essential to have a permanently posted Team Leader appointed from the project start to ensure adequate coordination and management.” (OR WRCP ICR, 2005, 12-13).

38 Stocktaking of World Bank Agriculture Water Management Projects in India, Desk Review, PR Number 43162, Centre for Development Finance, IFMR, 2010, page 60.

39 For example the ICR of TN WRCP mentions that: “The economic impact of an irrigation project will be improved by the inclusion of an agricultural component with strong agricultural support services at the outset. A multi-disciplinary approach to agricultural development should be continued. Investment in agricultural services should be flexible enough with government extension services and tied to marketing networks” (TN WRCP ICR 2005, 13-14).

In general, the interventions under agricultural support do not differ greatly across World Bank-supported projects reviewed. The normal themes are support to increasing intensification and promotion of diversification, with implementation involving many line departments including agriculture, horticulture, livestock and the State Agriculture University (SAU).⁴⁰

In terms of activities, the World Bank-assisted projects include support for training, goods, civil works, and incremental operating expenses associated with large scale farm-based

demonstrations with main themes including the awareness raising and training on improved production practices (e.g. on higher-value cropping systems, IPIM/IPNM/organic farming, water conservation through farm ponds and drip/sprinkler systems, etc.), and the promotion of the use of improved tools and farm equipment. Post-production support is provided in the areas of agro-processing and value-chain improvement, market infrastructure, information kiosks, market information systems, modern fisheries production systems, and improving livestock health, milk yields, and fodder production.

⁴⁰ In the case of TNIAMWARM, seven line departments were involved: agriculture, horticulture, agricultural engineering, marketing, animal husbandry, fisheries, TNAU.



Chapter 6 - Key findings and recommendations

The World Bank has dedicated a substantial portion of its ARD portfolio in India to AWM projects and this review finds evidence that it has been able to steadily improve the performance of its projects through increasing focus on institutional arrangements and a greater emphasis on AgSS to areas under irrigation. According to most accounts, the Bank portfolio has for the most part had a satisfactory performance and the Bank has achieved some degree of influence at State level in the so-called “reforming States.”

The review also found that reported results are often dependent on data collected through inadequate empirical strategies and often implemented late and with difficulties. This takes place despite recent improvements in monitoring and evaluation of projects in the sector. This casts some uncertainty on the quality of results measured and reported. The findings of the primary data collection (both qualitative and quantitative) seem to confirm such suspicion. In particular, the review pointed out that a significant share of WUAs in projects that have already closed are not organized as per the official rules of the Act (in terms of elections and other) and functions performed vary substantially across the sample. Most importantly, WUAs do not seem to have enough resources for conducting many of their pre-assigned functions.

The following is a list of the key findings and associated recommendations:

The AWM sector is high on the GoI agenda and is likely to remain given concerns over food security and the specificities of a country with India’s population and this seems to not always be captured well in World Bank portfolio considerations as of late, namely those discussing sector underperformance.

The ability of a country such as India to tap relatively small international markets (for example

the world’s rice market only accounts for around 6 percent of consumption) to ensure its food needs are dynamic factors and raise strategic concerns which are not always well captured in reviews analysing the World Bank AWM portfolio in a cross-sector perspective. Also they are not well reflected in project’s economic and other analysis conducted in project appraisal and at completion. Moreover, the lack of rigorous impact evaluations does not help “defend” the case for investing in the sector in India. This would require more detailed measurement of benefits and assessment of counterfactuals (namely in terms of the probability of scheme malfunction as result of no rehabilitation).

World Bank-supported projects in AWM have become a small part of overall investments in the sector (namely those by GoI) and some re-positioning may be warranted.

Being small is not a problem per se but also suggests that simply providing additional finance for similar type of investments or programmes with approaches close to existing Government projects is not always desirable. An alternative is for the Bank’s portfolio in AWM to evolve towards projects that foster innovation and a flexible environment for experimentation (which is reportedly well appreciated by officials). This, combined with improved impact evaluations may lead to increased learning on what works and not in AWM and also replication of successful approaches. Such a strategy would also be consistent of the Bank’s increasing role as a policy adviser and knowledge broker.

As with many other development ideas in the past, the sentiment on PIM seems to have shifted recently and there is increasing pressure for finding new quick solutions. Still, this review suggests there is probably not enough evidence to argue for quickly dismissing such approaches. The concept of PIM is no longer as fashionable as it was in the 1990s and this is being

made clear by both World Bank documents and other institutions that call for new ideas, namely through PPPs and other. Critics point at lack of successful cases in PIM and WUAs. The present review of existing evidence in India and the primary data collected (both qualitative and quantitative) also point to mixed results, namely in how some of these WUAs function in reality relative to what they are supposed to be performing.

The Bank's experience has to a large extent been similar to others, internationally and also in other sectors. That is one often of high hopes that simply enabling user participation would in some way result in large scheme systematic problems being overcome. It therefore is not surprising that the results have been mixed. The conditions that exist where PIM has been successful include a good physical and institutional environment, a well engineered scheme, efficient scheme management, a sound legal basis, delegation of responsibilities, adequate funding and sufficient capacity for system O&M.

As highlighted by the study surveys, the outcome of the Bank's efforts in the three States is consistent with international experience and previous work in India. It shows that some elements have been reasonably successful, particularly the formation of WUAs, and that WUAs are functioning to a certain extent, though not always consistent with the PIM principles of democracy and transparency. Key constraints are similar to those identified elsewhere: lack of funding, lack of autonomy, lack of capacity and so on, i.e. all elements which could be improved in future World Bank-supported projects.

Also the promotion of PIM appears to have suffered from the same problem as elsewhere, a myopic expectation that user participation alone would produce the desired outcomes. So while not new news, the key lesson is that the promotion of PIM within project design should be in the context of the scheme rehabilitation⁴¹

⁴¹ As discussed above rehabilitation provides an entry point but it also introduces a lot of difficulties such as procurement issues, contracting, delays, and other project implementation issues. Further, planning rehabilitation requires an up-front assessment of causes of poor performance. An alternative in some cases may be to improve system management quite a bit before rehabilitation starts, giving an opportunity to better prioritize civil works and focus on water service delivery as the primary outcome of the intervention.

(or in a process leading to rehabilitation) and institution reforms to which it is dependent and complementary.

WUA capacity building is a lengthy process and this is also consistent with findings of the qualitative research conducted as input to this report and the available literature in general. Once an acceptable level of self-sustainability of WUAs has been reached, further support should be available to them. Within government – for example in WRD – permanent capacity needs to be built therefore, to monitor WUAs and provide support and training as needed at any time. Still, this is not often reflected in projects and given sufficient attention in a context of pressure to disburse project funds over a short time period and quickly achieve output indicators to satisfy periodic performance reviews. Among the more recent projects in the sample, this lesson is only reflected in the AP and OR Community Tanks projects.

Some of the new ideas on PPPs constitute potentially interesting opportunities in India however it is not the topic of this review to analyse these. Still, PPPs have encountered problems in numerous countries, namely when institutions are weak (as concessions lead to the need for a strong and independent regulatory authority) and there are reasons not to fully drop the concept of PIM at this stage. In principle, it can also be envisaged to test PPPs with parts of the PIM concept (namely the rules for creation and function of WUAs, their role and responsibilities). This study identifies at least three key reasons for such a strategy:

- First, there is diversity in WUA performance and there are many successful cases even within a system that is overall not performing well. In a cross-State comparison it is also clear that PIM is not just one concept but has several dimensions in terms of the particular institutional solutions adopted, the degree of responsibility and autonomy given to WUAs, the rules for their creation and membership among others;
- Second, WUA performance is heavily conditioned by overall system performance,

including engineering efficiency and agricultural support. Without a comprehensive approach, participation of farmers in management with only a limited degree of authority over proceedings cannot be fully responsible for underperformance. The control by individual farmers over timing and quantity of water, as practiced in groundwater irrigation with private tubewells, also creates a challenge for the operations of WUAs and surface schemes (given farmers' fewer incentives to cooperate when they have very cheap groundwater available). As surface water and groundwater are intimately connected, planning and management of water should be closely integrated through a focus on conjunctive use. WUAs could also play a role in such type of conjunctive management;

- Third, the qualitative research focusing on the structure and work of irrigation departments in five States highlighted that PIM is now better understood following years of projects and trainings, and that there is an accumulated knowledge which did not exist in India ten years ago and which can be leveraged to improve the overall approach to PIM.

The project format raises challenges for achieving significant results, namely at the institutional level and there is probably scope for more targeted less ambitious interventions in terms of new institution building and infrastructure works.

The project format is very challenging in AWM in India not only given difficulties in building capacity of WUAs, but also helping to support significant change in key implementing institutions at State level such as agricultural and irrigation departments. This was a clear conclusion of both the review of World Bank project documents and the institutional analysis of irrigation and agricultural departments conducted as part of this study. Moreover, World Bank-supported projects usually have very ambitious implementation targets on rehabilitation works, thousands of WUAs being created and a large quantity of hectares having access to irrigation with an average implementation period of five years set at appraisal. This is an important factor in

large projects focusing on a number of large and medium schemes as those reviewed in this study. There is possibly an opportunity to have a more focused approach with less ambitious coverage targets that can allow a more detailed analysis of particular scheme level constraints of different types (such as in terms of institutions, existence of service-oriented management, overall scheme management, identification and prioritization of interventions to improve performance, engineering efficiency and agricultural practices) and be able to have more detailed and context-specific solutions being considered already at the project design stage.

Water service delivery should be an entry point for improving performance of irrigated agriculture.

Water management at field level must be improved. Unless there is a reliable, flexible and fair irrigation service, WUAs would have little interest in performing O&M. Conversely, if government agencies continue to see WUAs merely as surrogate collection agencies and do not improve actual irrigation service delivery, the chances of WUAs achieving long term sustainability are doomed. This means improving the irrigation service provided by irrigation agencies and introducing service-oriented management should be a top priority for future interventions. The focus of agricultural support programmes should be on water management and related agricultural practices.

On support to agriculture, the review concludes that despite some recent progress there is scope for major improvements namely on the technical packages offered and the coordination between departments at the State level. In particular, there is scope for the World Bank-supported projects to assist states in developing a policy framework for AWM, with particular attention to agriculture.

Overall, farmers need solutions based on local context and this is not being implemented at present with an over-emphasis on top-down approaches and input delivery. It is possible for World Bank-supported projects to experiment more on innovative coordination and service delivery mechanisms such as creating a water unit/cell within the agricultural directorates,

if not in existence, to be responsible for implementation with a mandate for convergence. This would follow some of the experiments already underway in World Bank-supported projects. Moreover, there is an opportunity in some situations to leverage ATMA and National

Agricultural Development Programme Rashtriya Krishi Vikas Yojana (RKVY). Finally, there is need to build capacity of extension staff both in participatory and facilitation techniques as well as the contents of technological training packages offered to farmers. Regarding the latter, there is scope for improving the curriculum of farmer field schools as well as its pedagogic approach.

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Environmental Assessment

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Integrated Safeguard Data Sheet

Environmental Assessment

Baseline Survey Report and Data (2008)

Orissa Community-Based Tank Management Project (P100735)

Project Appraisal Document (2008)

Integrated Safeguard Data Sheet

Social Assessment

Environmental Assessment

Resettlement Plan

Indigenous Peoples Plan



ANNEX 1

Note on methodology

The present synthesis document was the result of a number of studies including quantitative and qualitative primary data collection. The key studies were: (i) literature review, (ii) desk review of World Bank project documents in India, (iii) survey of WUAs and their members, (iv) qualitative research of WUAs and their members, (v) a study reviewing agricultural extension activities in support of irrigation infrastructure development, and (vi) a review of State water policy and institutional issues.

The desk review, survey work and qualitative field work were contracted to the Centre for Development Finance (CDF) at the IFMR in Chennai, India. For the other studies individual specialists were contracted.

Unfortunately, due to limitations in accessing information in different States, a study on the economic impact of World Bank-supported AWM projects in India based on State, District and Block level administrative data was cancelled as part of this stocktaking. Moreover, restrictions in access to data for constructing sampling frames of WUAs at the State level for the relevant projects led to fewer States than originally envisaged being targeted for primary data collection. This includes two States (Tamil Nadu and Maharashtra) for the survey of WUAs and three States (Tamil Nadu, Maharashtra and Orissa) for the qualitative field work.

The desk review employed a simple methodology to distil relevant information and perspectives from the project documents and strategic policy papers, consisting of core data capture and comparative analysis of trends over time. The analysis focused on the nine PADs, four ICRs, and a limited set of AMs¹. Contextual reference sources included World Bank water resources strategies, India CASs from 1995-2008, India irrigation policy papers, and reviews from the IEG of the World Bank.

The sample of nine projects in five states (see Table 1 below) was purposely selected by World Bank, FAO, and other stakeholders and includes: Tamil Nadu, Orissa, Andhra Pradesh, Maharashtra and Uttar Pradesh. Table 1 below describes the project sample in chronological order, encompassing 65 years of project implementation from 1995 to 2014. Of the nine projects, four have closed and five are ongoing. Eight projects are dedicated to agricultural water management, while for one of the projects, the AP ERP, irrigation is one of several other components. The project length has decreased over time, from over nine years for the Tamil Nadu WRCP to less than six years for the two most recent community-based tank management projects in Andhra Pradesh and Orissa. As seen by the gap between the original and actual closing dates of the four completed projects, delays in implementation led to project extensions of around two years. Similarly, the ongoing UP WSRP has been extended by three years from its original closing date.

For the qualitative field work, one canal project was chosen in each state, along with two tank systems in Tamil Nadu. "Best-performing" irrigation schemes were chosen based on deliberations with State Irrigation Department officials. In order to capture distributional differences in project performance, WUAs along the head, middle and tail reaches of the canal system were chosen. The method of choosing WUAs was contingent upon whether the project was a major or medium one, which decided the structure of FOs in each State. Tank systems were chosen randomly from the list of all such systems in the district based on the sampling frame constructed with support from State

¹ See "References and project documents consulted".

officials. Field work was undertaken in a total of 20 villages across the three States during the period April-August 2010.

The qualitative field work carried out by the CDF, sought to investigate a number of dimensions of project implementation and impact and PIM, especially the functioning of WUAs from the perspective of primary stakeholders – WUA members, farmers, women farmers and the landless in order to ascertain the functioning of WUAs and improvements (if any) in the distribution of water and benefits (farm and non-farm) to water users. In each of the three States, CDF chose one canal irrigation project and in Tamil Nadu, an additional two tank projects were chosen to conduct qualitative research. With regards to canal irrigation projects, the sample projects chosen were: in Tamil Nadu, the TNWRCP, in Maharashtra the MWSIP, and in Orissa, the ORWRCP. The two tank systems were chosen from Kanchipuram district in Tamil Nadu.

Finally, the quantitative survey consisted of a questionnaire being addressed to WUA management committee members for a total of 120 WUAs in two States: Maharashtra and Tamil Nadu. While the original objective included additional States (namely Orissa) the lack of a sampling frame being available on time did not allow implementation of the survey in additional States.

Table 1:
Desk review sample

Project ID	Abbreviation	Project name	Approval date	Project effectiveness date	Original closing date	Closing date	Project length, from project approval (years)
P010476	TN WRCP	Tamil Nadu Water Resources Consolidation Project	20-Jun-95	21-Oct-95	30-Sep-02	30-Sep-04	9.25
P010529	OR WRCP	Orissa Water Resources Consolidation Project	19-Dec-95	30-Jan-96	30-Sep-02	30-Sep-04	8.75
P035158	AP III Irrigation	Andhra Pradesh III Irrigation Project	20-May-97	3-Jul-97	31-Jan-03	31-Jul-04	7.2
P049385	AP ERP	Andhra Pradesh Economic Restructuring Project	25-Jun-98	26-Feb-99	31-Mar-04	31-Mar-06	7.75
P050647	UP WSRP	Uttar Pradesh Water Sector Restructuring Project	19-Feb-02	27-Mar-02	31-Oct-07	31-Oct-11	7.7
P084790	MH WSIP	Maharashtra Water Sector Improvement Project	23-Jun-05	29-Sep-05	N/A	31-Mar-12	6.75
P090768	TN IAMWARM	Tamil Nadu Irrigated Agricultural Modernization and Water-Bodies Restoration and Management Project	23-Jan-07	9-Apr-07	N/A	31-Mar-13	6.2
P100789	AP Tanks	Andhra Pradesh Community- Based Tank Management Project	19-Apr-07	27-Jul-07	N/A	31-Dec-12	5.8
P100735	OR Tanks	Orissa Community Tank Management Project	30-Sep-08	17-Mar-09	N/A	31-Aug-14	5.9



ANNEX 2

Use of monitoring and evaluation Information and data for project management decisions

The documentation review notes that there is almost no discussion on the collection of performance information or the use, or lack thereof, of this data for adaptive management. Some project AMs repeat the very same problems time and again: all three of the available TN IAMWARM AMs continue to emphasize the need to expedite hiring of an external M&E agency to conduct the baseline survey.

Even the earliest PADs mention the role of M&E information to improve decision-making and management and maximize effectiveness; for example the TN WRCP PAD notes the purpose of M&E “to redress problem areas and exploit evolving opportunities for faster or modified implementation” (TN WRCP PAD 2006, 219).

However, the description of the responsibilities of the M&E unit aligns more with traditional M&E, which focuses on data collection on inputs, activities and immediate outputs rather than results-based M&E (combining traditional approaches with the assessment of outcomes and impacts). Accordingly, the TN WRCP PAD calls for the newly created M&E unit to:

“... (i) monitor expenditures on programmes relative to total estimated costs; (ii) conduct post-project evaluations to compare benefits with original planning estimates; and (iii) perform evaluations of organizational effectiveness and performance of units within WRO for compliance with the goals and objectives of WRO. The M&E unit would utilize the programme budgeting process for much of its data to evaluate progress of projects and programmes.” (TN IAMWARM PAD 2006, 211).

The performance indicators for M&E were limited to the formation of a State-level Project Monitoring Committee and the installation of MIS, remote sensing and communications equipment in both the WRCP projects.

Linking performance with future budgeting and planning

According to best-practice in M&E, results-based performance information should be linked to a public expenditure framework or strategy to ensure that resources go towards what works and rewards achievement of results (Kusek and Rist, 2008, 106-7). The PAD of the AP III project specifically makes such a linkage between management and performance information, via an action-oriented reporting process:

“Preparation of the ARAPB [Annual Review, Action Plan and Budget] Report would be the main vehicle for annual GOAP review of project performance and future needs, for adjusting ICADD’s programme as needed, for budgeting by GOAP of ICADD’s expenditures, for assessing progress and determining follow-on actions regarding WUA formation policies, and for major review and supervision by GOI and the Bank/IA. For ICADD it would provide annual opportunity to assess the overall project programme, to propose adjustments as needed and to present its consolidated plan and justification for financing needs of the forthcoming year” (42).

However, while the process is outlined in project design, linking performance with future budgeting and planning reporting did not happen systematically across the project sample. At most, monitoring

reports were prepared, but did not feed directly into the budgeting process. The ICR of the TN WRCP project, which had a similar provision, stated that the ARAPB was only produced once for the purpose of the World Bank's mid-term review mission, indicating its lack of use as an actual management tool.

Adaptive management and quantified targets

From the MH WSIP onwards, the results framework tables of each project contain a specific column on "Use of Outcome Information". The MH WSIP PAD notes the purpose as "adaptive management," "supervision planning," and "outlining additional needs" (MH WSIP PAD, Annex 3, 2004, 26). The results framework of the TN IAMWARM project makes the link between project outcome performances to the design of future interventions.

The PADs of the AP and OR Tanks projects go further by identifying the uses of M&E information in the first three years of the project versus the last two years. For example, the OR Tanks project has an intermediate outcome of "Tank-based producers adopt better production techniques and undertake more effective marketing," with indicators such as the percentage increase in improved breed cattle and percentage increase in final sale value obtained by farmer marketing groups in targeted commodities. Accordingly, low KPI levels in the first years more likely suggest problems with mobilization of producer groups, planning, and appropriateness of agricultural support services. Thus, project activities could be adjusted to address these issues. Yet if problems persist in years four to five of the project despite adjustments, perhaps other constraints such as exploitative input or output market linkages are overriding the impact of project interventions and should be factored into the project exit strategy (OR Tanks PAD, Annex 3 Results Framework, Annex, 2008, 29-30).

Also, from the MH WSIP (2005) onwards, the PADs included specific numerical targets for each KPI, and a timeline for when progressive changes should take place.

Although the project design had been adding attention to results on top of traditional M&E functions, before the AP and OR Tanks projects, the exact phrase of "results-based management" was not mentioned in any of the PADs. The text for the "Results Framework and Monitoring" section of each PAD is exactly the same, and as follows:

"Project monitoring, learning and evaluation (MLE) framework has been designed to facilitate (a) results-based management (through timely monitoring, analysis and feedback of relevant indicators); (b) learning for process enhancement (through a mix of participatory assessments, self-ratings and reviews, and special thematic studies); and (c) impact evaluation (through measurement of specific performance indicators, including use of appropriate baseline and controls)" (OR Tanks PAD, Annex 3, Results Framework Annex, 2008, 31).

This description fully aligns with discourse on results-based management and M&E systems in World Bank and other industry literature. However, again, the utilization of such information to adjust project interventions in response to changing conditions captured by M&E is limited.



ANNEX 3

Other impact assessment project evaluations

TN WRCP

The only mention of an impact assessment in the Bank's portion of the ICR is from "Key Performance Indicators/Log Frame Matrix", which only notes that a post-project evaluation took place in 2003. The main text does not discuss the quality of the impact assessment. On the other hand, the Borrower's Evaluation Report of the TN WRCP ICR states that an "exact" impact evaluation could not take place given the drought which affected regular M&E procedures. Instead, a rapid impact evaluation study was undertaken by Anna University and the Tamil Nadu Agricultural University. The sample size, location and methodology of this assessment are not mentioned and the text admits that some of the economic analyses are based on "reasonable" projections (TN WRCP ICR, 2005, 10).² The results claimed by this rapid survey include improved conveyance efficiency benefiting mostly tail-enders, increased yields, improved irrigation management techniques, and "immeasurable" skills development of WRO staff.

OR WRCP

The ICR states that M&E was weak and neglected until the last two years of project implementation. The only mention of impact assessment in the text is limited, preventing any comment on quality: "Following a 2001 supervision recommendation, the TC [Twinning Consultancy] gave more support to impact studies by the Agricultural Finance Corporation in 2003 and by the international consultants in 2004, both of which documented the project's socio-economic impacts" (OR WRCP ICR, 2005, 6). The findings are not mentioned.

AP III Irrigation Project

The ICR list of documents mentions two "impact" studies in the main text that were only for the Resettlement Action Plan, and a "Project Completion Report" by an agricultural university is listed as being included in supporting documents. None of these were available to the research team.

The exception to the lack of quality impact assessments is the 2008 publication of the World Bank's IEG: An Impact Evaluation of India's Second and Third Andhra Pradesh Irrigation Projects: A Case of Poverty Reduction with Low Economic Returns. This study utilized a quasi-experimental design taking advantage of the fact that some areas of the newly constructed command area had not yet been irrigated. However, the report did not have the ability to influence decision-making during implementation of the AP III Irrigation project, which concluded in 2004.

AP ERP

The ICR states that a total of 12 studies were completed, all of which had significant delays "denying the project the utility of timely findings". The ICR goes on to offer an example of "weak emphasis on evaluation" by noting that the lack of follow up on recommendations of an external evaluation regarding trainings and on-farm demonstrations. The actual recommendations are not cited.³

² In drought situations, without a water supply, WUAs do not need to conduct O&M or collect water charges and agricultural productivity naturally suffers.

³ (AP ERP ICR, 2007, 14).



ANNEX 4

State-wide comparison across themes in participatory irrigation management from qualitative research

Theme	Tamil Nadu	Maharashtra	Orissa
Framework of PIM	Existence of Irrigation Association set up by the Agricultural Engineering Department for undertaking O&M activities. These associations were then transformed into WUAs. A top-down process, with no individual involvement. Translated into lesser devolution of power and responsibility to the WUAs currently.	Creation of WDAs in the backdrop of the people's socialist movement. A catalyst, which set the tenor for greater awareness, participation and equity in the functioning of the WUA.	None mentioned.
Equity Issues			
Technical issues	Lack of gradient in the canal and leakages along the Contour Canal reduce water availability to the tail end.	None mentioned.	Lack of lining reduces water availability to the tail end.
Voting eligibility for the MC	All members of the WUA, whose lands are registered with the WUA.	All members of the WUA, whose lands are registered with the WUA.	Theoretically, all members whose lands are registered. In reality, it is the chak members and leaders. Large farmers informed by the MC. Small farmers not even aware that they are members of the Pani Panchayat, let alone that they can vote if they register their land.
Small and marginal farmers woes	MC: Large landowners, belonging to the dominant caste, who have held positions on the MC and Panchayat previously and currently. However, farmers, except in one village, did not consider this to be a problem. This alludes to the fact that they felt that the "powerful" should occupy positions of power – capable of negotiating with the irrigation department officials etc. Also, since the WUAs suffer from severe paucity of financial resources, often MC members had to pay for O&M expenses out of their own pocket. Other: Small farmers in one village that larger farmers get preferential treatment from the Irrigation department.	MC: Much more "equity" seen since, MC members drawn from OBC and with small, medium and semi-medium landholdings. Only those persons interested in working for the village took up positions in the MC.	MC: Large landowners, belonging to the dominant caste, with incomes other than agriculture, and educated up to at least Class X. Also over 50% had political affiliations. Farmers did not complain about the characteristics of the MC. However, small farmers felt that the MC members invited large farmers to GB meetings and informed them personally about elections, etc.

Theme	Tamil Nadu	Maharashtra	Orissa
Tail end farmer woes	Illegal water theft by farmers in the head-reach WUAs. Difficulty in solving problems since they have economic and political clout.	None mentioned except in the case of one WUA on the WLBC.	Illegal water diversions by middle reach WUA. Problems here related to residents of the village belonging to a higher caste.
Water distribution patterns	Head-middle-tail, less equitable system.	Tail-middle-head, more equitable system.	Head-middle-tail, more equitable system.
Women participation on MC and WUA	None. Except in the case of one village, where a woman was a MC member. However, she was represented by her husband at meetings and did not participate in WUA activities.	Present in the MC, following the Act. However, in reality, participation is insignificant. Except in the case of two WUAs, where women felt that they participated actively since they enjoyed support by their husbands.	None. Exception is the case study of one all-women Pani Panchayat. Here, women spoke about encouragement received from their husbands.
Changes post project and WUA formation			
Post project	Main: Water reaches tail end farmer faster, and water is stored in the tank for longer periods of time.	Main: Water reaches tail end farmer faster. Secondary: Increased area under irrigation. More intensive agriculture through polyhouses. Greater collection of water charges, aiding sustained O&M.	Main: Water reaches tail end farmer faster. Secondary: Increased productivity and reduced migration.
Post WUA	None really mentioned.	Farmers had freedom to grow whatever crop they desired. Also, since water schedules were followed, there was more water availability in the summer months.	Benefits of trainings and workshops.
Programmatic Synergies			
Agricultural Extension Services	Inputs and information from private shops. No trainings/workshops conducted by State line departments. Visits from field officer almost non-existent.	Inputs and information from government shops. Trainings/workshops to the MC. Visits from field officer sporadic.	Inputs and information from government run shops. Regular visits by field officers and trainings/workshops to MC and farmer members.
NREGS	In case of the canal system, farmers viewed it antagonistically, since it was available year through and created a paucity of agricultural labour. In the case of tank villages, it benefitted farmers, as it augmented income from agriculture.	Landless labourers did not utilise it, as agricultural labour work available year through and at higher wage rates.	Available. Only during the lean season, rest of the time landless worked as agricultural labour.

Table 4.14:
Changes post project and WUA formation

Parameter	Tamil Nadu	Maharashtra	Orissa
Works undertaken	Cement lining of canals, repair of breaches and leakages.	Cement lining of canals, repair of breaches and leakages.	Cement lining of canals, repair of breaches and leakages.
Changes post-project	Water reaches the tail-end farmer faster due to less leakage, quantity remaining the same.	Water reaches the tail-end farmer faster due to less leakage, quantity remaining the same.	Water reaches the tail-end farmer faster due to less leakage, quantity remaining the same.
	Greater duration of water storage in tanks, given less leakage.	Increased area under irrigation. More intensive agriculture through polyhouses. Greater collection of water charges, aiding sustained O&M.	Increased productivity, reduction in migration.
	Reduction in aquifer recharge.		
Changes post-WUA formation	Not many changes mentioned.	Farmers have the freedom to cultivate whatever crop within water entitlement.	Less conflict between head, middle, tail reaches since water distribution methodical.
	Instead of going to Irrigation department officials, grievances, complaints and requests communicated to MC members.	Water management schedule led to increase in availability of water in the summer months. Formation of Wagadh Agricultural Producer Company for warehousing and marketing needs.	Benefits from training sessions and visits to other States to witness WUA functioning, conducted by WALMI and Irrigation department.

Table 4.15:
Water distribution patterns

Parameter	Tamil Nadu	Maharashtra	Orissa
Water distribution process	No process followed. Irrigation department releases water. WUA MC and farmers not involved in the process. For tank systems, informal village level rules for water usage.	Protocol followed. WUA MC and farmers involved in the process.	Protocol followed. WUA MC and farmers involved in the process.
Water distribution pattern	Head-Middle-Tail between and within WUAs.	Tail-Middle-Head between and within WUAs.	Head-Middle-Tail between and within WUAs.
Dates of release	Twice a year: January and August. Farmers informed through GB meetings.	Twice a year: before Kharif and Rabi. Farmers informed through GB meetings.	Twice a year: before Kharif and Rabi. Farmers informed through notice in WUA office.
Water charges	Crop based. Paid to Revenue Department. No water charges collected for tank systems.	Season based. Paid to Irrigation Department. Solves problem of double accountability.	Season based. Paid to Revenue Department.

Table 4.16:
Equity in water distribution patterns

Parameter	Tamil Nadu	Maharashtra	Orissa
Technical aspects	Lack of gradient in canal prevents tail reaches from receiving water. Seepages in the main Contour Canal reduce water flow to the tail.	None mentioned with respect to equity issues.	Lack of lining of water courses reduces volume and time of water delivery to the tail reaches.
Non-cooperation/ conflict with the head-reach	Siphoning of water by head-reach. Head-reach occupied by large landowning farmers with political clout.	Siphoning of water by head-reach along the Wagadh Left Bank Canal (WLBC).	Siphoning of water by middle-reach village, whose residents belong to the dominant caste.
Solution	Issue Government Order.	Constant patrolling.	None mentioned, since fear of dominant caste groups.



ANNEX 5

Agricultural Support Services

Structure and capacity of the agricultural support services

State institutions

The agriculture extension system is structured in more or less similar fashion in the States where the research was conducted⁴. The main extension agency is the State Agriculture Department. Apart from the Agriculture Department there are several other allied departments in each State which have independent organizational structure and programmes. The contribution of these departments is crucial in agriculture development. These allied departments in general are in the subject areas of: horticulture; animal husbandry; dairy and fisheries; sericulture; agriculture engineering; soil and water conservation/watersheds; seed certification; agriculture marketing and agribusiness; agro-industries. There are no standards or directives about the number of departments that any State can establish; however, departments on the above mentioned subject areas can be found in more or less any State in India.

Generally a three tier extension system is observed:

- (i). State level Secretariat and Commissionerate/Directorate;
- (ii). District level organizations; and
- (iii). Sub-district level entities.

At the State level, the secretariat is headed by the Cabinet Minister for Agriculture, assisted by the Principal Secretary/ Secretary, who would be normally a senior civil servant.

The Principal Secretary/Secretary, is the administrative head of the secretariat on behalf of the State Government assisted by Joint Secretaries, Deputy Secretaries, Asst. Secretaries, Section Officers, and support staff. The Principal Secretary/Secretary could be one for agriculture and allied departments but there are cases, where there is a separate Secretariat for the allied departments. The funding sources for the allied departments are also from the CSS and State Sponsored Schemes (SSS).

The Agriculture Production Commissioner (APC) is the head of all departments and has role to oversee the functions of all line departments meant for the agriculture development services including main agriculture department and allied departments.

The Commissioner/Director is the departmental head and could be a senior officer from the department itself with technical background (viz. UP) or could be a civil servant from the Indian Administrative Service. Like agriculture, there are separate and independent Directorate/Commissionerate for allied departments such as Horticulture, Animal Husbandry, Fisheries, etc. with independent programme and reporting mechanism.

At the district level, the agriculture and allied departments have programme implementation staff headed by the officers of the rank of Joint Director or Deputy Director assisted by technical and support staff.

At the sub-district (*Block/Mandals*) level, which is the level for direct interfacing with the farmers for programme implementation, the departments are staffed by field level extension officers. For some departments there are extension staff up to the level of cluster of villages. However, this may not be

⁴ This section relies heavily on research done at the level of three States: Tamil Nadu, Andhra Pradesh, and Uttar Pradesh.

the case with all departments. The staffing pattern below the district level depends on the intensity of work by the respective departments.

Independent institutions, State-sponsored autonomous bodies and private sector

Beyond the normal departmental structure, each State has created special institutions under the Corporations, Cooperatives and Societies Act, or through Government orders to implement projects or programmes which in view of the Government require a focussed approach. Although not explicitly stated, these institutions are created around a theme⁵ which can be conducted on a commercial basis. Such institutions have their own mandate and separate management systems. Normally these institutions are headed by a Managing Director, who is a middle-level civil servant reporting directly to the Principal Secretary of the parent department.

Apart from the State-sponsored institutions, there are also several other organizations providing extension services, such as Commodity Boards (spices, rubber, tea, coconut, coffee etc.), non-governmental organizations, media firms involved with broadcasting of good agriculture practices etc. These institutions have their own programmes and separate management systems.

The private sector is increasing its exposure in the extension and support services, particularly as they discover that the financial benefits from providing services to farmers for improved quality and production of specific commodities are significant. Generally, the private sector takes on a commodity approach and has the flexibility to target locations favourable to the crop, usually tie up input supply and provide credit and some kind of assurance on price. Moreover, in some cases, they target multiple commodities: this is the case of Reuters Market Light, which uses ITC technology to provide packages of information through subscription based on demands by farmers⁶.

Agriculture research organizations

Agricultural research is the mandate of the SAUs which are supposed to carry out State-specific relevant research on all aspects of agriculture including allied sectors and disseminate the research results through the departments. For on-farm testing of technologies and for dissemination the SAUs are equipped at the District level with front-line extension centres known as Krishi Vigyan Kendras (KVKs) or Agriculture Science Centres where they provide training for line department staff and for farmers. The resources for research in SAUs come mainly from the Indian Council of Agriculture Research (ICAR), partly from the respective State governments' funds, and can be supplemented with other external⁷ or SAUs' own sources. So, there is responsibility on the part of the SAUs to provide research support to the state governments on a regular basis. However, the departments are free to access research also from other national and international research institutes in the public or private domain.

Funding sources and mechanisms

There are three key sources through which the agriculture and allied departments are funded, namely: CSS/SSS; loans and grants from financial institutions such as NABARD (National Bank for Agriculture and Rural development); and loans and grants from bi-lateral and multi-laterally aided projects.

⁵ For instance, the seed production activity, which is a commercial activity, is managed through the State Seed Development Corporations. Similarly, the fertilisers' distribution is managed through the Apex Cooperative Marketing Federation (MARKFED). In Tamil Nadu, the Tamil Nadu Horticulture Development Agency (TANHODA) was created as a Society in 2004 under Societies Act to channel the central assistance to promote horticulture in the State in a larger scale. In UP an earlier World Bank funded project, now closed, called UP Diversified Agriculture Project (UPDASP) continues to function with State support as a special institution.

⁶ Good examples of this are Daawat foods and Basmati rice and ITC and durum wheat production. One initiative that the private sector is promoting is "e-Choupals", community (farmer) computer with internet access that provides up to date market information, weather, and agronomic advice. Another recent private sector initiative combining market, weather and agronomic information is Reuters Market Light.

⁷ For example, in Tamil Nadu the SAU is receiving funding through the IAMWARM project for the component of agriculture research and dissemination. The funding structure of SAUs received negative comments from the Planning Commission (ibid, p.,13): "This situation, where States still provide salary and establishment costs but SAUs look to ICAR for other funds, not only affects their education function adversely but it also distances SAUs from State Agricultural Departments and reduces relevance of their research for local problems".

There are a large number of CSS, many for which have overlapping interventions and for which any farmer may be eligible for more than one. Autonomous agencies set-up by State Governments can receive funding through central schemes. In many CSS the State Governments are required to make co-financing in the order of 10-15 percent of the total scheme cost.

Apart from this contribution by the States to the CSS, many States have their exclusive SSS fully funded by them. States do also provide some budget towards support activities, which varies greatly from State to State, depending on the revenue of the State, and the level of importance placed on agriculture. In general, the departments are attempting to shift towards a more service-orientated approach, based on farmers' needs; however this is very much in its infancy, with programmes such as ATMA and Rashtriya Krishi Vikas Yojana⁸ which are providing funding for district level agricultural initiatives in attempt to decentralize and move toward a bottom-up approach.

The externally aided projects contribute a small portion to the State's overall budget for programme and human resources, although there can be exceptions⁹.

Staff composition and skills mix

The line departments have varying levels of staff at the State, district, block and cluster levels. Representation at the village level is rare, with the possible exception of the major departments. The adequacy of staff to reach out to a large community of farmers is a serious issue, even in the cases where the extension system is established up to the block or cluster of village level. Normally, one extension staff is allotted 10-15 villages which could cover about 2 500-3 000 farming households. Such large areas to cover for one person is very challenging as witnessed by field staff. Moreover there are a significant number of unfilled front-line staff vacancies¹⁰. The Gol Planning Commission (Gol, 2008a p.7) notes that: "[...] although the Plan share in States' total expenditure on agricultural and allied sectors has improved considerably from a low just after Fifth Pay Commission, much of it represents increase in Plan subsidies at the cost of essential staff, particularly in the extension system and the co-operative sector. With hindsight, it appears that the policy of restraining new hiring may have been excessive, as is evident from the age composition and high vacancies among extension staff and reduced reach of co-operatives."

Formal technical education on agriculture is a prerequisite to be employed in the agriculture department. In general, the departments are filling vacant posts with staff with higher education levels usually with a minimum of BSc in Agriculture or related discipline. However no systematic staff training programme was observed in the three States studied. Discussions with State government officials revealed that staff rarely receives training and exposure to the new technologies and no budget is systematically – if ever - allocated for these activities. What is clear is that the States generally lack a proper human resources development plan and the resources for this crucial component. On the contrary, World Bank-supported projects allocate significant resources to staff training, and training opportunities were quoted as a major incentive by many government staff to join the projects.

⁸ More details on these programmes are available at: <http://agricoop.nic.in/Rkvy/Rkvyfinal-1.pdf> for RKVY, and <http://www.manage.gov.in/NATP/atma.htm> for ATMA.

⁹ For example, in the case of Tamil Nadu, the IAMWARM project supported by of the World Bank, is contributing a major share of the State's agriculture budget. During 2007-08, 2008-09 and 2009-10, the IAMWARM's share in the State's expenditure on agriculture was 52 percent, 49 percent and 53 percent, respectively, as per the data provided by the Department of Agriculture of Tamil Nadu. In the cases of Andhra Pradesh and Uttar Pradesh, it is the CSS that contribute the lion's share of the State's agriculture budget.

¹⁰ In UP out of sanctioned positions of 8 000 Kishan Sahayak (Agriculture Extension Agent at the village level), approximately 4 000 are in place. Also there are only 50 percent availability of staff against sanctioned positions for Class – I and Class –II officers. Situation is definitely better in Andhra Pradesh where 82 percent staff is available against all sanctioned positions.

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