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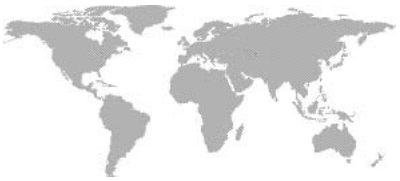

INDIA: World Bank Assistance for Water Resources Management

A Country Assistance Evaluation

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OPERATIONS EVALUATION DEPARTMENT

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Currency Equivalents

Currency Unit	=	Indian Rupees (Rs)
Rs. 43.44	=	US$1.00 (February 18, 2000)

Weights and Measures (Metric System)

1 meter (m)	=	3.28 feet (ft)
1 kilometer (km)	=	0.62 miles (mi)
1 hectare (ha)	=	2.47 acres (ac)
1 million cubic meters (m^3)	=	804 acre-feet (ac-ft)
1 cubic meter per second (m^3/s)	=	35.28 cubic feet per second (cusec)
1 kilogram (kg)	=	2.2 pounds (lb)
1 metric ton (mt)	=	2,205 pounds (lb)
1 thousand million cubic feet (TMC)	=	28.3 million cubic meters (Mm^3)

Fiscal Year of Borrower

April 1 – March 31

Abbreviations and Acronyms

ADB	Asian Development Bank
AP	Andhra Pradesh
APPI	Aggregate project performance indicator
APPR	Annual Project Performance Review
ASTAG	Asia Technical – Agriculture
BCM	Billion cubic meters
CA	Constitutional amendment
CAD	Command Area Development
CADA	National Command Area Development Authority
CAR	Country Assistance Review
CAS	Country Assistance Strategy
CEM	Country Economic Memorandum
CTU	Central training unit
CWC	Central Water Commission
DAC	Development Assistance Community
DANIDA	Danish Aid
DFID	Department for International Development (formerly ODA of the UK
ERR	Economic rate of return
ESW	Economic and sector work
FAO	Food and Agricultural Organization
GOI	Government of India
GDP	Gross domestic product
HYV	High-yielding variety
IFPRI	International Food Policy Research Institute
MoWR	Ministry of Water Resources
M&E	Monitoring and evaluation
NABARD	National Bank for Agriculture & Rural Development
NEP	New Economic Policy
NGO	Nongovernmental organization
NWMP	National Water Management Plan
O&M	Operation and maintenance
OED	Operations Evaluation Department
OP	Operational Policy
QAG	Quality Assurance Group
R&D	Research and development
RWSS	Rural water supply and sanitation
SAS	Sector Assistance Strategy
SEB	State Electricity Board
UK	United Kingdom
UP	Uttar Pradesh
USAID	United States Agency for International Development
UWSS	Urban water supply and sanitation
WUA	Water users association
WRI	Water resources and irrigation
WRM	Water resources management
WSS	Water supply and sanitation

Table of Contents

Figures

Boxes

Annexes

Preface

This report is written to serve two purposes. It provides an evaluation of the effectiveness and relevance the World Bank's lending and non-lending activities to India as an input into the Operations Evaluation Department's (OED's) India Country Assistance Evaluation of April 23, 2001. It also provides a case study of how the World Bank's 1993 Water Resources Management Policy and Strategy has been utilized and applied among the Bank's borrowers, and this case study is part of OED's global evaluation of the Bank's experience in implementing the water policy.

The study was initiated in May 1999 when Keith Pitman (Task Manager) and Inderjeet Singh (Consultant) visited India to meet with Government of India (GOI) and state government officials, bilateral development partners, members of civil society, nongovernmental organizations and other stakeholders. It built upon several earlier OED performance audit missions and evaluations of water sector projects over the past five years and intensive desk review of the Bank's investments and economic and sector work. Following field visits to Uttar Pradesh, Maharashtra, Tamil Nadu and Andhra Pradesh, the study team reviewed preliminary findings with Indian stakeholders at a half-day workshop held in the Bank's New Delhi Country Office. After internal Bank review during the spring of 2000, the draft report was widely circulated within India among stakeholders as a key background paper to a national consultation organized by the Bank's Global Water Unit on the *Role of the World Bank in India's Water Development* (May 11-12, 2000).* Subsequently, key stakeholders from that consultation met with the Bank's Regional Operational Staff and OED to discuss this paper on May 12. It is expected that the outcome of these national consultations will be taken into account by the World Bank and provide direction for the water-related components of the evolving year 2000 India Country Assistance Strategy.

This report has been reviewed by the Government of India and their comments are given in Annex F.

The authors of this paper acknowledge the extensive research support provided by Monica Scatasta, Greg Browder, Samir Stewart, Reno Dawina and Kavita Mathur, and the administrative support of Pilar Barquero and Marcia Bailey. William Hurlbut provided invaluable editorial guidance and review. Any omissions and errors remain the responsibility of the authors.

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* The details of the presentations made by participants at this New Delhi Roundtable may be directly accessed through the World Bank's web site: http://www.worldbank.org/environment/topics.htm. Once into the site, click on **Water Resources Management**, on the next screen click on the block labeled **Water Resources Management**, from the list that follows select and click on **Water Resources Sector Strategy**, and then select and click on **South Asia**.

Executive Summary

1. India has made little progress to reform its water sector institutions even though there has been active debate on water policy and sustained Bank support to its water sector. India's 1987 National Water Policy preceded the Bank's by six years and central government has long been concerned about maintaining water infrastructure. Yet only recently has this become an important issue at state level, driven by the 1991 constitutional and fiscal reforms, pressure from the center and a few reformist state politicians. With assistance from the Bank, some states have issued their own water policies – most notably Tamil Nadu (1994), Orissa (1995) and Rajasthan (1999). Andhra Pradesh issued an Irrigation Sector Policy (1998) that stresses participatory management with less emphasis on water resources management. Transforming policy into action has, however, been uneven.

2. Following the 1991 Irrigation Sector Review and the Bank's 1993 Water Resources Management Policy, the Bank switched from project to sector loans that would finance agreed statewide programs through water resources consolidation projects, thus enhancing the state as the focus of decentralization in national policy. The Narmada controversy and the Independent Review (Morse Commission) also focused intense international scrutiny on the Bank's water-related work and helped shape Bank strategy in the 1990s. Unlike earlier project-by-project investments, these new projects covered water resources management, addressed current and future intersectoral needs and provided support for institutional development and reform in line with the Bank's new water policy. Although the Bank's policy advice is highly regarded and India is the Bank's second largest borrower for water investment, nationally the operational impact has been modest. Bank lending historically accounts for less than a tenth of India's water investment, and even that amount was widely dispersed among many states thus lowering its impact for reform.

3. Fortunately, the move by the Bank in 1996 to focus large integrated investment packages on the few states willing to undertake public expenditure reform has given the Bank much greater leverage than it had before. So far, only three of 17 states have qualified: Andhra Pradesh is on board and Uttar Pradesh and Karnataka are in the pipeline; dialogue continues with Rajasthan and Orissa. The comprehensive packaging also ensures that Bank dialog in each sector/subsector addresses institutional and financial reform issues consistently – a major problem in the past.

4. Translating action into results, however, has remained difficult. While performance of completed Bank water projects has been unsatisfactory because of over-optimistic appraisal and state's unwillingness to tackle institutional and financial reform, there are signs of improvement. India's comparative performance for water projects designed in the late 1980s and early 1990s and recently completed is below that of similar Bank investments in China, other South Asia countries and globally. However, the quality of the Bank's portfolio has improved substantially following more stringent management since 1996 and the proportion of satisfactory completions increased markedly in 2000. Many ongoing Bank projects are also doing better – three projects have received excellence awards for supervision by the Bank's Quality Assurance Group – but it is too soon to make a definitive judgment on eventual outcomes.

5. Much still remains to be done on developing sustainable mechanisms for water allocation and management. Severe water shortages, pollution and flooding affect many major cities with the poor being most adversely affected. Much more attention needs to be given to management of groundwater which supplies the majority of rural water supplies. While more than half of the Bank's post-policy water resources operations addressed water resources management issues from a national perspective, only a third addressed them at river basin or state level. In part this is

because continued fragmentation of responsibility for planning and management at national and state level across sectors and organizations frustrate sound resource management and provide few incentives for cooperation.

6. Protracted inter-state water disputes have thwarted rational water planning and investment. The tribunal process to adjudicate water disputes has encouraged a race among some states to build dams to establish prior appropriation and often involves involuntary displacement of tens of thousands of people. Unfortunately, government is not receptive to the idea that allocation of interstate rivers should be brought within the purview of the central government rather than the state governments. This lack of agreement about water development priorities has curtailed Bank investment on interstate rivers, and a more holistic treatment of all water management and resource issues at the river basin level remains elusive.

7. There has been headway on reform of water institutions in the few reformist states where there is political will to change after decades of malaise – but in some the reforms appear to be cosmetic. While the focus is stronger on fiscal reform than on the underlying organizational and institutional issues that create perverse incentives in the water sector, subsidies, especially for rural electricity, encourage inefficient water use. Implementing water tariffs to cover supply costs remains as a challenge. Operation and maintenance suffer as a result, further reducing revenues. For fiscal reform to succeed, sooner or later state governments must address subsidy issues and right-size public sector agencies to increase efficiency.

8. Key issues that must be addressed are persuading state governments to limit their role to water policy rather than management – excellent examples of what is possible is the unbundling of several state electricity boards. The primary objective is efficiency. While privatization is normally evoked as a cure, this is neither essential nor necessary if government and states can change their incentive structures to induce and sustain reform. Investment and operation and management activities should be separated. Bulk water delivery, maintenance and financial management should be assigned to autonomous and financially self-sufficient units that are accountable for performance to regulators and users. There must also be greater attention to good governance and decentralization that allows the private sector, including users' groups, to take a greater stake in water planning, investment and management.

9. The comprehensive water resources sector review of 1998, a collaborative effort of government, the Bank and several development partners covered, for the first time, all subsectors. Unlike the 1991 irrigation review, it focused only on India's performance, not the Bank's. The review found that little had changed since 1991: *"in recent years there has been realization and policy pronouncements regarding the need to address these problems; however the policies have not been translated into action."* In response, it proposed a comprehensive water reform strategy.

10. This strategy was developed following in-depth consultation with key central agencies and a number of states. Many of the recommendations, for example, reducing the size of public sector agencies and decentralizing to beneficiaries, affect both Bank projects and nationwide practices in the water sector. Other recommendations, such as establishing private water markets, are the subject of intense debate in India. Indeed, Indian participants at the May 2000 water roundtable in Delhi stated that the Bank was too doctrinaire on privatization and that its water investments were insufficiently pro-poor. These issues require more debate at state level to create a broader consensus and ownership in India and factor-in the Bank's global experience.

11. The water sector reform strategy lays out a very ambitious and detailed agenda that covers most of the principles of the Bank's 1993 water resources management policy. It contains more

than 80 national and intersectoral recommendations aimed at the central and state governments, and more than 170 for the main subsectors. Notably lacking, however, is clarity about the role of the Bank in these reforms.

12. The scope of this strategy suggests that the Bank has learned little from the 1991 Irrigation Sector Review that contained 52 recommended actions, which largely failed – most of the recommendations have yet to be acted upon – because incentives and ownership were lacking. The Bank needs to be more candid about the performance of its own projects informed by more pragmatic monitoring and evaluation and inclusive of local stakeholders' experience. This would encourage development of Indian (rather than Bank-imposed) solutions that fully factor-in their suitability to Indian conditions and indicate where reform is likely to succeed. And this would enable the Bank to tailor its assistance to what is practicable and feasible for both the Bank and India in the short to medium term.

13. Since political economy is at the root of many problems in the sector, the Bank should pay more attention to issues of political will and commitment, and include political and civic leaders in the Bank's dialogue on water reform. Inviting them to see successful water projects and reforms in other countries could prove effective, as it did for Turkey. The Bank also needs to work better with other development, research and donor agencies in India, not only keeping them informed but also opening itself to learning from their hard-won experience.

14. Under the 1998 reform agenda, institutions and practices that have remained unchanged for decades are to be tackled and changed quickly – an approach to institutional reforms that flies in the face of institutional realities and the political will such as they exist in India today. The future of water sector reform in India depends critically on GOI enforcement of its national water policies. Without such enforcement – that may mean withdrawing support from states unwilling to reform – there will be little progress towards modernizing India's failing water institutions.

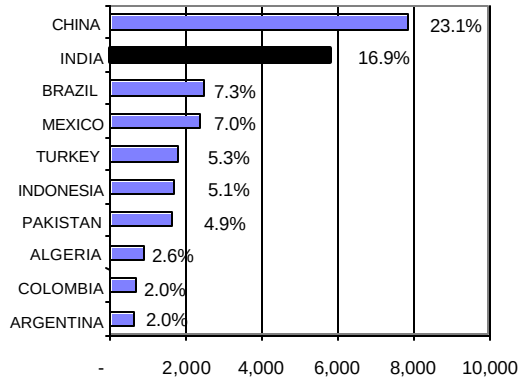
15. Time is also needed for ownership of new water sector institutions to grow to maturity – Europe's water institutions, for example, are still evolving 30 years after the first privatizations of the 1960s, indicating that not everything can be done at once. A more selective and incremental approach to key policy and institutional reforms might be more productive. This is particularly important as the Bank has limited capacity to help India implement the ambitious 1998 reform program and it must avoid spreading its resources too thinly to be effective.

1. Background to the India Water Sector Evaluation

Introduction

1. Each year in developing countries approximately $70–80 billion is invested for water development. Multilateral and bilateral agencies supply about $9 billion, of which the World Bank provides almost 20% or $2 billion, equivalent to about 3% of global funding for water. The Bank's portfolio of water projects accounts for 14% of its total lending. Between 1985 and 1998 the Bank invested more than $33 billion in water and water-related projects covering more than 700 operations. Although the water portfolio covered 57 countries, three-quarters of the Bank investment was concentrated in only 10 countries and more than half in only four (Figure 1). The Bank plans to update its water strategy in late 2000 based on a thorough evaluation of sector experience. Accordingly, OED is evaluating the Bank's experience with implementation of its Operational Policy 4.07 "Water Resources Management" elaborated in the strategy described in the 1993 document *Water Resources Management, A World Bank Policy Paper*.[1] A key component of the evaluation is determining the relevance and efficacy of the Bank's water operations, and economic and sector work to its three largest borrowers, China, India and Brazil. In that context, this review evaluates the evolution of the Bank's water policy and strategy in India spanning the period 1987–99.

Figure 1: Bank Lending for Water is Heavily Focused on a Few Countries



Total Lending 1985-98, $ millions and % total

Background

2. The 1993 Water Resources Management Policy was the Bank's response to an increasingly problematic water portfolio. Until the late-1980s, the Bank treated the various water subsectors (water supply, irrigation, hydropower, drainage, flood control) separately. It recognized intersectoral impact, but did not seek to systematically optimize water allocations. The damage to aquatic ecosystems inherent in some projects was treated, if at all, by limited add-on corrective actions and rarely by substantive adjustments to project design. Irrigation and water supply and sanitation projects tried, with varying success, to implement pricing schedules and cost-recovery agreements to help with recurrent costs and achieve more efficient water management within projects. It became increasingly clear that the Bank needed to move from the project-by-project approach to a more comprehensive and strategic development framework.

3. A new "holistic" paradigm emerged globally in the late 1980s and early 1990s. Within the Bank, planning for multisector water allocations constrained by environmental directives advanced rapidly. The forerunners of reform were in the South Asia region where proponents were concerned with efficiency and optimization *per se*, the Middle East and North Africa region where water scarcity was causing problems, and in some Latin American countries where

1. In today's Bank terminology, documents of this sort are called strategies rather than policies. This document uses the current terminology.

sweeping policy reform paved the way for rethinking the institutional and legal setting for water resources management. Work on a World Bank water resources strategy began in 1991, bringing all the regions together with central Bank policy units and other concerned sector staff, including environmentalists. Shortly thereafter, in 1992, an international conference in Dublin on Water and the Environment established a consensus on the principles governing water development. In mid-1993, guided by the Dublin principles, the Bank consolidated proposed reforms for the water sector into the comprehensive strategy guideline paper—*Water Resources Management, A World Bank Policy Paper*—and this was the basis for the Bank's Operational Policy 4.07 (Box 1).

4. The principal target for the OP is Bank staff who implement it through economic and sector work, lending for specific projects and programs, and by dissemination of its principles among the Bank's clients. The OP meets the Bank's overarching objective of reducing poverty by giving priority to the water requirements of poor communities. It recognizes that, to improve the performance of the water sector, it is first necessary to help borrowing countries reform their water management institutions, policies and planning systems. Thus, reform is identified as the principal outcome of Bank and other interventions.

5. The OP is implemented primarily by assisting governments in their formulation of priority policy, planning, and institutional reforms—and investments—that are consistent with the Bank's country assistance strategy that should guide the Bank's sector lending programs. Individual lending operations should be linked to and promote the priorities for reform and investment. The Bank's strategy also places a high priority on support for upgrading the skills of country policy analysts, planners, managers, and technicians.

Box 1: The Bank's 1993 Operational Policy 4.07 – Water Resources Management

The Bank assists borrowers in the following priority areas:

- Developing a comprehensive framework for designing water resource investments, policies, and institutions. Within this framework, when the borrower develops and allocates water resources, it considers cross-sectoral impacts in a regional setting (e.g., a river basin).
- Adopting pricing and incentive policies that achieve cost recovery, water conservation, and better allocation of water resources.
- Decentralizing water service delivery, involving users in planning and managing water projects, and encouraging stakeholders to contribute to policy formulation. The Bank recognizes that a variety of organizations—private firms, financially autonomous entities, and community organizations—may contribute to decentralizing water delivery functions. Thus it supports projects that introduce different forms of decentralized management, focusing on the division of responsibilities among the public and private entities involved.
- Restoring and preserving aquatic ecosystems and guarding against overexploitation of groundwater resources, giving priority to the provision of adequate water and sanitation services for the poor.
- Avoiding the waterlogging and salinity problems associated with irrigation investments by (i) monitoring water tables and implementing drainage networks where necessary, and (ii) adopting best management practices to control water pollution.
- Establishing strong legal and regulatory frameworks to ensure that social concerns are met, environmental resources are protected, and monopoly pricing is prevented. The Bank requires legislation or other appropriate arrangements to establish effective coordination and allocation procedures for interstate water resources.

6. Bank actions are only one of several forces driving water management reforms. A host of country and region-specific variables influence reforms in borrowing countries, which differ in their water requirements and endowments, economic and political conditions, institutional capacities, and environmental problems. Other development institutions, including multilateral and bilateral development agencies, nongovernmental organizations, and the private sector, also influence the pace and direction of reform. Promoting collaboration with these international actors is an important element of the OP. Thus, the design of relevant reforms, and the time frame for their implementation, crucially depends on the internal dynamics and water situation of the country, and on the quality of partnerships involved in water sector operations.

7. This paper, therefore, sets out to determine:

- Whether the Bank implemented its strategy in India
- How it implemented the strategy
- Whether that implementation was relevant to the country context and the Bank's assistance strategy
- The degree to which the implementation was effective in meeting the country's needs and policy goals, and
- Whether the policy remains relevant.

Evaluation Context in India

8. The Bank's water sector portfolio in India has been large: 60 operations were active between 1988 and 1999 of which two-thirds (40) have been completed (see Annex A).[2] Sixty percent (36) of these were approved prior to 1988, 20 were completed before the Bank's 1993 water policy became effective, and 16 were completed later. Of the 24 operations approved after 1988, four have been completed and only 13 operations post-date the 1993 water policy. Thus, in the six years before and after the water policy an almost equal number of projects were approved.

9. A global review of the Bank's water strategy implementation has been conducted by the Bank's Global Water Unit. Their findings also inform this country evaluation and enable cross-country comparisons. Cooperation has included sharing a database of project characteristics and reviewing experience in four focus countries. In-depth review and discussions between Bank staff and country/regional stakeholders have taken place in Brazil, Yemen, India and the Philippines. A small workshop on water policy reforms and the Bank's role in India took place in New Delhi, May 1999, and, following circulation of this evaluation paper in India, a larger roundtable conference is provisionally planned for May 2000.

10. Finally, it must be understood that there are some limitations to this evaluation. While it is possible to discern shifts in water policy and new initiatives, most of the Bank-financed projects designed to implement new or improved water policies were initiated after 1993 and are not yet complete. Consequently, it is too soon to assess the impact of any changes brought about by the Bank' strategic interventions.

2. The oldest project in the active portfolio was approved in 1979.

2. Water Development in India

11. The proper and efficient use of water resources is emerging as one of the most critical issues facing India. The growth of population from the current 945 million to 1.4 billion by 2025 will make huge claims on India's natural resources, not least water. The situation of plentiful water resources in the past is rapidly becoming one of water scarcity.[3] Six of India's 20 major river basins are classified as water scarce.[4, 5]

Water is Under Stress

12. Agriculture, which provides over 65% of India's employment and 35% of its GDP is highly dependent on irrigation systems and accounts for over 80% of consumptive water use. However, there has been a rapid shift towards non-irrigation demands, which are projected to increase their share in water consumption from 8% to 25% by 2025. The growing conflict between alternative water uses is a serious and growing problem. The availability of both surface and groundwater is further reduced by pollution and inappropriate waste disposal. Environment and health problems are also emerging as central to social welfare and sustainability.

13. Groundwater now accounts for more than half of irrigated area, and more than 17 million tubewells, mostly in the private sector, are now in operation. Often this is a response to the unsatisfactory performance of large public-sector surface water projects because ownership of tubewells allows full control at the farm-level; in the drier northwest, groundwater provides supplemental water within *waribundi* command areas. Groundwater has been central to the spread of the Green Revolution throughout India and hence to continued growth in agricultural output. But groundwater also supplies 80% of water for domestic use in rural and 50% in urban areas, and the adverse effects of unregulated competition are becoming apparent, causing severely depleted aquifers. Overdraft has been increasing at 5.5% annually over the past 15 years, and at this rate, over 35% of all agricultural blocks in the country will become "over-exploited" within 20 years without regulation.

Institutional and Organizational Problems

14. Past approaches in India have been to develop water resources rather than to manage them efficiently. State ownership of water has induced a race to secure the water available in shared river basins. This has precluded comprehensive and optimal water development and management and has led to acrimonious water disputes that take decades to settle with huge foregone benefits. There has been a lack of political will to tackle the hard financial, administrative, institutional, political and cultural constraints needed to effect better management of demand. Accountability is missing. The approaches have also been top-down, bureaucratic and fragmentary, rather than participatory, client-oriented and integrated. Most users and beneficiaries have been excluded from decision-making and have no incentive to participate and improve

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3. India is not a water scarce country when compared to many others – Turkey, Korea, South Africa, Morocco, Egypt, Israel and Jordan – but they have managed to harness their scarce water resources more effectively to satisfy the needs of agriculture, industry, drinking and sanitation water for both urban and rural people.

4. An internationally accepted measure of water scarcity is having less than 1,000 cubic meters of water available per year per capita.

5. This and subsequent chapters draw upon earlier Bank reviews of the irrigation sector and water resources: *Irrigation Sector Review – A Review of Past Bank Strategy in the Irrigation Sector,* ASTAG, June 1990; *India Water Resources Management Sector Review – Initiating and Sustaining Water Sector Reforms*. Report No. 18356-IN with five supporting volumes, 1999.

service delivery. There are negligible incentives for government agencies to deliver adequate or quality services. This sets up a vicious cycle of poor service, reluctance to pay, and insufficient income for operation and maintenance (O&M) that further reduces efficient service.

15. The shortcomings of the present approach are becoming more evident. The proportion of national and state budgets absorbed in the water sector are large but they are not achieving their objectives efficiently. And as public sector investment in irrigation infrastructure induces complementary private sector investment, the decline in state investment in irrigation, particularly for O&M, is causing GOI serious concern about future agricultural growth.[6]

16. In the long run, the gap between growing demand and inelastic supplies must be closed by increasing managerial efficiency, rather than developing new supplies. This will require radical changes in institutions governing water supply, development, distribution and use. The following chapters review the evolution of Indian and Bank water policy in India, and evaluate the relevance, efficacy and efficiency of Bank's assistance for water policy and development over the period 1988–99.

Too Many Actors

17. An unresolved issue, cutting across all water subsectors, is the number of independent institutions dealing with water at the center and state levels. While the Ministry of Water Resources through the Central Water Commission is the apex federal water planning advisory body, seven other federal-level organizations perform different functions, mostly independently.[7] These are supplemented by 10 *ad hoc* boards and commissions with responsibilities for the execution of specific engineering objectives within river basins. Only two of these latter organizations – the Damodar Valley Corporation and the Bakra-Beas Management Board – have responsibility for river basin water planning and management. The Sone River Commission was wound up in 1988 after completion of a comprehensive plan for the multipurpose development of the basin.

18. There have been attempts by various agencies at the center and state levels responsible for water to take a multisectoral view, but most of these have been frustrated by the institutional gap caused by a lacuna of appropriate institutions and procedures. There is a lack of intersectoral coordination on water at the national level and integrated water planning to identify and optimize water and complementary investment is lacking. Several crosscutting issues such as allocation between irrigation and water supplies, pollution of drinking water resources and groundwater over abstraction require better coordination among the apex ministries.

19. The situation is generally worse within the states as each subsector follows its own interests, frequently to the exclusion of the common good. Even then, responsibilities for water may be fragmented across several agencies, most notably for major and minor irrigation, groundwater, water quality and pollution control, environment, health and watershed management. Staff structures are dominated by supply-side engineers with limited presence of

6. Dhawan, B.D. Relationships between Public and Private Investments in Indian Agriculture with Special Reference to Public Canals. Indian Journal of Agricultural Economics 209-219.

7. In addition to CWC, these are the National Water Development Authority responsible for water development studies of the Deccan river basins, the Central Board of Irrigation and Power, the Central Electricity Authority, the central Groundwater Board.

other disciplines that would be more able to deal with demand-led management, and environmental and social issues.[8, 9]

3. Evolution of Water Policy in India

20. India's national water policy led the Bank's water policy by several years, but it has been adopted only slowly, and in varying degrees, by a few states. It is only since the mid-1990s, following GOI's 1991 constitutional and fiscal reforms, that the problems of investing in and maintaining water infrastructure have become central issues of state public sector reform. While there were notable advances in water policy in the late 1990s, they were limited to a handful of states with very uneven implementation performance.

Policy Evolution

21. Traditionally, water policy in India has evolved through a series of national commissions that examined irrigation and irrigation water pricing. The Second Irrigation Commission (1972) made important recommendations that the annual cost of irrigation should be paid by beneficiaries and not the general taxpayer. In addition, it raised the issue that a more comprehensive approach was essential for sustainable water development. In recognition of this, the former Department of Irrigation was renamed the Ministry of Water Resources in 1985 and the National Water Resources Council was established under the Chairmanship of the Prime Minister. Subsequently, extensive discussion at the national level led to the adoption of a National Water Policy in 1987.

22. The policy recognizes that water is a scarce and precious resource and aims at planning, developing and conserving it on an integrated and environmentally sound basis recognizing the needs of the state governments. The policy promotes integrated river basin planning, conjunctive use of surface and ground water, participation of beneficiaries in water management and collection of water rates. It promotes environmentally sustainable development with an emphasis on mitigation. The policy specifies water allocation priorities in the order: drinking water, irrigation, hydropower, navigation and industrial and other uses. It promotes water rates that "*convey the scarcity value of the resource to the users and to foster the motivation for economy in water-use*." It advocates covering annual O&M costs and part of the capital but states that "*efforts should be made to reach this ideal over a period...but rationalized with due regard to the interests of the small and marginal farmers*."

23. In 1990, GOI established a National Water Board to coordinate state and center discussions on water policy and to effect a gradual shift towards river basin planning. Following the center's lead, and with Bank assistance, some states have issued their own water policies within the overall framework of the National Water Policy – most notably Tamil Nadu (1994), Orissa (1995) and Rajasthan and Uttar Pradesh (1999). Andhra Pradesh issued an Irrigation Sector Policy (1998) that contains some discussion of water resources management. There are many older water-related policies and regulations in effect such as those dealing with pollution abatement, national conservation, and environment and development. Regrettably, few of these policies have been translated into action.

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8. Santhakumar et al., Planning Kerala's Irrigation Projects – Technological Prejudice and Politics of Hope. Economic and Political Weekly. March 25, 1995.

9. Chadha, Ashish. Subrenarekha Project – Singbhum's Sorrow. Economic and Political Weekly, October 9, 1993.

24. In parallel with discussions on the national water policy, GOI set up a High Level Technical Committee on Hydrology to diagnose the problems of India's water resource monitoring and prediction systems. Its report in 1985 recommended a wide range of policy, technical and institutional changes to meet the needs of integrated water management. Shortly thereafter, the GOI and the Bank undertook a more detailed look at the three states in the Hydrology Sector Review (1987). And at the same time, the CWC established a permanent central training unit (CTU) for Integrated River Basin Planning and Management at Pune assisted by USAID. Subsequently, following a major irrigation sector review by GOI and the Bank in 1991, GOI implemented a National Dam Safety Project (1992) that focused on improving CWC's and four pilot states' dam safety capability with a lesser emphasis the regulatory environment (Madhya Pradesh, Rajasthan, Orissa and Tamil Nadu), and a National Hydrology Upgrading Project (1995) that focused on the seven Deccan states as well as supporting the CTU. A substantial program to clean up the heavily polluted River Ganges, assisted by the Netherlands, was started in 1988.

25. Currently, the National Water Resources Council is promoting a number of initiatives to enable implementation of the national water policy. Key are preparation of a Water Information Bill; a policy note on setting up a river basin organization; an irrigation management policy including organizational and procedural changes in the irrigation sector; national policy guidelines for water allocation for interstate rivers amongst states; guidelines for planning conjunctive use of surface and ground water in irrigation projects; and overall policy guidelines for water management and pricing of water for industrial purposes. In 1998, furthering the agenda for holistic water management, the Ministry of Water Resources established a National Commission to develop an Integrated Water Resources Development Plan.

26. While the liberalization of the economy advocated in the New Economic Policy of 1991 allowed for the decentralization of management and privatization of urban water utility management, almost nothing has happened. In 1992, the 74th Constitutional Amendment (CA) provided for locally elected municipal government with the financial and administrative means to govern effectively. It also requires district and metropolitan planning. Subsequent ratification by the state governments signaled their intent to take these new responsibilities seriously, and State Finance Commissions were set up in all states. Although states are required to devolve responsibilities to municipalities for domestic, industrial and commercial water supply, and public health, sanitation and solid waste management, little has been done.[10] There have been, however, GOI moves to regain the initiative as evidenced by the February 2000 *Cochin Declaration*. Conversely, several states have embarked on irrigation reform programs, and notable advances in irrigation policy, assisted by the Bank, were introduced in Andhra Pradesh in 1997 and, more recently, initiated in Uttar Pradesh.

27. The Approach Paper for the Ninth Five-Year Plan (1997) spells out the sector-specific policy requirements in detail. The paper strongly advocates private sector participation to supplement public sector investment and urges suitable revisions to procedures and regulations to create a conducive environment. For the first time in India, full cost recovery for water supply and sanitation is national policy with no 'excessive' cross-subsidization from other sectors. It also requires that subsidies, if required, be transparent, selective and well targeted for the poorer sections of urban society. However, a major study of the sustainability of rural water supplies by the Rajiv Gandhi National Drinking Water Mission in 1994–95 shows that efforts have to move far beyond issues of finance alone.[11] In particular, lack of participation of beneficiary

10. In Chennai, the O&M of 75 sewage pumping stations was contracted out starting in 1992, and cost savings of 45–65 percent have been achieved. This has now been extended to the O&M of municipal water supply wells.

11. Pant, S.K. How Relevant are Rural Water Supply Programs? Economic and Political Weekly. December 7, 1996.

communities in planning and maintenance, marginalizing the role of women, and inadequate coordination with organizations engaged in similar work were seen as major roadblocks to sustainability. A 1998 review of India's watershed development projects reached similar conclusions.[12]

A History of Rich Policy Dialog

28. Many of these new policy initiatives echo three decades of rich dialog over India's irrigation policy stemming from the federal government and scholars, and from 1991 with the World Bank. While the Fifth Finance Commission (1969) recommended that state revenues from irrigation should yield the annual costs of O&M plus part of the capital, subsequent commissions diluted the capital requirement to zero. Even though the 1986 National Conference of Irrigation and Water Resources Ministries argued that water rates should be more than just the O&M cost and include an element to indicate the scarcity value of the resource as well as capital recovery, nine years passed before the Tenth Finance Commission recommended a one percent capital recovery. This was emboldened by findings of the Vaidyanathan Committee on Pricing of Irrigation Water and the preparatory Working Group for the Eighth Plan.[13, 14]

29. The Vaidyanathan Committee carefully considered the basis on which to levy water charges and its affordability. It recommended a two-tier unit area pricing policy because of the practical difficulties of volumetric measurement needed if marginal cost pricing of water were to be introduced. Interestingly, the committee calculated that recovering the O&M costs and one percent of capital would cost about six percent of gross irrigated output, similar to that estimated 20 years earlier. As a result of these various efforts, GOI recommended all-India average irrigation charges to cover only O&M be increased from Rs 100 per hectare (ha) in 1984, to Rs 200–250/ha in 1989, and Rs 300/ha in 1995. Despite these recommendations and significant increases in irrigation fees in three states in which the Bank is working, overall cost recovery has declined since the early 1980s because states put political popularity above federal or fiscal concerns.

30. The committee also considered that a drastic change in the incentive structure and institutional responsibilities was essential if the irrigation sector was to remain viable (Box 2). In particular *"Making the whole process more transparent and public is essential. One of the most effective ways to induce more economical use of resources is to give potential beneficiaries a strong stake, both to be consulted and to participate in the design and operation of each project, and also to share a substantial part of the investment cost and/or to meet the full cost of operating and maintaining the facilities*."[15]

31. A critical review of needed irrigation sector reforms by the National Bank for Agriculture and Rural Development (NABARD) states: *"that improvement in financial position and consequent improvements in the physical design and control structures do not necessarily ensure*

12. Kerr, John, Ganresh Pangare, Vasudha Lakare Pangare, PJ George and Shashi Kolavalli. 1998. The Role of Watershed projects in Developing Rainfed Agriculture in India. Indian Council for Agricultural Research and the World Bank.

13. GOI. 1989. Report of the Working Group on Major and Medium Irrigation Programme for the Eighth Plan 1990–95, New Delhi.

14. GOI. 1992. Report of the Committee on Pricing Irrigation Water (the Vaidyanathan Committee). Planning Commission, New Delhi.

15. Vaidyanathan, A. 1993. Second India Series Revisited: Water. Madras Institute of Development Studies. Madras, India. Background paper for the WRI Report The Second India Revisited: Population, Poverty and Environmental Stress over Two Decades (1994).

better management unless the institutional arrangements are also strengthened."[16] Recommended changes include granting financial autonomy to irrigation departments and establishing farmer water users associations (WUAs) who would bulk-purchase water from the irrigation department, take responsibility for water distribution, collect fees from members and undertake O&M. NABARD envisages joint operation of systems with the irrigation department managing the storage and main canal network with the WUAs managing the tertiary system and the national Command Area Development Authority (CADA) acting as a catalyst between the two. Saleth went one step further and argued that the financial incentives to conserve and better manage water need to be reformed. In particular, users should be given transferable rights to the resource, thus promoting economic efficiency in water use.[17]

Box 2: The Political Reality of Irrigation Development

"The political pressures for starting new irrigation projects are very strong: since new projects stand to benefit a large number of farmers, politicians view them as instruments for mobilizing electoral support. Large construction projects also happen to be a convenient means for mobilizing funds for party and other users. The frequent turnover of both ministers and bureaucratic managers responsible for irrigation further shortens the time horizon for decision-making. It militates against strict enforcement of standards of design, efficiency and cost control of projects. Since the consequences of bad decisions or delayed implementation rarely visit the individual minister/officials who make decisions, there is little check on the several undesirable tendencies: the propensity to commit the government to new projects without necessary technical preparation and without regard to economic viability, to exert political pressure to get engineers to prepare projects in a hurry and obtain necessary clearances, and to start far more projects than can be accommodated within the available resources."

Source: Vaidyanathan (1993) *op. cit*.

32. Attempts to privatize water run counter to the bureaucratic culture of India and have caused a lively debate about its efficacy and social implications. A Model Bill to Control and Regulate Groundwater (based on an earlier 1971 version) that was introduced by the Ministry of Water Resources in 1992 illustrates the problem. According to reviewers it would "*set up a regulatory system, insulated from local involvement, where power is concentrated at the state level and formally wielded by the technical bureaucracy*."[18] Indeed, similar bills with draconian regulatory powers introduced by Gujarat, Maharashtra, Tamil Nadu and Karnataka were either not passed or failed because of a lack of effective mechanisms for enforcement. At the very lowest level, a prime issue is effective allocation and measurement of resource use, a problem that has eluded India's state electricity suppliers to agriculture for decades, and the fact that "*system managers have no effective powers to enforce rules or the penalties for violating those rules*."[19]

And Some Success in Policy Implementation

33. Despite these problems, the GOI and a few states have actively pursued participatory irrigation management policies since the late 1970s. In 1985, the Ministry of Water Resources

16. Mitra, Ashok K. Irrigation Sector Reforms. Economic and Political Weekly, March 30, 1996.

17. Saleth, R. Maria. Towards a New Water Institution. Economic and Political Weekly, September 24, 1994.

18. Moench. Marcus. Approaches to groundwater Management – to Control or Enable? Economic and Political Weekly, September 24, 1994.

19. Vaidyanathan, A. 1991. Critical Issues Facing Indian Irrigation. In "Future Directions for Indian Irrigation: Research and Policy Issues." International Food Policy Institute. Research Report.

asked all state governments to select a small part of an irrigation system under the Command Area Development (CAD) program to pilot farmer participation. Following these small pilot projects, active handover and turnover of irrigation systems and subsystems to farmers has been growing since the early 1990s and there is strong evidence that user management of water is viable under a variety of Indian conditions. In Gujarat, successful wholesaling of water has been managed, for example, by the Mohini Water Distribution Cooperative. In Maharashtra, successful community water supply management initiated in the 1980s (the Pani Panchayat experiments) have received substantial publicity. And close collaboration with NGOs since 1985 has enabled turnover of 84,818 ha to 226 WUAs and an additional 267,000 ha are in process of turnover. Sample surveys show that under these WUAs, cost recovery for O&M exceeds 94 percent and water use efficiency increased.[20] Perhaps more surprising is that pump irrigation markets have successfully developed in North Bihar and are transforming the local agrarian economy. Even though there is monopoly pricing of water, the benefits to all members of the communities involved far outweigh the costs.[21] Shah's study also highlights the need for a more comprehensive policy on rural energy: electricity shortages give diesel suppliers monopoly powers in some areas.

34. **Andhra Pradesh Irrigation Sector Reform**. Unlike Maharashtra, Andhra Pradesh adopted a "big bang" approach to irrigation sector reform and user participation driven by the political will to reform state finances. Following piloting of participatory irrigation management in the Sriramsagar project in 1994 and assisted by the Bank, the government commissioned a thorough diagnostic analysis of the state's irrigation sector performance and identified the reform issues and process in a widely circulated White Paper (1996). The Bank was a significant partner in these initiatives. This was followed by a year of extensive district-level consultations which concluded that farmer empowerment and management should form the heart of the reforms that should be bold and comprehensive rather than incremental.

35. Key factors underlying the reform effort were a successful coalition of political and bureaucratic organizations in the state (a team effort led by a charismatic and visionary Chief Minister), inclusion of the rural community, utilizing NGOs to catalyze the process, adopting an evolutionary rather than a blueprint approach, and making it transparent. Thus, when the Andhra Pradesh Farmers' Management of Irrigation Systems Bill and a measure to increase irrigation charges by 300 percent was presented in the state legislature, it was enacted unanimously in April 1997. While the hike in irrigation charges puts it within the GOI's recommended range, there is still a reluctance to derive a fee structure based on full-cost accounting because it would reveal the true burden of excessive over-staffing of the state's Irrigation Department.[22]

36. As a result of the new Act, over 10,000 water user associations were elected throughout the state in June 1997, followed by election of 174 distributary committees five months later. Initial indications are that there is a significant increase in the state's irrigation area (510,000 ha or 10 percent) in the 1998/99 kharif season. Over 73 percent of WUA presidents report an increase in irrigated area while a smaller sample had improved water distribution to tail-enders

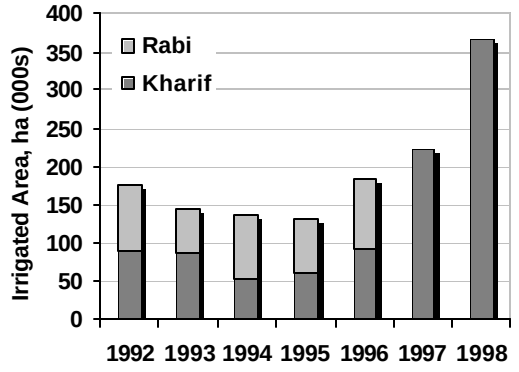
20. Pant, Niranjan. Impact of Irrigation Management transfer in Maharashtra – An Assessment. Economic and Political Weekly, March 27, 1999.

21. Shah, Tushaar and Vishwa Ballabh. Water markets in North Bihar – Six Village Studies in Muzaffarpur District. Economic and Political Weekly, December 27, 1997.

22. SAR staff state (May 2000) that the government of Andrah Pradesh (GOAP) attaches great importance to the transparency of water charges. To this end GOAP has made a decision to computerize the system and "internalize" it between the farmer organizations and the I&CADD.

and more timely supplies overall.[23] The results from the Sriramsagar project are remarkable even given that there was a drought in 1997 (Figure 2).[24] It is too early to determine the impact of these initiatives on cost recovery, but all WUAs now undertake O&M following devolution of the contracting role to them by the Irrigation Department.[25]

Figure 2: The Effect of Irrigation Reform in Andhra Pradesh



37. **Karnataka's Irrigation Sector Reform.** Karnataka prepared an Agricultural Policy Resolution in 1995 that included major institutional reform in the irrigation sector (Box 3). Although little of this was actually implemented, the government has established an autonomous public corporation for raising and deploying finance to manage irrigation activities in the Upper Krishna basin and work with WUAs.

Box 3: Irrigation Reforms in Karnataka – Agricultural Policy Resolution of 1995

"Irrigation Department may be granted financial autonomy and converted into a corporation on condition it should recover at least the O&M expenses from the direct beneficiaries. Also, WUAs would be involved in the management and ownership of canal networks. Farmers would be made co-owners of these irrigation structures through the issue of "water equity shares." Farmers would get representation on Management Boards of Irrigation Corporations, where they can air their views more effectively. This would be the beginning of a process to convert the irrigation works from tops down to bottoms up. Canal waters would be sold to these WUAs in bulk quantities, leaving the individual-specific distribution of water, as also collection of dues thereof, to these WUAs on attractive commission basis."

Source: Karnataka Agricultural Policy Resolution

But There are Still Problems

38. **Subsidies are Still an Issue.** A prime and continuing cause of the states' fiscal problems are the subsidies to agriculture, particularly through the power sector for groundwater irrigation and through low tariffs for surface water irrigation. This has led to excessive water use, depletion of groundwater resources and high levels of soil salination. Even in Punjab, the leader of the Green Revolution in India, there is now serious concern about declining agricultural growth and the adverse impacts of indiscriminate and excessive use of water for irrigation – now boosted by the state government's decision to provide electricity and water free of cost to farmers.[26] As a result, the Bank has frozen its assistance at this retrogressive step. Subsidies have squeezed out new public investment essential for sustained agricultural growth to meet demand – and power

23. This does not take account of the impacts of better or worse rainfall or other factors affecting irrigation, such as better reporting. See World Bank (1999), Transferring Irrigation Management to Farmers in Andhra Pradesh, India, Technical paper 449.

24. Rabi data for 1998 is not yet available.

25. Most of the maintenance contracts are awarded within the WUAs and provides a significant incentive to accepting the O&M responsibility.

26. Chand, Ramesh. Emerging Crisis in Punjab Agriculture–Severity and Options for the Future. Economic and Political Weekly. March 27, 1999.

and irrigation subsidies account for more than half of this. By 1994–95, only 38% of total spending on agriculture was spent on productivity enhancing investments compared with more than 60 percent in 1981–82. Unfortunately, poorer states fare worse than rich ones with adverse impacts on poverty alleviation.[27]

39. A recent study by the Tata Energy Research Institute estimated price elasticities of demand for electricity to range from -0.45 for heavy industry and residential consumers, to -1.2 for agriculture. Since the agricultural sector consumes an average of 28 percent of total power supplied, this suggested that if consumers paid the true economic cost of their electric power, much of India's electricity generation deficit could be eliminated and significant water resource conservation and environmental benefits achieved.[28] More recent Indian research has shown also that the power subsidies for groundwater pumping were highly inequitable, skewing the subsidy to benefit water-rich farmers who grow water-intensive crops.[29]

40. **Maharashtra's River Basin Corporations.** Public sector autonomous Irrigation Development Corporations have been established for five river basins covering the whole state. Their mandate is to raise finance on the capital markets to finance new dams and canals. The first five-year bond issue raised Rs 975 crore in 1996–97. While *prima facie* this seems to be in line with GOI's privatization and water resources policy, in reality these corporations were set up primarily to enable Maharashtra to circumvent restrictions to expanding state budgets. The goal is to secure Maharashtra's interstate claims to the headwaters of the Godavri and Krishna rivers by building dams as quickly as possible, whatever the longer-term financial consequences and impact on downstream states.

Summary

41. The water sector has seen increasingly strong policy debate and formulation over the past 20 years at the federal level, and this has accelerated since the early 1990s, especially in the past few years. Unfortunately, most of the debate by federal select committees and commissions has little ownership in the states that possess the water. Active and highly relevant academic research and debate is accessible but only to a select public. From a national perspective, there is little transparency and community participation is negligible. Little of this policy dialog reaches the multiplicity of water management institutions.

42. With some notable exceptions, there is insignificant follow-through of federal water policy at the state level. Even though most states flout national water policies, the center continues to hand out subsidies for water development, thus providing no incentives for reform. Comprehensive water management by river basin is notably absent and institutionally fraught. State-level investment in water, water allocation and pricing policy is highly politicized with strong vested interest, not least in the engineering-focused irrigation and municipal water supply departments. Public participation, with a few exceptions, is notable by its absence. Conversely, public objection to top-down project implementation frequently makes the international press and highlights the accountability gap. There are virtually no state incentives or policy initiatives to treat water holistically and use economic criteria to allocate this scarce resource. Even the boldest

27. World Bank. 1996. Country Economic Memorandum. Five Years of Stabilization and Reform: The Challenges Ahead.

28. World Bank. 1999. Meeting India's Energy needs (1978–98) A Country Sector Review. Operations Evaluation Department.

29. Sant, Garish and Shantanu Dixit. Beneficiaries of IPS Subsidy and the Impact of Tariff Hike. Economic and Political Weekly. December 21, 1996.

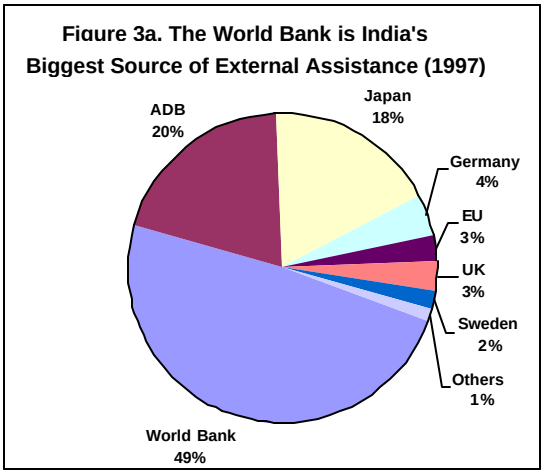
state reforms of the late 1990s are incremental and at the margin. State policymakers are unwilling to consider full-cost pricing of water supplies that reflects its opportunity cost, not least because it will highlight the gross inefficiencies and overstaffing of the present water management institutions and the political difficulties of making them financially viable.

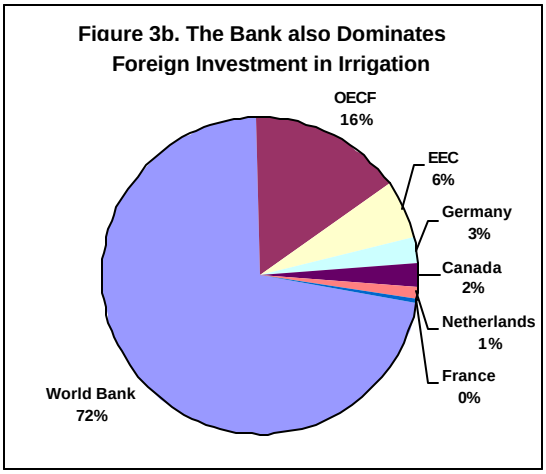
4. Evolution of the World Bank's Water Policy in India

43. This chapter reviews evolution of Bank policy for water and water-related investment before and after the Bank's 1993 Water Resources Management Policy. It shows that the Bank was overly focused on a project-by-project approach until the mid-1980s with little policy dialog on anything other than engineering quality. Between 1987 and 1993 the Bank became increasingly involved in policy debate on means to arrest failing infrastructure and address critical institutional constraints and broader environmental safeguard issues. After 1991 the Bank's water policy and the first serious attempts at public sector reform by GOI evolved simultaneously, thus providing a policy environment that by the mid to late 1990s became conducive to reform in the electricity, irrigation and water supply sectors. Much of this was built on the reform debate within India – not least, the direction provided by India's 1987 Water Policy. The first major breakthroughs in irrigation and water utility reform only happened because a new generation of reform-minded political leaders enabled the Bank's dialog to move from technically oriented state line agencies to engage the body politic. Overall, the Bank's policy dialog on water in India closely reflects the requirements of the Bank's water policy, which is highly relevant to India's needs.

The Bank's Role

44. The Bank's involvement in India's water development grew steadily from the early 1960s to reach a peak in the mid-1980s. Until 1992, India was the Bank's biggest borrower for water and water-related investment. Conversely, the Bank has always been the dominant development partner accounting for almost half of total concessional foreign investment among the development assistance community (Figure 3a) and is responsible for an even larger share of foreign assistance for irrigation (Figure 3b). But compared with internal Indian investment it is marginal – around 10% for the period 1985–97 – and thus the Bank has little leverage for policy





reform unless it focuses its investment.

45. Other donors have also been active in the water sector in India. The UK Department for International Development (DFID), the Danish (DANIDA), FAO and ADB have also been active participants in this sector. None has a program anywhere near the size of the Bank's program and they all tend to defer to the Bank. Even so, some have long-standing programs in India and most are focused on the rural and urban water sectors. Their programs are small, more localized and more committed to long-term involvement in specific projects or areas with close association with beneficiaries. They tend to have simpler procurement rules than the Bank, contracting with local governments and paying against works. DFID, for example, has also taken a different view than the Bank on many issues particularly in the rural water sector where it operates a growing program.[30] It is clear from interviews that the Bank's relationship and work program are not coordinated with other donors who are not kept well informed about Bank initiatives. The Bank, seeing itself as the "big player" tends, in effect, to ignore other donors (and local initiatives) and fails to learn from their experience, which is considerable at the local level.[31]

Bank Policy in India Before 1993

46. Until the mid-1980s the Bank's policy in irrigation was to prefer project over program lending because it provided major opportunities for agricultural investment and had the necessary absorptive capacity. However, while "*the Bank would have preferred to become involved at an early stage in practice, its role was in examining projects and deciding if they were suitable for financing without being able to develop lending based on a set of technical, regional or other criteria*."[32] Part of this policy was driven by GOI's refusal to allow ICB on Bank-financed projects, thus limiting procurement, and this impasse was only resolved by 1984. In consequence, the Bank developed a lending policy for irrigation based upon exclusion criteria. In particular, by 1981 it would not finance projects (a) affected by international or interstate water disputes, (b) early in the construction cycle to avoid drawn-out disbursements, (c) more than halfway through the construction cycle because the Bank could have little influence on the outcome, and (d) that the state would not increase its investment allocation because GOI would not agree to additionality until 1984. As a result, the Bank tended to select projects and then retrofit design improvements to improve operational efficiency. Even this was fraught with difficulty because GOI was strongly averse to hiring consultants to do this work, and as most states had insufficiently qualified staff for this work, Bank staff and consultants unwisely became immersed in detailed project engineering. This was driven in part because GOI also resisted Bank involvement in policy and planning issues.

47. Not surprisingly, until the mid-1980s there was a Bank preoccupation with projects and detailed engineering and design and little with furthering the policy agenda for institutional reform. In many cases, the policy of taking on projects in mid-stream frequently meant the Bank was involved in mitigating bad design or providing social safety nets for flawed resettlement

30. For example, DFID continues its programs in Maharashtra because it believes it is reformist and will not operate in Uttar Pradesh (unlike the Bank); and works with local *panchayats* and inside village *parishads* with a long-term commitment to institutional reforms. Conversely, the Bank's approach is to allow WUAs to form according to the local circumstances that differ among projects and states.

31. The Bank's regional staff contest these observations and points to successful partnerships with UNICEF, DFID, Denmark and the Netherlands. However, at the May 2000 Roundtable participants' feedback on how the Bank has helped included comments such a: "impervious to local innovation – sees only its own," and "sets up parallel institutional structures instead of using existing ones better," and is missing the "ability to identify and augment the efforts of those that help themselves."

32. World Bank. 1981. Concepts for the Future in Irrigation Planning.

policies. Recovery of O&M costs became a condition of every loan but still remained ineffective. On the water management side, the preoccupation with irrigation efficiency led the Bank to strongly support command area development at the lowest levels of public irrigation projects. Bank policy mandated canal lining whether needed or not – and this led to considerable controversy among Indians because of the greatly increased costs. Although the institutional constraints were well known to Bank staff, they sought to bypass them: *"technical solutions can reduce the freedom of engineering and administrative staff to corrupt the operation of the system if technical improvements are proven effective and for all to see, (they) will become politically acceptable."*[33]

48. Bank policy was set on a new track following nascent economic and sector work in the early 1980s.[34] Some of this highlighted the need to address corruption and institutional problems plaguing state irrigation departments. Others pressed for elevating Bank support to national programs to address systemic irrigation management and water resource problems, in particular unreliable and inequitable water delivery. GOI first approached the Bank for a national water management program for the irrigation sector in 1982. After discussion and initiatives to improve water management in 17 ongoing Bank-supported projects, the GOI established a Water Management Cell to facilitate program development in the (then) Ministry of Irrigation. By 1985, a joint GOI/Bank team agreed a new policy that directed Bank finance to participating states following federal approval of scheme-specific operational plans.

49. Unlike most earlier Bank investments, the major foci under the new policy were rehabilitation of deferred maintenance rather than new projects, an emphasis on strengthening the states' capacity to plan and implement O&M, and mutual farmer/irrigation department operation of irrigation systems below a certain water management level following reengineering of water control structures. In comparison with the Bank's earlier policy, Bank management viewed this as an extremely ambitious and highly risky strategy and advised making it smaller and piloting the approach first. Despite heeding management's advice to get the loan through the Board in 1987, by 1990 the Bank's response to India's macroeconomic crisis made disbursement the driving force behind the project and the new policy effectively became defunct. While the national approach made sense in terms of institutional reforms, it highlighted the absurdities of trying to apply specific water management techniques nationally given the diverse range of agroclimatic conditions and seasonal water availability.[35]

50. As a lead-up to preparations for the Eighth Plan, the Bank, in collaboration with GOI, undertook an Irrigation Sector Review, which it completed in 1991. Following an extensive diagnosis of the sector's ills and their impact on agricultural productivity, it identified four areas for priority action and made 52 recommendations for reform:

- Forging a coherent water policy and implementing it
- Prioritizing investment and getting control of expenditure
- Improving productivity and ensuring sustainability, and
- Building critical capacity within the public and private sectors in order to manage the sector more efficiently and effectively.

33. G. Tibor, April 29, 1983.

34. World Bank. 1982. Economic Returns to Investment in Irrigation in India. Staff Working Paper 536.

35. For example, the application of the *waribundi* proportional water allocation method developed in the arid northwest to the wet delta areas of the southeast.

51. For the first time, the Bank review was blunt about the cause of many of the problems. "Much of the current sectoral malaise stems from the fact that irrigation is largely managed by government monopoly, that a culture of 'government must do it' prevails, and that the sector's bureaucracy has grown unwieldy, not adaptive to changing needs with narrow interests and lacking incentives to improve performance." It recommended that both state and center reassess their monopoly and ascribe new roles as necessary. And "where appropriate, and opportunities abound," they should divest as much investment and implementation as possible to the energetic nongovernment sector. An ambitious prescriptive one-year action plan for sector reform at state and federal level was included that flew in the face of the institutional realities highlighted by the review. Unfortunately, it neither identified the Bank's role in this process nor addressed incentives needed to get reforms moving. The 1991 review did, however, give a clear signal that a new direction was needed and it ushered in a series of new-style projects – the water resources consolidation projects and a national hydrology project.

52. The 1991 Country Economic Memorandum (CEM) focused on the agricultural sector and, *inter alia*, built on the findings of the irrigation sector review. In particular, it highlighted the need to mitigate the adverse impacts of irrigation development on people and the environment. The main recommendations were that more attention be paid to the correct pricing of inputs and cost recovery. In 1991, Bank policy extended lending in a new direction for industrial pollution control that would have a significant impact on water quality. It also introduced the first loan to mitigate the environmental risk posed by dams and strengthen the institutional capability of the center and states to manage this risk and address rehabilitation. The macroeconomic crisis of 1991 occupied the 1992 CEM, but even so, it noted the difficulties of pushing the center's reform agenda to the states, especially for irrigation. The 1993 CEM identified the absence of demand-led irrigation through well-identified water user groups as a major impediment to reform and further stressed that perverse price incentives must be removed. In a major change of Bank policy, it argued that "*rather than exhortations for blanket water pricing or user charges, there should first be a call for some form of system monitoring by independent system utility regulators to see who actually benefits from irrigation*."

Bank Water Policy in India After 1993

53. The intense international scrutiny of the Bank's water-related work in India caused by the Narmada controversy and the International Review (Morse Commission) gave rise to new policies for water investment, augmented by the preparation and finalization of the Bank's 1993 Water Resources Management Policy.

54. By 1994 the Bank moved from project to sector water investment loans that would finance an agreed state-wide program generally in line with the new Bank water policy and some of the specific recommendations of the 1991 Irrigation Sector Review. These sector loans were implemented through *water resources consolidation projects*. Unlike earlier investments, WRCPs covered water resources planning, addressed current and future intersectoral needs and provided support for institutional development and reform. This built upon broader-based lending to mitigate the environmental impacts of waterlogging in Uttar Pradesh through active and wide-scale beneficiary participation that took place in late 1993. This was followed by the first investment for environmental management capacity building which help address, *inter alia*, increasing Bank concern, raised in the 1994 CEM, about water pollution.

55. In the same year, the Economic Development Institute of the Bank initiated discussions on, and provided a strategy for, the devolution of irrigation O&M to water users – a policy the 1995 Country Assistance Review (CAS) saw as key to improving natural resources management and efficiency in expenditure. In the event, the EDI intervention was well scheduled by the Bank

as it provided "just in time" input to the evolving policy dialog then taking place between the Bank and the government of Andhra Pradesh on initiating reform of public utilities and turnover of irrigation systems to water users groups. The policy agenda for agriculture was elaborated in the 1995 and 1996 CEMs, which rehearsed the recommendations of the Vaidyanathan Committee and delivered the important message that there is room to spend "less but better" on agriculture, provided that, in the short term, programs are introduced to target the poor who are the most vulnerable to the phase-out of input subsidies.

56. The key policy breakthrough over the period 1996–98 facilitated water reform through comprehensive statewide public expenditure operations. Under this new policy, the Bank bundled its new loans into state-specific packages conditional upon implementing reforms. Not only did this give the Bank much greater leverage than it had before, it also ensured that Bank dialog across sectors was consistent – a major problem in the past. The first policy packages were outlined in economic and sector reports on Orissa and Rajasthan in 1996, followed by Andhra Pradesh in 1997 and Karnataka and Uttar Pradesh in 1998.

57. The first of the new state economic restructuring packages was for Andhra Pradesh in 1998. Its primary objectives were to meet priority needs in human development (nutrition, primary health and primary education) and maintenance of economic assets affecting the rural poor (irrigation, rural roads). Investments under the package are linked to a program of fiscal reform aimed at maintaining a tight control over public expenditure and debt. Modernizing the state's irrigation sector was a substantial part of the package. Similar proposals are being discussed for Uttar Pradesh.

58. The Bank's dialog has been intensive with the states of Tamil Nadu, Orissa, Uttar Pradesh, Rajasthan and Andhra Pradesh. Most of the other states have not been directly involved, a major shortcoming that may limit the impact of the ESW. It was also pointed out by Indians during field discussions in May 1999 that nowhere in the Bank's ESW is there any reference to its own experience with water projects – that is, reference to the findings from its own OED or other internal project supervision documents or reviews. This should be a matter of major concern, because it means that much of the Bank's own extensive experience is not being internalized and it is failing to learn from its own mistakes.

59. In 1998, the Bank completed a comprehensive water resources management sector review that gave issues of water management a high profile in the 1998 CAS (Annex C1). The review was aimed at initiating and sustaining water sector reforms undertaken in partnership with GOI and with contributions from the UK, Denmark and the Netherlands. Unlike the 1991 review, its preparation had involved consultation with seven federal ministries and short visits to 13 states. The proposals were discussed at five national workshops, and several hundred copies of the reports were disseminated. The report has been published in India and is now widely available.[36, 37] Unlike previous Bank sector reviews, the GOI actively and independently organized discussions and workshops on its findings and the review's recommendations have figured significantly in a revised GOI water policy due in the spring of 2000. Indeed, one of these GOI's

36. World Bank. 1998. India Water Resources Management Sector Review – Initiating and Sustaining Water Sector Reforms. Report No. 18356-IN in 6 volumes (Summary report; Intersectoral Water Allocation, Planning and Management; Groundwater Management and Management; Irrigation; Urban water Supply and Sanitation; Rural Water Supply and Sanitation).

37. The ministries consulted include Ministry of Finance (Planning Commission), Water Resources; Urban Affairs and Employment; Rural Development; Environment and Forests; Agriculture; and Power. States consulted were Andhra Pradesh, Tamil Nadu, Madhya Pradesh, West Bengal, Punjab, Kerala, Uttar Pradesh, Orissa, Maharashtra, Karnataka, Gujarat and Haryana.

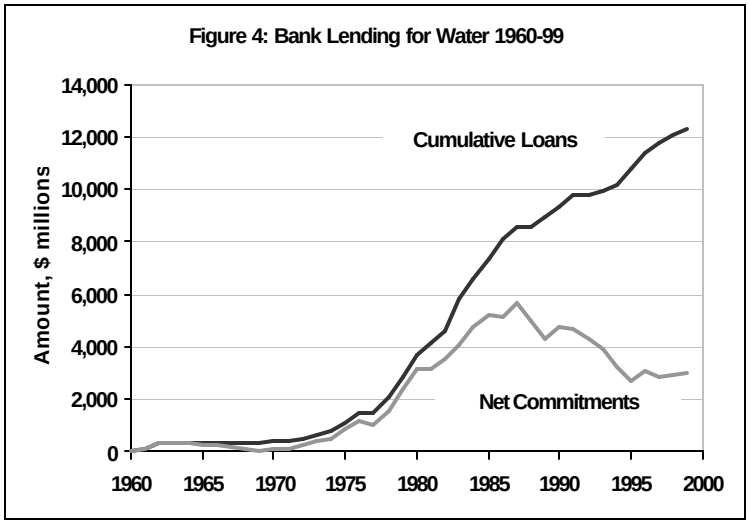
workshops sponsored by the Bank led to the *Cochin Declaration* (February 2000) on rural water supply and sanitation.

60. Unfortunately, however, the findings of the sector review are almost identical to those of the 1991 review: the top-down, supply-oriented and fragmentary development framework still persists and present institutional arrangements do not enable comprehensive allocation, planning and management of water. As the review aptly summarizes: *"in recent years there has been realization and policy pronouncements regarding the need to address these problems; however, the policies have not been translated into action*."

5. Bank Assistance to India's Water Sector

The India Water Portfolio

61. The Bank has lent $12.4 billion (at 1996 prices) for 87 water and water-related operations since the early 1960s (Figure 4). Lending expanded at about $720 million a year from the mid-1970s and reached its peak in 1987 when outstanding net commitments were $5.6 billion. Since then new lending has almost halved to average about $330 million a year. Net commitments in 1999 were almost $3.0 billion for 20 active operations.[38]



62. The Bank's water sector portfolio has been large with 60 operations active between 1988–99 of which two-thirds (40) have been completed (see Annex B).[39] Sixty percent (36) of these were approved prior to 1988, 20 were completed before the Bank's 1993 water policy became effective, and 16 were completed later. Of the 24 operations approved after 1988, four have been completed and only 13 operations post-date the 1993 water policy. Thus in the six years before and after the water policy an almost equal number of projects were approved – but the volume of lending for water increased substantially.

63. In terms of new Bank lending for Indian water and water-related operations since 1988, the total amount in current prices almost doubled from $1.345 billion before the 1993 water policy, to $2.537 billion after it. This increased water's share of the Bank's total India investment from 9% pre-1993 water policy, to 25% post-water policy. Most of this change took place in the agricultural sector portfolio which had 38% invested in water projects in the pre-policy period, but 83% post-policy. While investment in water supply and sanitation almost doubled to $520 million after 1993, it still only represented 5% of the Bank's total India lending in the period.

38. It should e noted that these numbers differ from those given by the GOI's Ministry of Water Resources April 28, 2000, which only includes irrigation sector projects. This exemplifies the fragmented view at the center.

39. The oldest project in the active portfolio was approved in 1979.

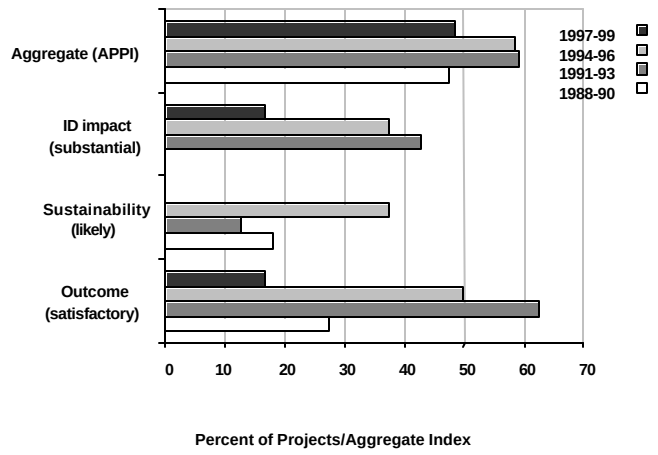
New lending for industrial pollution control was confined to two operations, one before, one after the water policy, each for about $160 million. An environmental capacity-building loan for $50 million was made in 1997.

64. The composition of the active portfolio changed significantly from the period 1979–87 to 1988–99, moving away from its earlier heavy irrigation focus to encompass broader water resource issues as the portfolio contracted. This change is most marked in the transition from pre-1988 to the six years preceding the water policy, as there is relatively small change between the pre- and post-policy periods. Overall, irrigation projects were replaced by more water resource-oriented projects while the water supply and sanitation portfolio remained fairly stable.

6. How Has the Bank Performed?

65. **Outcomes.** The performance of completed Indian Bank-financed water operations is poorer than South Asia and the Bank as a whole, and far below that of China.[40] Satisfactory project outcomes have been declining, projects have become less sustainable, their institutional impact has diminished, the Bank's own performance at appraisal and supervision has deteriorated (Figure 5).[41,42] While the OED's rating of Indian performance in implementing water projects and in complying with project covenants has got worse, the ratings of Indian project preparation have consistently improved from zero satisfactory in 1998–90, to 66% satisfactory in 1997–99. The aggregate project performance indicator (APPI), that combines the individual ratings for outcome, institutional development and sustainability shows that overall performance has declined since 1997 (Figure 6).[43]

Figure 5: India Water Projects Performance (ARPP 1988-99)



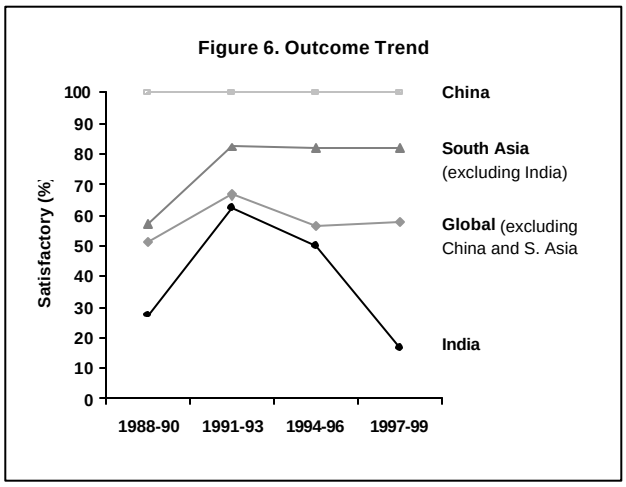
40. The Chinese water projects and portfolio were about half that of India's during the same period.

41. These findings are based on performance ratings by the OED on all projects for which annual project performance reviews (APPRs) have been completed 1988 – 99. The ratings were carried out independently of this study and are only reported here.

42. The Bank's Regional staff state that this analysis is irrelevant to judging the India portfolio as these projects went to the Board in the late 1980s and "are hardly recent performance" and it recommends that they be deleted. OED disagrees. The outcome of these projects was the result of both design and the implementation experience of the last decade and thus they are highly relevant indicators of recent institutional performance.

43. The Bank's Senior Water Policy Advisor has raised (June 2000) the issue that the declining performance could be indicative of changing and more demanding evaluation standards, rather than a gross deterioration in actual performance. A detailed review of the evidence shows this issue to be unfounded. Each project is evaluated against its stated objectives and for the 1997-99 cohort of projects both the SAR region and OED independently gave the same ratings. What this indicates is that the quality of the development objectives improved faster than the quality of implementation in the late 1980s and early 1990s. That this gap is closing is well illustrated by the FY00 exits of which 3 of 4 are satisfactory. It is salutary to note, however, that the only irrigation project was also the only unsatisfactory

66. **Performance by Subsectors.** A closer look at the performance by subsectors in India shows that the Hydro and RWSS had the poorest performance on outcomes with none of the projects performing satisfactorily.[44] Only 40% of the irrigation and drainage and 60% of the UWSS projects had satisfactory outcomes. All fisheries and aquaculture and the agricultural adjustment projects have performed satisfactorily.



67. When satisfactory project outcomes are compared to South Asian and global projects, Indian performance has been poorer in irrigation, hydro and rural water supply, and better in urban water supply and agricultural adjustment projects. Development objectives were achieved by two-thirds of hydro and all irrigation and drainage projects, while the 87% of the UWSS had a satisfactory rating. The single RWSS was also rated satisfactory in spite of an unsuccessful outcome. It seems that, even when projects have unsatisfactory outcomes, they often tend to meet broader development objectives of providing water even if there are problems managing it.

68. **Sustainability.** Sustainability is defined in terms of whether or not the project – for both internal and external reasons – is likely to be sustained over the long run. Here the evidence is dismal at best. A little over a third of the irrigation, drainage and hydro projects and less than a third of the UWSS projects were likely to be sustainable in the long run. The single RWSS was rated as unlikely to be sustained.

69. These ratings could be due to external factors out of control of project authorities. But more likely, they point to severe long-term problems with Bank water projects. They succeed in the short run because they are heavily supervised (Box 4). Any problems that are discovered in the process of implementation, are tackled by project authorities because the Bank is there to provide support – budgetary or supervision – and insist on their correction. The Bank's presence and "clout" help the projects get back on track. The Bank's own evaluations during implementation reflect the optimism that comes from a focus on short-term outcomes. However, once Bank involvement ceases, they often become unsustainable for two reasons. First, the state fails to provide adequate budget to support staffing and other components over the long-term. Second and more seriously, the Bank does not focus enough on long-run sustainability – financial, institutional and environmental – in designing its projects.

70. **Institutional Development.** The continuing inability to bring about institutional change is evident. Only half of the UWSS, a fifth of the irrigation and drainage, and none of the hydro, RWSS or other projects, were deemed to have had any substantial institutional impact.

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one. The others were two watershed management (hill and plains) and the TN agricultural development project that contained sizable water-related components: RWSS with significant involvement of women, and a watershed management component that reduced run-off and increased groundwater recharge.

44. There may be several reasons for this. First, development goals are generally more limited and clearly defined in UWSS projects Secondly, they are inherently easier to undertake because they do not have the long history and institutional inertia that is associated with irrigation and drainage, nor the difficulty of working with village institutions that lack capacity in RWSS projects in India.

71. It has long been recognized that most of the project-related problems in India are institutional or political in nature (Figure 7). Yet, despite this, the Bank has totally failed to tackle institutional problems until recently. Institutional reforms require a long-term commitment to the goals of bringing about institutional change. Yet working on institutional change raises

Box 4: Bank Supervision – When does it Substitute for Lack of Ownership?

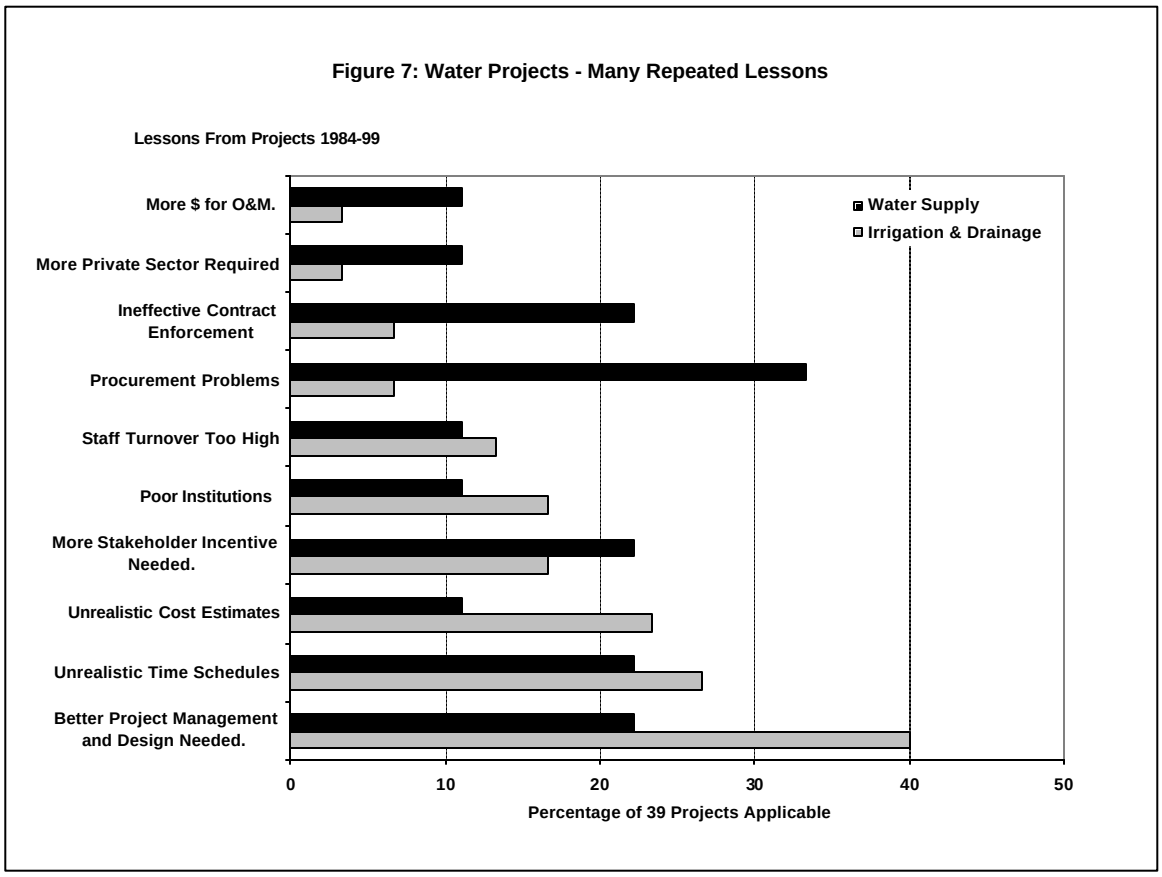
The National Water Management Project (NWMP, 1987-95) was designed to enable Irrigation Departments in selected states to design and implement operational plans aimed at sharing the O&M of projects with farmers groups to make water supplies more timely and optimal and improve cost recovery. It was driven by Bank staff who spent 309 staff weeks preparing the proposals for the initial three subprojects. Two years into the project supervision reports stated: "project implementation is also slowed by the time-consuming process of convincing water users of the benefits and of motivating them to abide by the regulations and to understand the implications of the revised Operational Plan [developed by the project]…and "training, information and motivation of both irrigation staff and water users has clearly emerged as a prime prerequisite to achieving the objectives of improved water management." By 1989, Bank management had cut Bank supervision from an average of 142 staff to 42 staff weeks a year.

In the absence of state ownership, the quality of new subprojects entering NWMP declined and it effectively became a project that rehabilitated deferred maintenance. As a result, disbursement rose rapidly and the project's development objective was raised from 2 to 1. Because the Bank at that time judged success by disbursement, the Bank agreed to prepare a second-stage project covering 5.2 million ha and costing $575million over the period 1995-2000. Following completion of a project preparation mission by the FAO Investment Center in 1994, the project outcome was downgraded to unsatisfactory, institutional development was rated as modest, sustainability as unlikely and Bank and Borrower performance as unsatisfactory. As a result, the Bank cancelled the proposed phase II project. After 9 years of encouraging signals from the Bank, the cancellation caused great rancor within GOI. Yet at the same time it caused the Bank to seriously restructure its operations to the irrigation sector. Overall, this experience highlights the need for thorough and continuous monitoring and evaluation of active projects.

preparation, supervision and other project costs while the Bank is determined to cut them. Indian officials complained to the evaluation team that the Bank also has a tendency to bypass and often ignore existing institutions and create its own parallel project-specific institutional structures because it finds it easier than the difficult and time-consuming job of working with and reforming existing institutions. In fact the Bank actually increases the burden on existing institutions and reduces their effectiveness because establishment costs from Bank projects – say of engineers in irrigation works – have to be absorbed. Most of the senior Indian officials also stated that Bank projects tend to be high profile and crowd out financial and technical support for the states' own projects. The response of the Bank's regional water policy team is that this is exactly what they are trying to achieve – to heighten the focus on reforming projects and suck money away from "frivolous now starts."[45]

72. There is also a severe problem with internal Bank incentives, which preclude a serious attempt to deal with sustainability and institutional issues. Incentives were all focused on the number and amounts of loans processed by the Board and short-term project outcomes during Bank implementation. Hopefully, this may now be changing with the Bank's renewed focus on poverty alleviation and the comprehensive development framework. What happens to projects after the Bank closes its books on them does not figure in its incentives and behavior for operational staff. No operational budgets are allocated, or staff assigned to, any follow-up on

45. Memorandum from SAR regional staff, May 14, 2000.



what happened unless it is a repeater project. There is little monitoring by Bank operations to determine what the long-term impact was and what lessons can be learned from this experience.

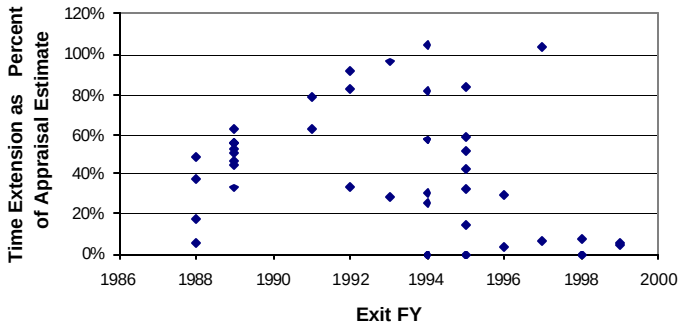
73. These shortcomings are widely known in India and deplored. As one Indian expert points out: *"It is surprising that the Bank has shown so little interest in, and has not been willing to commit resources to, systematic evaluation of project implementation and impact. It is also striking that the periodic sector reviews, which are supposed to help the Bank assess its strategy and policy do not even mention the experience of Bank projects. Changes in the Bank's perceptions of the nature of the problems and remedies, evident in successive reviews, are not grounded on any in-depth study of the India experience. Institutionalized learning from experience is conspicuous by its absence."*[46]

74. **Efficacy.** Bank projects have not met the test of efficacy – the power to produce an effect, in this case sustainable institutions, water management and reform. The evidence is that projects have been enclave subsector projects, failing to address issues of integrated planning and management of water resources. They have neglected financial, institutional and governance constraints affecting project performance, and given no explicit attention to poverty issues – except in that increased irrigation also provided benefits to the rural poor. Insufficient attention was paid to environmental degradation problems and their effects on the poor, although this is being remedied in some current projects.

46. Vaidyanathan, A. 1999. Bank Group Operations In India's Irrigation Development – A Critical Review of program and Impact. Madras Institute of Development Studies.

75. Large supervision resources have been devoted to project works – the maintenance of physical structures and their completion and the associated attention to procurement and disbursements issues to ensure "project success." But even using this very narrow concept of "success," evidence shows that projects have performed rather poorly.

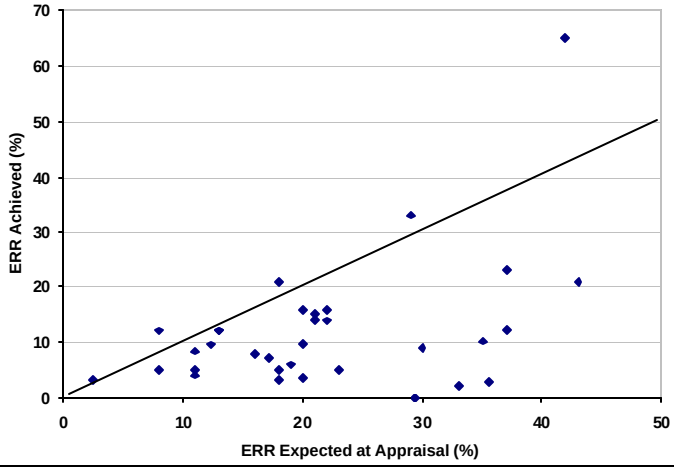
Figure 8: Projects Took Much Longer than Planned



76. Apart from the few national projects (hydrology and dam safety), the main implementing agencies involved in Bank projects have been state-run irrigation departments or municipal water boards or authorities. They all suffer from the incentive, institutional and political constraints discussed above. Few have been effective; most have hampered progress. Apart from the Andhra Pradesh irrigation sector reform, and RWSS projects where local village panchayats or zilla parishads and beneficiaries have been involved, few of the other implementing agencies had any local or beneficiary participation.

77. **Efficiency.** One of the biggest problems affecting project performance was overly optimistic appraisal because insufficient attention was given to institutional issues. In particular, most implementing agencies could not complete the projects in the time agreed with the Bank (Figure 8). Major problems included inadequate advanced preparation, incomplete engineering designs, insufficient staffing, land acquisition and resettlement, and procurement. The trend line in Figure 8 shows that there is a steady improvement in project performance. Poorly performing projects reached a peak in the early 1990s when delays typically reached 4–5 years. The situation improved significantly after 1996 when Bank management introduced more stringent portfolio management. The one exception in this period is the Maharashtra Composite III Irrigation Project (closed FY97) that overran its completion date by 5½ years or 103%. Delays in project completion caused cost overruns and delayed benefits that significantly lowered expected economic rates of return. Irrigation projects fared much worse than WSS projects (Figure 9) (Annex B1).

Figure 9: Economic Returns are Less than Expected



Recent Bank Experiences

78. The Bank's recent experience with ongoing projects provides a more sanguine picture and suggests that some progress is being made to correct some of these shortcomings and increase the ratio of satisfactory outcomes. A significant signal about the Bank's resolve for reform was given to Punjab when the project pipeline was suspended following the state's abolition of water and electricity tariffs in 1998. A similar stand by the Bank on the reform of the

SEBs in 1996 was effective in getting them on track.[47] The evidence from supervision ratings show that most current projects are performing satisfactorily, but it is too soon to judge outcomes. Additional evidence comes from reviews carried out by the Bank's own Quality Assurance Group (QAG) and impact studies by OED.

79. Ten projects in three subsectors – irrigation, urban water supply and sanitation and hydropower – have been reviewed by QAG (Annex D). QAG reviews are more important than the Bank's self-supervision ratings, since they are not *pro forma* and provide more in-depth review. They confirm the OED view that current and active Bank projects in this sector seem to be doing very much better. The supervision performance of 9 of the 10 projects evaluated by QAG was rated as satisfactory or better. Three of these projects have received "excellence for supervision" awards and were graded "highly satisfactory"; the Uttar Pradesh RWSS has been nominated for the President's Award.[48] QAG's rating of the quality at entry of the latest India irrigation loan (AP III) was rated as satisfactory and the project's concept and approach, treatment of poverty and social aspects and readiness for implementation were rated as "highly satisfactory." Despite this, the QAG findings also point out that the preparation and implementation problems in this sector are far from over. In hydropower projects there was too much focus on physical results and procurement issues at the cost of a dialog on the core institutional issues. In UWSS, none of the projects was embedded in any coherent sector strategy and failed to address sectoral issues at the national or provincial level. They were not preceded by any comprehensive sector work or agreement with the borrowers on the long-term policy and institutional reforms program.

80. **Rural Water and Sanitation Sector**. An OED impact evaluation report for three projects in Rajasthan, Maharashtra, Kerala, and one ongoing project in Karnataka showed that WSS coverage and access both increased and that public health improved.[49] Economic and social impacts were positive except for women. However, cost recovery was poor, institutional achievements were modest, beneficiary participation remained problematic and the sustainability of services was in doubt. Overall, since 1980 there has been a slow shift away from top-down traditional supply-driven approach to full local participation with stakeholder involvement generally through WUAs, but this is not without problems. Two ongoing RWSS projects (Karnataka and Uttar Pradesh) have moved significantly towards a demand-responsive approach that emphasizes management at the lowest level and reforming cost recovery mechanisms.

81. **Political and Social Constraints to Equitable WUAs.** Any WUA formed to manage water will have to contend with the dominance of powerful landholding interests and their power in the rural hierarchy, particularly for irrigation. Over the past five decades, they have been able

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47. So great was the problem of State Electricity Boards (SEBs) that the Bank ceased new lending in mid-1993 until there was a demonstrated commitment to reform. By 1996, the annual subsidy to agriculture and residential users had increased to about $4.6 billion (1.5% of GDP), the annual loss of State Electricity Boards reached $2.2 billion, and GOI, following extensive sector work assisted by the Bank, promulgated the Common National Action Plan for Power which endorsed and supported state efforts to enact reforms. Faced with a growing crisis in power supply and state finances, five states (Orissa, Bihar, Haryana, Rajasthan, and Uttar Pradesh) agreed to undertake reforms starting with privatization of the distribution systems to attract new investment for renovation and expansion, and erection of a strong regulatory environment. Andhra Pradesh joined these five in 1998. Within this new environment, it is expected that tariff reform for groundwater pumping, *inter alia*, will be the main target of the new private sector utilities. Above all, the process of reforming the SEB will provide invaluable lessons for the water sector, be it for irrigation or municipal water supplies.

48. The three projects whose supervision was rated "highly satisfactory" by QAG are: Tamil Nadu Water Resources Consolidation; Karnataka Water Supply and Environmental Sanitation; and the Uttar Pradesh Sodic Lands Reclamation I.

49. World Bank. 1999.

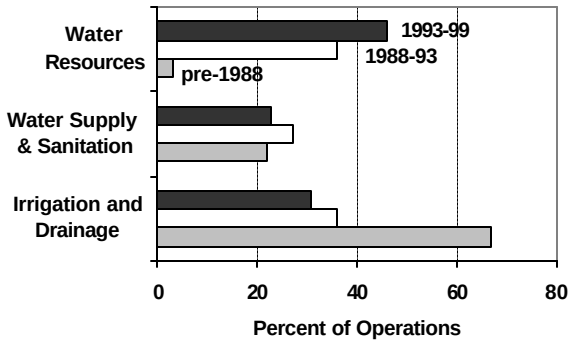
to subvert all programs designed to deliver services – water, credit, fertilizers, extension or other social benefits to the poor, unless they first get their own slice of the pie. Generally, they belong to the higher castes in the villages and also have control over local rural government through party affiliations. In some states, Bihar and Uttar Pradesh, their power is being challenged by the rise of new political parties to power, dominated, for example, by the lower castes or *dalits.* Bank-sponsored arrangements for WUAs and marketing water will have to contend with this rural reality and safeguard the rights of the scheduled castes and poor. The early evidence is that with effort and political will, constraints can be overcome and WUAs made to work. Bank interventions in this area are new. It is too early to tell how they will work out, particularly given the deep-rooted institutional, incentive and technical problems that plague Indian water systems and which need to be addressed through complementary measures.[50]

7. Has the Bank Implemented its Water Policy in India?

82. The Bank has implemented its 1993 Water Resources Management Policy and strategy in India. Through economic and sector work it has elevated the discussion of water to occupy a significant part of the India CAS. The Bank's 1998 India water reform agenda fully complies with the policy but, as presented, with over 170 recommended actions of which 82 cover required national and state-level reforms, it is impractical.[51] The institutional problems already discussed and the lack of widespread Indian ownership at state level probably mean that few of recommendations will be mainstreamed – a repeat of the experience with 1991 Irrigation Sector Review's 52 recommendations – unless government, assisted by its development partners including the Bank, make major efforts to change the incentive structure.

83. **Increased Portfolio Relevance**. The water portfolio is highly relevant to the 1993 water policy, but many of the positive trends started before the water policy came into effect. Mostly this was because some of the authors of the Bank's policy had been heavily engaged in Indian irrigation operations from the late-1980s. There has been a distinct shift away from the earlier project-by-project irrigation focus, to a more integrated statewide approach to the management of water resources (Figure 10). This is seen in the number of projects listed as watershed management and water resource consolidation projects aimed at improving irrigation and

Figure 10: Increased Portfolio Relevance



50. Other measures include, for example, system modernization, dynamic (water) regulation, solving the water rights and markets issue, integrated land and water management, improved on-farm water management and access to markets as discussed in Oblitus, Peter et al., Transferring Irrigation Management to Farmers in Andhra Pradesh, India. World Bank Technical Paper No. 449, October 1999.

51. The Bank's Regional Staff state that this is a premature conclusion and that the recommendations are practical and rather than being a "blueprint" for reform they should be considered a "menu": "The Action Plan...included state, sub – state (city, town, village) and central level responsibilities and suggested a time-frame for action…No uniform prescription or blueprint will be appropriate for all circumstances. A strategic, but also opportunistic approach will often be needed, tackling first those issues considered most important and susceptible to change."

drainage systems with the current focus on Andhra Pradesh, Uttar Pradesh, Haryana, and Orissa. Rajasthan and Karnataka are in the pipeline. Two integrated watershed development projects covering the hills of Haryana, Punjab, Himachal Pradesh and Jammu-Kashmir (1990), and the plains of Gujarat, Orissa and Rajasthan (1990) include water management and conservation components. The Uttar Pradesh Sodic Land Reclamation Projects (1994, 1999), which integrate on-farm and institutional development with improvements in drainage and irrigation, has proved to be extremely successful, no only reversing damage caused by waterlogging and making land cultivable, but also in mobilizing participation of farmers' and womens' groups to manage implementation with profound and positive impacts on the poorest.

84. The Dam Safety Project (1991) and the National Hydrology Project (1996) – both being innovative and the first of their kind in the Bank's global portfolio – are fully in line with the Bank's water policy to build institutional capacity for water management and better water data monitoring and analysis, as are three environmental projects. Two other projects, one to address, inter alia, water pollution control and prevention (1991) and the other an environmental capacity building project (1997) will benefit environmentally sustainable design of water programs and projects.

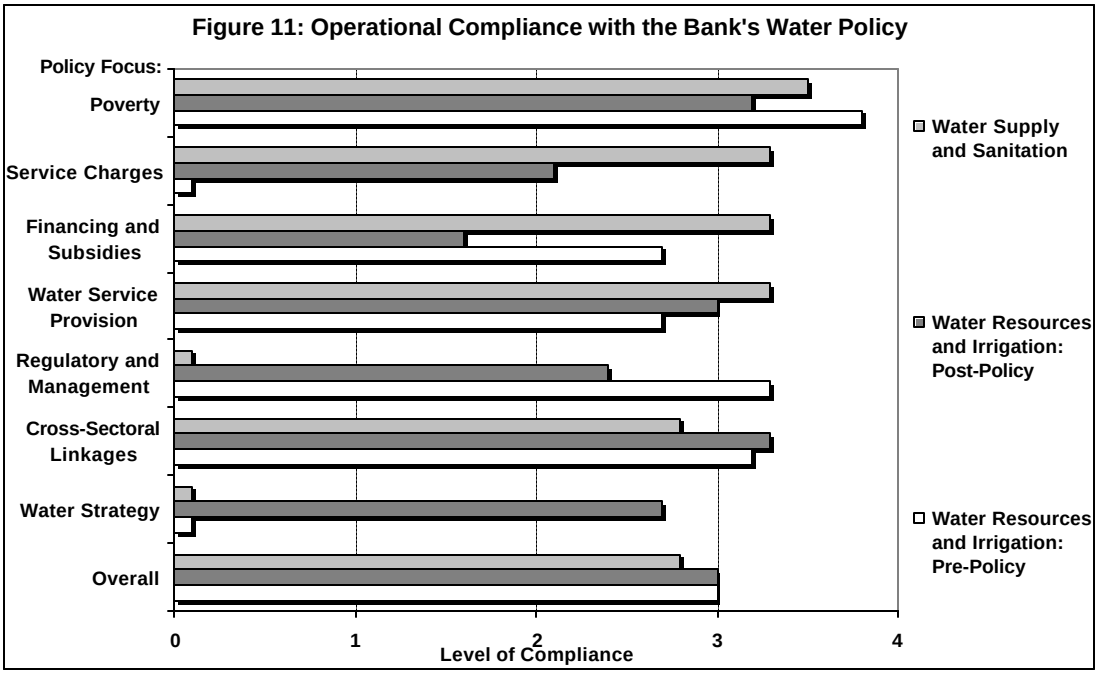
85. Lending for rural and urban water supply and sanitation projects meets social objectives in line with the high GOI priorities given to drinking water and public health and the Bank's water policy. There is probably too little of it in the current active portfolio of four projects that accounts for 23% of all water lending since the water policy was implemented. Even then, almost 90% of this lending is heavily focused on three major cities, Bombay, Madras and Hyderabad where it is easy to disburse. Given the relatively poor coverage and service provision in the rural areas where the bulk of the poorest live, and the Bank's renewed poverty focus, the Bank should probably invest in the more challenging RWSS that is currently expanding with pipeline projects in Kerala, Karnataka, and one planned for Andhra Pradesh.

86. Hydropower is limited to only two operations dating from 1989 (Maharashtra Power and Nathpa Jhakri Power). The Sardar Sarovar Dam and Power Project, approved in 1985, canceled by India in 1993, had a profound effect on the Bank's global perception of the environmental and social risks involved in large-scale water diversions, dams and resettlement. In India, it effectively precluded any further new Bank investment in dams even though there is a pressing need, particularly for flood control and clean power generation.[52] A companion review of the performance of the Bank's assistance for social development in India shows, however, that the Bank still has good reason to be wary of projects involving resettlement.[53]

87. **Compliance of Operations with the 1993 Water Strategy**. The 1993 water strategy paper provides a policy framework covering the three guiding principles for Bank water operations derived from the Bank's OP (Box 1). First, it emphasizes adoption of a comprehensive analytical framework for identifying priorities (holistic planning); second, provision of institutional and regulatory systems supported by legislation that promotes reforms with emphasis on decentralization and participation; and third, that water be treated as an economic good considering the financial and opportunity cost of water in all its competing uses. OED has developed a methodology to systematically screen the design of water projects against these three

52. Several ongoing Bank projects do include dams, for example, in Orissa and Tamil Nadu.

53. World Bank. 2000. "World Bank Assistance for Social Development." Annex to OED's India Country Assistance Evaluation, 2000.



criteria and their areas of policy focus. The results of the evaluation of 20 operations against seven areas of policy focus are summarized in Figure 11.[54]

88. Overall, Bank operations substantially comply with the water strategy. All, except the post-policy water resources and irrigation operations (WRI) projects, show negligible concern with measures to implement a comprehensive approach to water resources development. Even then, 40% of post-policy WRI operations failed to address water resources from a national perspective, and 60% did not address them at river basin or state level. Conversely, substantial compliance was found at the project level for both WRI and urban and rural water supply and sanitation operations (WSS) where designers traditionally feel more comfortable and in control. At this level, cross-sectoral linkages, participation and environmental concerns were generally well covered. Again WRI scored slightly better than WSS.

89. Design of provisions to ensure a sound institutional and regulatory environment differed significantly between WRI and WSS. While WRI was rated substantial to 1993, it declined to modest thereafter. Conversely, WSS was almost non-compliant mainly because it did not address water resource and institutional issues that affect its sustainability. While both subsectors substantially addressed factors affecting water service provision, and WSS did better than WRI, 60% of pre-policy WRI projects ignored this issue – a situation that improved post-policy.

90. Generally, economic, financial and social issues were much better covered in WSS than WRI projects. While financing and subsidies were key issues for WSS and scored well, attention to these issues was less and declined for WRI projects post-policy as it became more heavily engaged in beneficiary participation in O&M of irrigation projects – a warning that Bank staff capacity may be a significant constraint to implementing the proposed 1998 reform agenda. Where the Bank did focus its resources WRI's attention to service charges increased dramatically from modest to substantial post-policy but still lagged behind WSS. Finally, both subsectors scored substantially on their poverty focus, although the WRI projects declined slightly in the

54. A score of 4 indicates a high level of compliance with no major shortcomings, 3 a substantial level of compliance with some major shortcomings, 2 modest compliance with numerous shortcomings, and 0 non-compliance.

post-policy period. A review of active irrigation projects shows that little attention was paid to poverty and gender and environmental issues, at least explicitly, except in one or two recent projects.[55] In the RWSS sector however, environment and gender have been central both to project design and implementation, while this is less so of the UWSS sector.[56]

91. **Relevance to India's Needs.** It is clear from this evaluation and problems in each subsector that the Bank's strategy and lending and non-lending activities, during the past decade, have become increasingly relevant to India's institutional and water policy needs. The problem now is that the 1998 reform agenda is too ambitious and probably far exceeds the Bank's capacity to implement and monitor it unless the Bank focuses its efforts.

92. While the designs of the Bank's new projects (Box 5) have made some progress towards helping India address comprehensive intersectoral water planning and participation much still remains to be done, particularly at the river basin level and on developing mechanisms for interstate water allocation. The GOI, cognizant of the likely adverse impact on coalition politics, is still not receptive to the idea that allocation of interstate rivers should be brought within the purview of the central government rather than the state governments.[57] Thus, a more holistic treatment of all water management and resource issues at the river basin level remains elusive. Indeed, Bank projects avoid work on interstate rivers. The Tamil Nadu WRCP does not include the Cauvery river basin, while a pipeline irrigation sector reform project for Uttar Pradesh is strictly limited to a small river basin (the Ghaghra) wholly within the state.

93. Other high-priority areas are reforming subsidies that perversely encourage inefficient water use, and on reducing the size of the large state water utilities and irrigation departments (which in some states exceed 100,000 employees) that preferentially absorb revenue better spent on O&M of infrastructure. These are among the most critical issues affecting the long-term sustainability of Bank investments in water.

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55. The exception is Sodic Soils II, where attention has been given to *the role of women* in WUAs. Generally women have few leadership positions in community based organizations. Apart from the UP Sodic Soils I & II projects and the Third AP Irrigation project, most irrigation projects still fail to address environment issues.

56. Both the rural water supply and environmental sanitation projects in Karnataka and UP place environment sanitation issues at the center. Women have been at the center of RWSS projects and have been major beneficiaries. This is less true of the UWSS projects, though the Bombay Sewage project, by carrying away the city's sewage, does improve the environment.

57. In 1991, the Bank argued (unsuccessfully) that under the Indian Constitution that water should be shifted from Entry 17 in List II (State List) to Entry 56 of List I (Union List) in Schedule VII. The Bank again raised the issue in 1998 with similar results.

Box 5: Towards Comprehensive Water Management….Perhaps

Under the Water Consolidation Projects, Tamil Nadu and Orissa have created State Water Resource Councils, Maharashtra has established a Water Resource Authority, Punjab is proposing a Council and Rajasthan is considering it. The Haryana Water Resources Consolidation Project, approved in 1994 was quickly followed by those for Tamil Nadu and Orissa in 1995. All three envisaged multi-sector water planning but progress towards this goal is uneven.

The Haryana project is in trouble and follows a well-known path: the replacement barrage is completed but the conveyance system is way behind schedule and the State Water Plan is not even started – and the Bank plans to restructure the project. The Tamil Nadu is on schedule although the farmers' organization and turnover is lagging and may not be fully achieved. Conversely, preliminary integrated plans for 16 river basins and stakeholder meetings in 8 of them have been completed assisted by international consultants but are probably too late to guide the next phase of investment. In Orissa, progress is less sanguine mainly because of inadequate trained staff and difficulties with river basin planning concepts. Despite this, 6 of 11 river basin plans have been completed using a sophisticated computer model, and a draft strategic environmental policy to guide river basin planning is under review. However, in June 2000, the Orrisa WRCP was classified by Bank management as a problem project as it failed to meet cost-recovery covenants and make adequate progress on resettlement, environment, irrigation turn-over and river basin planning.

8. Conclusions and Lessons

94. There has been considerable headway on reform of water institutions in the few reformist states where there is political will to change after decades of malaise. Even then, the focus is stronger on fiscal reform than on the underlying organizational and institutional issues that create perverse incentives in the water sector. For fiscal reform to succeed, sooner or later state governments must address reducing the size of public sector agencies and ensuring good governance that allows the private sector, including users' groups, to take a greater stake in water planning and management.

95. The Bank is meeting the challenges of changing from supply to demand management but is making less progress on improving the allocation and management of water as a unitary resource through a comprehensive and integrated, rather than a fragmentary, approach. The Bank's current water sector operations have moved away from new construction and are focusing on making existing infrastructure work efficiently and this is most appropriate given the poverty alleviation mission of the Bank.[58] Decentralization and engaging stakeholders including local governments is a key part of the Bank's efforts assisting state reforms. There is less progress on treating water as both a social and economic good which, as a scarce resource, needs to be properly priced and widely available to all, particularly the rural and urban poor and landless. The unfinished debate on water as a private and public good precludes pure market-based solutions

58. A recent 1999 study on India by the International Food Policy Research Institute confirms that government investment in new irrigation is an important source of growth of agricultural productivity (third after roads, and agricultural research and development). But an important policy finding is that new irrigation "has no discernible impact on poverty reduction" compared with seven alternative investments (in the order: roads, R&D, education, rural development). Only soil and water conservation, power and health scored worse. Conversely, investments in roads and R&D have very much higher impacts on both agricultural productivity and poverty reduction. Thus, the message is clear: if poverty alleviation is the goal, government should invest only enough to maintain the productivity of existing irrigation infrastructure and concentrate instead, in the short- to medium-term, on roads and R&D.

and has profound implications for the water rights of the poorest.[59] Nationally and at state level, effective rationalization of water planning and management organizations and their coordination arrangements remains an enigma. There has been very limited progress with the states on dealing with water comprehensively within river basin units that integrate the needs of all users – at root is the state ownership of water and lack of incentives to cooperate on water management and allocation.

The Bank's Future Reform Agenda

96. The missing element is how to identify and promote incentives that will lead to sustainable and effective reform. Only then can the critical next step be achieved: agreeing on the three to five short to medium-term priorities on which to focus efforts.

97. Creating full Indian ownership at state level is high on the list of incentives. The water reform strategy was developed following in-depth consultation with some key central agencies but with only a few states and was not sufficiently inclusive. The Bank may have mistaken agreement on principles for ownership, a problem that diluted the effectiveness of the Bank's 1991 reform agenda for the irrigation sector.[60] Many of the recommendations, for example, reorienting and reducing the size of public sector agencies and decentralizing to beneficiaries, affect both Bank projects and nationwide practices in the water sector. These issues require more debate at state level to create a broader consensus and ownership in India. Time is needed also for ownership of new water sector institutions to grow to maturity – Europe's water institutions, for example, are still evolving 30 years after the first privatizations of the 1960s, indicating that not everything can be done at once.

98. The Bank seems to have shifted drastically from benign neglect of many of the most difficult financial and institutional problems of the water sector, which it ignored for decades, to an overwhelming desire to intervene in all of them at once. Institutions and practices that have remained unchanged for decades are to be tackled and changed quickly – an approach to institutional reforms that flies in the face of institutional realities and the political will as they exist in India today. Little account is taken of the Bank's limited capacity to help India implement the ambitious 1998 reform program and it risks spreading its resources too thinly to be effective. A more selective and incremental approach to key policy and institutional reforms might be more productive.

99. Key issues that must be addressed are persuading state governments to limit their role, to unbundle public sector water supply and irrigation agencies along the lines agreed for SEBs, and take a comprehensive river basin approach that reveals critical cross-sectoral linkages. Investment and O&M activities should be separated; and O&M services (bulk delivery, maintenance and financial management) should be assigned to autonomous and financially self-sufficient units that are accountable for performance to regulators and users.

The Bank's 1993 Water Policy and Strategy

100. The Bank's water strategy is highly relevant to India's needs and the Bank is implementing it with growing success. The policy has been fully internalized within the Bank's

59. See A. Vaidyanathan, *Water Resource Management: Institutions and Irrigation Development in India*, Oxford University Press, 1999, p.134-136.

60. The Region disagrees with this statement and states that the consultations on the 1998 Bank sector review were much deeper than OED surmises and that they were driven by strong government ownership.

evolving water strategy for India. The main issue is making it practicable. This will involve tradeoffs, not least a realization that the Bank can assist effectively in the few areas where it has a comparative advantage and resources available. In Uttar Pradesh and Rajasthan, the Bank is now looking towards significant long-term water investment providing certain key reforms are implemented up-front – in particular developing a comprehensive state reform plan and commercializing service entities.

Overall Ratings for the Bank's Water Resources Sector

101. Aggregate ratings of the Bank's water sector performance in India were made as part of the Country Assistance Evaluation (Annex B) for the six years before and after the Bank's 1993 Water Policy.

Relative to the Bank's Water Policy:	***Before (1988–93)***	**After (1994–99)**
Outcome	Unsatisfactory	Moderately Satisfactory
Relevance	Modest	Substantial
Efficacy	Modest	Modest
Institutional Development Impact	Modest	Substantial
Sustainability	Uncertain	Uncertain

102. Ratings remain unchanged for efficacy and sustainability because it is too soon to reach judgments given that many of the operations designed to the new reform agenda are still early in implementation. Overall Bank performance in the irrigation sector in the pre-policy period was unsatisfactory. Since the 1993 policy, most of the Bank's new irrigation sector initiatives have been in the right direction but because many of the old institutional problems persist or are reemerging in the water resources consolidation projects, Bank performance is rated as moderately satisfactory. The exception is the WSS subsector where Bank performance is satisfactory. The overall rating of borrower performance raises it from unsatisfactory to moderately satisfactory primarily because the wealth of rhetoric on needed reforms has not yet moved to operationalization at central and state level: experience teaches that this is the Achilles' heel of India's public sector reform efforts.

Lessons and Recommendations

- The Bank's new policy of focusing its attention on a few reforming states, governance and bundling the water sector within statewide fiscal reform package appears to be paying off. The new approach gives the Bank much greater leverage through its enlarged lending and unifies the differing subsectoral reform agendas that formerly sent conflicting signals to Bank clients.

- Since political economy is at the root of many problems in the sector, the Bank should pay more attention to issues of political will and commitment. Generally, inducing reform during water project implementation through loan covenants has not worked in India and experience indicates it will be more effective to make these conditions of negotiation. This will require deeper dialogue on reform with client states during project preparation. There are clear lessons for the water sector from the Bank's experience in the states' electricity sectors.

- Disseminating and discussing the reform agenda more widely among civil society at the state level helps India build a national consensus on the substance of the problems and their solutions. It builds ownership by taking seriously local concerns about their suitability to Indian conditions. The Bank should also develop a nationwide campaign to include political

and civic leaders in the Bank's dialog on water reform, and invite them, as it did in Turkey, to see successful water projects and reforms in other countries.

- India's vibrant intellectual community has deep insight into the systemic issues in the water sector as a whole and has much to contribute to the Bank's water agenda. Similarly, the Bank should work more closely with other development partners in water to create synergy from their experience.

- The experience of Narmada shows that Bank needs to anticipate NGO objections by including Indian NGOs early in project preparation and paying less attention to outside NGOs, who have other constituencies in mind, and do not necessarily know Indian conditions.

- The Bank has failed totally to carry out any serious monitoring and evaluation, despite costly M&E components in its projects. It can do this at a relatively low cost by linking up with strong India research and academic institutions on a long-term contractual basis. It should also consider contracting out its ESW to Indian institutions with proven records.

- The weakness of state water institutions has required intensive Bank management of its water projects to the detriment of broader reform agenda. Closing Bank operations in non-reformist states and right-sizing of state water management organizations and deepening staff skills and knowledge base in reformist states may alleviate this problem. This would enable the Bank to focus its scarce resources on promoting and facilitating the broader policy and reform agenda and move from an exclusive focus on its own operations.

Annex A

India Water Projects by Year of Approval, 1988-99

Project ID	Credit/Loan No.	Sub Sector	Project Description	Approval FY	Closing FY	Environmental Category	Commitments (US $m)	Total Project Cost (US $m)
9898	C2010	ID	Upper Krishna (Phase II) Irrig	1989	1997	..	325	505
9965	C2076	ID	Punjab Irrigation & Drainage	1990	1999	B	165	246
9890	C2115	UWSS	Hyderabad Water Supply & Sanitation	1990	1998	B	90	141
9882	31750/21000	WSM	Integrated Watershed Dev (Hills)	1990	1997	..	88	126
9860	31970/21310	WSM	Integrated Watershed Mngt (Plains)	1990	1999	..	63	92
9906	33340/22520	ENV	Industrial Pollution Control	1991	1999	..	156	236
10369	C2234	RWSS	Maharashtra Rural Water Supply	1991	1998	B	110	141
9877	33250/22410	WRM	Dam Safety	1991	2000	B	153	197
9961	25100	ID	Uttar Pradesh Sodic Lands Reclamation	1993	2001	B	55	80
10408	24390	ID	Bihar Plateau Development	1993	1999	B	117	132
10418	24830	RWSS	Karnataka Rural WS and Env	1993	2000	B	92	118
9964	25920	WRM	Haryana Water Resources Consolidation	1994	2001	A	258	483
10463	37790/37806/ 26450	ENV	Industrial Pollution Prevention	1995	2001	A	168	352
10522	27330	ID	Asam Rural Infrastructure	1995	2004	..	128	147
10461	39070/39076	UWSS	Madras Water Supply II	1995	2002	A	276	421
10476	27450	WRM	Tamil Nadu WRCP	1995	2003	A	282	316
10484	40560	RWSS	Uttar Pradesh Rural WSS	1996	2002	B	60	71
10480	29230/27630	UWSS	Bombay Sewage Disposal	1996	2003	A	167	295
10485	27740	WRM	Hydrology Project	1996	2002	..	142	178
10529	28010	WRM	Orissa Water Resources Consolidation	1996	2003	A	291	346
43728	29300	ENV	Environment Capacity Building TA	1997	2003	..	50	65
35158	41660/29520	ID	Third Andhra Pradesh Irrigation	1997	2003	B	325	477
49385	43600/31030	ID	Andhra Pradesh Economic Restructuring	1998	2004	..	543	830
50646	31520	ID	UP Sodic Lands Reclamation II	1999	2006	B	194	287

Environmental Category:

A - Significant adverse environmental impact that are sensitive, irreversible or diverse and require full environmental assessment.

B - Impacts are less significant, sensitive or diverse and require simple environmental analysis.

Annex B

Portfolio of Bank Lending to India (Exit/Approval FY1990-00)[a]

OED Database Ratings of Completed and Active Projects

Project ID	Project Name	Net Commitment US$m.	Approval Date	Closing Date	Outcome[b]	Sustainability	Institutional Development Impact	APPI[c]	Bank Performance	Borrower Performance	QAG at Risk	Latest IP from PSR	Latest DO from PSR	ARPP Exit Year	% Cancelled
	Agriculture														
9786	Madhya Pradesh Major Irrigation	186.5	09/15/81	06/30/91	Sat	Uncertain	Not Rated		nr	nr				1991	15.2
9798	Haryana irrigaiton II project	133.8	01/25/83	03/31/92	Sat	Likely	Substantial	8.25	nr	nr				1992	10.8
9799	Uttar Pradesh Tubewells 2	101.0	03/08/83	03/31/91	Unsat	Unlikely	Substantial	5.25	nr	nr				1991	0.0
9797	Himalayan Watershed Management	28.3	05/31/83	09/30/92	Marg Unsat	Uncertain	Modest	5.25	nr	nr				1993	38.8
9801	Maharashtra water utilization project	31.4	06/09/83	08/31/91	Unsat	Uncertain	Modest	4.50	nr	nr				1992	42.5
9812	Rainfed Areas Watershed Dev	20.1	12/08/83	12/31/93	Sat	Uncertain	Modest	6.75	nr	nr				1994	35.2
9814	Periyar Vaigai Irrigation 2	33.1	05/01/84	10/31/93	Sat	Likely	Substantial	8.25	nr	nr				1994	5.4
9813	Upper Ganga Irrigation	100.4	05/24/84	09/30/94	Sat	Uncertain	Modest	6.75	nr	nr				1995	19.7
9815	Gujarat Medium Irrigation 2	145.2	06/12/84	03/31/94	Sat	Uncertain	Substantial	7.75	nr	nr				1994	15.6
9829	Narmada River Dev. (Gujarat) S. S. Dam & Power	118.5	03/07/85	06/30/95	Marg Sat	Uncertain	Modest	6.00	nr	nr				1993	60.5
9830	Narmada Riv Dev (Gujarat) Water Delivery & Drain	145.2	03/07/85	07/01/92	Marg Sat	Uncertain	Substantial	7.00	nr	nr				1993	3.2
9845	West Bengal Minor Irrigation	39.4	07/02/85	03/31/94	Sat	Likely	Substantial	8.25	nr	nr				1994	60.2
9893	Maharashtra Composite Irrigation III	128.8	07/16/85	12/31/96	Unsat	Unlikely	Negligible	3.75	Unsat	Unsat				1997	19.5
9828	Nabard credit project	375.0	02/25/86	06/30/91	Unsat	Uncertain	Modest	4.50	nr	nr				1991	0.0
9843	Andhra Pradesh Irrigation 2	140.0	03/20/86	06/30/94	Highly Unsat	Uncertain	Negligible	2.25	nr	nr				1994	48.3
9859	Bihar Public Tubewell	22.3	10/16/86	05/31/94	Unsat	Unlikely	Negligible	3.75	nr	nr				1994	67.2
9846	National Water Management	114.0	03/24/87	03/31/95	Unsat	Unlikely	Negligible	3.75	Highly Unsat	Unsat				1995	0.0
9898	Upper Krishna (Phase II) Irrig	166.8	05/04/89	06/30/97	Unsat	Unlikely	Modest	4.25	Unsat	Unsat				1997	48.7
9965	Punjab Irrigation & Drainage	145.3	12/14/89	07/31/98	Unsat	Uncertain	Negligible	4.00	Unsat	Unsat				1999	11.9
9961	UP Sodic Lands Reclamation	55.0	6/10/1993	3/31/2001							Nonrisky	Sat	Sat		0.0
9964	Water Resources Consolidation	258.0	3/29/1994	12/31/2000								Sat	Usat		0.0
10476	Tamil Nadu WRCP	283.0	6/20/1995	3/31/2002							Nonrisky	Sat	Sat		0.0
10529	Orissa WRCP	291.0	12/19/1995	9/30/2002							Nonrisky	Sat	Sat		0.0
35158	AP Irrigation III	325.0	5/20/1997	1/31/2003							Nonrisky	Sat	Sat		0.0
50646	UP Sodic Lands II	194.0	12/15/1998	9/30/2005							Nonrisky	Sat	Sat		0.0
41264	Watershed Management Hills II	135.0	6/15/1999	3/31/2005							Nonrisky	Sat	Sat		0.0
	Electric Power & Other Energy														
9805	Upper Indravati Hydro	170.4	05/10/83	06/30/95	Unsat	Uncertain	Modest	4.50	nr	nr				1995	47.8
9822	Indira Sarovar Hydroelectric	15.3	05/17/84	06/30/94	Unsat	Likely	Modest	5.00	nr	nr				1994	94.9
9838	Kerala Power	99.6	06/13/85	12/31/94	Unsat	Uncertain	Negligible	4.00	nr	nr				1995	43.4
9869	Nathpa Jhakri Hydro Project	485.0	3/2/1989	12/31/2002							Nonrisky	Sat	Sat		0.0
9941	Maharashtra Power	337.3	06/15/89	12/31/98	Unsat	Uncertain	Negligible	4.00	Sat	Unsat	Nonrisky	Sat	Sat	1999	15.7
	Environment														
9860	Waterdhed Management Plains	55.0	5/15/1990	3/31/1998	Sat	Likely	Substantial				Nonrisky	Sat	Sat		0.0
9882	Waterdhed Management Hills	13.0	3/6/1990	6/30/1997	Sat	Likely	Substantial				Nonrisky	Sat	Sat		0.0
9877	Dam Safety	93.0	5/14/1991	9/30/1999	Marg Sat	Uncertain	Modest		Sat	Sat	Nonrisky	Sat	Sat		39.2
10463	Industrial Pollution Prevention	166.0	7/26/1994	3/31/2002							Actual	Unsat	Unsat		1.2
10485	Hydrology Project	142.0	8/22/1995	3/31/2002							Nonrisky	Sat	Sat		0.0
	Water Supply & Sanitation														
9810	Water Supply & Sewerage	54.4	07/06/82	12/31/91	Marg Sat	Unlikely	Negligible	5.25	nr	nr				1992	24.5
9827	Tamil Nadu Water Supply	73.0	03/29/84	12/31/94	Sat	Likely	Substantial	8.25	nr	nr				1995	0.0
9858	Ker. Water Supply & Sanitation	20.8	07/16/85	03/31/94	Marg Sat	Uncertain	Substantial	7.00	Unsat	Sat				1994	49.3
9857	Bombay Water Supply and Sewerage 3	124.2	12/16/86	06/30/96	Unsat	Likely	Negligible	4.50	Unsat	Unsat				1996	32.8
9954	Madras Water Supply & Sanit.	64.3	06/17/87	03/31/96	Sat	Likely	Substantial	8.25	Unsat	Sat				1996	6.9
9890	Hyderabad Water Supply & Sanitation	73.5	03/27/90	03/31/98	Sat	Uncertain	Substantial	7.75	Sat	Sat	Nonrisky	Sat	Sat	1998	18.2
10369	Maharashtra Rural Water Supply	99.8	05/02/91	06/30/98	Marg Unsat	Uncertain	Modest	5.25	Unsat	Unsat	Nonrisky	Sat	Sat	1998	9.2
10418	Karnataka Water Supply & Environment	92.0	4/20/1993	12/31/1999							Nonrisky	Sat	Sat		0.0
10461	Madras Water Supply II	87.0	6/20/1995	6/30/2002							Nonrisky	Sat	Sat		68.5
10480	Bombay Swage Disposal	192.0	7/6/1995	12/31/2002							Nonrisky	Sat	Sat		0.0
10484	UP Rural Water	60.0	6/25/1996	5/31/2002							Nonrisky	Sat	Sat		0.0
50637	TN Urban Development II	105.0	5/27/1999	11/30/2004							Nonrisky	Sat	Sat		0.0

* This table include evaluated projects with OED raings (176) and active proejcts with and without QAG / ARPP ratings (80) as of December 31, 2000; [b] nr: not rated; [c] Details shown on page 4.

Evaluated projects since FY93	APPI Average	Standard Deviation	No. of Projects
India	6.26	1.94	89
Pakistan	6.42	1.80	43
Sri Lanka	6.43	1.48	26
China	7.57	1.50	68
SAR	6.30	1.80	213
AFR	5.83	1.80	525
EAP	7.07	1.75	256
Bank-wide	6.43	1.89	1,579

[c] Note: The APPI (Aggregate Project Performance Indicator) is a cardinal index, ranging from 2 to 10, which summarizes the project-specific ordinal ratings on Outcome, Sustainability, and Institutional Development Impact (a score of 6.75 corresp to a project with Satisfactory Outcome, Uncertain Sustainability, and Modest ID Impact). The average APPI in the Bank-w portfolio for all projects evalutaed since FY93 is 6.42, and the SD = 1.9.

Data as of December 31, 2000

Ratings (current):

Outcome	Highly Sat, Sat, Moderately Sat, Moderately Unsat, Unsat, Highly Unsat
Sustainability	Likely, Uncertain, Unlikely
ID Impact	High, Substantial, Modest, Negligible
Bank Performance	Highly Sat, Sat, Unsat, Highly Unsat
Borrower Performance	Highly Sat, Sat, Unsat, Highly Unsat

Note:

(a) Outcome was initiated as Sat / Unsat, expanded to Highly Sat & Highly Unsat in 1993 , Marginally Unsat in 1994 and with Moderately Sat and Moderately Unsat in 2000.

(b) Sustainability and Institutional Development Impact was initiated in 1989 on a 3-point Marginally Sa scale, the latter was expanded to a 4-point scale in 1994.

(c) Bank Performance was initiated on a 3-point scale in 1991, similarly for Borrower performance in 19 both were adjusted to a 4-point scale in 1994.

* This table include evaluated projects with OED raings (176) and active proejcts with and without QAG / ARPP ratings (80) as of December 31, 2000; [b] nr: not rated; [c] Details shown on page 4.

Annex C1

India: Water Issues in the Country Assistance Strategy

NO.	COUNTRY	CAS	REPORT No.	FY	Water in CAS
1	INDIA	Yes	17241	1998	Mentioned under two of three areas objectives of CAS (sustained rapid growth with equity in rural areas and investment in physical infrastructure). Under sustainable rapid growth the strategic objectives are: (1) to spur faster and sustainable agricultural growth and rural development by improving technical, financial, environmental performance of irrigation systems and improving the composition and delivery effectiveness of public spending and rural programs to close productivity gaps in irrigated and rainfed agriculture; (2) to ensure environmental sustainability by abating industrial, municipal, and agricultural sources of water pollution and energy sector sources of air pollution. The strategic actions for sustainable growth are: (a) promoting state-level comprehensive water resource restructuring programs; (b) supporting service institution (water user's associations (WUAs), Water Authorities); (c) increase cost recovery, establish water tariff commission; (d) create the environment for private sector privatization; (e) enhance institutional capacity for community-based, participatory approach to agricultural and rural development programs. The strategic actions to ensure environment are: (a) strengthen GOI pollution control policies, compliance systems, and enforcement; (b) expand investment in sanitation both rural and urban. For the area of physical investment, the strategic objective is to support urban development. The strategic actions for urban water supply and sanitation are (a) to formulate comprehensive state-level reform programs to enhance financial and operational viability of water utilities; (b) to promote private sector privatization.
2	INDIA	Yes	14509	1995	The objectives of CAS contain three specific enhancements requested by the authorities: (a) increased focus on state finances and sector reforms beyond the five areas on which structural change has focused since 1991; (b) assistance to the Government in establishing a framework conductive to efficient private investment in infrastructure; and (c) support in restructuring social programs to increase their effectiveness, and ensure that they provide the poor with the health and skills that will enable them to participate in a more competitive market economy. Sectoral Reform Agenda under agriculture is improving natural resources management (forest and water) and strengthen local participation. The ESWs related to this sector are: (a) the 1991 irrigation Sector review; (b) the 1994 EDI conference on devolution to water users continue to provide the strategy for dialogue and operations in water and irrigation. In operations: (a) the National Hydrology Project (FY95) supports improvement in national resource management and efficiency in expenditure.

Annex C

World Bank ESW & Research Papers since FY89

	Report Title	Report Type[1]	Date	Report #	Publi-shed?	Year
Agriculture						
1.	Asia Region - Improving Poverty Alleviation Through Groundwater Irrigation : Exploratory Proposals For East India, Bangladesh, And Nepal	SR	06/13/89	7857		1989
2.	How Infrastructure And Financial Institutions Affect Agricultural Output And Investment In India	PRWP	03/31/89	WPS163		1989
3.	Water Resources of The Ganges Basin : An Assessment of Their Development, Availability And Demands	SR	11/05/90	9127		1990
4.	Irrigation Management on The Indo –Gangetic Plan	WBTP	10/31/90	WTP129		1990
5.	Fisheries And Aquaculture Research Capabilities And Needs In India	WBTP	09/30/91	WTP147		1991
6.	The Evolving Role of The World Bank - The Food Crisis In South Asia: The Case of India	Pub	01/01/94	13536	yes	1994
7.	Design and Operation of Smallholder Irrigation In South Asia	WBTP	04/30/95	WTP256	yes	1995
8.	The Rain Decided To Help Us : Participatory Watershed Management In The State of Maharashtra, India	EDI LRS	11/30/95	15198	yes	1995
9.	Water Resources Management Sector Review : Report On The Irrigation Sector	SR	09/10/98	18416		1998
10.	Trade Policies And Incentives In Indian Agriculture : Methodology, Background Statistics, And Protection And Incentive Indicators, 1965-95	PRWP	08/31/98	WPS1953		1998
11.	Measuring The Impact of Climate Change On Indian Agriculture	WBTP	03/31/98	WTP402	yes	1998
12.	Towards Rural Development & Poverty Reduction (Vols. I & Ii)	ER	06/24/99	18921		1999
13.	Access To Land In Rural India: Policy Issues And Options	PRWP	5/01/99	WPS2123		1999
14.	The Green Revolution And The Productivity Paradox : Evidence From The Indian Punjab (Vol.1)	PRWP	11/01/99	WPS2234		2000
15.	Transferring Irrigation Management To Farmers In Andhra Pradesh, India (Vo l.1)	WBTP	10/01/99	WTP449		2000
Economic Management						
1.	Recent Economic Developments And Prospects	ER	05/27/94	12940	yes	1994
2.	Country Economic Memorandum : Recent Economic Developments – Achievements And Challenges	ER	05/30/95	14402		1995
3.	Growth And Poverty In Rural India	PRWP	01/31/95	WPS1405		1995
4.	Recent Economic Developments And Prospects	WBCS	03/31/95	14047	yes	1995
5.	Economic Developments In India : Achievements And Challenges	WBCS	10/31/95	15036	yes	1995
6.	Macroeconomic Management And Fiscal Decentralization	EDISP	12/31/95	15305		1995
7.	Country Economic Memorandum : Five Years of Stabilization And Reform : The Challenges Ahead	ER	08/08/96	15882		1996
8.	Andhra Pradesh : Agenda For Economic Reforms	SR	01/16/97	15901		1997
9.	1997 Economic Update : Sustaining Rapid Growth	ER	05/30/97	16506		1997
10.	Sustaining Rapid Economic Growth	WBCS	07/30/97	17382	yes	1997
11.	1998 Macro Economic Update : Reforming For Growth And Poverty Reduction	ER	06/30/98	18089	yes	1998
12.	Fiscal Aspect of Evolving Federations : Issues For Policy And Research	PRWP	02/28/98	WPS1884		1998
13.	Uttar Pradesh: From Fiscal Crisis To Renewed Growth	ER	11/30/98	18633		1999
14.	India – Policies To Reduce Poverty And Accelerate Sustainable Development (Vol.1)	SR	1/31/00	19471	yes	2000
Energy						
1.	Power Sector Efficiency Review	SR	11/30/89	7878		1989
2.	Long Term Issues In The Power Sector	SR	07/23/91	9786		1991
3.	Mini-Hydro Development On Irrigation Dams And Canal Drops Pre-Investment Study	ESMAP	07/30/91	ESM139		1991
4.	Conference on Power Sector Reforms In India	ESMAP	10/29/93	ESM166		1993
5.	Mitigating Risks In Power Reform - A New World Bank Lending Approach : Power Sector Reform In The Indian State of Haryana	Viewpoint	05/31/98	17899		1998

Annex C

	Report Title	Report Type[1]	Date	Report #	Published?	Year
6.	Financial Incentives For Renewable Energy Development : Proceedings of An International Workshop, February 17-21, 1997, Amsterdam, Netherlands World Bank Discussion Papers ; No. WDP 391	WBDP	10/31/98	WDP391	yes	1998
7.	Meeting India's Energy Needs (1978-1999): A Country Sector Review	OEDCS	12/23/99	19972		2000
8.	India : environmental issues in the power sector - manual for environmental decision making (Vol.1)	ESMAP	06/01/99	ESM213		2000
Environment						
1.	India's Environment : A Strategy For World Bank Assistance	SR	03/31/89	7676		1989
2.	Professional Development Workshop on Dry Land Management		06/30/90	ENV33		1990
3.	India's Environment - Taking Stock of Plans, Programs And Priorities : An Assessment of The Environment Action Program – India	EAP	01/31/96	16715		1996
4.	Environment Matters At The World Bank	Pub	01/01/97	17631	yes	1997
5.	Fostering Riparian Cooperation In International River Basins : The World Bank At Its Best In Development Diplomacy	WBTP	01/31/97	WTP335		1997
6.	The Metropolitan Environmental Improvement Program (MEIP) In Asia - People - Cities – Environment	DWP	06/30/98	17937		1998
7.	Environmental Issues In The Power Sector	ESMAP	06/30/98	ESM205		1998
Multi-Sector						
1.	NGOs In Bank-Supported Projects : An OED Review	AROE	09/14/98	18399		1998
Other						
1.	The Evolving Role Of The World Bank : Helping Meet The Challenge Of Development	Pub	08/31/95	14921	yes	1995
2.	Why Have Some Indian States Done Better Than Others At Reducing Rural Poverty?	PRWP	04/30/96	WPS1594		1996
3.	India - Scientific and Technical Manpower Development in India (Vol.1)	SR	08/30/00	20416		2001
Public Sector Management						
1.	Public Expenditure Review	ER	12/31/93	12570		1993
2.	Private Sector Assessment	SR	01/31/94	12619		1994
3.	Does Public Capital Crowd Out Private Capital? : Evidence From India	PRWP	05/31/96	WPS1613		1996
4.	Choices For Efficient Private Provision Of Infrastructure In East Asia	Pub	08/31/97	17093	yes	1997
5.	Uttar Pradesh : From Fiscal Crisis To Renewed Growth	SR	11/30/98	18633		1998
6.	Public Policy For The Private Sector		03/31/98	17728		1998
7.	Balance, Accountability, And Responsiveness : Lessons About Decentralization	PRWP	12/31/98	WPS2021		1998
Social Sector						
1.	Participation And Social Assessment : Tools And Techniques	Pub	04/30/96	17796	yes	1996
2.	Reducing Poverty In India : Options For More Effective Public Services	ER	06/29/98	17881	yes	1998
3.	The Evolution Of Poverty And Inequality In Indian Villages	PRWP	01/31/98	WPS1870		1998
Urban Development (5)						
1.	Why infrastructure financing facilities often fall short of their objectives (Vol.1)	PRWP	06/01/00	WPS2358		2000
Water Supply And Sanitation						
1.	Satisfying Urban Thirst - Water Supply Augmentation and Pricing Policy In Hyderabad City, India	WBTP	11/30/97	WTP395	yes	1997
2.	Water Resources Management Sector Review : Rural Water Supply and Sanitation Report	SR	01/28/98	18323		1998
3.	Water Resources Management Sector Review : Urban Water Supply and Sanitation Report	SR	06/26/98	18321		1998

Annex C

	Report Title	Report Type[1]	Date	Report #	Publi-shed?	Year
4.	Water Resources Management Sector Review : Initiating and Sustaining Water Sector Reforms	SR	09/29/98	18356		1998
5.	Water Resources Management Sector Review : Report on the Irrigation Sector (Vol.1)	SR	9/10/98	18416		1999
6.	Transferring irrigation management to farmers in Andhra Pradesh (Vol.1)	WBTP	06/01/99	WTP432		1999

Abbreviations:

CAS: Country Assistance Strategy
DWP: Departmental Working Paper
ER: Economic Report
EDI LRS: EDI Learning Resource Series
IDP: Internal Discussion Paper
ESMAP: Working Paper, Economic & Social Council For Asia & Pacific
OEDCS: OED Country Sector Study
PRWP: Policy Research Working Paper Pub: Publication
SR: Sector Report
WBDP: World Bank Discussion Paper
WBCS: World Bank Country Study
WBTP: World Bank Technical Paper

Annex D

Independent Reviews of India Water Sector Projects by the World Bank's Quality Assurance Group (QAG).

1. **Hydro-Power.** The QAG reviewed the on-going Nathpa Jhakri Hydro-Power project that was rated as "unsatisfactory at entry." The QAG review noted many cross-cutting issues that affect all hydro-power projects. The quality of projects at entry is the most important factor explaining project success, as it is very difficult to overcome design shortcomings later through supervision. It found that "the technical and engineering supervisions by Bank engineers have met the highest standards" and their advice was sought and heeded. However, projects were approved without adequate resettlement plans and resettlement was not properly supervised early enough, making the problems more difficult and costly to correct during implementation. The QAG stated that risks – on institutional capacity, financial viability and resettlements - were not properly analyzed at entry, eluded timely mitigation during implementation and needed to be constantly monitored. It found that bypassing an ineffective state agency and linking the project to a more trustworthy units of the central government did not work. There was too much focus on physical results and procurement issues at the cost of a dialog on the core institutional issues – how to reform and restructure financially weak, bureaucratic and politicized utilities (in this case the State Electricity Boards in Himachal Pradesh).

2. Urban Water Supply and Sanitation. Two projects were reviewed by QAG in this sub-sector - the Second Madras (Chennai) Water Supply and Sanitation project and the Bombay (Mumbai) Sewage Disposal project.

3. The QAG stated that the Madras Water Board was the best utility visited by them in South Asia. The Second Madras Water Supply and Sanitation Project has the prime objective to increase the supply of water to the urban areas in Madras. QAG found that it had a committed, competent and result-oriented management and that considerable progress was being made on solving institutional and pricing problems and in gaining access to private capital markets.[1]

4. On the Bombay Sewage Disposal project, where the objective was to construct two huge sewerage pumping stations and out-falls deep in the ocean to carry away Bombay's ever mounting sewerage, the QAG review noted that the project will meet its objective of reducing pollution in the city. Although the treatment plants are among the largest in the world and their design and construction is a huge challenge, the physical work is going well. A particularly innovative feature is a component designed to build one million public toilets for the urban poor in city slums.

[1] The project had persuaded the state government (Tamil Nadu) to allow the utility to set tariffs, and take procurement decisions to its Board (something that cannot be conceived of as yet in Mumbai for example). The bill collection rate had significantly improved (to over 90%), the labor productivity had doubled in 5 years. A number of pilots to subcontract services to private vendors had been successfully implemented. The utility expects to raise funds from domestic capital markets by selling its own bonds, having already obtained a favorable credit rating. A restructured project (after cancellation of large pipeline component that was supposed to bring in water from long distances and is non-viable) will reduce unaccounted for water and raise operational efficiency and financial viability of the utility. The quality of supervision was deemed satisfactory throughout. It did note several design problems including the inclusion of a very high cost component (250 km pipeline to bring bulk water to Madras) "without proper due diligence" under political pressure and the predication of the project on the risky assumption that Tamil Nadu would not get its share of inter-state water from the Upper Krishna scheme, which in fact it did, forcing a cancellation of the component and restructuring of the project with a substantial cost of time and money.

5. The QAG noted several cross cutting issues that were common to all UWSS projects. While the choice of projects seem to have been driven mainly by the investment needs of the borrowers, the physical objectives and procurement aspects were crowding out the development objectives including enhanced performance and utility capacities. More seriously, none of the projects was embedded in any coherent sector strategy and failed to address sectoral issues at the national or provincial level. The projects were not preceded by any comprehensive sector work or agreement with the borrowers on the long term policy and institutional reforms program. Client ownership to many components and reforms was weak or non-existent, and the core policy issue of non-performing public utilities remained unresolved because the hard choices of requiring institutional change – enforcing hard budget constraints for the utilities with proper regulation or their privatization – were not even tackled. Thus the QAG's finding is consistent with OED's evaluation.

Annex E

Water Development in India

1. Since independence, India has placed a high priority on the development of its water resources, particularly for agriculture and hydropower. Initially, following partition of the Indus Basin which gave India only 20 percent of the Punjab's irrigated area but forty percent of its population of 46 million, most of the early development was to provide compensatory irrigation to replace the Punjab 'bread basket' and develop the arid north-west. The contentious nature of the 13-year dispute over the Indus waters, solved by the Indus Treaty of 1960, highlighted the importance of water to India's economy and to the Bank which had facilitated the process. Indeed, Nehru in a famous phrase referred to large dams and irrigation projects as "the temples of modern India."

Irrigation

2. Irrigation was seen by policy makers as the flagship of water development. Under assured irrigation, crop yields doubled and encouraged use of complementary inputs that led to the Green Revolution. As a result, government policy over the next 30 years was devoted to expanding irrigation on a project-by-project basis that was seen as key to augmenting food production, rural employment and incomes. And this policy was successful because there were few water resource constraints to development, a situation that is now rapidly changing. Between 1950 and 1997, net irrigated area grew from around 21 million to over 48 million ha, and gross irrigated area under all crops approached 90 million ha.[1,2] And the cropped area planted to high yielding varieties increased from 17 percent in 1970 to 55 percent in 1994 but with considerable regional variation-from 90 percent in Punjab to only 16 percent in Rajasthan.

3. India is only slightly behind China in terms of irrigation area and together they account for almost 40 percent of the world's irrigated area. Overall, irrigation in India sustains about two-thirds of agricultural production which provides about 28 percent of India's GDP and 67 percent of employment. [3] As a result of increased agricultural production from irrigation, food grain prices fell about 20 percent relative to the price index for all commodities over the period 1970-86 with major consumption benefits for the poorest. It also has secondary multiplier effects of 2.2 on non-farm incomes stimulating increased output in manufacturing and tertiary activities.

4. Most of the Central government's efforts went into assisting States on a grant basis to construct large-scale canal irrigation projects, fed either by river diversions or new dams, and these doubled the area from 8.2 to about 17 million ha over the period 1950-91. A few of these projects, such as the Bakra-Beas, Subareneka and later Narmada, were multi-purpose and provided hydropower, irrigation and flood control. Traditional surface water irrigation, mainly

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[1] Net irrigated area is the potential area served by irrigation, gross irrigation is the total area irrigated and generally covers up to two crops a year, but in some areas, three.

[2] Irrigation coverage is uneven reflecting the widely ranging agro-climatic zones and water endowments. Thus in the arid northeast, about 90 percent of all crops in Punjab are irrigated while in the more humid eastern states-for example West Bengal and Orissa-less than a quarter are.

[3] Estimates of the contribution of irrigation to total agriculture production vary, but recent research indicates it may be in the range 55 to 78 percent of total food production, and 95 percent of non-food production. Hazell and Haggblade, 1990.

from tanks in the south, contributes 3-4 million ha but has had little attention from the public sector. Helped initially by public sector pilot projects and by rapid rural electrification, highly subsidized power, and focused rural credit, private sector groundwater-based irrigation took off rapidly during the 1970s and its 17 million wells provide 24 million ha or more than half of India's irrigation. In drought years, groundwater is the primary reliable source for irrigation. It is also the primary drinking water resource for over 950 million people.

Table E1: Water Supply: Demand Balance (BCM)

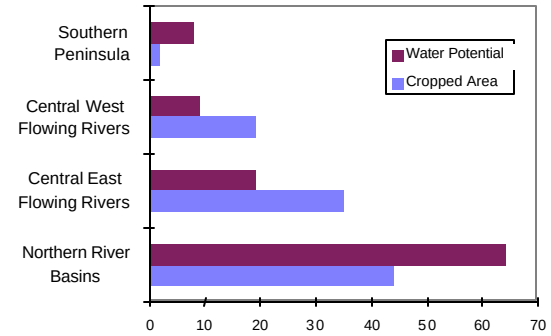
Demand Sector	1990	2025	Increase
Domestic	25	52	108%
Industrial	67	228	240%
Irrigation	460	770	67%
Total	552	1,050	90%
Supply	1,140	1,140	-
Amount Utilized	48%	92%	44%

Source: Inter-Sectoral Water Planning and Allocation. GOI, 1997

Water Resources Management Problems

5. India's water resources are under increasing stress (Table E1). Annually, rainfall and snowmelt generate about 1,870 billion cubic meters (BCM) surface water runoff. Because most of this occurs in the four-month annual monsoon and the relatively inaccessible waters of the Brahmaputra-Barak system of eastern India accounts for almost a third, only about 37 percent or 690 BCM can be utilized. Groundwater resources are estimated at 452 BCM. Actual utilizable water resources may differ from the total of 1,140 BCM because "the resource estimates [of surface and groundwater] have been made independently by the two organizations. In view of this, the inter-action between the two resources and the change in utilization possible from one source because of the development of the other source may not have been fully considered in the figures."[4] Even then, regional water availability is poorly matched to cultivated land area (Figure E1). Indeed, the SA Region estimates that of India's 20 major river basins, the six draining the Deccan have water scarcity, and by 2025 this will have increased to 11.

Figure E1: Water and Land Resources are Mismatched



6. By 1990 about half of the country's readily available water had been utilized and it is estimated that by 2025 this will increase to 95 percent (Table E1). While the irrigation sector remains the biggest consumer, its share will decrease as India urbanizes and industrializes and the population increases by about 47 percent from 950 million at present to 1,400 million.[5] It is possible that agricultural demand may be overestimated as the estimates of river water diversion assume that all the diverted waster is consumed whereas more than half is recycled either to groundwater or through drainage.

7. Groundwater supplies 80 percent of the rural and 50 percent of the urban population. Its rapid utilization for irrigation is in direct competition with drinking water supplies and has led to the need to replace dried-up drinking water wells, as well as greatly increased pumping costs and agrochemical pollution in many parts of India. Areas identified as being at risk from overdraft increased at a continuous rate of almost six percent over the period 1984-93, and if this continues over 35 percent of India's groundwater will be at or near permanent depletion within 20 years. Externalities of excessive groundwater abstraction include the drying up of rivers that have important environmental benefits, including effluent dilution to acceptable levels (Box E1). Other

[4] CWC 1988. "Water Resources of India." Publication No. 30/88. The estimates of surface and groundwater were made by the Central Water Commission and the Central Groundwater Board respectively.
[5] World Bank, 1997. India: Sustaining Rapid Growth - A World Bank Country Study. Washington DC

problems include saline water intrusion. Notable cases exist in Chennai, in the Mandevi and Mundra districts of Gurjarat, and from drawing fossil saline groundwater into fresh water aquifers in Haryana. A principal cause of excessive groundwater abstraction is the high level of subsidies for irrigation wells, flat-rate power tariffs and the fact that withdrawals are unregulated and available on demand, unlike the large public surface water irrigation supplies.[6] In addition, there will be substantial increases in pumping costs as water levels decline, and under the flat rate tariff this is becoming an increased burden for state governments.

Box E1: Groundwater and Stream flow in Gujarat.

In Ahmedabad, groundwater abstraction by the Municipal Corporation in the 1960s and early 70s caused groundwater levels to fall at a rate of 1.5-2 m/year. As a consequence, the dry season flow in the Sanbrmati river that was fed by groundwater declined to almost zero. Because the Sabrimati was the receiving waters for effluent, its pollution levels increased dramatically such that the Central Pollution Control Board (1989) stated "the Sabrimati becomes essentially a trunk sewer" CPCB recommended that "the real key to the success of any effort to restore the Sabrimati to any reasonable quality level will be to ensure minimum flows at all points and at all times in the river." And this can only be achieved through sound groundwater management.

8. While groundwater depletion is seen as a problem confined to the more arid areas of India, a significant and growing problem is waterlogging and alkalization of soils mostly associated with canal irrigation. Waterlogging is due to a combination of factors that affect groundwater levels but excessive irrigation water applications due to poor management and too little drainage are primary causes. Waterlogging depresses crop yields as farmers become risk averse on inputs, and in some areas in the northwest and Uttar Pradesh waterlogging led to salinization putting up to half a million ha out of production. All India estimates of waterlogging vary greatly, ranging from 13 million ha of which 6 million are waterlogged and 7 million suffer from salinity/alkalinity to a minimum of 1.6 million ha.[7] Solutions to water logging, as with water shortages, require that surface water and groundwater be managed together in an integrated manner sensitive to local environmental conditions.

9. A large part of both rainfed and irrigated eastern and central India, most of the eastern deltas, and localized areas within irrigation projects are subject to water logging and flooding during the monsoon. Although some 40 million ha is prone to floods, in a typical year only about 8 million ha are affected. Preventative measures successfully applied include flood detention in reservoirs, and river training using revetments and embankments. Environmental degradation through deforestation of hilly areas is a major contributing cause, yet some of the worst flood-affected areas in Bihar and UP are the result of unsustainable land practices in Nepal. Thus in addition to adopting a multisectoral management approach in India's watersheds, and providing infrastructure to mitigate flood damage, there is also a need to develop joint-management strategies with India's upstream riparians.

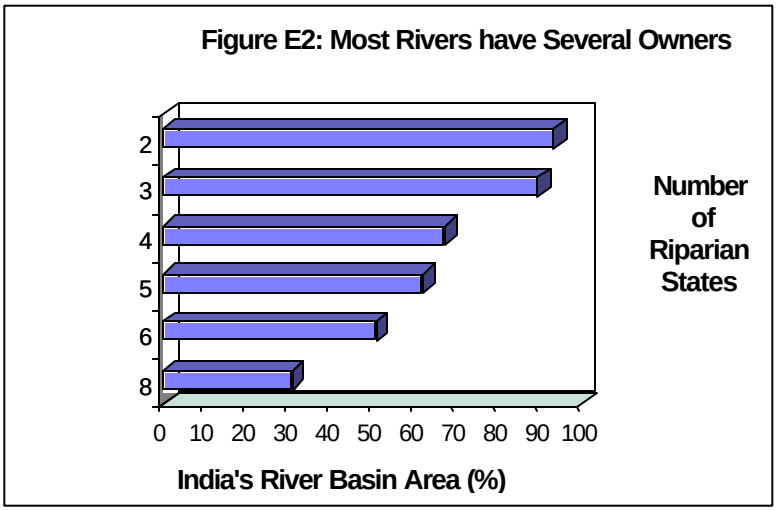
10. **Comprehensive Water Management**. A key impediment to sound water resource planning and management is that most of the larger river basins are shared by several states who manage their resources independently (Figure E2). And the four largest rivers accounting for more than half of India's river basin area are international watercourses. India successfully negotiated bi-lateral treaties with its neighbors on the Indus (1960), Ganges (1977, 1998, Gandak (1959, 1964) and Kosi (1954, 1966) even though international law would require that all riparians

[6] Recent research indicates that the huge demand the irrigation wells place on electrical power supplies leads to unacceptable load shedding, and in some areas of eastern UP farmers have switched to diesel power because the flat rate tariff is too expensive for *the water they actually receive.* A corollary of this is that the provision of unmetered power to the agricultural sector creates an accountability gap and hence opportunities for large unaccounted losses to the State Electricity Boards. Shah (1996).

[7] Mitra 1997; Ministry of Agriculture, 1990; Central Water Commission, 1990.

should be consulted. More recently, the 1996 Mahakhali treaty with Nepal has aroused intense animosity within the Nepalese parliament primarily because in many quarters it was perceived as being an "unequal" treaty.[8]

11. As surface and groundwater development accelerated in the 70s and early 80s, it became clear that the increased water resource utilization had a price. As the number of surface water abstraction projects increased, conflicts over water allocation arose primarily because in India's Constitution, water is a 'State Subject'. And under India's federal administration, the states have substantial autonomy over surface water utilization within their jurisdiction and complete control of groundwater. While the River Board Act of 1956 enables the government to set up a river board on any inter-state river, the boards' functions are solely advisory. The Inter-State Water Disputes Act of 1956 authorizes the government to refer any water dispute to a legal tribunal whose decision is final. However, the experience to date shows that the tribunal process is impracticable with huge foregone benefits because it takes decades to resolve water disputes.[9] Given that most of India's river basins are shared by more than one State, this has made simple water sharing a contentious issue and is a major roadblock to integrated river basin planning and economically efficient allocation of water.



Emerging Subsectoral Issues

12. By the mid-1980s it was apparent that even the successful surface water irrigation schemes were running into difficulties. Irrigation development appeared to be an end in itself and only weakly integrated into national and state's agricultural development work and extension services. Command area development (CAD) is separate from irrigation in most states yet both competed for a share of the state's budget despite the dependent relationship between the two.[10] There is considerable uncertainty about how much of the command area is actually irrigated and how efficiently. Providing sufficient funds to keep projects maintained and operational is a growing problem. And overshadowing them all are institutional and organizational constraints.

[8] Gyawali, Depak and Ajaya Dixit. Mahakhali Impasse and Indo-Nepal Water Conflict. Economic and Political Weekly, February 27, 1999. The Mahakhali Treaty will enable construction, *inter alia*, of the Panchaeswar dam (the highest rockfill dam in the seismically active Himalayas).

[9] Currently there are major unresolved disputes among riparian states over the waters of the Khrisna (Andhra Pradesh , Karnartaka and Maharashtra) and the Yamuna (Haryana and Uttar Pradesh). More recently following Tribunal, the Cauvary water dispute (Tamil Nadu, Karnartaka and Kerala) was awarded in 1991 but Karnataka contested the outcome. In 1998, the central government intervened and the riparians agree to the establishment of a Cauvery River Board.

[10] An OED review noted that the command area development (CAD) receives a 50% matching grant from the center and, given that it is effective at the lowest distribution levels of the irrigation project is very popular with farmers and politicians. Unfortunately, money allocated by the state to CAD under agricultural departments means that less is allocated to the irrigation departments and this jeopardizes maintenance of the main supply canals rending the CAD investment useless if the main supply fails.

13. Government makes annual estimates of the irrigation potential created and how much of that is utilized (Table E2), and it is seen that for public projects larger than 2,000 ha the difference averages about 4.4 million ha. How much of the unused irrigation potential could

Table E2: The Difference between Irrigation Potential Created and Utilized (million ha) for projects greater then 2,000 ha.

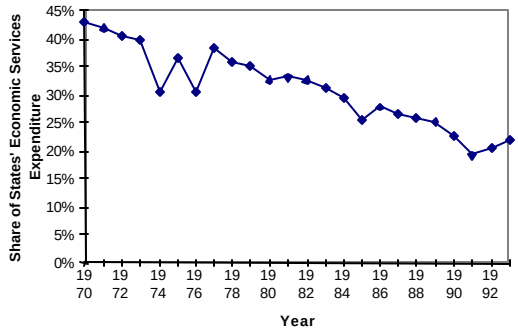
	1978-80	1980-85	1985-90	1990-92	1992-93	1993-94	1994-95	1995-96
Potential	26.6	27.7	29.9	30.7	31.1	31.6	31.9	32.3
Utilized	22.7	23.6	25.5	26.3	26.6	27.1	27.5	27.6
Unutilized	3.9	4.1	4.4	4.4	4.5	4.5	4.4	4.7

Source: CWC (1995)

actually be brought into operation is questionable because there is little systematically collected information about system status, farmers' water use, actual water availability and the potential economic benefits. Better monitoring and evaluation coupled with improved management could allow a strategy to be formulated. Research postulates that better management leading to an increase in water use efficiency of 10 percent would be equivalent to adding 14 million ha of additional gross irrigated area.[11] Apart from inefficient water use, one of the primary reasons for the increase in unutilized irrigation potential is disrepair of infrastructure due to lack of maintenance.

14. Finding sufficient financial resources to build, operate and maintain public sector irrigation has been a major challenge to central and state governments since the mid-1970s. Central government budget allocations for irrigation have declined from 22 percent of the First Plan (1951-56) to only 8 percent of the Eighth Plan (1992-97). Irrigation expenditure by the states has declined significantly since the 1970s (Figure E3). In the early 1970s it was the largest budget item among total expenditures on infrastructure (irrigation, power, roads, rural development and agriculture) accounting for more than 40 percent. But by the early 1990s, this had declined by half even though India was the largest spender on the agriculture sector among all Asian countries.[12] States' capital expenditure on power and irrigation, in marked contrast to roads and rural development, significantly exceeded revenue expenditures until the late 1980s, but by 1991 revenue expenditures (mostly wages and salaries) on irrigation outstripped capital investment.

Figure E3: Indian States' Irrigation Expenditure 1970-93



15. And at state level irrigation charges were allowed to dwindle for political and social safety net considerations, even as O&M costs increased. Most irrigation departments are small armies- sometimes exceeding 100,000 staff-that consume significant chunks of the state budget (in Andra Pradesh for example, during 1992-97 over 24 percent of the State budget). This makes their reform politically fraught given the strength of the public sector unions. This is not helped

[11] Saleth, R.M. 1996. Water Institutions in India: Economics, Law and Policy; Commonwealth Publishers, New Delhi.

[12] Compared with the Chinese government, in purchasing power parity terms agricultural expenditure was 16 percent higher and 13 percent higher in India if measured by the official exchange rate. Fan and Purdey "Government Expenditure on Asian Agriculture: Trends and Public Consequences." Paper presented at Asian Productivity Organization, Taipai, June 4-12, 1997.

by the power and vested interests of irrigation departments, and the general lack of strategic leadership because of high staff turnover.[13]

16. Systems for charging irrigation fees vary widely. In some states before 1996, Andra Pradesh, Karnateka and Tamil Nadu, irrigation charges were incorporated within the general land revenue levy; in West Bengal they vary only by season; in Kerala they are charged in terms of gross area irrespective of crops grown or season; and in Gujarat they are crop specific. Perhaps more remarkably, even as O&M rose rapidly since 1980, most state irrigation charges remained unchanged even as state budget deficits increased (Table E3). [14] Notable exception are Andra Pradesh increased its irrigation charges by 300 percent in 1998, and Mahrastra that.

Table E3: State Fiscal Deficits and Irrigation Rate Revisions in Selected States

State	Irrigation's Share of State Budget Deficits 1995	Year Irrigation Rates last Revised
Andra Pradesh	24%	1986
Bihar	na	1983
Gujarat	26%	1981
Haryana	na	1975
Karnataka	na	1985
Madhya Pradesh	30%	1990
Maharastra	16%	1989
Orissa	28%	1981
Punjab	16%	1974
Rajasthan	na	1982
Tamil Nadu	23%	1962
Uttar Pradesh	24%	1983
West Bengal	16%	1977

Source: Saleth (1996), Mathur (1996)

na = not available

17. Not surprisingly, the national average ratio of receipts to working expenses fell from 72 percent in 1980-81 to 34 percent in 1996-97. Even if this money had been used to finance O&M there would have been severe budget problems but, without exception, the charges collected went into the states' treasuries, and not to the Irrigation Departments that had to do the O&M: collection is divorced from operational needs. Given all the other calls on the states' budget-for example subsidizing electricity to agricultural sector-even less becomes available for irrigation O&M at field level. Indeed, in Andra Pradesh, the irrigated area fell 21 percent from 2.9 to 2.3 million ha between 1988-95 because of deteriorating infrastructure.

18. By the mid-1980s, there was a growing conviction within India's and the international water development community that not all large surface water projects were sustainable. Following abandonment of the Silent Valley Project in Kerala, a growing willingness to question government decisions about public goods involving common property resources allowed other projects to come under close NGO scrutiny. The Tehri hydroelectric project was subject to intense criticism and GOI was forced to convene a high-level review committee, while the externalities of the Narmada Sadar Sarovar Project, particularly enforced resettlement, became subject of public interest petitions in the Supreme Court. The dominance of water engineers is challenged at the highest levels (Box E2). Large irrigation projects are no longer seen as "the temples of modern India" particularly as the cost of environmental and social mitigation increase while the overall budget is shrinking, adding to already drawn-out project implementation. Similar problems affect the water supply sectors.

Water Supply and Sanitation

19. Since the Sixth Five-Year Plan (1980-85) and the launch of the International Drinking Water Supply and Sanitation Decade, India has substantially increased its commitment to the

[13] In Karnataka for example, there were 17 Chief Engineers over a period of six years during the period of the National Water Management Project (Credit 1770, 1987-95).

[14] For example, one study estimates that the share of wages and costs in O&M have increased from about 30 percent in the 1960s to 50 percent in the late 1980s (Svendsen and Gulathi, 1995).

water supply and sanitation sector. Sector investments are split 60:40 between rural and urban and have increased to about 3 percent of the national budget. Although the Constitution considers rural water supply and sanitation to be a state financial responsibility, central funding provides 40 percent of total investment. During the period 1985-95, an additional 22 million people in rural areas were supplied with water each year, a significant accomplishment even though the quality of service is very uneven. This investment has enabled provisions of public water supply facilities to about 600 million people or three-quarters of the rural population but only about four percent of this population has access to sanitation. Urban populations appear better served: 85 percent has access to water supplies and 48 percent to sanitation.

Emerging Problems

20. In both rural and urban areas, however, public service coverage and standards are poor and supplies are intermittent, and in many cases water is polluted and unfit for consumption.[16] Nationally, the government estimated that in 1994 more than 32 million of the rural population were not covered by public water supply facilities, 284 million were only partially covered, while less than half the population-303 million-had full coverage.[17] And coverage varied significantly by state: full coverage ranges from 7 percent in Kerala to 78 percent in Bihar. But these figures may be misleading because in Kerala for example, almost 70 percent of panchayat households rely on private water sources, yet state statistics on privately owned supplies are notably absent in public sector supply-led planning.[18]

Box E2: Roadblocks to Environmentally Sensitive Water Planning

"..environmental and other concerns continue to be regarded as disagreeable external inhibitions; they have not become integral parts of the planning from the start, despite many 'guidelines" and instructions to this effect. Everyone pays lip-service to those concerns, but the prime interest is in the engineering aspects. The implicit assumption is that water planning is essentially a matter for engineers. It is significant that the Central Water Commission which regards itself as the apex body for water planning in this country is not a multi-disciplinary body, but is merely a body of engineers."

Ramaswamy Iyer (1999)
(former Secretary GOI, Ministry of Water Resources),.[15]

21. **Rural Water Supply and Sanitation.** Like the irrigation sector, the approach to is supply-driven with little beneficiary participation. Central government remains financially committed to providing a minimum level of safe drinking water for all and bears the full cost that consumes 3 percent of the national budget. And the dominance of the central funding is a major hurdle to decentralizing planning to the state and local levels. Not only is it insensitive to local water resources constraints but it takes no account of user preferences or ability to pay. The lack of demand orientation constrains system performance and aggravates already inadequate service provision to the rural poor.

22. To meet central government's targets of full rural water supply coverage, total capital investment needs were estimated at US$5-6 million in 1997 and a third of this would be needed just for rehabilitation. Meeting the needs of expanding rural populations, replacement of dysfunctional assets, and higher service standards will require an additional US$5 billion. Achieving this over the next 10 years will require capital investment budgets 2.5 times existing

[15] Ramaswamy R. Iyer. 1999. *Water Resources Planning: Changing Perspectives*. Centre for Policy Research, New Delhi.
[16] Selvan (1989) found bacteriological standards were not met in 16 of 47 cities studied.
[17] GOI 1994 Report on Validation Survey. New Delhi: Rajiv Gandhi National Drinking Water Mission.
[18] Kerala Water Authority. 1992.

levels-clearly an unrealistic objective unless other funding mechanisms are developed.[19] Similar problems affect operation and maintenance whose total needs are estimated at US$830 million a year. The Rajiv Gandhi Mission estimates that of this total, US$286 million, or four times the current government allocation, is required just for physical works alone excluding staffing and establishment costs.

23. **Urban Water Supply and Sanitation.** Lack of adequate infrastructure to sustain commercial growth has been identified as one of the four principle constraints to the accelerated growth of the Indian economy.[20] And inadequate urban water supply and sanitation is major constraint to sustainable commercial and industrial growth. The problem is huge as the urban population of 244 million (1996) is projected to expand to about 660 million by 2025. While service coverage, particularly of water supply, is high it hides the fact that most consumers experience regular service shortages and receive supplies for only a few hours each day. For the 30 percent of the urban population who are below the poverty line, access is a major problem as most of the subsidy benefits go to the urban non-poor who receive individual pipe connections.

24. Government policy is not to provide sewerage to cities of less than 10 million and service latrines or defecation in 'open spaces' is the only alternative. As a result, about two-thirds of the low income groups in slum and squatter settlements have no alternative but to use 'open-spaces' for defecation with all the public health problems and loss of productivity that entails. The general lack of sewerage and wastewater treatment facilities invariably means that urban rivers are grossly polluted, a process that exacerbates water borne diseases. The situation is made worse in many areas because dry-season irrigation diversions reduces both water supply and the self-cleansing capacity of rivers.

25. Institutionally, the water supply and sanitation sector needs extensive reform. Although user charges are almost universally applied they have a weak relationship to the actual cost involved. There is poor monitoring of costs and little rigorous analysis to determine the financial viability of utilities. Like the rural subsector, there is little concern for the users' willingness to pay and what is affordable because of social concerns. Tariff structures are highly variable and there is a high degree of cross-subsidization from industry to the domestic consumer. Unaccounted for physical water losses are 25-50 percent because of poor maintenance. And like the irrigation sector, over-staffing is endemic with staffing levels 4-6 times greater per water connection than the South Asia regional average and 20-30 times greater than best international practice.[21] Thus any efforts to move towards full cost recovery will have to ensure that the inefficiencies of the public system are not passed onto the consumer. The commitment to major reforms is weak or non-existent. Due to controls on pricing and political interference, there is little or no incentive for participation by the private sector. But corruption and patronage is endemic.

26. There is a political economy dimension to the patronage in the form of bloated public utility establishments. The lack of adequate employment opportunities in urban areas in relation to exploding urban populations in a slow growing economy, has led to political patronage that uses governments as employers of first resort. This has clogged and politicized the public sector utilities and municipal boards (and other government institutions) with redundant employees and increased costs of operations. Public utility employees have also formed some of the strongest

[19] World Bank. 1988. India-Water Resources Management Review: Rural Water Supply and Sanitation Report.
[20] GOI: Approach Paper for the Ninth Five-Year Plan.
[21] Connections per 1,000 of population is a accepted measure of efficiency. Best international practice is 2-3 staff per 1,000 connections; south Asia regional average is 10 per 1,000 connections, while India is 40-60 per 1,000 connections.

unions in India which provide backing to political parties en-bloc in return for security of employment. Many public utility unions form the backbone of political parties in some states - such as the *Shivasena* in Mumbai and the CPI (Marxist) in Calcutta. There is little or no accountability and attempts to reform or privatize public utility operations leads quickly to job actions on part of employees – strikes, closures and work stoppages - further politicizing and disrupting services.

Too Many Actors

27. An unresolved issue cross-cutting all water subsectors is the number of different and independent institutions dealing with water at the center and state levels. While the Ministry of Water Resources through the Central Water Commission is the apex federal water planning advisory body, there are seven other federal-level organizations that perform different functions, mostly independently.[22] These are supplemented by 10 *ad hoc* Boards and Commissions with responsibilities for the execution of specific engineering objectives within river basins. Only two of these latter organizations-the Damodar Valley Corporation and the Bakra-Beas Management Board - have responsibility for river basin water planning and management. The Sone River Commission was wound up in 1988 after completion of a comprehensive plan for the multipurpose development of the basin.

28. There have been attempts by various agencies at the center and state levels responsible for water to take a multisectoral view but most of these have been frustrated by the institutional gap caused by a lacuna of appropriate institutions and procedures. There is a lack of intesectoral coordination on water at the national level and integrated water planning to identify and optimize water and complementary investment is lacking. Several cross-cutting issues such as allocation between irrigation and water supplies, pollution of drinking water resources and groundwater over abstraction require better coordination among the apex ministries. Within the states the situation is generally worse as each subsector follows its own interests frequently to the exclusion of the common good. Even then, responsibilities for water may be fragmented across several agencies, most notably for major and minor irrigation, groundwater, water quality and pollution control, environment, health and watershed management. Staff structures are dominated by supply-side engineers with limited presence of other disciplines which would be more able to deal with demand-led management, and environmental and social issues.[23, 24]

29. Incentives to improve public sector managerial and fiscal performance and accountability in most states are absent. Issues of governance, and transparency of state water agencies are still to be addressed, while corruption is still condoned in most states. Participation of beneficiaries and other stakeholders is nascent with one or two notable exceptions. Adequate and standardized water data are absent and imposes high uncertainties-and costs-on allocation and investment decisions. There are a number of regulatory acts related to water quality, but monitoring, if practiced, is uneven, and regulations are seldom enforced.

[22] In addition to CWC, these are: the National Water Development Authority responsible for water development studies of the Deccan river basins, the Central Board of Irrigation and Power, the Central Electricity Authority, the central Groundwater Board.

[23] Santhakumar et al.,. Planning Kerala's Irrigation Projects - Technological Prejudice and Politics of Hope. Economic and Political Weekly. March 25, 1995.

[24] Chadha, Ashish. Subrenarekha Project - Singbhum's Sorrow. Economic and Political Weekly, October 9, 1993.

Annex F

Comments from the Government of India

S.P. Vasudev A
Director (EA)
Ministry of Water Resources
Shram Shakti Bhawan
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New Delhi, India
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April 28, 2000

Dear Shri Bhaskar,

Subject:- India CAE/CAS Consultations

Please refer to your letters No.3/3/97-F8.11 dated 3rd March. 14th March and 6th April 2000 on the above cited subject. A note of this Ministry in this respect is enclosed herewith.

With regards,

Yours sincerely,

S.P. Vasudev A

Encl: as above

Shri V. Bhaskar
Director
Department of Economic Affairs
North Block
New Delhi

COMMENTS OF MINISTRY OF WATER RESOURCES ON EXECUTIVE SUMMARY OF SECTORAL EVALUATION CARRIED OU'T BY WORLD BANK FOR WATER RESOURCE MANAGEMENT

1. INTRODUCTION

Water is one of the most important natural resources vital for India's economic Development. The general objective of Water Resources Management in India is to make certain that adequate supplies of water of good quality is maintained for the entire population by preserving hydrological, biological and economical functions of eco-system adopting human activities within the capacity of unit of nature. Innovative technologies are being developed to fully utilise limited water resources and to safeguard this resource against evaluation. Water demand for irrigation is nearly 8396 of the total demand. However, due to urbanisation and industrialisation, the demand for domestic and industrial use is increasing rapidly. The increase in population is adding to this problem.

2. NATIONAL WATER POLICY

2.1 India has adopted a National Water Policy in 1987 which recognises water as one of the crucial elements in developmental planning. The policy document, inter alia, lays down that planning and development of this precious natural resource need to be governed by the national perspective. Resource planning in case of water has to be done for hydrological unit such as drainage basin as a whole or for a sub basin. All individual development projects and proposals should be formulated by the States and considered within the framework of such an overall plan for a basin or sub-basin so that the best possible combinations of options can be made.

2.2 Transfer of water from one river to another, especially if it involved inter-State transfer has always been a sensitive issue amongst the States. The policy document lays down that water should be made available to water-short areas by transfer from other areas including from one river basin to another, based on a national perspective, after taking into account the requirements of areas/basins.

2.3 On the issue of equity and social justice, the policy lays down that water allocation in an irrigation system should be done so that disparities in the availability between the head-reach and tail-end farms and between large and small farms should be obviated by adoption of rotational water distribution system and supply of water on a volumetric basis subject to certain ceilings.

2.4 The policy recognises water as a prime natural resource. A basic human need and a precious national asset and the planning and development of water resources need to be governed by national perspective. The policy has laid down that in planning and operation of systems, water allocation priorities should broadly be as follows.

- Drinking water
- Irrigation
- Hydro-power
- Navigation

- Industrial and other uses

However, these priorities might be modified, if necessary, in particular regions with reference to area-specific consideration.

2.5 The policy stipulates that adequate drinking water facilities should be provided to the entire population, both in urban and in rural areas. Irrigation and multi-purpose projects should invariably include a drinking water component, wherever there is no alternative source of drinking water. Drinking water needs of human beings and animals should be provided for in all irrigation projects.

2.6 The policy further provides that economic development and activities including agricultural, industrial and urban development should be planned with due regard to the constraints imposed by the configuration of water availability. There should be a water zoning of the country and the economic activities should be guided and regulated in accordance with such zoning.

2.7 Since adoption of this policy, all water resources development plans and projects are being implemented in accordance with it. Recently, the Government has announced its mandate to strive for harnessing the water resources of the country in an optimal manner so as to ensure that no available water is wasted and allowed to go to the sea. The mandate also provides for doubling the country's food production. Keeping in view the above policy decisions. as also the experience gained in the recent times on exploitation of water resources. the country is in the final stages of updating the existing National Water Policy to meet the future challenges.

3. MANDATE OF MINISTRY OF WATER RESOURCES

3. I Union Ministry of Water Resources is responsible for coordination, development, conservation and management of water as a national resource, i.e., for the general policy on water resources development and for technical and external assistance to the States on irrigation, multipurpose projects, ground water exploration and exploitation, command area development, drainage, flood control, waterlogging, sea erosion problems, dam safety and hydraulic structures for navigation and hydropower. Water Supply arid sewage disposal in Urban areas is handled by the Ministry of Urban Development. The water supply in rural areas is looked after by Ministry of Urban Development. The subject of Hydro-electric power and thermal power is dealt with by the 'Ministry of Power and Central Electricity Authority. Water pollution and environment control comes under the purview of the Ministry of Environment and Forests.

3.2 Water being a State subject, the State Governments are primarily responsible for use and control of this resource. The administrative control and responsibility for development of water rests with the various State departments and corporations. Major and medium irrigation is handled by the irrigation/water resources departments. Minor irrigation is looked after partly by water resources departments, minor irrigation corporations, Zilla Parishads/Panchayats and by the other departments such as agriculture. Urban water supply is generally the responsibility of public health

department and Panchayats take care of rural water supply. Government tubewells are constructed and managed by the irrigation/water resources department or by tubewell corporations set up for the purpose.

3.3 To promote better utilisation of created potential, Government of India provides assistance to States under Command Area Development Project for on-farm development activities and promoting rotational water supply system

4. BANK LENDING

The World Bank lending in the Water Resources Sector in the projects being handled by this Ministry since 1988 to 1998 was US$1.682 billion (Annaxure-I). At present, there are six Water Resources Projects being looked after by the Ministry of Water Resources with an outlay of US$1.44 billion as under:

1. Haryana Water Resources Consolidation project	- US$258 .00 Million
2. Tamil Nadu Water Resources Consolidation Project	- US$282.90 Million.
3. Orissa Water Resources Consolidation project	- US$290.90 Million
d. A.P. Irrigation Project-III	- US$325.00 Million
5. A.P. Economic Restructuring Project (irrigation component)	- US$142.00 Million
6. Hydrology Project	- US$142.00 Million
Total	**US$1,440.80 Million**

The future project will be based on conclusions pointed out in the sector review carried out by the World Bank in 1998 and discussions held in CAS every year. 1n the last two years meeting it was decided to have Water Resources Consolidation Projects in other States. Institutional development and reforms were also given top priority to have an early impact on water resources development. Based on this the following three projects are under active consideration of World Bank

(1) Rajasthan Water Resources Consolidation Project
(2) U.P. Water Resources Restructuring Project
(3) M.P.Water Resources Consolidation Project

5. WORLD BANK ASSISTANCE STRATEGY

There was no clear-cut World Bank irrigation sector strategy to guide investment in this sector up to 1990s. The assistance was mainly being provided for construction of dams and canals in the river valley projects to expand irrigation facilities. Linkages of water resources to the other sectors of development such as agriculture and land development was not touched. However, this strategy changed with the launching of Integrated Water Resources Consolidation Projects in the States of Tamil Nadu, Orissa and Haryana in 1994 -1995. Reforms were also initiated in Water Resources Sector with the launching of these projects. Andhra Pradesh Irrigation Project-III, which was mainly a Water Resources Project for completion of Sri Ram Sagar and Sri Sailam Reservoirs and the connected canals, was also actually an integrated water resources project.

The reform agenda in these projects contained the components of institutional strengthening. involving people in management and operation & maintenance of water projects through the constitution of Water Users Association, cost recovery by increasing the water charges for carrying out operation and maintenance including part of investment cost etc. **Institutional strengthening** is being undertaken of the irrigation/Water Resources Departments in these States, so that they become responsive to people's needs and aspirations. The role of Irrigation Managers is being shifted to that of a facilitator. **Restructuring of irrigation/Water Resources Department** is being done by including integrated MIS system for information management, modernisation office equipment like computerisation. telecommunication. right sizing of the Departments and Human Resources Development through exposure to new techniques and areas including specialised training abroad. All these projects have a component of recovery of O&M cost, where there is a provision to provide incentives and enforce the cost recovery of the irrigation projects by increasing the water charges for O&M and part of investment cost. The preservation of quality of environment and ecological balance is also being enforced through the formulation of environmental action plans and consequently enforcing their implementation. Beneficiary participation is being given due importance through the constitution of Water User's Associations. **These Water Users Associations** are also being given power to effect the recovery of water charges and consequently carry out operation and maintenance of the irrigation channels. The World Bank was instrumental in helping Government of Andhra Pradesh to come up with a policy document on involving people/beneficiaries participation in Water Resources Projects and similar policies are likely to be issued by Rajasthan, and Uttar Pradesh in near future when World Bank aided projects are taken up in these States.

6. FUTURE STRATEGY

Although the World Bank assistance in Water Resources Sector in India as indicated above has taken into account various clauses of the National Water Policy 1987 and was also the recent trends in the Integrated Water Resources Management. The following components need attention in future projects.

6.1 Water Resources Development Strategy

India is still to develop a large part of its water resources potential to meet the growing demand of our rising population. Participation of beneficiaries and stakeholders in this process is very important and crucial to ensure sustainability. Government is, therefore, promoting participatory approach for development and management of water resources. World Bank assistance for expanding irrigation facility would continue to be needed.

6.2 Attitude of the people towards participation

The World Bank-aided project in-hand, although they have a component of people's participation in the operation, maintenance and management of the water projects through the constitution of WUA, people are not involved in the formulation of the project. To have complete involvement of the people in any natural resources development project, they have to be involved right from the planning. preparation and implementation stage of the project. Secondly, the people's participation in development

will only be successful, if those people participates have got attitude towards participatory approach in water resources development. To some extent, such an approach was followed in A.P.Economic Restructuring Project in Andhra Pradesh. It is therefore suggested that this aspect may be taken care of in the future projects to have appreciable effect. This can be done through training in initial stages of project implementation.

6.3 Conjunctive Use of Surface and Ground Water

Integrated coordinated development of surface and ground water although is a part of some of the World Bank projects under implementation, due importance that it requires has not been given to the conjunctive use of surface and ground water. It, therefore, suggested that the importance that it deserves may be given to it in future projects.

6.4 Water as a Socio-economic Good

Since water is a basic need with safe drinking water, sanitation and irrigation for adequate food production for all and is also required for hydra power, industries and various other uses, water should be treated as a socio-economic good. Water rates should be adequate to cover the annual maintenance and operation charges and a part of the fixed costs and should convey the scarcity value of the resources. However, the paying capacity of a large number of small and marginal farmers the large population below poverty line has to be kept in view while fixing the price for various use and sections of the society.

6.5 Procurement procedure

Bank procurement procedure has led to poor utilisation of funds in many projects and therefore, there is need to review and simplify the procedure.

7. CONCLUSION

The need for water resources development for overall social and economic development of this country was duly recognised at the very outset of the commencement of the country's plan period. Accordingly, systematic water resources development works have been carried out since the inception of plan period and as an outcome of this effect. India is now marginally surplus in food. Irrigation potential created stands at 91.8 million ha. as against 22.6 million ha. in 1951 and with this the food production which was only 50 million tons in 1951, has increased to about 200 million tons at present. In spite of these, we cannot afford to brook complacency as we have to go near to achieving ultimate irrigation potential of 139 million ha. assessed for this country. The World Bank can facilitate the achievement of this irrigation potential through technical and financial assistance and increasing its assistance as suggested in this report.

Annex F

Annexure-I. WORLD BANK ASSISTANCE DURING 1988-1998

Name of the Project	*State*	*World Bank assistance (Million US$)*	*Assistance utilised (Million US$)*	*Date of commencement/ closing.*
Upper Krishna Irrigation Project-III	Karnataka	165.00	167.50	6/1989 6/1/1997
Punjab Irrigation & Drainage Project	Punjab	145.29	161.06	2/1990 7/1998
Dam Safety Assurance & Rehabilitation Project	Multi-state	92.97	82.22	6/ 1991 9/1999
Haryana Water Resources Consolidation Project	Haryana	258.00	136.11	4/1994 12/2000
Tamil Nadu Water Resources Consolidation Project	Tamil Nadu	282.90	78.77	9/1995 3/2002
Hydrology Project	Multi-state	123.00	35.93	1/1996 3/2002
Orissa Water Consolidation Project	Orissa	290.00	127.63	1/1996 3/2002
Andhra Pradesh Irrigation Project III	Andhra Pradesh	325.00	75.44	6/1997 1/2003