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COST RECOVERY IN IRRIGATION PROJECTS:
PERCEPTIONS FROM WORLD BANK OPERATIONS EVALUATION

by

Paul Duane

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A. Introduction

1. This paper derives from a recent report by the Operations Evaluation Department (OED) on cost recovery in World Bank financed irrigation projects.^{2/} The main chapters of this report (hereinafter referred to as the OED cost recovery study) are reproduced, with some slight editing, as Appendix I to the paper for ease of reference. They convey the important empirical findings about the extent to which costs of Bank-assisted irrigation projects have been financed or offset directly through payments by irrigation beneficiaries, and they provide an informative account of Bank policy on this subject. With this information as background, the paper does two things: first, it provides a summary and personal interpretation of the findings of the OED cost recovery study; and second, it seeks to offer several independent observations on cost recovery analytics and to identify fresh perspectives from which to examine selected cost recovery issues.

^{1/} The author is a Senior Evaluation Officer in the Operations Evaluation Department (OED) of the World Bank. Many others contributed to this paper indirectly. Numerous colleagues toiled on OED Report No. 6283, the source of the material in Appendix I: principally Ernest Smerdon (counselant), Christian Polti, Gottfried Ablasser, and Ian Carruthers (consultant); their Report also incorporates comments and insights from a large number of Bank staff. The balance of this paper has benefitted from valuable comments on an earlier draft by Gottfred Ablasser, Jose Olivares, and Robert van der Lugt, but the contents represent the views of the author alone. They do not represent the views of the Bank or OED.

^{2/} OED Report No. 6283, "World Bank Lending Conditionality: A Review of Cost Recovery in Irrigation Projects." June 25, 1986.

B. OED Cost Recovery Study - An Interpretation

2. The OED cost recovery study is an important document for three reasons: first, it describes the Bank's evolving policy on cost recovery in irrigation projects; second, it reports on the extent of Borrower compliance with the Bank's loan conditions in respect of such cost recovery; and third, it lists a number of factors that have impeded this compliance. Nevertheless, its direct implications for policy are constrained by the project experiences actually examined. It is quite normal for irrigation investments to require seven years or more between project approval and completion, and more time still is required to evaluate project performance. Consequently, the accumulated irrigation project evaluations available to OED for study were limited in most cases to projects approved before the second half of the seventies. All 48 such projects reviewed were subject to the Bank policy regime in effect from 1971 to 1976.

3. Before 1976, Bank policy required recovery of operation and maintenance (O&M) costs as a minimum, and investment costs to the extent practicable, recovery being measured in terms of direct water-related charges collected from irrigators. The Bank's policy changed in 1976, stressing three objectives as the basis for cost recovery: economic efficiency, income distribution, and public savings. The new policy also favored water charges that could be levied progressively. In 1984 new policy directives were issued which strongly emphasized concerns about the financing of O&M (see Appendix II). The major empirical findings of the OED cost recovery study relate to the earlier, pre-1976 policy of the Bank and not to

4. The study's findings show clearly that the levels of Borrower cost recovery in irrigation projects have fallen well short of what the Bank had desired or expected. In at least two-thirds of the projects reviewed the covenant requiring that cost recovery match the needs of O&M funding had not been complied with. The proportion of O&M costs recovered was frequently between 15% and 45% only. There were very few cases where capital costs were recovered. The study also notes that operation and maintenance of irrigation systems was considered satisfactory at audit in only about one-half of the projects.

5. This limited adherence to covenants on cost recovery has had three main causes: lack of government commitment, unreliable water supply due to poor O&M of irrigation systems, and the often heavy burden of direct and indirect taxes already imposed by governments on the farming sector. The response of the Bank to non-compliance with cost recovery covenants has varied, ranging from the extreme of refusal to consider further financing of irrigation projects to no reaction at all.

6. There are several sets of lessons from this experience. First, concerning government commitment, the study observes that:

- (a) the Bank's stated cost recovery objectives are not in harmony with some Borrowers' policies on cost recovery. A clear example is India's policy of not expecting its irrigation projects to be self-sustaining, while the Bank continued to invoke in its legal documents the need for stronger recovery efforts;^{3/}

^{3/} See details in Appendix I, para 3.25.

- (b) sound cost recovery policies are not easily implemented through covenants on a project-by-project basis; sector and policy-based lending operations may provide a better opportunity;
- (c) inconsistencies between contemporary and historic policy goals (of lender and borrower) may explain in part the non-enforcement of covenants. With a progression of (Bank) policy regimes, it is difficult to determine which regime is applicable, and the Bank could well have undermined government commitment simply by changing its own policy.

7. Second, regarding irrigation system operation and maintenance, the study concludes that:

- (a) adequate O&M of irrigation investments is necessary for a reliable water supply, which in turn is a necessary though not a sufficient condition for profitable farming and hence, for cost recovery. In many instances farmers were unwilling to pay water charges because the amounts of irrigation water supplied to them were inadequate or unreliable. It is therefore much more important for the Bank to insist (generally through covenants) that adequate funding for O&M of primary and secondary canal systems be provided.
- (b) only slow progress has been made in establishing water users' associations to look after tertiary systems. Thus, O&M of tertiaries has frequently been inadequate.

8. Third, concerning the burden of other taxes on the farming sector and the scope for direct irrigation cost recovery, the study observes that:

- (a) sometimes, other taxes are needed if there are fundamental Borrower objections to direct water charges; for example, religious traditions might proclaim water to be a free good, or political necessity might require that public irrigation services be financed from general revenue. Sometimes, the burden of other taxes limits farmers' willingness and capacity to pay direct charges. Bank policy should allow for such exceptions.
- (b) any direct recovery system should be simple and understandable by farmers. By mixing cost recovery and income distribution objectives and focussing upon incremental incomes, the more recent Bank policy runs the risk of being too ambitious and of confusing Borrowers and farmers.

9. This brief summary of OED's cost recovery study is meant to encourage a full reading and perusal of Appendix I. Such a reading is highly recommended, as it will give the reader a better appreciation of the current dilemma that, in my opinion, so clearly confronts the Bank. This dilemma concerns what the Bank should do in the face of widespread non-compliance with these lending covenants. On the one hand, it would seem that such covenants are unenforceable and that, on these grounds alone, the Bank should abandon them. On the other hand, a devil's advocate can still argue that weak compliance is a result of weak enforcement and/or of an unconvincing, not-comprehensive-enough policy. The OED cost recovery study has provoked such challenging questions and the World Bank is currently trying to seek answers. As a contribution to that debate the next part of the paper reflects on several issues of cost recovery analytics which I believe could benefit from either different approaches, or different emphasis.

C. Some Perceptions of Cost Recovery Issue

10. I would like to suggest that the problems of cost recovery that have been most persistent for Bank staff arise in three areas:

- the linkage of O&M deficiencies to inadequate cost recovery;
- the notion of recovery through indirect taxes; and
- the linkage of irrigation finance with economic efficiency.

In addition, a fourth topic, concerning whether irrigation agencies might operate better as financially self-reliant public utilities, also needs to be discussed.

Linkage of O&M Deficiencies with Cost Recovery

11. It has always seemed incongruous that 1971-76 Bank policy insisted so firmly on a recovery equivalent to O&M costs as a minimum, when there were, in fact, no prevailing uniform institutional arrangements among borrowers to guarantee that such payments by direct beneficiaries would result in the actual funding of O&M.^{4/} The precise origin of this policy feature is obscure. The most plausible explanation is a fiscal one: namely, the concern that project O&M costs should not become a burden on the government recurrent budget. But there has always been the hint of an implicit behavioral assumption: namely, that irrigation project entities could be induced to behave like public utilities - e.g., electricity supply, port, and potable water supply authorities - which are commonly set up as autonomous agencies, reliant on their own generated commercial revenues. The

^{4/} Bank Staff Working Paper No. 218, July 1975, "A Policy Framework for Irrigation Water Charges", by Paul Duane (paras. 1.34 - 1.37).

idea that the public utility model was an inspiration for this policy feature derives from the (author's) perception that many Bank staff have regarded a minimum recovery of O&M costs as a contribution towards the "efficiency" objective of water charges, their notion being that adequate recovery would help support adequate O&M. Yet Borrowers' irrigation entities are invariably a part of regular Government departments and Ministries, without financial autonomy, and wholly dependent on the Government budget. Their very existence in such a form - accountable directly to a Government Minister - is a notable expression of Borrower desire to keep such agencies firmly within the political domain where there is maximum opportunity to exercise discretion and minimum constraint from the rules of commercial undertakings.

12. Such a notion--that irrigation finance can mimic the public utility model and obtain some of its benefits without the necessary institutional reform--has had three unfortunate consequences. First, it has delayed the proper (Bank) recognition and enforcement of stronger, more direct covenants that Borrowers should finance O&M properly, without regard to sources of revenue.^{5/} Second, it has obscured the need to interpret and apply Bank policy on overall recovery (concerning O&M and capital costs) according to the varying motives upon which Borrowers base both their support of public sector irrigation and their recovery of associated costs. And third, it has

^{5/} There is evidence of such recognition in the March 1984 Policy note reproduced in Appendix II - see its paras. 27 and 29(a).

fostered a myth that inadequate O&M is somehow the fault of inadequate cost recovery.^{6/} Given the institutional arrangements that are typical for public irrigation, poor O&M reflects simply the low priority accorded by most Governments and their irrigation agencies to O&M relative to capital expenditures for new projects.^{7/} The most effective ways in which the Bank and other lending agencies can redress this imbalance is for them to offer persuasion in favor of more rational priorities, and to help finance O&M activities directly, learning from this experience also what other factors have given these activities their lowly status.

Should Irrigation Agencies be Organized as Public Utilities?

13. But there is also a school of thought which argues explicitly that irrigation agencies, in virtually all of their activities, should be public utilities. That argument requires that all or most aspects of public irrigation (to the extent they are not "privatized") -- irrigation construction, operation and maintenance services -- should be financed ultimately by voluntary, contractual obligations of direct beneficiaries to

^{6/} The OED cost recovery study observes that 70% of the projects with data available for study "had the anticipated association between revenue performance and O&M standards." But it goes on to say: "It cannot be assumed that this is a causal relationship, nor, if so what is the direction of causality", Appendix I, para. 3.06.

The claim that a myth has been propagated is not too different from that made by Sfeir Younis, who described as one of planner's myths that water charges promote "good" O&M. A. Sfeir Younis, AGREP Division Working Paper No. 84, "Irrigation Water Charges and Cost Recovery Policies: A Policy Perspective", The World Bank, October 1983, para. 3.29.

^{7/} It can be further argued that this low priority is reinforced by external aid being limited to capital projects.

pay all costs. Under such a discipline, the very survival of public irrigation would depend on cost recovery of all capital and recurrent costs, in the same fashion as does the survival of private irrigation.

14. Advocates of this type of institutional reform 8/ foresee many advantages. They favor the public utility solution because it:

- avoids a drain on government budgets
- provides a more certain guarantee (than does benefit-cost analysis) that irrigation investments are worthwhile;9/
- reduces the political pressures that bias irrigation designs towards maximizing the number of beneficiaries, rather than efficient production; and
- affords more direct public accountability and control over public irrigation agencies and their staff.

15. There is no reason why this philosophy of irrigation finance should not sit well with the Bank.....if it can find Borrowers who are also willing to try it. Naturally, such a method of finance will (continue to) draw opposition in Borrower countries from the special interest groups that profit from the irrigation subsidy arrangements that are now so common. This

8/ A comprehensive statement in favor of this position is given by Robert Repetto in "The Role of Appropriate Incentives in Improving Irrigation Performance" World Resources Institute, Washington, August 1986.

9/ Repetto argues that much of the observed demand for public irrigation projects is generated by rational, rent-seeking behavior of potential beneficiaries, who recognize the value of, or rent from, obtaining something for less (often much less) than full cost. His principal examples of this kind of behavior, stretching over a long period, concern the lobbying for subsidized federal government water projects in the U.S.A.

is also likely to block any early, broad adoption of such an approach as Bank policy. But the approach deserves support at least on an experimental basis to test its potential -- especially for reaching smallholder farmers and for building political consensus on the viability of self-financing public irrigation.

The Notion of Recovery through Indirect Taxes

16. However, in the real world, there is at present strong political pressures for public irrigation and weak government support for direct cost recovery. In this situation, the Bank has continually sought to interpret which government revenues should be counted as recovery. The basis for such determination has been some recognizable payment or transfer by direct beneficiaries, be it:

- direct irrigation charges (including betterment levies)
- producer transfers to consumers as a result of low statutory domestic prices for commodities that, in the absence of Government intervention, would have enjoyed higher prices in domestic markets^{10/}, or
- general taxes on land, commodity sales taxes, and taxes on agricultural exports.

17. The logic of this recognition process appears to have had its beginnings in the Bank's longstanding preference for direct charges, which had as their sole target, of course, direct beneficiaries. The other increased payments or transfers by these direct beneficiaries, comparing with- and without- project situations, for which they are liable on account

^{10/} Note, in passing, that such transfers to consumers do not constitute government revenue.

of general (but specifically agricultural) taxes or price distortions attracted more recognition the more such payments or transfers seemed exclusive to direct beneficiaries. The pertinence of other, more general taxes/distortions was never ruled out; but the search for recovery instruments bearing visibly on direct beneficiaries meant that they were not explored systematically.

18. This logical process of recognition has had three flaws. First, the admission of general taxes and price distortions as indirect recovery instruments has resulted in undue prominence being given to those taxes and distortions bearing on agricultural output. A serious shortcoming of having limited this focus so has been the increased inequities that result for those producers who do not use public irrigation water: rainfed farmers and private irrigators. The merits of expanding the focus to more general revenues is that any inequities are spread more thinly around the economy. It would be more useful in future analyses to take 100% recovery as a truism and to focus speculation on the distribution of the public irrigation cost burden among direct beneficiaries and other relevant groups. For example, if the direct beneficiaries of public irrigation are rice growers and rice exports are taxed, the other relevant groups to consider might be: rice growers using private irrigation, other private irrigators, rainfed farmers, urban rice consumers, and the rest of the economy.

19. Second, the relevance of offsetting subsidies, mainly for rural inputs, especially fertilizer subsidies enjoyed by public water irrigators, has tended to be overlooked. They should be counted, along with offsetting taxes, in the same broader calculus of who bears the burden of public expenditures.

20. Third, the original purposes of existing indirect taxes (and subsidies), which may have had an entirely different logic (from irrigation cost recovery), has been largely ignored. It is extremely difficult, and certainly wasteful, to restrict the more general analysis of public cost recovery to irrigation only. The myopia that is evident in recognizing certain indirect taxes as recovering irrigation costs, when such taxes can also be viewed readily as recovering other public expenditures, for example rural road costs, testifies to this. Consequently, any analysis of the distribution of the burden of public irrigation costs should probably be carried out in concert with similar analyses of who is bearing the costs of other public services.

21. Summing up, I believe that our options for analysing irrigation cost recovery, when recovery is not mandated by institutional arrangements as it would be in the public utilities model, are rather polarized. They are limited to: (i) restricting the analysis to direct charges only; and (ii) expanding the analysis to include all sources of public revenues, and to differentiate the economy into a larger number of groups to see who is bearing irrigation (and other) public costs.

Linkage of Irrigation Finance with Economic Efficiency

22. The circumstances under which (efficiency) prices can be employed to solve public water distribution and other water use efficiency problems are extremely limited. The new type of public tubewells that the Bank has helped finance in India in recent years allows for the possibility of some elements of water price-induced efficiency of operation, because they offer close to an on-demand irrigation service, and metering of water supplies can

be approximated. Even in this case, however, water supplies are typically rationed by roster, not by water charges. In the case of public sector gravity irrigation schemes, there are few practical working examples of efficiency pricing fit to study. Literature reviews offer examples of metering, negotiable water rights, and other means of encouraging trade in water across time and space. Yet the widespread practical use of these incentive systems for efficient water use is largely confined to economists' imaginations. Economists do not design such systems into public irrigation projects, partly because the client is not aware of their value, but ultimately because economists have not demonstrated their value under field conditions with the necessary research and development work. If there is indeed scope for employing such incentives, their realization will require the same kinds of experiments and demonstrations that have been recommended above for developing public irrigation utilities.

23. Cost recovery overlaps with general efficiency issues for irrigation in areas other than just water distribution and on-farm use. For example, the incentives for efficient O&M vary with the institutional arrangements for financing O&M. As discussed above (paras. 11-12), however, there is no point yet in the Bank advocating as policy the public utility model for O&M, even implicitly, as was the case perhaps with its 1971-76 policy, because most Borrowers have already adopted institutional arrangements that put O&M at the mercy not of irrigation revenues but of the government budget. The same holds true for concerns about the efficiency with which capital budgets for new irrigation projects are determined. Institutional reform towards the discipline that self-financing irrigation

requires ought to be tried, but the first requirement - even for experiment is interested Governments.

24. Greater efforts are needed in differentiating Borrowers who have different levels of sympathy towards user charges (rather than general revenue) for financing irrigation. Because these varying sympathies are likely to correlate with political characteristics of Borrower economies, some prior research in this area could also be highly beneficial. In fact, it is surprising that past analyses of recovery performance across countries have produced so few insights into the influence of a political economy factor on what, after all, is a decidedly political issue.

WORLD BANK LENDING CONDITIONALITY:
A REVIEW OF COST RECOVERY IN IRRIGATION PROJECTS 1/

I. BACKGROUND

1.01 Irrigation has been one of the largest components in Bank Group support for the agriculture sector. By late 1984, 278 irrigation projects, located in 52 countries, had received financing from the Bank. Total Bank lending for these projects, which together cost approximately US\$26.0 billion,^{2/} amounted to US\$10.9 billion.

1.02 The Bank has been concerned with the recovery of capital and recurrent costs in irrigation as these costs tend to be high compared with some other forms of agricultural investment and the opportunity cost of poor O&M continues to rise. It has been a constant Bank policy that irrigation investments should generate sufficient revenues to operate and maintain existing infrastructure and facilities, as well as to repay to the extent possible the irrigation investment cost.

1.03 The issue of cost recovery in irrigation projects is extremely complex for many reasons. As a case in point, the Bank favors the focussing of its loan programs on those population groups within developing countries that suffer the greatest poverty. To the extent, however, that irrigation projects are in areas where the people are very poor, the issue of the ability of these farmers to pay cost recovery charges constitutes a socio-political dilemma for the governments. However, for the most part irrigation farmers have a higher and more secure livelihood than other rural inhabitants and therefore an obligation to repay, at least in part, the public sector costs. Equity criteria are more and not less likely to require payment from farmers for irrigation services.

1.04 A second reason for the complexity of cost recovery is that the Bank's policy must apply to many different nations. This review showed clearly that each has different laws, customs and political attitudes toward cost recovery in investment projects-- particularly irrigation water charges. For example, there are cases where it is a fundamental belief that water should be free, and direct charges for the water, per se, may not be legal. However, there may not be any prohibition against charging for the services and facilities that are necessary for delivering water to the fields in a timely manner.

^{1/} Excerpts of OED Report No. 6233 dated June 25, 1986, Chapters I-III.

^{2/} Data on total project costs is available only for the period FY74-84, when Bank support comprised about 42% of total project costs. Using this same percentage for the period FY50-73, an aggregate figure of about US\$26.0 billion is obtained for total irrigation project costs.

1.05 A third reason for the complexity of the issue is that farmers, governments and the Bank all have a different perception of, and somewhat conflicting views on cost recovery. Furthermore, the views of individuals and institutions change over time as policy shifts and new insights modify perceptions of key issues. In these circumstances only a clear, uncomplicated, indicative policy is likely to succeed.

A. Purpose and Scope of the Study

1.06 A study issued by the World Bank's Operations Evaluation Department (OED) in 1982 reviewed the experience with legal covenants associated with World Bank lending operations in general. It found that compliance with such covenants had not been good and offered recommendations for reducing the extent of covenant violation. The Bank had been aware even before that study was undertaken that covenant compliance related to cost recovery in irrigation projects was particularly poor.

1.07 The main purpose of the present OED Cost Recovery Study is to analyze past practices of the Bank regarding cost recovery in irrigation projects, and to draw lessons from experience with cost recovery in completed and evaluated projects. Specifically, it endeavors to explore ways by which the Bank can improve the formulation of irrigation cost recovery covenants and conditions, and Borrowers' compliance with them. The main text first presents a reflection on the evolution of the Bank's policy in this respect. The core of the study is the review and analysis of the experience with cost recovery in specific Bank-supported irrigation projects. Special emphasis has been given to the regional dimension, in the Bank's operational set-up, with respect to the fulfillment of covenant provisions and the Bank's reaction to noncompliance with covenants.

1.08 The principal source of information for the study are Project Performance Audit Reports (PPARs) for 48 completed irrigation projects, this being all the projects in the irrigation subsector which had been evaluated by OED up to 1984. Although this group of projects represents only about 17% of all irrigation projects approved by the Bank up to that time, it constitutes the majority of those completed. The PPARs have been systematically reviewed in order to gain an overview of the experience with cost recovery in the respective projects. Other documents, particularly an OED 1981 Water Management Study and OED Impact Evaluation Reports, where available, also have been reviewed, and Bank staff involved in relevant aspects of cost recovery have been consulted. The results of this in-house review have been supplemented by field investigations in India, Indonesia, Mexico and Turkey-- countries in the four Regions where Bank support for irrigation development has been concentrated.

1.09 Full analysis of performance in relation to complex policy issues cannot rely solely on empirical analysis of PPAR's. An unprecedented response, in number and length of reply, from Bank staff to the draft of this report, elucidated valuable additional information. Three recent reports

from USAID and the Asian Development Bank^{3/} also provided useful insight. This large and valuable response to the draft study of performance in an increasingly important investment category (more than ten percent of the Bank investment in the 1970's) has led to a more normative form of review than is usual in OED reports.

II. THE BANK'S COST RECOVERY POLICY

2.01 The policy of the Bank on cost recovery in irrigation projects has evolved from a relatively simple formulation to one that is now fairly complex. Although an attempt has been made to retain the flexibility which is essential when a policy is to be applied to varied conditions in many different countries, there are numerous complaints that the current Bank policy, set out in OPN 2.10 plus the 1984 addendum, is too complex and is not easily applied in the field.

A. Past Cost Recovery Approaches

2.02 Almost all the completed projects which have been included in this review were appraised prior to 1976, when Bank policy was substantially changed. At the time of negotiation, therefore, all were subject only to Operational Policy Memorandum (OPM) No.2.61, issued on March 31, 1971. That policy began with the statement: "The recovery of all project costs from beneficiaries is a normal aim for projects financed by the Bank. However, agricultural projects are sometimes exceptions." The policy further stated: "As a minimum, operational and maintenance (O&M) costs should be recovered completely."

2.03 This policy of recovering O&M costs as a minimum, with the secondary objective of recovering a significant portion of the capital costs, was the one generally used in Loan Agreements of irrigation projects until 1976. Presumably, the reason for stressing recovery of the O&M costs as a minimum

3/ USAID, Irrigation Pricing and Management Report submitted by Devres Inc. to Office of Policy Development and Program Review, USAID Washington March 9, 1985.

USAID, Recurring Cost of Irrigation in Asia: Operation and Maintenance, K. William Easter, Water Management Synthesis II Project 1985.

ADB, Regional Study on Irrigation Service Fees: Final Report, Leslie E. Small, Manetta S. Adriano and Edward D. Martin. A report submitted by the International Irrigation Management Institute Sri Lanka, January 1986.

See also M. Svendsen (1986) "An unofficial donor perspective on irrigation system recurrent cost" paper to Overseas Development Institute, London, February 1986.

stems from the keen awareness that failure to provide adequate O&M tends to limit the success and sustainability of the project, and oftentimes, necessitates premature rehabilitation. Apparently, it has been assumed that if sufficient funds for O&M are recovered these would be allocated to O&M—an assumption that in most cases is not justified.

2.04 The Bank policy on cost recovery in general provides for the beneficiaries to pay for the investment cost of projects. One aspect of implementing the cost recovery policy relates to determining fairly who are the beneficiaries. Most certainly the farmers are beneficiaries, but others often benefit as much or more.

B. The Present Policy

2.05 The cost recovery policy was significantly changed in 1976, when the Central Projects Memorandum (CPM) No.8.4 reinforced the income distribution aspects of the Bank guidelines. One of the major changes introduced under the new policy was that project beneficiaries were to be charged progressively, in proportion to the incremental incomes generated by the project. Therefore, Bank staff were required to (i) identify the project beneficiaries and classify them into a number of income groups; (ii) estimate incremental incomes for each group; and (iii) design a selective and progressive tax system. To facilitate evaluation of the recommended water charges and benefit taxes, so-called rent recovery indices were to be calculated by Bank staff, and presented separately for beneficiaries in the following different income classes:

- (a) those with incomes below the critical consumption level (CCL);
- (b) those with incomes between the CCL and the national average;
- (c) those with incomes between the national average and twice the national average; and
- (d) those with incomes above twice the national average.^{4/}

2.06 CPM 8.4 instructed Bank staff to include information in appraisal reports and prepare related covenants on the following aspects:

- (a) general principles to be followed in determining the appropriate levels and structure of water charges and benefit taxes;

^{4/} There are clearly operational problems with establishing incremental farm incomes. For example one can cite the difficulty of explaining the concept of rent to a farmer on a tubewell drainage project where the benefits consist of damage avoided. It would also be hard to justify progressive charges for water but proportional charges for benefit.

- (b) the extent to which total (capital and O&M) public sector costs would be recovered, whether interest on the capital would be charged and, if so, the interest rate to be charged;
- (c) the cost recovery period and the grace period;
- (d) the submission to the Bank, for review and comment by a specified date, of the proposed schedule of water charges, benefit taxes or other assessments to be imposed and collected;
- (e) the appropriate institutional and administrative arrangements for monitoring progress of the project, the flow of benefits and the extent of water charges and benefit taxes;
- (f) the periodic review (at intervals not exceeding three to five years) by the Borrower and the Bank of the levels and nature of the schedule elements for cost recovery, taking account of changing price levels; and
- (g) the separate accounting for the costs recovered by water charges, benefit taxes and other assessments from project beneficiaries, with annual reports on project costs and revenues to be submitted to the Bank for a period of 20 years or until the loan or credit is fully repaid, whichever is shorter.

2.07 In 1980, the cost recovery and irrigation water charge issue was again addressed in detail in Central Project Note (CPN) No.2.10, which was a reissue of CPM 8.4 with minor editorial revisions, providing flexibility in implementation. The three key elements forming the basis for cost recovery consideration were identified as:

- economic efficiency - the extent to which scarce water resources are optimally allocated among different uses;
- income distribution - the manner in which the benefits flowing from irrigation are shared among project beneficiaries; and
- public savings - the extent to which government captures part of the increased net benefits for future investment in agriculture and elsewhere.

2.08 CPN No.2.10 (now designated Operations Policy Note (OPN) 2.10) refers to many points that should be considered in applying the Bank's cost recovery procedure to any given project. It includes detailed guidelines for making calculations of the CCL and other indices involved in the procedure. However, one major complaint with this procedure is that the system used in the calculations is poorly understood by irrigation officials and difficult to apply. Ideally, volumetric measurements should be made, which are normally not possible. The calculation of rent and cost recovery indices requires estimates of the critical consumption level. To apply the economic efficiency objective assumes that irrigation water can be allocated according to

market forces, which is generally not possible. The income distribution and public savings objectives are also difficult to apply in a prescribed format because so many judgment factors are involved. Although the principles embodied in the procedure are reasonable, the application to irrigation projects in developing countries is more difficult than the guidelines would suggest.

2.09 There is widespread recognition within the Bank of the difficulty of finding a simple and satisfactory solution to the irrigation cost recovery issue. In March 1984, a Policy Note entitled "Financing Operations and Maintenance in Irrigation" was circulated by the Vice President, Operations Policy, for filing with OPN 2.10 "Irrigation water charges, benefit taxes and cost recovery policies." Comments received from staff in response to the present OED draft report suggest that this note is not widely consulted. A copy is, for information, attached to this paper as Appendix 2. In summary the Policy Note concluded that:

- (a) at the project appraisal stage, assurances will be required that sufficient funds are available for O&M;
- (b) at the same time there has to be adequate recognition that the longer term objective is to have a system of resource mobilization that will recover capital costs so permitting replicability of investments;
- (c) the mobilization of resources should include capturing rents from those who benefit directly from irrigation unless there are specified reasons, e.g., equity, why governments choose not to do so; and
- (d) in any event, whatever the mode of resource mobilization, there has to be an analysis of how the fiscal system affects farmers' incentives.

The Policy Note does not change Bank policy as embodied in OPN 2.10, but rather proposes a modified approach to implementing these policy guidelines. For example, it elaborates on the many problems associated with cost recovery and emphasizes that the necessary institutional arrangements must be put in place to handle cost recovery. Important points such as assuring that funds for necessary O&M are available and that farmer incentives be provided are stressed.

III. EXPERIENCE WITH BANK-SUPPORTED IRRIGATION PROJECTS

3.01 A total of 48 Bank-supported irrigation projects in 29 countries had been subjected to performance audits by the Operations Evaluation Department (OED) by the time this review was conducted (1984). The Project Performance Audit Reports (PPARs) for these projects, which constituted the main source of published data for this study, are reviewed and the experience with cost recovery summarized in the following sections.

A. General Description of Cost Recovery Covenants

3.02 The essence of most covenants related to cost recovery in the projects reviewed was simply that the annual O&M costs were to be recovered. This directly followed the 1971 policy of the Bank as contained in OPM No. 2.61, which was in force when most of the loans/credits were negotiated. In several cases, the covenants also addressed the recovery of investment costs in general terms, such as indicating that such costs should be recovered to the extent that is practical. Costs were to be charged to farmers in different ways: through volumetric pricing (Morocco, Jordan), a charge per crop-hectare (Mexico) or as a general per hectare charge (most countries). Most charges were to be paid in cash, with a few exceptions providing for payment in kind (Philippines).

3.03 Frequently, the covenants required that a socio-economic study be undertaken to determine the ability of the farmers served by the project to pay water charges. These studies were to assist in providing data which could be used to determine the proper water charge rate for a given project considering all the factors of concern to the Borrower and the Bank, including equity.

B. The Fulfillment of Covenant Provisions

3.04 Based on the project performance audits, an assessment was made of the degree to which lending agreement provisions regarding water charges were fulfilled. Sometimes it could not be stated categorically that a cost recovery covenant had or had not been satisfied. For example, a covenant might not have been satisfied for a period of time before, eventually, substantial progress was made to meet its provisions. Conversely, initial compliance might have been subsequently reversed in effect, as for example when water charges were not indexed to inflation.

3.05 Recovery of O&M Costs. In at least two-thirds of the projects reviewed, the covenant requiring that cost recovery satisfy the O&M funding requirement was not fulfilled. In only about 15% of the cases were the covenant provisions fully satisfied. In general, about three-fourths of the cases were not in compliance with O&M-related cost recovery covenants.

3.06 The O&M was considered satisfactory at audit in only about half the projects. The question arises whether there is an association between the degree to which covenants were adhered to, in particular those relating to paying O&M costs, and the extent to which O&M was satisfactory. Of 36 PPAR's where this could be checked 16 had bad adherence and bad O&M and 7 had good adherence and good O&M. Although this showed two thirds of projects had evidence of association somewhat surprisingly nearly one third had bad compliance and good O&M. In effect more than 40 percent of all projects with good O&M and data on compliance had bad adherence to the covenants. A similar position emerges if simply revenue performance (up to O&M costs) and maintenance standards are compared. Seventy percent of the projects where data was available (37 projects) had the anticipated association between revenue performance and O&M standards. It cannot be assumed that this is a causal relationship, nor, if so what is the direction of causality.

Furthermore, the relationship needs cautious interpretations because for example "good O&M" is not precisely defined and each evaluator has personal criteria and subjective weighting and the issue is too polarised by the "good" and "bad" labels. Nevertheless it is worth noting that there were frequent reports that farmers were reluctant to pay when the irrigation service was not dependable.^{5/}

3.07 Although, in the projects reviewed, poor cost recovery tended to be positively correlated with poor O&M and better cost recovery associated with good O&M, there were exceptions as noted, particularly in the Europe, Middle East and North Africa (EMENA) Region. A possible explanation for this finding is that the projects supported by the Bank in that region tended to have a higher level of technical sophistication with more lined canals and better control structures, making them more immune in the early years at least to some of the O&M problems that were frequently encountered elsewhere. If this assumption is correct, it highlights the importance of project design to good O&M. The substitution of capital for O&M expenditure (and management) is certainly possible in irrigation and in view of the evident problems with operation it is a topic that deserves more consideration.

3.08 Recovery of Investment Costs. Most of the covenants on investment cost recovery were quite general, with nearly half of them containing wording pertaining to recovery levels such as "as much as is practicable" or "a reasonable portion of capital costs." Some merely stated that a study should be undertaken to determine what should be done. There were very few cases where significant capital cost was recovered. Nonetheless, in view of the wording of covenants, it is not possible to state categorically that these covenants were violated.

3.09 Studies of Cost Recovery. In many cases, the lending agreements provided that the borrowing government would undertake a socio-economic study to determine the farmers' ability to pay irrigation water charges. Although the specifications for these studies were quite general, the principal objectives were to look at the question of equity and to determine the method for recovering costs that was most appropriate in a given country. A deadline for completing the studies usually was given.

3.10 In seven out of 13 cases, the studies were carried out, but in six cases their recommendations were only partly applied, or not applied at all because they were politically unacceptable to governments. In six other cases, the studies were not implemented, presumably because of governments' reluctance to change their existing policies. In only one case did the study conclude that no charge should be levied because of farmers' limited ability

^{5/} Cases were reported in virtually every region of the world in which poor O&M was cited as providing a ready excuse to farmers for not willingly paying realistic charges. Moreover, when O&M is bad, government is weakened in attempts to enforce payment. Nevertheless in one sixth of the cases bad O&M was accompanied by good payment.

to pay. It might appear that, for both the Bank and for Governments, providing for studies in loan/credit documents often appears to have been an easy way to avoid addressing the difficult cost recovery issue in a timely manner. However, it is worth remembering that this issue is recognized to be extremely complex and extensive studies are often needed. Nevertheless, such studies should be completed before appraisal if the present policy relating to income distribution is to continue.

C. Bank Reaction to Non-compliance with Covenants

3.11 The reaction of the Bank to non-compliance with cost recovery covenants varied among different Bank regions. The most determined reaction occurred in Turkey, where the Bank in 1976 informed the Government that it would not consider further financing of irrigation projects until steps were taken to improve the cost recovery system. Another example in the EMENA Region was in Morocco, where the Bank took a firm stand and insisted on strong cost recovery provisions. An intensive dialogue between the Bank and Moroccan officials led to key issues being addressed forthrightly at an early stage.

3.12 In Mexico, the Bank made an effort to cover the cost recovery issue as part of a comprehensive irrigation subsector study. Mexico's Federal Water Act distinguished between charges to be collected for investment costs which were to accrue to the national treasury as it was the Federal Government which was responsible for financing the main works, while charges for O&M were to remain at the local level to supplement federal funds allocated for that purpose. The study showed that the portion of the full O&M cost of water covered by water charges in nine districts averaged only about 27% in 1982. This matter was subsequently addressed by Mexican officials at the insistence of the Bank.

3.13 The reaction of the Bank was more tolerant in other cases as is shown in the following section. In general, the Bank has been rather flexible in treating problems of low cost recovery from farmers. This may be due to the fact that the farmers served by irrigation often have been among the poorest in the country and the equity issue was considered. But evidence to support this view was not always produced. The Bank was particularly lenient with countries in South Asia and East Asia and the Pacific Regions in the sample, where covenants on cost recovery in irrigation were constantly breached without a strong reaction to non-compliance from the Bank.

D. Cost Recovery by Region

3.14 The PPARs from the six individual regions were analyzed to see if any regional differences emerged regarding the implementation of Bank policy on cost recovery. The recovery of costs by Region and in individual countries with different local conditions varied widely. Nonetheless, it is clear that in a large number of cases the water charges actually collected did not provide for the full O&M costs.

3.15 Equity considerations were often the basis for lack of remedial action by the Bank in cases of non-compliance. This is in line with current Bank policy which specifies "income distribution" as one of the basic factors in cost recovery considerations (para. 2.07). The following sections summarize the cost recovery performance in the present group of projects in different regions.

3.16 Eastern and Southern Africa. Only two irrigation projects in this region had been audited. In one, the Sudan Roseires Irrigation Project, there were no covenants on cost recovery. A 1980 OED impact evaluation study on this project revealed that water charges had not been collected up to that time. However, there was provision for the public sector to share in the net proceeds from cotton production. The sharing formula in effect in 1980 allocated only 47% of the proceeds to tenants and 2% to the Tenants Reserve Fund, while 36% went to the Sudanese Government and the remaining 15% to three other public sector entities. In the other project in the region, the Madagascar Lake Alaotra Irrigation Project, the covenants requiring project cost recovery from farmers were not fully applied. The audit indicates that the political situation was such that implementation of the covenants would have been impossible. During project implementation, the Bank did not address cost recovery issues in sufficient detail and with adequate force to help the Government resolve the serious dilemmas it faced. During this period and subsequently, the Bank's emphasis shifted to national cost recovery policies for irrigation which had been in disarray. Progress has been made in recent years, with passage of legislation and a start on implementation of a coherent and realistic cost recovery system.

3.17 Western Africa. Of the five audited irrigation projects in West Africa, only two had statements regarding cost recovery. For these, the Mopti Rice Project in Mali and River Polders Project in Senegal, cost recovery showed good progress. In Mali, the levy increased by a factor of 2.6 in the three-year period from 1974 to 1977. Collection rates were also high. Yet, the levies were sufficient to recover only 42% of O&M costs at the time the completion report was prepared in 1980. The Senegal River Polders Project had a covenant to recover costs through consolidated fees. The cost recovery was over 80% in 1977, an amount adequate to finance O&M costs. These funds were reportedly used for general support, however, rather than O&M, because of general budget shortfalls and as a result O&M was not adequate. Undoubtedly, such use of water charges revenue was in violation of the intended purpose of the covenant.

3.18 East Asia and the Pacific. The handling of cost recovery issues in the 12 projects in the East Asia and the Pacific Region was characterized by a considerable range in conditions. For instance, two examples of excellent progress in cost recovery occurred in this region. These were the Korea Pyongtaek-Kumgang Irrigation Project and the Korea Yong San Gang Irrigation Project, where collection rates were good and sometimes reached over 95% of assessments. Also in Korea, water charges were increased annually, assuring that inflation did not erode the progress toward planned cost recovery. Korea is a good example from which to learn because, after completion of irrigation systems, the Government generally transfers the responsibility for

O&M to the respective Farmland Improvement Associations (FLIA) in each project area. These farmers' groups are points of contact to assist in the collection of water charges, reflecting the political and socio-economic structure of rural Korea.

3.19 By contrast, the Malaysia Muda and Kemubu Irrigation Projects have had serious cost recovery problems. At the time of audit the water charges and land taxes remained far short of meeting O&M costs, and the audit report noted that prospects for improvement were not good. Although Malaysian Government officials accepted the proposition that beneficiaries pay O&M costs, they argued against the principle of recovering capital costs from beneficiaries. Nonetheless, the Bank insisted on following its normal approach.

3.20 The Government of Malaysia cited a number of problems in collecting water charges, including a heavy burden of the religious tithe (zakat) and a substantial sales tax collected from produce in the region. Other problems were mentioned such as continuing difficulties with the water distribution system. The audit report for these Malaysian projects recognized the zakat as well as the indirect return to the Government resulting from controlled prices on rice as alternative cost recovery mechanisms. It is noteworthy that these two Bank-supported projects were important in enabling Malaysia to reduce rice imports from 42% of its total requirements in 1967 to 17% in 1974. An FAO study showed the zakat to be capturing between 5% and 7% of gross farm income, considerably more than previously suspected. Based on the FAO figures, the audit concluded that Muda farmers' combined payment of water charges, land taxes and the production tithe covered all of O&M costs plus 20% of the projects' capital costs (at 10% annual interest). Taking these factors into account it could be argued that there was no real non-compliance.

3.21 In the Philippines, the irrigation service fee in the Aurora-Penaranda Irrigation Project was, in principle, more than adequate to meet O&M costs. However, the collection rate was not good although it appeared to be improving. The collection of water charges in that country has been by the National Irrigation Administration instead of the tax collection agency. The fee has been set in terms of the price equivalent of rice to compensate for inflation. In-kind payments, although unusual, were permissible. Keying the water charge rate to the price farmers receive for their products is a logical way of indexing water charges. However, problems can arise if real prices of key commodities fall compared to the general price index.

3.22 In Thailand, where authority to levy water charges exists under the Irrigation Act, no such charges had been collected under the projects reviewed. A study of farmers' ability to pay was undertaken by the Ministry of Agriculture and Cooperatives. The results showed that the project beneficiaries had very limited ability to pay charges. This matter was to be re-examined after the increase in income from the project had been realized by the farmers. Although Thai rice farmers did not pay water charges, they paid a tax (rice premium) on their marketable surplus which was a tax of some

significance and as such presumably a suitable cost recovery method. In some projects in Thailand, poor O&M was mostly due to low construction standards and poor design of irrigation systems.

3.23 In some countries, such as Indonesia, water charges, per se, had not been acceptable in the past since water has been viewed as a "God-given" commodity. The Government for some time had objected to water charges as a condition of credit effectiveness, but now generally agrees with the concept of charges to recover O&M costs plus a "reasonable" proportion of capital costs. An impact evaluation study found that villagers made inadequate contributions to O&M. Water User Associations, set up under the first Indonesia Irrigation Rehabilitation Project, were not able to increase farmers' participation in rehabilitation of tertiary blocks or in their maintenance, and could not prevent a decrease in the proportion of farmers paying the village-level water retribution, which declined from 84% in 1976 to 67% in 1981.

3.24 South Asia. In the Bangladesh Chandpur II Irrigation Project, the covenant on recovery of O&M costs was breached. However, the Bank in 1977 took no action and instead concluded that the issue needed no further discussion. Also, the covenants were not fulfilled in the Bangladesh Northwest Tubewells Project and apparently no action was taken there either. In the Burma Irrigation I Project, instead of covenants on cost recovery there was a letter by the Government expressing the intention to recover maintenance costs of flood embankments from beneficiaries. Until recently, no such charges had been levied, although a betterment tax on irrigated land was introduced in 1981/82.

3.25 In India, the covenants on cost recovery had, in general, not been satisfied. The covenants often were vague and in several cases studies of water charge rates had been requested. For various reasons, the provisions of the covenants were not satisfied and the Bank let the covenants be ignored for several years without action. During the review of the India Chambal Command Area Development Project (PAR), the Borrower's failure to meet contractual obligations was addressed and it was noted that: "Good reasons are given, but it would seem that the Bank should specifically agree to waive compliance, rather than let the covenants be ignored for 5 to 6 years. By now the Bank should know what realistic goals can and should be achieved, and the covenants, dialogue, and performance should all be more compatible and respected than now seems to be the case." The Government of India in commenting on the OED Cost Recovery Study stated that, first, it did not expect irrigation projects to generate revenues or recover costs to ensure project sustainability after completion; irrigation projects were regarded as part of the Government's development program and were not supposed to be self-sustaining. Second, since most irrigation projects were targetted towards the rural poor, water charges were not intended for the purpose of recovering costs and were a function only of the farmer's capacity to pay. Third, recovery of water charges as a fee for services rather than as a tax was more a matter of semantics than of substance.

3.26 The experience in the Nepal Birganj Irrigation Project showed a drastic decline in water charge collection in surface irrigation schemes. Conversely, there had been good progress in improving collection of water charges for tubewells. Still, the provisions of the covenants were not met. This project offers a good example consistent with the view of the importance of reliability of water supply to the successful collection of water charges. The following table compares the collection rate in percent for the tubewell scheme and the surface scheme in the project for three years.

NEPAL: BIRGANJ IRRIGATION PROJECT
Assessment and Collection of Water Charges
('000 Rupees)

<u>Year</u>	<u>Surface Scheme</u>			<u>Tubewell Scheme</u>		
	<u>Assessment</u>	<u>Collection</u>	<u>%</u>	<u>Assessment</u>	<u>Collection</u>	<u>%</u>
1977/78	104.7	6.9	6.6	10.7	1.3	12.1
1978/79	334.9	3.7	1.1	15.3	6.0	39.2
1979/80	305.6	1.8	0.6	98.8	73.0	73.9

These data clearly show that the decline in collection performance for the surface scheme from 6.6% to 0.6% was in sharp contrast to the collection in the tubewell scheme which increased during the same three-year period from 12.1% to 73.9%. The audit reported that farmers did not feel pressed to pay water charges or to contribute to the maintenance of the irrigation system because they felt that doing so was unlikely to improve the quality of the services they received, including timely water supply. Adequate cost recovery reportedly was considered possible, but only if the farmers were provided with reliable water supply. It would be interesting to obtain current (1986) data, when reliability of tubewells may have been expected to decline, to see the impact of this on revenue performance.

3.27 In Sri Lanka, as in most countries in the South Asia Region, cost recovery covenants had not been complied with. Studies had been requested under the Mahaweli Ganga Development Project, but these did not achieve entirely satisfactory results. However, prior to 1978 the price of rice in Sri Lanka was controlled by the Government at about 30% below the world market level, so the farmers were paying a large implicit tax--a fact that was surely recognized by farmers.^{6/} In connection with the Lift Irrigation Project, Government was reported to be reluctant to introduce water charges.

^{6/} Easter op cit reviewing an imaginative new policy in 1984 finds collection varies from 15 to 57% of O&M in Mahaweli but with most districts below 15% and 7 of the 17 Districts below 2%. There is a real danger that imagination will outrun practical politics.

With one minor exception, no water charges were collected since that project's inception despite a Government assurance that such charges would be introduced in 1979. A decision taken in 1981 requiring farmers to supply fuel and lubricants for the pumps still left Government with the burden of paying for maintenance and operating staff.

3.28 Europe, Middle East and North Africa. In most projects in the EMENA region, lending covenants required that O&M costs be recovered as a minimum. The attitude of the Bank in addressing non-compliance varied significantly within the region. The Turkey case presents one extreme where the Bank took the drastic action of curtailing further irrigation loans until the matter of non-compliance had been recognized and addressed. Nevertheless, despite various attempts to increase revenues from project beneficiaries, O&M recovery rates never exceeded 4% until 1981, and no attempts to recover investment costs had been made. The Bank attributed this poor performance to Government's agricultural sector policy rather than to sociological factors. A different case occurred in Yemen Arab Republic, where the Bank acknowledged that the original cost recovery covenant was fraught with difficulty and that a tax on gross production, similar to the zakat tax (tithe), was the only one that could be successfully administered under existing conditions. In that country, there had been a special study on cost recovery, but it was controversial and the results were never implemented. Therefore, the Bank accepted the compromise approach of levying a surcharge of one or two percent on gross production from irrigated land, following the centuries-old religious tithe system, which has the advantage of being simple and understandable.

3.29 In numerous cases in the EMENA region the Bank stressed equity considerations. Such considerations, along with early reluctance by the Turkish Government to implement the recommendations of a study on cost recovery, probably were factors in prompting the loan curtailment action in that country. Perhaps most critical was the fact that the beneficiaries in the project area had incomes well above the national average. The Government of Turkey has in recent years shown a willingness to take action to correct the problem, but there is still much to be accomplished.

3.30 Cost recovery in the projects in Morocco, in which the Bank stressed cost recovery issues, appeared to be relatively good. The proportion of invoices paid had increased and approached 90% in the Doukkala I Irrigation Project, for example. The volumetric charge rate of this project was increased significantly (86%) between 1969 and 1980. Pumping rates were indexed to the cost of energy. In all, the audit reported that the then existing level of water charges and the betterment levy were expected to recover 100% of O&M costs and 14% of investment costs. In Jordan, collection was high, approaching 100%, but cost recovery remained low (about 35% of O&M costs) because the charges had not been increased to compensate for inflation. A study was being undertaken in Jordan to determine the appropriate upward adjustment in charges considering farmers' ability to pay. Both Jordan and Morocco were applying volumetric water charges. However, because of its outmoded design, the North East Ghor Irrigation

Project in Jordan required ten times more staff for O&M than the Doukkala Project in Morocco, which had been designed as a capital intensive but modern, efficient and relatively low-cost system to operate. In Egypt, Cyprus and Iran the cost recovery covenants were not satisfied and there was no indication of firm action by the Bank in these projects.

3.31 Latin America and the Caribbean. In the Atlantico Irrigation Project in Colombia, the covenant on water charges was not complied with. A study of the farmers' capacity to pay was required under the loan agreement, but the study turned out to be useless because originally projected conditions could not be realized. A new study was subsequently requested by the Bank which accepted the fact that farmers could not pay for several reasons, including the fact that much of the project area could not be irrigated at the time of the audit. By 1982, water charges had been pegged at US\$20/ha/year plus a volumetric charge of 4 cents/m³ (a drainage fee of US\$6/ha/year was levied in the rainfed sector). However, cost recovery rates were only about 10% of amounts due because of farmers' reluctance to pay for irrigation and drainage services they considered inefficient. A similar situation occurred in Ecuador in the Milagro Irrigation Project where only small amounts in water charges could be collected before the water system was completed.

3.32 In the Tapakuma Irrigation Project in Guyana, the cost recovery covenant was not complied with in that only 10-15% of the O&M costs were recovered through water charges. A study reportedly was underway to determine a suitable system of water charges. Of importance in this project was the fact that the price of rice was controlled by the Government and had not kept pace with inflation. Farmers were thus paying a significant indirect tax.

3.33 In several projects in Mexico, the typical covenant provision of collecting water charges to meet O&M costs and some investment costs was violated, although in some projects water charges at one time fully covered O&M costs. However, rapid inflation eroded the real value of charge collections. In other projects, like Panuco, where annual rainfall is relatively high and irrigation tends to be supplemental, it was found that charges cannot be easily increased without creating a disincentive for irrigation, resulting in underutilization of the potential irrigation water supply. To increase water charges in cases like Panuco could be counterproductive in achieving the original purpose of the project.

3.34 In Peru, cost recovery under the San Lorenzo Irrigation and Land Settlement Project initially was quite low and, although progress had been made, the respective lending covenant had not been fully complied with. The issue of unreliable service providing an excuse not to pay was mentioned. Under a new system introduced in 1981, most of the funds recovered were to be allocated to the Water User Association under the assumption that such an arrangement would improve collection rates. Water rates were increased from US\$6.0 per ha in 1978 to US\$10.0 per ha in 1980, and were expected to be raised further in 1983 and thereafter to eventually cover the full O&M cost.

3.35 In general, in the Latin America and Caribbean region, there was no firm action taken by the Bank regarding non-compliance with cost recovery covenants. In each case on apparently valid reason was perceived (e.g., irrigation system not complete, low irrigation adoption rate or high inflation) for the covenant conditions to remain unsatisfied. In several cases the Bank called for studies searching for answers to some of the questions related to cost recovery.

E. Main PPAR Findings

3.36 The following section analyzes the poor cost recovery record in the 48 projects reviewed and presents some additional findings which may be relevant for future Bank policy.

3.37 The statement that cost recovery has not measured up to expectations arising from lending covenants is repeated often in the PPARs. A representative cost recovery rate for the audited projects could not be determined. Recovery rates through direct water charges spanned the range from zero to 100% of O&M costs, and a large number were in the range of 15 to 45%. In more than a third of the projects under review, reference was made to special studies on cost recovery and the farmers' ability to pay which were part of the lending agreements. In general, the results of the studies were not reported in the PPARs or their recommendations were not applied. It is worthwhile noting that all projects under review were formulated and implemented under the 1971 Bank policy, which was much less stringent and specific than that in force in the mid-1980s. Therefore, it can be reasonably deduced and discussion with field staff confirms that the prospects for compliance with the stricter cost recovery covenants in on-going irrigation projects are unlikely to be improving.

3.38 There are three main reasons why cost recovery covenants have been insufficiently observed: (i) lack of government commitment, (ii) poor operation and maintenance of the irrigation system, and (iii) the heavy burden of direct and indirect taxes collected by governments from farmers as a result of price distortions within the economy as a whole.

3.39 The lack of government commitment with respect to cost recovery was noted in a number of projects. Although officials repeatedly expressed recognition of the importance of improving cost recovery from beneficiaries, at project completion, the issue remained a very sensitive political matter. There has been a tendency for action to be repeatedly delayed. Many government agencies have neglected to pressure farmers on cost recovery because they count on government appropriations rather than water charges to finance their operational budget and hence have no direct financial incentives.

3.40 The issue of the quality of the irrigation service, including reliability and dependability of water supply, was stressed in many of the reports. It has been confirmed that farmers will not willingly pay high water charges for poor irrigation operations (not in many instances for a good irrigation supply). Good operation of the irrigation system may be a

prerequisite for good cost recovery but it is not a sufficient condition. Certainly cases have been frequently reported where farmers willingly paid more for private well water than they would be willing to pay for public canal water. The reason often given was the superior dependability and timeliness of the private well water supply. However it often helped meet peak demands and thus enabled "free" canal water to be used for most of the season to increase cropping intensity and yields.

3.41 Projects in several countries illustrated the problem of poor operations, involving inequitable distribution of water and lack of responsibility on the part of irrigation engineers for delivering designed discharges to every outlet.

3.42 Maintenance is also critical because projects will deteriorate if maintenance is not adequate, and thus poor collection of water charges, and/or poor budget allocations, sometimes results in unnecessarily high O&M expenses and possibly higher charges to farmers. The PPAKs tended to routinely relate the level of O&M to water charge collection. However, when the water charge collections go to the general revenue fund, such a direct correlation is not necessarily valid and seldom is justified. The relation between revenue and O&M standards is more likely to be positive when water charges are collected by the agency doing the maintenance, and an agency which has a clear institutional structure, appropriate responsibility and sufficient revenue. However, a number of irrigation agencies have been found not to be accountable either to the farmers they serve or to government financing authorities, resulting in overstaffing and low productivity.

3.43 Farmers' perception of the effect of increased cost recovery on the quality of O&M is very important. The data do indicate that when cost recovery is good, O&M tends to be better than when cost recovery is poor. However this cannot be proven with current information. It may well be that good O&M facilitates cost recovery rather than vice versa or a tenuous or even a spurious relationship may exist.

3.44 The issue of farmer incentives to utilize the irrigation supplies made available by the projects emerged time and again in the audits. In this context, policies on commodity prices, water charges and other input prices have to strike a delicate balance. On the one hand, they must provide producers with adequate incentives to ensure their participation in the project and, on the other hand, they must help keep the project on a sound financial basis.

3.45 There were several cases where farmers were paying a sizeable implicit tax (i.e., the difference between farmgate prices and the higher border price equivalent) by having to sell their products at low government controlled prices, although it is recognized that such a general tax not only compensates the public sector for the cost of irrigation water but for other important services as well. In the Malaysia Muda project, for example, farmgate prices for rice were projected below international prices for the period 1973-78, with a saving to the national treasury over this period of some US\$500 million in 1974 constant value terms. The same issue of "fair

farmgate prices existed in Mexico where the price distortion amounted to an implicit tax of 20 to 50%, and in Sri Lanka, where the indirect taxes were up to 10 times higher than the water charges. A similar situation also existed in Guyana where controlled rice prices did not keep pace with inflation. These examples demonstrate that the Bank's emphasis on direct cost recovery, without proper consideration of implicit tax and indirect recovery mechanisms, was inappropriate.

3.46 Experience from this set of projects also provides some insights of general interest in future applications of Bank financial policy. These relate in particular to the need to employ several alternative cost recovery approaches; the problems in exposing farmers to the real cost of water; the benefits to be gained from farmer participation; ways in which low collection rates can be improved; the difficulty of pursuing cost recovery on a project rather than a national basis; and, finally, how studies can be made more useful.

3.47 The audits illustrate that alternative cost recovery approaches besides direct water charges are possible and in some cases may be better. These include taxes of various types. In some instances commodity price controls have a direct impact on cost recovery from the farmers. However, these aspects are often ignored. Bank staff have tended to implement Bank regulations and guidelines with insufficient regard to their timeliness, utility or applicability to country specific socio-economic conditions.

3.48 Some PPARs state clearly that ways must be found to expose farmers to the real economic cost of water from the start of water deliveries without discouraging irrigation. Projects which provide expensive water to farmers, who in many cases are new to irrigation, can seldom collect high water charges in initial years. Yet, when farmers have received the benefits of water without paying full costs, they are reluctant to accept the increased water charges at a future time. In addition, if the farmers are not exposed to the real cost of water they may choose crops which are financially attractive to them, but marginal or non-economic if the real cost of water is taken into account. Careful thought and negotiation is needed to obtain a reasonable balance between giving valid price signals to farmers yet understanding thoroughly their circumstance and perspectives.

3.49 The participatory role of the farmers in O&M was often emphasized. A number of irrigation projects appraised in the past years, particularly in East Asia, had been designed so as to give the water users full responsibility for O&M of tertiary systems. Bank experience with water user associations and groups is still recent and limited. The excellent cost recovery record in Korea is a good example of the role of water user associations, both in O&M and in improving cost recovery. Leaders of farmers' groups in Korea who are responsible for organizing O&M also act as points of contact for extension agents. This suggests that a link between extension and O&M activities may be desirable at the farm level. In the Philippines, communal farmers' organizations have been relatively successful in O&M of the tertiary and quaternary systems. The public sector financial crisis has forced withdrawal of some irrigation personnel from the field which has provided an

opportunity for farmers to prove their capacity to operate and maintain systems efficiently. In Thailand, water users' groups exist mostly on paper and generally have not worked satisfactorily. There are exceptions, however, and some groups have been found successful when the canals were short enough to ensure small size and cohesiveness of the group, and in the traditional systems in the North of the country. In contrast to East Asian countries, little or no attempt to encourage farmers' participation in O&M was made in EMENA, although irrigation has been practiced for centuries in some countries in this region, and farmers have been used to operating, maintaining and repairing their traditional irrigation systems without government involvement. Reviving traditional participation of farmers appears highly desirable for irrigation systems in some EMENA countries. Participation of farmers in the operation of irrigation systems in LAC has helped ensure that cost minimization policies are pursued.

3.50 Even though low collection rates are frequently mentioned as a problem, penalties and dissuasive sanctions such as water supply suspension are reported to be rarely applied. In the event water charges are very low, the collection rate can be high while cost recovery rates remain very low. An efficient collection system, featuring water cut-off sanctions to non-paying farmers, was introduced in Jordan which achieved collection rates close to 100% (para. 3.30). Nonetheless, the recovery rate reached only about 35% of O&M cost because of low water charge rates. Jordan also provides an example that illustrates the effect of lack of indexation as the volumetric water charge rate in Jordan was not changed during the period 1974-1982 despite double figure inflation.

3.51 The audits further illustrate the difficulty of introducing cost recovery on a project rather than on a nationwide basis. This difficulty is particularly acute where the direct cost recovery required in Bank-supported projects significantly exceeds similar requirements in other projects in the same country. Such discrepancies may create an internal problem for government officials. Nevertheless the advantages of special new project charges or rehabilitation fees are potentially high and attempts to find viable methods should be maintained.

FINANCING OPERATION AND MAINTENANCE IN IRRIGATION

Agriculture and Rural Development Department
The World Bank

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Financing Operation and Maintenance in Irrigation

The Problem

1. There has been growing concern, expressed at meetings of the Board by the Executive Directors when considering new irrigation projects, as well as among Bank staff and management, over the implementation of past irrigation investments. The major concern is that the efforts to recover the costs of investment and of operation and maintenance appear to be inadequate. A review was therefore undertaken of a sample of developing countries to assess the performance of different irrigation cost recovery systems. The review confirms that in many countries there is neither effective cost recovery nor adequate resource mobilization in irrigation schemes, although a few countries have been relatively successful on either or both counts. The manner in which countries implement irrigation projects, including the cost recovery policies related to them, varies a great deal. In general, this variance is an outgrowth of differing legislative frameworks, public finance policies, development objectives, and physical, social and ecological factors. The purpose of this note is to discuss the mechanisms for recovering costs and ensuring that operation and maintenance are carried out satisfactorily.
2. The most critical finding to emerge from the review is that government revenue-raising efforts for irrigation, from whatever sources, are typically very weak. The inability of irrigation project entities to obtain sufficient resources to maintain the existing irrigation systems properly (let alone provide for their replacement in due course) is jeopardizing investments in irrigation by most of our borrowers. The project justifications assume that operation and maintenance (O & M) will remain at standards which assure that benefit streams will be unaffected by deterioration of the project infrastructure, but with inadequate resources devoted to O & M that basic assumption does not hold in too many cases.
3. The problem is therefore one of ensuring that adequate resources are received in timely fashion by the authorities responsible for O & M in irrigation projects. It is important to underscore that this is both a resource mobilization and allocation problem, and not a cost recovery or water charges problem per se. Cost recovery (and water charges are among such recovery measures) is part of the resource mobilization process, and the criteria which apply to cost recovery measures include financial (public and private), efficiency and equity objectives. It is unlikely that efficiency and equity goals can be addressed without the financial needs of irrigation being met, either because insufficient revenues are raised or they are not allocated for irrigation financing purposes. However, a restatement of the approach to be taken in appraising irrigation projects is needed in order to clarify the relative contributions which different parts of the resource mobilization process can be expected to make

Policy on Irrigation Cost Recovery

4. The existing World Bank policy concerning the recovery of costs in irrigation is embodied in OPN 2.10. This note proposes a modified approach to the implementation of these guidelines. Starting from the observation that irrigation water is a costly input and that development and recurrent O & M costs tend to be high, the OPN sets forth the approach by which recovery measures should be built into irrigation projects and irrigation components of rural development and other multi-purpose projects. This approach addresses three basic objectives:

- (a) Economic efficiency — The economic efficiency of the project is to be promoted by levels and structures of prices for irrigation water which minimize wasteful use of water and maximize the project's net benefit to the economy. It is recognized that true efficiency pricing is rarely encountered in irrigation projects because it normally requires accurate measurement of volumes of water supplied, to a degree of accuracy that is difficult and excessively costly to attain. But even a nominal price for water is expected to offer incentives to reduce waste in water use. It is also recognized that even if it were possible to charge economic efficiency prices, these may not be compatible with other goals such as equity and public savings. Thus, modified cost recovery measures should be considered to address the equity question and to ensure adequate recovery of project costs.
- (b) Income distribution — In order to achieve equity in capturing benefits from a project the OPN recommends progressive benefit charges which at the same time take into account the disincentives, the possibility of payment evasion and the costs of collection that are associated with some forms of benefit taxes. A major consideration would be that the base for computing benefit charges should be an accurate measure of the benefits provided by the project.
- (c) Public savings — It is assumed that governments in most developing countries are short of fiscal resources for development, and that it is desirable to collect more revenues from beneficiaries than would result solely from efficiency pricing of irrigation water. The need to mobilize resources and to ensure adequate funds for investments, operation and maintenance may appear to conflict with equity considerations insofar as some project beneficiaries are "poor!" In practice, however, direct beneficiaries of irrigation development are likely to be much better off than those not receiving irrigation water, and equity and resource mobilization concerns should be

5. The OPN identifies different kinds of policy measure which might be used to achieve the above objectives, and offers several guidelines on how to design benefit taxes, measures of cost and rent recovery, the norms of recovery and how to present these matters in appraisal reports.

Review of Experience

6. The review noted earlier was undertaken to sample a wide range of irrigation systems to see what experience has been with implementation of these guidelines and how cost recovery systems function in practice. Some of the major findings are summarized below.

7. Water Charges and Economic Efficiency. Markets for water are not as transparent as the markets for other commodities. Characteristics such as time, quality, location and security of supply generate multiple potential markets. Consequently, there could be a large number of efficiency prices across any one irrigation system and over time.

8. Because of these characteristics of water as a commodity, the demand schedule of farmers on individual irrigation systems, that will reflect their willingness to pay at any given point in time, has proven difficult to estimate in practice. It has seldom been feasible to meter consumption, due in large part to the existing technology of delivery systems and on-farm practices. Examples exist of successful metered systems, but the cost of the meters, recording and billing procedures and farmers' reactions thereto can be prohibitive relative to the benefits of such systems. Careful consideration of the economic costs and benefits must precede the introduction of such innovations. Moreover, the change to such efficient practice usually requires investments in modification of the delivery system.

9. It is very difficult to charge for water when the irrigation system is not fully reliable, e.g., during construction or when the system is not properly operated or maintained.

10. Some existing water distribution systems, (e.g., where water is allocated on rotation at fixed intervals of time), supply water to a farm unit at a particular point in time whether the farmer wants water then or not. Such a system responds to existing rules for allocating water but also to limits imposed by the technology for water distribution across farms. For water allocation among watercourses, the systems operate under similar constraints. These systems impose patterns of water rationing which do not take account of individual farm demands. This rigidity could be modified by improving the effectiveness of water distribution, but long-established water management practices are difficult to change. Attitudes toward water and irrigation are conditioned by a great many cultural considerations. Irrigation as an activity goes back well over 2000 years and attitudes toward it are ingrained and strongly held. Thus, in many countries water is considered to be a "God-given" commodity by both farmers and policy makers, and therefore free. Predictably, this view is not easily changed and, whenever attempts are made to charge for water, conflicts are created

11. Water Charges and Equity Objectives. Any pricing or taxation system has equity consequences that need to be assessed; this assessment of tax incidence can be technically difficult and costly. Water charges levied as a user fee have seldom been used to improve equity, although it is well understood that irrigation development generates significant economic rents for project beneficiaries and that different systems have different income distribution effects. In some cases, the water pricing structure changes the equity pattern indirectly, e.g., in cases where farmers pay more for water when cultivating cash crops than subsistence crops. This often involves an assumption that poorer farmers produce food crops and richer farmers produce cash crops—an assumption which may well be questionable.
12. Irrigation affects the economic rent which farmers receive, and this incremental rent can therefore serve as a measure of benefits received. Rents may be captured via new charges but there are limits on the extent to which it is possible to set up a system that will capture farmers' rents differentially. The limit is set by costs of estimation, collection and enforcement. In dealing with equity issues, countries tend to use one or more of the means of taxation at their disposal. For example, under certain conditions land taxes are a means for achieving equity. As irrigation is made available, land values and farmers' income are expected to go up, and consequently land taxes to increase. The progressivity or regressivity of this tax depends, however, on the tax structure prevailing in the system and the existing pattern of income distribution among beneficiaries.
13. Public Savings Efforts. Policy statements are often made to the effect that water charges will finance O & M costs; a few also include payments for capital costs. In practice, however, most cost recovery systems in existence today seeks to cover only O & M costs at most, and are not designed to collect full capital costs from direct project beneficiaries. Some governments are willing to use additional sources of national revenues, beyond direct user fees or taxes on benefits, to finance the needs of irrigation projects, but such policies encounter constraints at the national level given the competing demands for revenues.
14. Other Elements. In addition to the limitations noted above, there are several contributing factors to this generally unsatisfactory picture. For example, in many developing countries legislation does not exist specifically on water charges, nor on cost recovery generally. Even when it does exist, the laws need to be accompanied by the necessary codes and regulations which allow a cost recovery system to be put into operation.
15. Few public irrigation agencies have autonomy—defined as the capacity of the public agency to set, collect and allocate back to irrigation, funds for O & M and capital expenditures. Even in cases where autonomy appears to exist, it may be only nominal since changes in water charges can require a decision from a central agency of government. The absence of real autonomy may be an important reason why irrigation authorities lack incentives to collect charges or to improve organizational performance, (e.g., upgrading the billing system).

16. Many cost recovery systems, as they operate today, are shaped by institutional factors. Land tenure is one of these factors; if farmers generally are not owners of the land under irrigation, cost recovery is often sought by taxing output in cash or in kind. However, taxation of land could be both more efficient and more equitable in this situation, but this needs to be assessed. Better and less sophisticated institutional arrangements frequently need to be established in order to improve collection. The more sophisticated the irrigation water charge system becomes (e.g., encompassing both efficiency and equity objectives), the more expensive it is likely to be to implement—conceivably to a degree where the cost of collection may be higher than the total amount to be collected.

17. Enforcement of existing laws is often difficult and expensive, since appropriate institutional arrangements for collecting use charges do not exist, and because the sums of money owed by individual farmers are generally too small to justify court litigation by public agencies. Moreover, this mode of enforcement is not available to agencies which are not autonomous.

18. Cost recovery systems have rarely employed any kind of "indexation", although a form of indexing takes place when payments are made "in kind." The lack of indexing results in significant changes in equity, e.g., farmers located in "old" irrigation systems (where the cost at the time of construction was relatively low in nominal terms) often pay much less for the same type of service than those located in "new" irrigation systems (where construction and related costs have typically been higher in nominal terms). Further, in the absence of indexation, when in due course adjustments in water rates or taxes are made they often call for such large quantum changes in water rates or taxes (reflecting increases in of costs in nominal terms) that serious political problems are presented.

19. Summary of Experience. The review of experience in developing countries suggests a series of propositions:

- (i) The benefits of and net returns on additional O & M expenditures in irrigation are often very high because of increased and more reliable crop production.
- (ii) Cost recovery systems based on water charges and other recovery measures have been successfully implemented in some developing countries, and when they have, the financing of O & M activities has generally improved.
- (iii) The organizational and practical aspects involved in O & M activities require much more attention if the effectiveness of irrigation systems is to be sustained.

- (iv) Important considerations regarding cost recovery systems include: the need for greater simplicity in establishing collection systems, organizational autonomy, and the extent to which the irrigation technology used affects recovery options.
- (v) Water charges are often difficult to implement because of strongly held traditional attitudes and values about water access which make water charges politically difficult to introduce or change.
- (vi) Collection mechanisms for cost recovery have often been neglected, resulting in very low rates of cost recovery.
- (vii) The importance and complexity of the micro and macro economic problems involved in cost recovery necessitate analysis at both the project and sector levels in order to devise viable recommendations.

Implications for Irrigation Policy

20. Irrigation lending constitutes the largest Bank subsector portfolio and represents more than one-third of all Bank lending in the agricultural sector. Similarly, such investments loom large in the activities of many developing countries, and are proportionately even greater in those countries with large irrigation potential. As a consequence, the economic and financial implications of irrigation are of major importance in a macro-economic context. In this respect, the longer term objective of cost recovery should be to have a system of resource mobilization that will finance capital costs, so permitting the replication of investments. Long term objectives should also include capturing rents from those who benefit directly from irrigation, unless there are specified reasons (e.g., equity or regional development goals), why governments choose not to do so.

21. However, an important short-term objective of irrigation policy should be to ensure that revenues provided to irrigation authorities are, at least, sufficient to meet O & M costs. There are various ways to achieve this objective--funds may be allocated from the central budget (derived from whatever revenue sources are used); funds may come from water charges or other charges imposed on the beneficiaries and paid directly to the irrigation authority; or some combination of cost recovery and general revenues may be employed. This objective is primarily important because of the benefits to be obtained from adequately financed O & M. But adopting this target should also provide an incentive for farmers to pay charges if they see that benefits actually accrue to them. The task is to design and put into place institutional mechanisms which will collect the funds necessary for adequate O & M, and to ensure that they are made available for that purpose. Whatever the mode of resource mobilization being considered, however, there has to be an analysis of how the fiscal system affects farmers incentives.

22. National, regional, state and local authorities may be appropriate vehicles for both revenue collection and the implementation of O&M. For all such institutions, rules and procedures should be designed to fit country-specific conditions and to provide appropriate institutional incentives for effective implementation.

23. In many instances, the cost of implementing a system of water charges that could help to achieve full efficiency of water use may be greater than the expected economic benefits. Whenever this is the case, a simpler system of water charges may still be useful as a means of recovering costs (e.g., "area based charges, "or" flat rates").

24. When countries are unable to collect the full amount of O & M and capital costs through water charges assessed against farmers who directly benefit from the project, other means of taxation should be considered. As stated earlier, a comprehensive analysis should be carried out in each case of the impact on efficiency and equity. This analysis should take into account the incidence of other taxes on farmers since the tax burden from other sources may be such that additional taxation could be inequitable, excessive and therefore inadvisable.

25. Additional factors to be taken into account include:

- (i) Simplicity: efforts should be made to keep collection efforts as simple as possible, because complex measures become difficult to enforce, and the costs of collection and billing can become self-defeating.
- (ii) Autonomy: organizational autonomy has proven to be desirable. Experience shows there is little incentive to collect from farmers if the collection agency cannot retain the funds necessary to provide O & M services.
- (iii) Technology of Irrigation: depending upon the cost involved, projects financed by the Bank should attempt to incorporate technologies which enable planners and farmers to measure water use--as, for example, by a metering system.
- (iv) Collection: in most cases more funds could be mobilized from those who benefit from irrigation, but the organization of proper collection systems has to be given careful attention.
- (v) Indexing: the systems used to establish water rates must have an indexing procedure to reduce financial problems and inequities across irrigation projects.

26. Because water charges are one among the many prices, taxes and subsidies faced by farmers, careful attention must be given to examining the overall framework in which cost recovery fits. If change in the fiscal system is needed, this should be a major focus of attention in the Bank's dialogue with governments. The best vehicles for such a dialogue are probably through sector work and related structural adjustment lending and sector lending.

27. The thrust of the foregoing is that an important element in project justification of Bank support for irrigation development should be that, at the very least, countries be prepared to mobilize funds and make them available to project entities to the extent necessary to meet adequate O & M costs. Cost recovery is an important part of this effort, and the flexibility built into the Bank's cost recovery principles should be fully exploited in devising any new national program. Responsibility for ensuring, to the maximum extent practicable, the financing required for operation and maintenance requires a national commitment by the borrower.

28. The task of the appraisal team includes review of the means for providing a financial capability to maintain the project as a continuing productive investment. To the extent these means are derived from cost recovery measures in the project area, the existing cost recovery policy applies. In some cases guidance may be required on how to interpret the guidelines, and this type of support service should be provided by OPS as a matter of high priority. Specific attention should be paid at the early stage of the project, preferably well before appraisal, to the design of institutional arrangements for the collection and management of funds, as touched on briefly above, such that the proposed financial plan and the institutional arrangements associated with it can be fully elaborated in the project documents. Provision should also be made for monitoring and evaluating progress in the implementation of whatever program is proposed. Clearly, the rate of progress expected and the type of instruments used can and will vary from one country to another, and these variations should be reflected in the different approaches proposed.

29. In summary:

- (a) At the project appraisal stage, assurances will be required that sufficient funds are available for O&M.
- (b) At the same time there has to be adequate recognition that the longer term objective is to have a system of resource mobilization that will recover capital costs so permitting replicability of investments.
- (c) The mobilization of resources should include capturing rents from those who benefit directly from irrigation unless there are specified reasons e.g. equity, why governments choose not to do so.
- (d) In any event, whatever the mode of resource mobilization, there has to be an analysis of how the fiscal system affects farmers incentives.