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Lessons Drawn from ISPAN Experience and Publications 1988-1994

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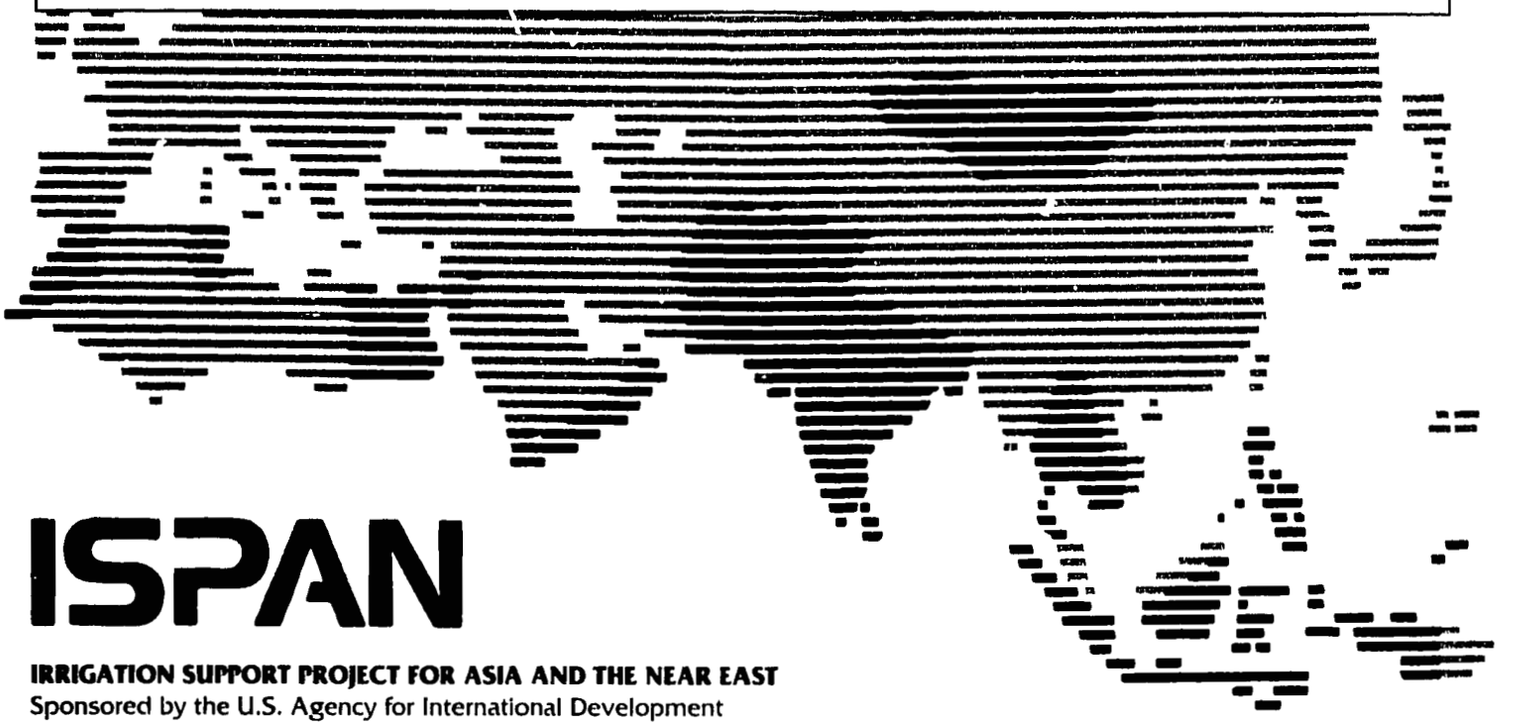

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IRRIGATION SUPPORT PROJECT FOR ASIA AND THE NEAR EAST

Sponsored by the U.S. Agency for International Development

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IRRIGATION SUPPORT PROJECT FOR ASIA AND THE NEAR EAST

ISPAN Technical Support Center
Room 1001
1611 North Kent Street
Arlington, Virginia 22209-2111
U.S.A.
Phone: (703) 243-7911
FAX: (703) 525-9137

Camp Dresser & McKee International Inc. (Prime Contractor)
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A

Irrigation Support Project for Asia and the Near East
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ISPAN LESSONS LEARNED

1. INTRODUCTION

The Irrigation Support Project for Asia and the Near East (ISPAN) has provided technical services in water resources to the USAID Bureau for Asia and the Near East (ANE) and to missions in the region since August 1987. The initial focus of the project was irrigation water management, but within three years the emphasis broadened to reflect the changing interests of the agency and the bureau. The project has covered such diverse water sector matters as flood management, water pricing and cost recovery, water policy adoption, participatory irrigation management, water dispute resolution, coastal zone management, and water resource sustainability. ISPAN also assisted USAID in the preparation of water resource strategic agendas for Asia and for the Near East.

ISPAN has provided technical assistance and training and carried out water resources applied studies in 15 countries in the region, as well as in three other countries which served as study sites. The work over the past seven years has been a valuable learning experience. This report is an attempt to capture some of the more important learnings that have applicability for the development of future donor and country programs in water resources.

ISPAN's environmental and geographical information systems activities related to the Bangladesh Flood Action Plan will continue through mid-1995. Other ISPAN services will terminate at the end of December 1994.

The lessons of broad applicability that can be drawn from the experience of ISPAN can be grouped into five broad topic areas. These are:

- Water shortage and excess
- Water quality
- Institutions for water management and delivery
- Donor assistance
- Project Implementation

2. WATER SHORTAGE AND EXCESS

Resource Sustainability

Water allocation and use patterns generally do not reflect water scarcity that is resulting from population growth and industrialization.[1]

Conservation and reuse are rarely a part of government water sector policies, in spite of growing water shortages exacerbated by pollution. Measures that should be considered everywhere include:

- Integrated approaches that consider complete systems, not limited to individual subsectors such as urban, industrial or agricultural use, in water planning and management
- Incorporation of the range of stakeholder interests through transparent decision-making that involves the stakeholders
- Conservation of water in all water subsectors through minimization of transmission losses and reduction of wastage (such as through excessive evaporation) by users
- Management of demand through water pricing and removal of subsidies on such factors as electricity for pumping
- Reuse of wastewater and sludge
- Conservation of energy, funds and other resources used in water sector programs and projects
- Maintenance of base flows to support ecology and biodiversity, and conduct of studies to quantify such needs.

Need for Improved Measures of Efficiency

Measures of efficiency of water use and for computation of water balances are inadequate to measure progress toward sustainability.[1]

While efficiency of water use is generally understood to require minimization of losses and wastage, it is clearly defined only in the irrigation subsector. That definition does not completely isolate wastage from beneficial use. Other subsectors use conflicting terminology. For example, consumptive use to a water resource manager is very different from an urban utility manager's notion of water consumption. Water use components of national water balances appear to have varying bases. Sector-wide terminology and measures of performance need to be agreed on to provide a basis for monitoring use and abuse of the water resource in both quantity and quality, and for tracking progress towards sustainability.

System Sustainability

System sustainability depends on the appropriateness of the design to the needs of the users and to other existing and future conditions, and the setting up of institutional and financial arrangements for operation, maintenance and, where needed, rehabilitation, at the time of planning and implementation. System users have critically important roles, starting at the planning stage, in providing for sustainability.[2,3]

Large water management systems and facilities have been constructed by central or state governments with no arrangements or funds for maintenance. Inevitably, the facilities have deteriorated. Under today's circumstances, in which world food prices are low, economic justification of funding for rehabilitation of deteriorated facilities for irrigation, or for protection of agricultural land against flooding, is very difficult. There are numerous examples of both urban and rural water systems in which staff, often in excessive numbers, exist for operations but do not have the resources or incentives to maintain and repair facilities. Rural potable water systems are frequently fully dependent for maintenance on users, who may lack the necessary skills. Revenue collection is often inadequate and sometimes non-existent.

There are some well operated and maintained systems. These include urban systems where, through public relations and other initiatives, water users are paying the full cost of service and other types of systems where users are motivated and have been empowered to own and operate them. Where revenues are adequate, there are examples of successful operation and maintenance through both public and private sector ownership and, under public ownership, through operations by direct-hired staff, by village or user associations, and by contractors.

At the heart of successful operation and maintenance is the motivation of the users either to provide the necessary revenues through user fees or to take direct responsibility for operations. Such motivation is very difficult if the users feel that the system and its costs have been imposed on them. Demand-driven initiatives are therefore very important, requiring special efforts to

generate public support for measures the benefits of which may otherwise be seen as largely external to the individual users.

Flood Management

Embankment systems designed to separate rivers from their flood plains are unlikely to be sustainable.[4,5,6,7]

Except to protect certain limited high value areas such as cities, embankment structures are likely to:

- Fail to provide the agricultural benefit that their proponents claim would result from avoidance of agricultural damage and curtailed crop growth during major floods
- Prevent beneficial annual flooding that brings soil, nutrients and fingerlings for subsistence fishery (which, in Bangladesh for example, is the principal source of protein for the rural poor)
- Increase the impacts of floods on residents of unprotected lands between the embankments by increasing flood depths, durations and velocities
- Be short-lived because of overtopping caused by elevation of the flood channels due to silt deposition between the embankments, because of possible sabotage by residents of unprotected areas, and also because of the inevitable channel migrations
- Create health and environmental problems due to ponding of water behind the embankments

Where embankments are not appropriate, protection from some of the most serious effects of flooding can be provided through combinations of flood proofing and flood warning.

Water Rights

Significant efficiency gains and economic and social benefits can be expected from establishing markets in tradable water rights.[8]

Experiences in Chile, Mexico, and California on adopting comprehensive market-oriented water policies provide guidance in resolving the complex issues that arise, including the initial

allocation of water rights, definition of rights, treatment of return flows, protection of the environment, role of water user associations, infrastructure requirements, and the role of public and private institutions.

Even comprehensive water law reform allows a phased approach to implementation, which can begin with carefully regulated markets that are progressively opened up as market experience is gained. Greater regulation at the outset will limit the size and scope of the market and will likely reduce the efficiency gains. The benefits show that losses incurred from excess regulation of the market can be very large, but this may be an appropriate trade-off for risk-averse governments that are in the early stages of undertaking fundamental reform.

Existing inefficient water systems are under heavy pressure because of the increasing economic value of increasingly scarce water. Development of water allocation systems through markets in tradable water rights offers a viable approach to meeting some of the challenges facing developing countries, and should therefore received serious consideration from policy makers.

3. WATER QUALITY

ISPAN did not provide technical services specifically oriented to sanitation and potable water delivery, but an applied study[1] did address some issues in this area. Lessons from the study are presented here.

Sewerage and Sanitation

The preference by many governments in the region for inappropriate treatment facilities that cannot be operated effectively and efficiently has diverted attention and funding from low-cost solutions which could be more sustainable and socially acceptable to urban populations.

Expensive treatment facilities have been installed to ward off pollution, but operating them properly is either too expensive or not justified by the benefits. Low-cost treatment systems, such as lagoons or other natural systems, have also been installed in some locations in the region, but these methods are often not considered because of conflicts with pollution control regulations, the difficulty or cost of acquisition of the large site areas needed, or the fear of social unacceptability or nuisance. Large-scale demonstrations are needed of successful low-cost, operable, socially acceptable solutions for urban populations.

Separation of Waste Streams

The combined collection of sewage and industrial wastes contaminates otherwise recoverable water and sludge with toxic and carcinogenic chemicals. The separation of non-biodegradable and toxic/hazardous waste streams from sewage should be encouraged, and industrial wastes should be minimized.

A number of countries in the region are considering or already implementing programs of wastewater reuse for agriculture. However, whether by design or happenstance, urban wastewater systems often carry uncontrolled mixed discharges of sewage from domestic and commercial premises and industrial wastewaters. Water contaminated only with biodegradable substances can be recovered for reuse, as can the sludge recovered from treatment, but if toxic and carcinogenic substances are present, they may render the liquid or solid materials unsafe for use in agriculture. Toxic substances may even interfere with biological treatment of the wastewater. Removal of these substances after admixture with wastewater is very expensive and, in many economies,

impracticable. It is therefore important not only that discharges of toxic and hazardous waste be minimized, but also that industrial wastes be handled, to the maximum practicable extent, separately from domestic sewage.

Industrial Wastes

Toxic and carcinogenic substances in industrial wastes (and also in agricultural chemicals) enter the food chain even without deliberate recovery and reuse of wastewater. Water and nutrient conservation through safe reuse of wastewater liquids and solids is dependent on control of toxics and carcinogens. This is a serious potential problem but quantified data are needed.

Industrial activity, encouraged by governments, is increasing in many developing countries. Industrial use of toxic and carcinogenic materials is also increasing. Unless they are retained, and either reused or separately disposed of, these materials find their way into wastewater streams and hence into freshwater bodies. There, together with other industrial waste components, they endanger human health, through both potable water use and the food chain, add to the costs of other water users, and damage ecological resources such as wildlife habitats. However, very little quantified information is available. Studies are needed urgently because it is possible that the health hazards from this are considerable and may not be able to be taken care of by improved treatment and disposal of urban sewage.

4. INSTITUTIONS FOR WATER MANAGEMENT AND DELIVERY

Water System Operations and Maintenance

The operation and maintenance of water systems must be provided for by countries and donors from the start of the planning, design and implementation process as vigorously as the preparations for construction. However, these efforts alone will not lead to sustained user management of the systems.[9,10,11,12,13,14]

The planning, design and construction of infrastructure hardware is more rewarding and generally easier for infrastructure engineering agencies than operating and maintaining facilities. This often leads to separation of these functions and to deferral or omission of operations planning, poor service, and facility deterioration. The development and implementation of effective methods and procedures for system and facility operations and maintenance generally involves technical assistance and training of personnel from central or other sources and, for irrigation systems, close linkages between water user and main system operating organizations. Many water resources experts have argued a priori that by bringing users into decision-making roles during system design and construction, users will develop "a sense of ownership," leading to their better care and improved system performance of a system. However, all evidence indicates that even when users participate in the design and construction phases, they generally do not assume responsibility for effective operation and maintenance of systems.

Effective operation and maintenance of water systems depends upon accountability of management to the system users and autonomy in the collection and retention of user fees.[3,15]

There are many ownership, organizational, contractual and other arrangements that can provide successful operation and maintenance. However, a fundamental requirement is a responsible organization that is accountable to the system users and that has sufficient financial autonomy to assure the availability of adequate funds for operations and maintenance.

Sustainable Water User Organizations

Factors that influence the sustainability of effective rural organizations in irrigated areas are (a) degree of control the organizations have over resources, (b) social structure -the

degree of fit the organization has in community networks, and (c) administration - the character of the relationship between farmers and local or national government.[16]

The following summarizes lessons learned during ISPAN studies of how best to assist the development of sustainable arrangements for participatory management:

- Farmers in both water-abundant and water-short systems need water user or community organizations for reasons other than the delivery of water. Single-purpose, water-only organizations disappear from both if they do not meet other needs, especially economic needs, of their members.

- Land tenure is a deciding factor in water user association sustainability. Where tenure is secure, such associations have a better chance of surviving. If land tenure is insecure and there are many tenants, community associations are likely to become a permanent part of the agricultural landscape.

- Water user associations generally have better records in older systems when irrigation agencies work closely with traditional community leaders. Most of these are small systems where association members have real control over their resources.

- The clearer the lines drawn between what water and land resources, and irrigation infrastructure, belong to farmers and what to government, the easier will prove the task of encouraging and strengthening meaningful and sustainable user associations.

- Attempting to organize farmers on watercourses is time-consuming and labor-intensive. Governments and others have had success in organizing at the level of a major or minor distributory and letting farmers organize themselves on the lower reaches of systems.

- Coordinated government support for water user associations can improve their prospects for survival. However, associations perform better and last longer when not under the aegis of a specific technical line agency.

- Governments need to enact enabling legislation and implementing regulations that give water user associations legal recognition as formal, multifunctional organizations. Without this legal recognition, such associations will disappear when the projects that support them end.

Transfer of Management Responsibilities

Programs to turn operation and maintenance responsibility for water systems over to water users are generally supply driven. To be successful, turnover programs must be preceded by strong user associations and be demand-driven, with users wanting to take over the systems.[2,16]

Numerous countries and many donors hope that turnover programs will solve the problems of disappearing water user associations and inadequate operation and maintenance. They may be disappointed. Turnover programs have generally been supply-driven and do not transfer ownership of resources to the water users. Under these conditions, users generally see limited benefit in relieving governments of their responsibilities. The success of turnover programs depends on the strength of the user associations to which systems are given, and on the perception of their members of economic benefit to themselves as a result of turnover.

Institutional Reform

The effective management of water requires interactions with water user representatives and other stakeholders in ways not familiar to many water agencies. Managing water effectively and equitably generally requires significant changes in organizational cultures, skills and approaches. These changes depend on policies for change by responsible senior decision-makers plus iterative and consultative action-planning procedures.[17]

The effective management of water requires interactions with water user representatives and other stakeholders in ways generally not familiar to many water agencies, most of which are technically oriented. Adjusting to user-oriented ways of managing water requires significant changes in organizational cultures, skills and procedures. These changes are difficult to achieve, and depend on a firm commitment at the highest levels as well as on the application of managed change processes. The amenability of organizations to change depends in part on the clear establishment of policies for change by responsible senior decision-makers after initiating and overseeing an iterative and consultative action-planning procedure.

Policies and Planning

Water management decisions made by narrowly-focused government agencies tend to be biased. Equity and efficiency in water allocation and management, and protection of the environment, require balanced decision-making processes that provide integration across subsectors and that identify and accommodate stakeholder interests.[1,18,19,20]

The sustainability of water resources, in the face of increasing demands for water and increasing discharges of pollutants, is a major issue for most countries of Asia and the Near East. Approaches to water management vary but in several countries there is a trend towards increasing autonomy of water service providers. In others, however, service providers operating in particular water subsectors, such as irrigation and urban water supply, retain the powers and rigidities of government. Most water projects are implemented by single purpose agencies. As a result, intersectoral issues and efficiency of allocation of rights to use and pollute water tend to be considered inadequately, if at all. The interests of many stakeholders, especially the poor, are in many cases not determined or taken into account. Balanced decision-making processes are needed that provide integration across subsectors, and that mandate the discovery and accommodation of stakeholder interests.

While no generic approach to policy formulation can apply to all situations, some bases for effective policy change include a sound analysis, non-confrontational approaches and coordinated donor support.[17]

Successful policy change in the water sector is favored by, among other factors:

- Limited policy focus and limited number of institutions affected
- Perception of the changes as desirable by all parties, with no losers
- An iterative, flexible and consultative process
- Usefulness of the process outputs to senior decision-makers
- Leadership by motivated and experienced officials
- The existence of solid data and analysis to support the change
- Support by multiple, coordinated, donors
- Implementability, based on existing capabilities and available technical assistance

Sound data, careful analysis, and thoughtful non-confrontational presentation of conclusions in support of policy change are critical elements in policy development. In Bangladesh, there has been a major policy shift from fully structural approaches to flood protection to integrated, environmentally sustainable planning involving public discussion of issues. Activity by public

interest groups and NGOs, and donor re-orientation, have played a role but an important factor has been scientifically-based analyses.

Technology Applications

Appropriate technologies for use in developing countries are not limited to those that are simple and easily institutionalized. Where the need exists, the cost is low, and an unsustainable maintenance burden is not created, hi-tech applications such as geographic information systems can be very appropriate.[21]

The use of GIS technologies in the Bangladesh flood action plan has enabled several difficult issues to be analyzed rationally for forward decision-making by the government. The combined use of digital mapping, satellite imagery and image processing has enabled the quantification and prediction of several important aspects of riverine behavior that were previously subject only to very approximate assessments. Local staff have been trained in this work, a GIS users' group has been set up in Dhaka, and a strategy for institutionalization is being prepared. The benefits of the GIS work are already significant and include evaluation of population displacement due to erosion of island chars, establishment of a national GIS database, pilot flood compartment design and environmental assessment, and a pilot evaluation of disaster planning and relief.

Cost Recovery

Cost recovery for water is a critical and contentious topic in many developing countries and is politically extremely difficult, exacerbated by the prodding of donors. Instituting effective cost recovery measures depends heavily on having adequate information on costs and distribution of benefits, and on dissemination of the data to stakeholders.[22]

The implementation of cost recovery for water systems is politically extremely difficult and in some cases is even questioned technically and socially. In some countries, the term is itself contentious and has been replaced with cost sharing, reflecting that both the government and users are liable to shoulder the financial burden. Cost recovery depends on the acquisition of adequate information on actual costs and on the distribution of benefits and on suitable dissemination to users of the water system.

5. DONOR ASSISTANCE

Promotion of Sustainability

In addition to their obligation to support only environmentally sustainable water programs and projects, donors have an opportunity to help governments to develop and apply sector-wide strategies and policies to support sustainability.[1,23,24,25,26]

The economic, health, and ecological implications of uncontrolled use of water resources by any one subsector are now so great that it is clear that sector-wide approaches are necessary by countries. Given the degree to which country water development actions are influenced by international donors, new approaches by donors are warranted. Past approaches have tended to focus on individual projects and to rely heavily for coordination of water management on such devices as loan covenants or institutional studies that are tacked onto water infrastructure projects.

Given the potential beneficial influence of donors, it is critical that they strongly support cross-jurisdictional and transparent approaches to water resources development and assist host countries, through technical assistance, to develop the necessary strategic and policy frameworks and environmental assessment processes. Because of countries' reluctance to borrow except for infrastructure development, this implies a need for grant assistance.

Because water issues affect many agencies in governments, donors wishing to promote water policy rationalization need to take care to base their approaches on sound analyses and work in partnership with countries, if necessary engaging at high levels of government.[20]

Water issues generally cut across the interests of numerous line agencies in governments (such as those responsible for agriculture, irrigation, environment, health, urban planning, industry, public works, transportation and local government). This makes the establishment and implementation of coherent water policies and strategies very difficult for most governments, and tends to lead to ad hoc decision-making based mainly on consideration of limited sub-sectoral interests.

Water issues cut across the interests of many agencies in most governments, creating difficulties not only for the governments but also for donors. Because of the vested interests of powerful individuals and agencies in certain aspects of the water sector, effective policy engagement on this subject in general is likely to require both solid support based on careful analysis and engagement at higher levels of government than is necessary for some other sectors. The

appropriate point of access must be carefully selected, especially since some of the policy issues may not yet be fully understood or acknowledged at the start of a program of assistance.

Donor Coordination

Some degree of understanding between donors is needed to establish and maintain a common focus on environmental sustainability and to avoid undercutting.[1,20]

International development funding agencies are to some extent in competition with one another. Without dialogue between them, there is a potential for donors to fund projects that are pressed for by governments even if at some point they are found to fail important sustainability tests. A very fine line is walked by responsible donors which do promote sustainability but which also support the responsibility of governments for their programs and projects. Some criticism of donor-funded programs has ignored the difficulty of doing this. Nevertheless, important examples do exist of donor-funded water projects that are not sustainable or that lack measures needed to mitigate important environmental or social shortcomings.

It is important that donors maintain continuous dialogue among themselves on processes and criteria for recognizing environmental sustainability in defining the objectives and conditions of assistance for water development.

Policy and Institutional Improvements Take Time

The benefits of leveraging the effects of assistance in policy and institutional areas through linkages to infrastructure assistance are well recognized by grant assistance donors. However, in practice, the project cycle for infrastructure development tends to become a constraint if construction funding is released before funds for institutional development. The attempted leveraging of funds then becomes counterproductive.[19,20]

Multilateral and bilateral providers of assistance in policy and institutional areas of water sector development have an interest in linking their inputs with infrastructure loan assistance programs. The main reason is the greater attractiveness to most governments of visible infrastructure development over policy and institutional changes the need for which may not be well understood and which need more time to be successfully implemented.

While response to country interest in infrastructure investment will often be the best opportunity for donors to promote sound water policy and institutional concepts, the development of the

strategies on which detailed policies and institutional arrangements should be based takes more time than is commonly allowed for facility planning and feasibility analysis for water projects.

6. PROJECT IMPLEMENTATION

Role of Experts from the Region

Including host country and regional professionals in technical assistance teams in both leadership and technical capacities adds appreciably to the benefits. The quality of ISPAN's outputs owes a great deal to these arrangements.

Country and regional professionals were a part of nearly every short-term ISPAN assignment in Asia and the Near East. They proved to be highly effective team members. Experts from the region served in leadership positions as program directors of long-term applied studies and policy formulation programs in Egypt, Jordan, India, and Sri Lanka. An important ISPAN innovation was the use of experts from the region in other countries where they could bring to bear their own experiences and knowledge. The quality of ISPAN's outputs owes a great deal to these arrangements.

Start-up and Review Workshops

Project-related workshops, held at the beginning of and regularly during the project cycle, can provide an opportunity for host government officials, donors, and technical assistance teams to clarify and modify expectations and objectives for the project, discuss problems and issues that are hampering project implementation, and identify specific strategies for overcoming implementation constraints.

USAID Missions sponsoring project start-up and review/planning workshops have noted that they provide a process which is very valuable for reaching agreement on critical implementation issues and identifying specific steps needed. The agreements that come out of the project workshops provide a structure for monitoring progress being made toward achieving project goals and objectives. Introduction of the workshop process has frequently been a significant contribution to effective local resource management.

Team Planning Meetings

Short-term technical assistance teams are most effective if they arrive in-country well prepared to perform the work they are expected to do. Team planning meetings comprise

a very important element of team preparation used consistently by ISPAN. To be effective, they must be properly planned and rigorously facilitated.

Team planning meetings were conducted with all technical assistance teams prior to their departure for the field. Additional team planning sessions are also held in-country with the local consultant team members. Such meetings help teams to understand their mandate and who they are responsible to, clarify their team and individual scopes of work, decide how they are going to work together, identify ways of dealing with conflict within and outside the team, schedule their time in-country, and agree on an outline and assignments for the final product. Team members who participate in the 1-2 day team planning meetings arrive in country with a clear understanding of their role, who they want to meet, and what they want to investigate. They also know the background and history of the activity and who the key players are. The team planning meeting design is adapted as appropriate from a guide[27] produced by the WASH Project in 1985.

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