

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT IDENTIFICATION DOCUMENT
FACESHEET (PID)

1. TRANSACTION CODE <input type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete	Revision No.	DOCUMENT CODE 1
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2. COUNTRY/ENTITY Central	3. PROJECT NUMBER 936-4179
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4. BUREAU/OFFICE S&T/FA	A. Symbol <input type="checkbox"/>	B. Code <input type="checkbox"/>	5. PROJECT TITLE (maximum 40 characters) Irrigation Mgt. Support and Research
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6. ESTIMATED FY OF AUTHORIZATION/OBLIGATION/COMPLETION A. Initial FY 87 B. Final FY 93 C. PACD 97	7. ESTIMATED COSTS (\$000 OR EQUIVALENT, \$1 =)	
	FUNDING SOURCE	LIFE OF PROJECT
	A. AID	20,000
	B. Other U.S. 1. 2. AID Bilateral (20,000) C. Host Country D. Other Donor(s)	
TOTAL		20,000

8. PROPOSED BUDGET AID FUNDS (\$000)							
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. 1ST FY 88		E. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) 103	120 S	064		2,000	0	20,000	0
(2)							
(3)							
(4)							
TOTAL L3				2,000	0	20,000	0

9. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each) 022 874 876	10. SECONDARY PURPOSE CODE
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11. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each) A. Code RGEN PART	B. Amount
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12. PROJECT PURPOSE (maximum 480 characters)
Assist USAID Missions and host-countries to establish the capability to bring about the water management/utilization improvements necessary to achieve productivity increase within their agricultural sectors.

13. RESOURCES REQUIRED FOR PROJECT DEVELOPMENT
Staff: Agriculture Development Officer; 5 weeks
Irrigation Management Specialist; 4 weeks
Irrigation Engineer; 4 weeks
Funds PDS \$47,000

14. ORIGINATING OFFICE CLEARANCE	Signature	Date Signed MM DD YY 16 3 08 16	15. DATE DOCUMENT RECEIVED AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY
	Title A. R. Bertrand, S&T/FA		

16. PROJECT DOCUMENT ACTION TAKEN <input type="checkbox"/> S = Suspended <input type="checkbox"/> A = Approved <input type="checkbox"/> D = Disapproved CA = Conditionally Approved DD = Decision Deferred	17. COMMENTS
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18. ACTION APPROVED BY Signature: Nyle C. Brady Title: SAA/S&T	19. ACTION REFERENCE	20. ACTION DATE MM DD YY 08 12 86
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AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

JUN 30 1986

ACTION MEMORANDUM FOR THE SENIOR ASSISTANT ADMINISTRATOR
FOR SCIENCE AND TECHNOLOGY

THRU: S&T/FA, Anson Bertrand *AB*
S&T/HR, Ruth Zagorin *RZ*
S&T/EN, Jack Vanderryn *JV*

FROM: S&T/AGR, Tejpal S. Gill *Tejpal S. Gill*
S&T/RD, Chris Russell *Chris Russell*
S&T/EY, Allen Jacobs *Allen Jacobs*

SUBJECT: Project Identification Document: Irrigation
Management Support and Research Project (936-4179)
(Doc #0001)

Problem: Your approval of the subject Project Identification Document (PID) is required in order to proceed with development of a Project Paper for the proposed Irrigation Management Support and Research (IMSAR) project, which is designed to help service the Agency's continuing program and sector-support needs in the irrigation/water management area beyond FY 1987.

Background and Discussion: Growing food requirements, together with continued reliance upon agriculture to provide the economic engine for broader rural development, are forcing many developing countries to accelerate efforts to increase agricultural productivity and output. For these countries, one key to the success of such efforts is more efficient and effective use of their water resources, including the expansion of irrigation in areas where ample water and suitable soils exist and through the improved performance of irrigation systems already in place. Achieving this however presents a formidable task, requiring not only a major investment in physical infrastructure but also the development of both an adequate technological base as well as the necessary human resources and institutional capabilities for carrying out such efforts in an effective and sustainable way.

1. Past and Present Efforts

A.I.D.'s Water Management Synthesis-II (WMS-II) project, which the S&T Bureau has managed, as well as jointly supported in collaboration with the Asia and Near East Bureau, has focused strongly on the above problem-area, providing leadership to the Agency's overall efforts to expand and strengthen its

bilateral program in the irrigation/water management area. The project has exerted this leadership through a two-pronged approach which included both short-term assistance to missions and regional bureaus, aimed at helping them develop a stronger portfolio of irrigation projects, as well as through a companion program of broader sector-support activities, including special studies (research), action training and technology transfer. Missions and Regional Bureaus acceptance and response to these efforts have been greater than anticipated, with interest and requests for WMS-II assistance expanding to include the Near East and Latin America regions and more recently Africa.

Despite this success however, the need for continued efforts in this area, beyond WMS-II's scheduled termination date of 9/28/87, is well recognized. Consequently, under S&T/AGR's leadership, an Inter-Bureau Working Group on Irrigation and Water Management was formed last July (1985) to initiate efforts to develop a suitable follow-on program/project to meet the Agency's continuing requirements in this regard. The Working Group produced a Concepts Paper which was endorsed by all three Regional Bureaus as well as three offices within S&T interested in collaborating (S&T/AGR, S&T/RD and S&T/EY). A copy of the Concepts Paper and Action Memorandum is attached. And, although the Asia and Near East Bureau subsequently decided to develop its own 'stand-alone' project to service the specialized needs of its missions and host-governments, it has expressed a strong desire to remain a part of this Agency-wide umbrella program and net work which the proposed project hopes to establish and maintain.

2. Content and Structure of Follow-on Project

Subsequent efforts by the Working Group has yielded a Project Identification Document describing a 'follow-on' project that would provide continuing (direct) assistance to AID's field programs as well as a longer-term program of action research and technology transfer to help developing countries establish and maintain the knowledge and technological bases necessary to address the problems confronting better water management and the more efficient use of irrigation resources. While the project's goal is to bring about the improved (productive) performance of LDC irrigated agriculture, it proposes to help achieve this by assisting host-country institutions responsible for irrigation development and improvement to discharge their responsibilities in a more effective and efficient manner.

The PID for this proposed (new) project, which will be jointly funded by the Africa and Latin American Bureaus, as well as S&T, was reviewed and endorsed by the Agricultural Sector Council in its meeting of May 6, 1986 (Copy of Minutes Attached), with the Africa Bureau abstaining until additional internal clearances had been obtained. The latter has subsequently given its agreement in principle (See Edelman's Memo of 6/11/86, attached), which now clears the way for its formal approval by the Science and Technology Bureau.

Recommendation: That you approve the attached Project Identification Document for the Irrigation Management Support and Research Project and authorize the preparation of a Project Paper, as the required next-step in developing an Agency-wide supported follow-on to the Water Management Synthesis-II Project.

APPROVED: _____

[Handwritten Signature]

DISAPPROVED: _____

DATE: _____

August 12, 1986

Attachments:

1. Concepts Paper & Action Memo,
2. Copy of Minutes
3. Edelman's Memo dtd 6/11/86

S&T/AGR/RNR:LFitzgerald:mt:6/27/86:Ex1275:Wang #1246C

IRRIGATION MANAGEMENT SUPPORT AND RESEARCH

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PROJECT IDENTIFICATION DOCUMENT

IRRIGATION MANAGEMENT SUPPORT AND RESEARCH (IMSAR)

I. PROGRAM CONSIDERATIONS

A. The Project and Country Programs

While irrigation does not now play a predominant role in either food or other crop production in Latin America and Africa, it is of special importance in several countries. In Africa, as a result of recurring food crises, and the long-term downward trend in agricultural production, there is growing interest in expanding and improving irrigated acreage as a partial solution to the food problem. This, coupled with the great potential for irrigation development in many African and Latin American countries, provides a sound rationale for developing a concerted water management initiative with emphasis upon irrigation.

FAO estimates there are 33.6 million hectares of potentially irrigable land in Sub-Saharan Africa. Out of 5.6 million hectares actually under irrigation, only 2.7 million consist of "modern" forms, and of these, 1.7 million hectares are in Sudan alone. Only nine countries in Africa have 50,000 or more hectares of modern irrigation. Aggregate figures on existing irrigation, and especially on irrigation potential, are at best "guesstimates". The largest underdeveloped irrigation is found in countries often overlooked when irrigation is discussed: Zaire, Zambia, Sudan, Mozambique and Tanzania (each with over 2 million hectares potential). Furthermore, there are eight countries in the drought-affected zone where irrigation is a priority concern: Senegal, Mauritania, Burkina Faso, Mali, Niger, Somalia, Kenya and Botswana. Other major factors affecting Africa's irrigation are high cost—generally \$4,000 to 8,000 per hectare (excluding roads and social infrastructure)—and the poor performance of large public sector schemes. Public sector irrigation is mostly confined to high value or export crops, not food production.

While utilization of potentially irrigable area within most Latin American countries is relatively low, land currently under irrigation nonetheless contributes significantly to many of their agricultural economies, playing the particularly important role of foreign exchange earner through the production for export of agricultural products and commodities. During recent years, irrigated area has steadily increased in a number of these countries, including Peru, Ecuador, El Salvador and Honduras, as well as several of the Caribbean countries where AID has assistance programs. In fact, expansion is expected to accelerate in many LAC countries, as they are in a good position to take advantage of the growing export market for fruits and vegetables that they can supply under the Caribbean Basin Initiative.

Capital and operating costs for gravity irrigation in LAC are high, as is the level of technology required for successful production using irrigation. Privately owned systems, often associated with commercial plantation systems, have proven much more successful than public-financed systems. Most beneficiaries of public-sector systems are basic grain producers, often

unaccustomed to the high level of organization required for system operation. Yet, under agrarian reform programs, complex irrigation systems have been turned over to untrained farmers, who experience severe problems in operating them.

While a few countries such as Peru and Sudan have well developed irrigation systems and considerable irrigation capacity already in place, most countries in Africa and Latin America do not. In spite of the major AID commitment either underway or planned in a few countries, our investment portfolios are small in comparison with the large operations, maintenance, and capital improvements budgets of some host countries and other donors such as the World Bank. The problems that AID portfolios deal with are not, for the most part, those that concern the creation of major new irrigation capacity. Rather they consist of activities which modify existing patterns of irrigation, increase the efficiency of existing irrigation systems, retrain and reorient organizations involved in irrigation, and emphasize revised organizational and physical improvement strategies for increasing agricultural production.

Although the problems of poor water management and utilization are worldwide, this project will address the needs of those African and Latin American countries wherein AID has assistance programs. This uneven focus stems from the fact that the Asia and Near East Bureau (ANE) is developing its own support project to provide similar service for its Missions and host countries. Any activities under this proposed project in the ANE region will be executed in close collaboration with the ANE's Irrigation Management Improvement Project.

B. The Project and AID Central/ Regional Strategy

The proposed project will strengthen AID's efforts to resolve two strategic development problems, as set forth in the Agency's "Blueprint for Development"—namely, hunger and economic growth. In doing so it will utilize all four pillars to its strategy for development assistance: technology development and transfer, institutional development, policy reform and the private sector. The project will support the Agency's goal of a two-percent sustained rate of economic growth per annum and will help reduce the percentage of children under 5 that suffer from chronic and severe under nourishment to less than 20 percent, as well as attain the critical level of calorie intake for at least 90 percent of the population. It will accomplish this by assisting developing countries to improve the productive performance of those components of their agriculture where water management is especially critical, particularly their irrigated subsectors.

The project will directly address AID's priority concerns for improving the performance of LDC agriculture, including more efficient and effective use of the land and energy resources available, greater agricultural output, increased employment opportunities and higher income for farmers. It clearly falls within S&T/AGR's priority program of natural resource management for agricultural production and supports its emphasis on greater farmer participation and improved institutional performance for development of the rural economy.

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Recognizing the importance of water resource development for irrigation, AID has led in supporting research and development to assist host countries in developing their irrigation resources, and to use these resources more efficiently. Although most of AID's current irrigation portfolio is in Asia and the Near East, over \$67 million dollars are targeted for new or continuing irrigation activities in LAC. The "African Assistance Plan--1986-90" (draft) notes that irrigation water is an obvious and so far little used input that could significantly reduce vulnerability to drought, help even out production swings, and raise output. While irrigation development in Africa has proved difficult and costly, there is considerable potential for irrigation development and water harvesting in many countries. In LAC, the ROCAP Mission has identified irrigation/water management as a major constraint to agriculture in Central America, improvement of infrastructure, including irrigation systems, is a specific objective under the Jackson Plan.

The Bureaus are approaching this subsector with renewed interest. AFR is now emphasizing rehabilitation of existing facilities, expanded support for locally managed irrigation systems, and improved water management. LAC sees irrigation's role as important in developing export trade in the Caribbean Basin by promoting irrigated winter vegetable production, while at the same time safeguarding fragile hillslope resource bases and retarding erosion by designing and improving--and maintaining--irrigated hillside cultivation systems.

C. Mission Responses Supporting the Project

Missions in both AFR and LAC have indicated a need for, and a willingness to utilize the services of a centrally funded irrigation/water management research and support project designed to build upon AID's successful Water Management Synthesis II Project. Mission comments and suggestions were discussed at the 1985 AFR ARDO Conference in Lome, Togo, and more recently with Mission representatives both informally and officially through cable responses from 14 AFR and 8 LAC Missions. Mission input and comment on design issues have been helpful, and sufficiently supportive of the project to pursue PID development. Additional suggestions and comments will be sought following approval of the PID.

II. PROJECT DESCRIPTION

A. The Problem

Increasing food requirements, together with continuing reliance upon agriculture to provide the economic engine for rural development, are forcing many developing countries to accelerate efforts to expand agricultural productivity and output. For these countries, one key to the success of such efforts is more efficient and effective use of their water resources, including the expansion of irrigation in areas where ample water and suitable soils are available and through better performance from existing systems. Increased attention is also being given to other types of farming where water management and utilization are critical. These include flood recession

agriculture, wet lands (marshes) and swamp cultivation including drainage, and water harvesting/spreading practices to allow crop production under extremely low rainfall conditions. While the constraints to achieving more efficient use of available water resources are varied, they create an urgent need for better water management.

Major problems include the following:

1. The Nature of Poor Irrigation System Performance.

Poor water management is the leading cause of poor irrigation system performance. It can manifest itself in a variety of ways, including excessive canal losses, poor main system operation, inequitable distribution of water among cultivators, deterioration of facilities and structures, failure to use water supplied at night, unreliable delivery schedules, inadequate cost recovery to fund O&M, inability of systems to fully irrigate the design command area, and a host of others. Although the need for improved irrigation system operation, including better water management at all levels of operation, is increasingly recognized, how best to address it is less well known. What is now recognized is that the causes are social and institutional as well as technical and economic. Effective solutions require an integrated and multidisciplinary approach that gives adequate attention to both the physical and non-physical components of the overall water delivery/allocation/distribution/production system. Among the questions and problems that require this multidimensional approach are the following:

- extremely high cost systems in Africa and LAC compared to those in Asia, with some irrigation systems being abandoned;
- lower population density within irrigation systems in Africa (typically 10% or so of South Asian levels) where labor, rather than land or water, is often the scarcest resource;
- rehabilitating and improving dilapidated systems and those with inadequate water control capability in a cost-effective way;
- developing and implementing more efficient data-based management systems for system operations and maintenance;
- finding more effective ways to organize farmers into irrigator associations;
- developing and applying effective irrigation management practices for export crops and other cropping patterns;
- finding ways to enhance local resource mobilization to support O&M and to responsibly devolve increased system management authority to farmers;
- developing ways to stimulate and support ground water and other small irrigation systems development through the private sector;

--examining the viability of energy systems for water pumping, taking into account fuel availability and costs, ease of repair, access to spare parts, and associated managerial and economic issues.

2. Water Management Problems in the Non-Irrigated Sector

Water management is also a critical element under a variety of non-irrigated production systems, ranging from situations of excessive water to those with sub-marginal amounts. Opportunities for improved water management, and ultimately increased agricultural production, under these extreme conditions are challenging, since there is a far greater potential in many countries for improved water harvesting and agronomic practices than for conventional irrigation. This is certainly the case for much of Africa where rainfall can be both scarce and overabundant during alternate seasons of the year. Efforts to bring about more effective and efficient water resource management under such conditions are difficult, requiring attention to social and institutional constraints as well as economic and technical. This, in turn, requires a multidisciplinary and integrated approach to bring about improved water management and the associated intensification of agriculture under such conditions.

3. Lack of Institutional and Human Resource Capability.

While there is general agreement on the nature and urgency of the above problems, the human and institutional resources available to deal with them in effective and innovative ways remain strikingly inadequate in Africa and Latin America. The multidisciplinary approach needed in addressing them is also difficult to obtain from established government line agencies.

In most countries in Africa and Latin America the "support sector" of institutions, comprised of universities, research and training institutes, private companies and organizations, and various PVOs and other NGOs is not able to support water management adequately. In many cases, the need for such support is not recognized, even though recent experience indicates that such institutions have an absolutely pivotal role to play. There is also a striking absence of adequate technological bases for irrigation/water management support in most countries. While solutions are known for some problems, new and better answers are needed for others. Addressing this institutional support deficiency is essential to any sustainable, long-term effort to achieve better water resource management and utilization on a scale that can significantly increase agriculture productivity and output.

Actual adoption of improved water management practices in the field is the only way to achieve better water management and ultimately increase agricultural production. Developing and putting the improvements into practice in an effective manner and over a large enough area to have any significant impact requires establishing the necessary capability within the agencies and organizations responsible. AID can play a vital role in addressing that general weakness while also giving direct support to developing country efforts to get better water management practices employed.

This can be done through establishment of bilateral field projects which provide assistance to the "support sector". Such efforts can be strengthened by the additional resources of a centrally-funded project that emphasizes the need for strengthening institutional and technical capabilities, and offers direct assistance to AID's field missions for design and implementation of programs and projects in irrigation/water management. It is this need and the role that such a centrally-funded effort can play that provide the argument and justification for the project being proposed.

4. Energy Constraints to Pumping and Expansion of Irrigation

Agricultural experts predict that roughly 80 percent of all African irrigated agriculture will eventually rely on pumped irrigation. Pumping is an energy-intensive activity; thus, the energy/power component in irrigation systems should not be overlooked. The ease of repair and access to spare parts, as well as the availability and cost of fuel, have dramatically affected the operation of various African irrigation projects. A 1985 report by Utah State University states that lack of power can be a more important obstacle than poor water management. As irrigation projects become more widespread in Africa, there is a need to match irrigation energy requirements with indigenous (or other) energy resources. This project will support and encourage a multidisciplinary approach to examine these needs.

B. Project Goal and Purpose

The goal of the proposed project is to bring about improved performance of developing country agriculture through better water management. Better water management is the means by which needed productivity increases can be attained to meet growing food requirements and save scarce foreign exchange through the expansion of agricultural exports and reduction in food imports. Productivity increases can also contribute to broader economic growth by increasing employment opportunities within agriculture, generating excess capital for investment in other sectors, raising farm income and creating expanded markets for non-agricultural products.

While productivity increase through better water management is the goal, project activities will aim directly at the problems and constraints to its achievement. Thus, the project purpose can be stated as follows: To assist USAID Missions and host countries to establish the capability to bring about the water management/irrigation improvements necessary to achieve productivity increases within their agricultural sectors. This requires that the project focus its operational attention to strengthening developing country institutions responsible for irrigation development and water management/utilization, and to developing the technological base by which needed improvements can be achieved and maintained.

C. Expected Achievements and Accomplishments

The project's immediate aim is to increase the capability of AID-recipient countries in Africa and Latin America/Caribbean to effectively address the causes of poor water management and to improve the performance of their agricultural sectors. However, this improved performance, while primarily

measured in terms of increased agricultural productivity and output, should be understood to also reflect concerns for sharing results among as broad a set of beneficiaries as possible while minimizing detrimental environmental effects. The project will pursue its objective through a two-pronged strategy:

1. Field Support to Missions. Through a program of direct support to field missions, including: (a) technical assistance in designing, developing, monitoring, and evaluating AID-funded efforts in irrigation/water management, including regional and country irrigation sector assessments; and (b) training of host country nationals through in-country short courses, workshops and the development of training materials—video tape modules, computer training models, instructional manuals, etc..

2. Sector Support. Through a program of action research and technology transfer, in collaboration with selected international, regional, and national institutions, assist developing countries develop and maintain the knowledge and technological base necessary to address the problems and constraints confronting better water management and more efficient water resource utilization.

The Logical Framework (Annex 1) provides an illustrative list of the outputs that will be produced. In terms of more general achievements and end-of-project status, below are the major results being sought:

1. A More Effective AID Portfolio in Irrigation/Water Management. While irrigation and other means to develop and use water resources more effectively are not the sole answer to the need to increase agricultural productivity and bring about broader economic development, they will play an increasingly important role in this regard for a significant number of developing countries. A growing number of LAC and AFR Bureau Missions are contemplating expanding their project portfolios to include water management/irrigation activities. Through a program of assistance to Missions and host governments, in conducting sector surveys, feasibility studies, project design, implementation monitoring, evaluation and redirection, the proposed project will help develop and oversee the implementation of an expanded program for irrigation and water resource utilization.

2. Improved Capability Within Developing Country Institutions Responsible for Irrigation and Water Management. Among those countries relying heavily upon irrigation and other forms of water management to achieve the intensification needed within their agricultural sectors to meet food production and other development goals, most do not have the necessary capability to function in an efficient and effective manner. Through training, technology transfer and technical assistance (most often in conjunction with AID bilateral programs), the proposed project will create a much strengthened capacity within these countries to plan, develop and carry out successful programs of irrigation and water management.

3. An Appropriate Technological Base and a Means for Maintaining and Updating It. Although irrigation and other water management techniques are not new in most of the developing world, insufficient attention has been given

to establishment and maintenance of an adequate technological base from which effective improvement efforts can be launched. Not only do most developing countries lack such technical knowledge and the ability to generate it, but regional institutions lack the ability to provide or even supplement this need. A major aim of this project is to help establish an improved resource capability at both the national and regional levels, including networks to facilitate and contribute directly to the knowledge base and joint cooperative investigations with such institutions wherever possible.

4. A More Integrated Way of Understanding and Addressing the Problems of Poor Water Management. WMS II and earlier AID projects have clearly demonstrated that the causes of poor water management and the constraints to its improvement are interrelated and require dealing simultaneously with social, institutional and economic concerns as well as the more obvious technical ones. Thus, a multidisciplinary approach has been employed to bring about better irrigation system performance and improved water resource use. Farmer involvement in the design and development of irrigation systems as well as their participation in operation and maintenance has also been shown to be important to achieving high system performance. This new way of understanding and addressing the wide-spread need for better water management and irrigation constitutes the greatest impact of AID's efforts to date. This follow-on project will further the adoption of this approach as well as expand upon the concepts and methods that underlie it.

5. An Increased U.S. Capacity to Service AID's Assistance Needs in Africa. While the U.S. university community and the consulting industry have had a long history of involvement in Asia and Latin America, their depth of experience and level of expertise in other regions of the developing world, particularly Africa south of the Sahara, is quite limited. Thus, with Africa Bureau intending to undertake a long-term program of irrigation development and improved water resource utilization, an expanded multidisciplinary cadre of water management experts is needed to implement this effort and help bring about needed improvements. The proposed project will continue efforts started under WMS II to develop such a cadre.

6. Identification of Energy Constraints to Expand and Improve Irrigation. There is a clear need to identify and quantify water pumping/irrigation necessary for development and expansion of agricultural production. The energy requirement to support irrigation systems must be matched to the energy availability in the region. Should energy be a constraint the project will collaborate with ST/EY in identifying means to remove those constraints.

Through its support of irrigation research and development, AID has been instrumental in changing the overall terms of reference for the field. Where irrigation once was considered the domain of engineers alone, and donor assistance concentrated on large-scale public sector systems, years of work, and the achievement of real success by AID-supported water management projects utilizing a multidisciplinary approach, have resulted in dramatic shifts of perception within the field. It is now taken for granted that water management will be concerned with small as well as large-scale systems; with private as well as public systems; with participation by water-users as well as bureaucrats in the design and management of systems; with operations and

maintenance as well as construction; and complementing these new concerns, with the utilization of multidisciplinary teams of technical and institutional specialists for design and implementation.

The proposed follow-on project thus carries forward important concepts which have become established through extensive testing and verification in AID projects. The project intends to direct attention to water management and irrigation issues in regions outside Asia and the Near East, using the proven "synthesis" approach to explore problems and develop solutions in irrigation in Africa and Latin America.

D. Outline of Project Implementation.

The project will be a \$40 million 10-year effort managed in the S&T/AGR office, with S&T/RD providing a supporting co-manager. Core funding will come from a combination of S&T, Africa and Latin American Bureaus, with the remainder from mission contributions for specific activities or programs of work. Some activities such as international conferences and possibly training and information dissemination may be co-sponsored with the ANE IMI project. With the central funds being provided, mission buy-ins and the collaboration with ANE, this project will be very much a joint effort.

A contractor will be selected through open competitive bidding to implement the project. The bulk of project funds will be expended through this contract. However, some funds will be reserved for use outside the primary contract to provide the project manager with maximum flexibility in meeting project objectives. For example, an agreement to co-sponsor a workshop or conference with another donor where only a financial transfer is involved may be done far more cheaply if the funding does not have to pass through a technical assistance contract.

Funding may be provided to selected international research institutions for collaborative research in Africa and Latin America. Furthermore, certain research funds will be held for irrigation research outside the main contract to be disbursed against specific irrigation proposals from researchers, universities and institutions in the US or other countries. These arrangements will be more fully articulated in the PP.

Day-to-day administration of the project will be the responsibility of the contractor, who will operate within the guidelines of an AID-approved workplan. The contractor will be required to provide up-to-date information on all project activities to AID upon request. This will require a computer-based telecommunications link-up, a Washington base for the contractor, or both.

USAID missions will have primary responsibility for reviewing credentials of proposed TDY personnel and arranging details of particular TA activities directly with the contractor. AID/W will provide missions with technical advice on these matters upon request.

Major research proposals submitted to the project for funding both within

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and external to the major contract will be subject to outside peer review as a precondition for inclusion in the work plan. Project funds will be allocated for this review process to insure its quality and objectivity.

III FACTORS AFFECTING PROJECT SELECTION and FURTHER DEVELOPMENT

A. Social Considerations

1. Sociocultural contexts

The project proposes to focus its efforts in the AFR and LAC regions. Unlike Asia and the Near East, irrigation is less well established in these regions, and its production potential is far less well known. In some African and Latin American/Caribbean countries, such as Sudan, Senegal, and Peru, public sector irrigation works are extensive and important to the economy. But in most AFR and LAC countries, irrigation is a private sector, mostly small scale enterprise, combining basic technology with difficult climatic and topographical situations to wrest a minimal living from the land. The sociocultural contexts for irrigation in these regions vary from centrally administered bureaucratic irrigation regimes with little local participation in decisions, to Sahelian oasis systems expanding as villagers develop stable food production systems in the face of drought, to small hillslope systems constructed and maintained autonomously by Native American farmers in Guatemala. Moreover, evidence is increasing that water control in tropical conditions, involving aggressive rainfall regimes on steep slopes, and drainage as well as supply, will require strenuous research efforts to define sociocultural as well as technical parameters of these problems, in order to devise means of addressing them to improve productivity and income. It is important that AID lead in exploratory research aimed at practical development of water control for agriculture in those regions.

2. Beneficiaries.

As the example of WMS-II indicates, the ultimate beneficiaries of this project are low-income farmers who will be able to grow more food and fiber due to enhanced control of scarce and expensive water. Additional beneficiaries of this project will be research professionals, in both the US and LDCs; policy makers in national governments and donor organizations; and local farmers at project sites in AID-assisted countries where project impacts are augmented by the activities of this project.

3. Participation.

Although low-income farmers will be longer-term beneficiaries of the project, their initial participation in project design and implementation will come through examination of the various means which they have evolved for controlling water for crop production in specific agro-climatic and topographical settings. Their efforts will be examined and assessed for efficiency and effectiveness by multidisciplinary research teams, who will utilize farmers' local knowledge as a base for developing more general findings.

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Participation also involves the collaborative efforts of U.S. and host country professionals representing several disciplines in assessing and analyzing irrigation practices in diverse settings. This joint participation, the "synthesis" which has been found to be an important element in the development of irrigation interventions under WMS-II, will be emphasized and broadened in this follow-on project.

4. Sociocultural Feasibility.

The proposed project both breaks new and important ground, and follows directly from successful previous efforts in irrigation water management such as WMS-II and its predecessors. The feasibility of the guiding synthesis concept is assured through its extensive testing over nearly two decades of AID efforts. The application of this approach to new regions will require "adaptive research" addressing the diverse climatic and topographic as well as sociocultural and institutional settings within which irrigated agriculture takes place.

B. Economic Analysis

Project activities are expected to result in increased efficiency in water delivery, utilization, control, and management. The enhanced reliability of irrigation water, along with the increased quantity, would increase agricultural output without the addition of other inputs. However, as well documented, the availability of larger and more reliable supplies of water will induce the use of additional complementary inputs of fertilizer, improved seeds and labor. This profitable, yield-boosting technology package, along with technical advice on its application, will also reduce unit cost of output. Thus one can expect:

- higher yields per crop;
- greater cropping intensities—more multiple cropping;
- faster growth in the production of higher value crops;
- higher net incomes for participating farmers—more units of output and lower per unit production costs;
- greater utilization and more productive use of household labor;
- more on-farm employment for landless laborers;
- more business activity, enhanced income and increased employment for enterprises in the agricultural support subsector; and
- expanded purchasing power in the community, for products/services of non-agricultural light manufacturing, retailing and construction enterprises, promoting growth, investment and employment in these subsectors.

It makes little sense to attempt direct quantification of project benefits at this time. It seems clear that the number of beneficiaries will be very large and that the net benefits will also be very large relative to the project cost. One reason for this belief is that there is a substantial research component in the proposed project; and as is well documented, returns to research have been very attractive generally. As noted, the other components of the project are expected to make the research effort more effective than it would be in the absence of these components.

Additional documentation supporting the belief of high returns to this proposed project are the findings of the final evaluation (1985) of the Sri Lanka Water Management Project (383-0057). The external evaluation estimated the internal rate of return for that project at 47 percent. While the linkages between these two projects are tenuous, that project, as well as other specific country projects which are being implemented, and the proposed project share the same underpinnings and have generally common objectives and strategies, differing only in geographical emphases.

There are a number of lessons to be learned from that project and from other projects that WMS II has had a role in shaping. Observation and evaluation of these projects will make it possible to avoid mistakes and to profit from the successes. A number of evaluations of ANE and other Bureau projects are scheduled during the life of the project proposed here. The project framework will be designed to incorporate lessons from these evaluations for project design and management and to feed this back through the project into AFR and LAC Mission efforts.

C. Experience with Similar Projects

The proposed project, along with ANE's Irrigation Management Improvement project, is a successor to the Water Management Synthesis II project, which was a joint undertaking of the Asia and Science and Technology Bureaus. Because the newly merged ANE Bureau contains a critical mass of bilateral irrigation and water management projects and considerable in-house expertise and experience, it has chosen to develop its own follow-on project to serve the special needs of the ANE Region. Close links between the two projects are essential to insure that "lessons learned" and expertise from the more developed irrigated areas of the ANE Bureau can be applied under this project.

WMS II is generally regarded as an extremely successful project. Its core premise, that irrigation management problems are multidimensional in nature and require multidisciplinary teams for their solution, has been amply validated. The continuity of personnel made possible through a standing contract has also been a very positive feature of WMS-II. Likewise, combining technical assistance, training, and research activities in a single project executed through the same contractor has had powerful synergistic effects on both the TA and research sides.

On the other hand, the administrative mechanisms for WMS-II have proven cumbersome and slow. The project has yet to develop a timely and responsive

management information system to track project activities and report their progress to AID project management on request. It has also had difficulty in producing technical and, particularly, administrative reports in a timely way.

A project which may have lessons to offer in project management is the Water and Sanitation for Health (WASH) project, managed by ST/H. This project, similar in outline to WMS II, has developed an administrative structure that places far more responsibility for day-to-day project management on the contractor. WASd appears to have been successful in developing an effective computer-based management information system that provides timely information to the AID project manager on request. Administrative costs for this system, however, are high. A challenge will be to devise a structure and operational mode for the proposed project that will provide adequate activity tracking and monitoring at reasonable cost.

A third useful model is provided by the recently authorized ARIES project in ST/RD. This project incorporates a buy-in mechanism that allows services paid for by missions to be initiated through field services agreements rather than contract amendments. This is a promising innovation which may be utilized under the IMSAR project.

D. Implementation Requirements and Capability

While the project will be funded by both the Africa and Latin America/Caribbean Bureaus as well as the Bureau for Science and Technology, S&T/AG's Senior Water Management Specialist will have primary responsibility for project supervision. S&T/RD will provide an Associate Project Manager to assist in the project, concentrating on institutional development and local participation aspects of project activities, and addressing the close relationship of water management/irrigation and fragile lands management. S&T/AG ranks the proposed project high in its portfolio and is committed to provided the administrative support required. The regional bureaus are also fully committed to the project and will furnish the backstop capacity necessary to ensure that the project works efficiently.

An inter-Bureau Water Management Working Group has been established informally to develop this project, and will continue to provide guidance on project management. Besides appointing representatives to formalize this Working Group, the regional bureaus will facilitate communications between Missions and the project, provide technical scrutiny, and advise when required on scopes of work, TDY reports, mission inquiries, and the review/approval of project publications.

The project will be implemented through a contractor selected through free and open competitive bidding. The types of services required for this project will be diverse in scope and duration. The need for rapid response, which became apparent during implementation of WMS-II, as well as the requirement for high quality professional expertise in a variety of disciplines, make it likely that a combination of private firm(s) and educational institution(s) would comprise the strongest bidding entity for contracting under this project.

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Where possible, select international institutions working in irrigation/water management will be actively involved in the project. This may be accomplished through sub-contract arrangements with the implementing contractor or directly with AID using funds reserved for the purpose. Host country institutions will also be involved in project activities where feasible.

E. Evaluation Plan

The project will be evaluated periodically both internally, and externally. Annual internal assessments of project progress and contractor performance will be made a part of workplan preparation and approvals. Periodic in-depth external evaluation of the project's progress, intended to provide guidance for mid-course changes if required, will be executed during the third and fifth years. In-depth evaluations will involve participation by mission and regional irrigation specialists as well as external experts. Funds for the external evaluations will be provided in the project budget, outside the prime contract.

F. Estimated Costs and Methods of Financing

An illustrative budget for the project on an annual basis is provided below. This budget includes an S&T allocation of 1.5 million per year (\$1.3 million S&T/AGR and the remainder from S&T/RD) and allocations from the Africa Bureau of \$400,000 and LAC of \$100,000, with Mission support or buy-ins equivalent to the Central and Bureau funding of \$2 million per year. Therefore, the total annual contribution would be \$4 million with a Life of Project funding of \$40 million.

SOURCE OF FUNDING ILLUSTRATIVE BUDGET
(Annual \$000)

	<u>S&T Budget</u>	<u>Africa/LAC Budget</u>	<u>Mission Support</u>	<u>Total</u>
Technical Assistance	500	150	1,100	1,750
Research/Dissemination	500	200	300	1,000
Training/Tech. Transfer	350	100	400	850
Project Support	<u>150</u>	<u>50</u>	<u>200</u>	<u>400</u>
Total	1,500	500	2000	4000

G. Project Design Strategy

1. Project Development Plan

Project Paper design and development will be the responsibility of an AID Design Team consisting of the following individuals:

S&T/AGR: Worth Fitzgerald
S&T/RD: H. S. Plunkett
AFR/TR/ARD: Thomas Worrick/Marc Winter
LAC/DR/RD: Brian Rudert
ANE/TR/ARD: Mark Svendsen

Selected members of this team will also undertake some drafting work and supervise the consultant in preparation of the draft PP.

Project Development and Support (PD&S) assistance will be required to hire a contractor to prepare the draft PP for the Design Team to review and finalize. The consultant team is expected to include a senior Agriculture Development Officer, an Irrigation Management Specialist and an Irrigation Engineer. The consultant team will be supervised by the S&T/AGR Senior Water Management Specialist with assistance from the AID Project Design Team.

2. Project Design Schedule

The project design schedule is outlined as follows:

April 9, 1986	PID Project Committee Review
April 28,	Final Review by Bureaus
May 6,	PID Formal Review by Agr Sector Council
May 14,	Contract for Technical Assistance
July 11,	PP Drafted and Project Committee Review
July 25,	PP Formal Review
August 8,	Project Authorization
August 22,	Publish RFTP Notice
October 3,	Deadline for Submission of Technical Proposals
November 7,	Select Contractor
December 5,	Execute Contract

H. Recommended Environmental Threshold Decision

An Initial Environmental Examination (IIE) has been conducted and a negative determination made. The IIE is attached as Annex 2 to this paper.

I. AID Policy Issues

1. Mission Participation in Centrally Managed Project.

A substantial part of the technical assistance, research and training to be provided under this project will be in support of Mission bilateral projects. Funding for these activities will be provided through "buy-ins" from Mission-funded projects. M/SER/AAM has recently questioned the "buy-in" facility and has indicated that this type of support to Missions should be reviewed. We believe that it is essential that Missions be supported with the highest caliber of technical resources available in the irrigation and water management subsector. Frequently, broad contractual support for Mission

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technical requirements is required in order to meet the time limitations placed on technical assistance. The "buy-in" mechanism of WMS II has worked well and with appropriate management and monitoring adjustments, including a system for "task order" arrangements for Mission buy-ins, will be an important tool for applying consistently high caliber technical resources in support of Mission irrigation development problems on a timely basis.

2. Management Arrangements for Prime Contract.

We plan to design the proposed project so that much of the administrative arrangements for project technical assistance, research and training, currently performed primarily by the S&T Bureau under the WMS II Project, will be delegated to the prime contractor. However, Bureau staff will be directly involved in setting the overall direction for the project and in monitoring the progress of project activities. Appropriate management and monitoring systems to allow proper oversight over the technical resources provided under this project will be included in the administration plan of the PP and the prime contract.

3. Title XII Set-Aside.

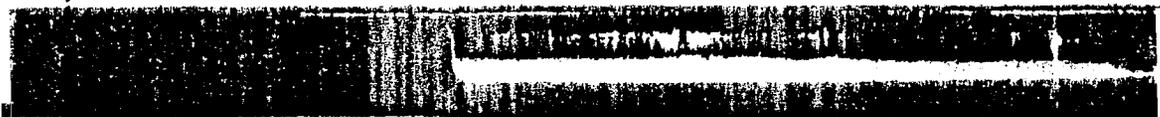
BIFAD has raised the issue of a possible Title XII set-aside for the proposed project, similar to the manner by which the WMS-II Project was contracted. WMS-II was awarded on a non-competitive basis to the Consortium for International Development, sub-contracted to three cooperating universities. More effective implementation of the proposed follow-on project is likely if the contract is opened for competitive bidding. Further, the services envisioned under this project are not exclusively those which may only be provided by educational institutions and international research centers, but rather comprise a mixture of technical assistance, research, technology transfer and training. While a university may be best equipped to execute the training and some of the research, private sector firms may be better situated to provide rapid response and high quality technical assistance to the project. Neither universities nor private firms will be excluded from bidding on the project, but, as stated above, it is likely that a combination of these entities would provide the strongest bid for the contract.

4. Is a Broader Project Focus Required?

While it is clear that, in order to meet the anticipated research and technology transfer needs of AFR and LAC, the project must deal with the broader topic of water management (including flood recession farming, wetlands/swamp cultivation, water spreading, and water harvesting) rather than limiting itself to irrigation per se, should it also pay attention to soils and agronomic improvement aspects of the problem as well? The Project Paper design team must carefully delineate the limits, as well as the central focal elements, of the project.

5. Level of S&T/RD Participation.

S&T/RD has participated actively in the implementation of Water Management Synthesis II, and in the design of this proposed S&T follow-on project. It strongly wishes to continue such participation in the future. However, the extent of its participation in the proposed project will be contingent upon availability of funds and staff in FY 88 and beyond.



Annex 1

PRELIMINARY PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Project title and Number: Irrigation Management support and Research; Project No. _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or sector goal: The broader objective to which this project contributes: (A-1)	Measures of Goal Achievement: (A-2)	(A-3)	Assumptions for achieving goal targets: (A-4)
Bring about improved production performance of developing-country agriculture through better water management and the more effective use of related production inputs.	Significant increase in agricultural output and real income for participants in mission projects applying methodologies recommended by project.	<ul style="list-style-type: none"> -Mission project evaluations -Mission project monitoring reports -Special research studies 	<ul style="list-style-type: none"> -appropriate national policy -complementary inputs available -effective implementation of recommended methodologies

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Project title and Number: Irrigation Management support and Research; Project No.

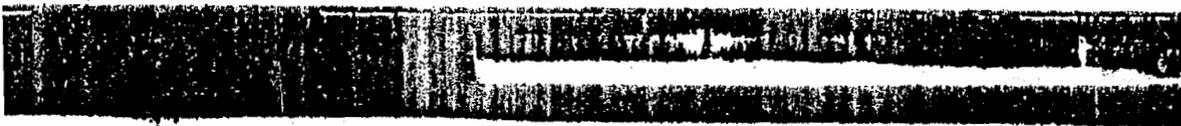
NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Purpose: (B-1)	Conditions that will indicate purpose has been achieved: End of Project Status. (B-2)	(B-3)	Assumptions for achieving purpose: (B-4)
Assist USAID Mission and host-countries to establish the capability to bring about the water management utilization improvements necessary to achieve productivity increase within their agricultural sectors.	A. A more effective AID portfolio in the irrigation/water resource area B. An improved capability with developing country institutions responsible for irrigation and water resource use. C. An appropriate technological base and an international network established for maintaining and updating it. D. A more integrated way of understanding and addressing the problems of poor water management. E. An increased U.S. capacity to service assistance needs in Africa	-Interviews with network members -Active roster of network members -Research reports and newsletter -Evaluations of host country institutional programs. " -Technical and other reports -Annual reviews and evaluations of the project -Evaluations of host country regional institutions programs and projects Annual reviews and evaluations of this project	-Contractor provides adequate quantity and quality personnel in a timely way -Contractor defines critical constraints and issues accurately -AID mission, host countries regional institutions support improved water management as a high priority -Contractor develops relationship with mission host country, regional and international institutions

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Project title and number: Irrigation Management Support and Research: Project No.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)
<u>A. Irrigation Sector Support</u>			
1. Research conducted and reports produced	1. <u>X</u> professional reports produced.	Project records and same means of verification as indicated in B-3 above.	-contractor provides adequate quantity and quality personnel in a timely way
2. Dissemination with active roster and program circulating professional materials, and training courses held	2. <u>International</u> system established and disseminating materials.		-contractor defines pertinent issues in terms of researchable hypotheses
3. Capacity building with research and training institutions and more professionals active and better trained.	3. <u>2</u> institutions assisted.		-demand for outputs exists
4. Better managed systems through improved agency capabilities and farmers organized and taking responsibility.	4. <u>X</u> systems assisted and <u>Y</u> farmer organization established.		-contractor identifies market for output on a global basis

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B. Field Support to Missions

- 1. Irrigation sector assessments conducted.
- 2. Irrigation development strategy papers developed
- 3. PIDs and PPS written.
- 4. Project evaluations conducted.
- 5. Technical support to Mission/Government.

- 1. X sector assessments conducted.
- 2. Y strategy papers developed
- 3. X number of PIDs and PP's developed.
- 4. Y number of projects evaluations.
- 5. Y person months of technical support provided.

Project reports and other records

Project title and Number: Irrigation Management Support and Research: Project No.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Inputs: (D-1)	Implementation Target (Type and Quantity) (S-2)	(D-3)	Assumptions for providing inputs: (D-4)
Central/Regional funding.		Project records and reports	Funding is forthcoming
1. Technical Assistance.	1. 33% of the total project budget.		
2. Research/Dissemination.	2. 34% of the total project budget.		
3. Training/Tech Transfer.	3. 23% of the total project budget.		
4. Project Support.	4. 10% of the total project budget.	Project records	Contractor staffs up the project
Countries buy-into Project at level equal to core funding.	X countries with total funding of \$20 million.		

2/p

Initial Environmental Examination

Environmental analysis in the design of the IMSAR project is not required in accordance with Agency environmental procedures, CFR 216.2(c)(2)(i) and (iii). The project, which builds on the successful experience of Water Management Synthesis II, will support technical assistance, training, and on-site studies and institutional analyses in the irrigation sector. These activities will address implementation issues, assess current directions and approaches, and formulate problem-solving strategies within existing irrigation projects in the region. The project will affect the physical environment only indirectly, insofar as its activities bring about modified approaches to implementation and, in some cases, redesign of irrigation and water management practices in the field. Based on the performance and results of Water Management Synthesis II, we know that the adoption of improved water management practices will reduce salinization and waterlogging of soils. Improvements in water distribution and drainage will reduce the effects of over-irrigation, which commonly include nutrient leaching and discharge of chemical fertilizers in downstream water courses. It will also reduce the area of standing or stagnant water, which has the potential of creating hazards to public health.

The IMSAR project will also have resources to contribute directly to environmental enhancement as an element of irrigation project design and evaluation. Through technical assistance and training, the project will help to analyze environmental constraints to irrigated agricultural development. In particular, In particular, the project will allow examination of problems concerning the physical environment in relationship to socioeconomic and institutional factors as well as policy settings.

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Redrafted:SPlunkett:4-11-86:WangPC filename PID

ACTION MEMORANDUM FOR THE SENIOR ASSISTANT ADMINISTRATOR FOR SCIENCE AND TECHNOLOGY

FROM: S&T/AGR, Tejpal S. Gill
 S&T/RD, Eric Chetwynd

THRU: S&T/FA, Anson Bertrand
 S&T/HR, Ruth Zagorin

SUBJECT: Concepts Paper: Irrigation Management Research and Support Project--a Follow-on to WMS II

Problem: Your approval of the subject Concepts Paper is requested in order to proceed with development of a follow-on effort to the Water Management Synthesis II Project, the latter being necessary to meet the continuing needs of the Agency in the irrigation/water management area.

Background and Discussion: In terms of achieving its specific objectives of providing direct field support to A.I.D. Missions and host-governments, as well as undertaking longer-term sector support initiatives (special studies, training and technology transfer), the Water Management Synthesis II (WMS II) Project can be said to be quite successful. It has also been successful in terms of the impact it has had on focussing attention on the interdisciplinary nature of the more serious constraints to improving irrigation sector performance throughout the developing world, and the need to address these problems from this broader perspective.

Moreover, WMS II has also greatly furthered acceptance of the need for, as well as benefits to be gained from, greater farmer involvement in irrigation system development and use--from design and construction to operation and maintenance. It has also helped produce a new and more effective approach to examining and resolving the underlying causes of poor irrigation sector performance; and, it is this latter "paradigm shift" in the way of thinking about and understanding, as well as approaching the problems facing irrigation development and improvement that may, in fact, turn out to be its greatest contribution in the longer run.

1. Follow-on Effort is Needed

However, despite this success, it is also clear that continued efforts in this area will be needed, well beyond WMS II operational life, if these sought-after changes are to be achieved, especially for Africa and

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 406 SA-18

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Latin America. In fact, it was clearly envisioned from the start that a 15 - 20 year effort would be required, and that WMS II was only part of an overall program in this regard.

This need is made even more urgent by the fact that the project's success has resulted in greater-than-anticipated Mission buy-ins, for technical assistance and training, which in turn is causing the project's overall funding ceiling to be rapidly approached. Little head room is expected to remain after the end of the current operational year (FY1986), leaving little ability to service Missions' assistance requests beyond that date. Thus, there is need to have a follow-on project approved and operational in early FY1987, if the above inability to provide field support is to be avoided.

2. Inter-Bureau Working Group Formed

Recognizing the above, a meeting of the three regional bureaus, S&T/AGR and S&T/RD was called last July (1985) to discuss this need. This discussion resulted in unanimous agreement that not only was a follow-on effort in irrigation/water management area vitally needed but that, for this effort to be most effective, joint collaboration and support from all the bureaus would be essential, both in its development and implementation. This viewpoint further resulted in the establishment of an Inter-Bureau Working Group on Irrigation and Water Management (IWG/IWM), made up of representatives of each of the above entities, whose main purpose would be to give leadership and guidance to:

--the various bureaus, both separately and collectively, in attempting to identify their field-support needs in the irrigation and water management area; and

--the development of a joint, Agency-wide program that can effectively address these needs, including the design and approval of a new companion or follow-on project (or projects) to supplement and extend current efforts under WMS II.

The subject concepts paper is a product of the IWG/IWM's efforts. It has been reviewed and approved by the three regional bureaus as well as at the office levels of S&T/AGR and S&T/RD.

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3. Focus will shift away from ASIA

While very much interested in remaining a part of the Agency-wide umbrella program (network) called for above, and for which the S&T Bureau should provide leadership and guidance in both developing and overseeing, the ASIA and NEAR EAST (ANE) Bureau has decided to develop its own "stand-alone" project to service the specialized needs of its Mission and host governments.

On the other hand, the AFRICA Bureau has indicated a strong interest in working with S&T to support a follow-on project, that would give strong emphasis to that region's problems, as well as participate in the broader umbrella program. The LAC Bureau, with whom WMS II has also worked progressively, has likewise expressed interest and support for the proposed follow-on project.

Consequently, what is evolving is a S&T/AFR/LAC project having an African focus, but giving increased attention to the specific needs of the LAC region. The problems and needs of the ANE Bureau will be limited to special studies and technology transfer, with the training and technical assistance requirements to be met through their own bureau's project.

Recommendation: That you approve the attached Concepts Paper for the Irrigation Management Research and Support Project and authorize the preparation of a Project Identification Document as the first step in the process of developing a follow-on to the Water Management Synthesis II Project.

Attachment

Approved: Walter C. [Signature]

Disapproved: _____

Date: MAR 13 1986

WCF
ST/AGR/RNR:LWFitzgerald:2/26/86:X51275:revised 3/4/86

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IRRIGATION MANAGEMENT RESEARCH AND SUPPORT PROJECT

CONCEPT PAPER

The Context

The irrigated 20 per cent of the world's agriculture generates 40 per cent of its agricultural production. Moreover, as many as half of the world's people are directly influenced by irrigation as primary or indirect beneficiaries. However, the distribution and importance of irrigated agriculture varies greatly from region to region. Asia, where 90% of the developing world's irrigation lies, depends heavily on irrigated food grain production, while agriculture in some Near East countries such as Egypt depends almost entirely on irrigation. In Africa the potential for irrigated cultivation, although smaller, is still largely untapped.

Over the next decade, an estimated \$75 to \$100 billion will be invested in irrigation development worldwide, and irrigation water use is expected to double by the year 2000. Yet development of known water resources will take place at increasingly greater costs--both financial and environmental. This makes it imperative to find more cost-effective irrigation technologies. In addition, population growth throughout the developing world continues apace, making continued development of irrigated agriculture necessary simply to "run in place."

Further development of irrigation around the world must build on past experience. But that experience differs from region to region and conditions change, sometimes rapidly, over time. For example, Asian water management projects will continue a trend toward increasing complexity in irrigation system planning, design and management, while in Africa, projects will likely turn toward basic technologies whose implementation nonetheless requires elaborate planning, design and management arrangements. Irrigation system improvement, including some expansion in smaller-scale systems, will characterize development efforts throughout Latin America and the Caribbean.

Keeping pace with the impact of population growth and changing environmental, social, and economic conditions will require both expansion and intensification of irrigation systems. No other technological option has the power that irrigation does to increase

agricultural output both independently and through its ability to stimulate parallel investments in fertilizer, land development, equipment and other inputs. Capitalizing on this potential will require a continuing stream of innovation in a diverse set of irrigation technologies ranging from water harvesting and low lift pumping to water-saving trickle and drip irrigation adapted to LDC circumstances. At the same time, practical innovative organizational modes for both farmers and irrigation agencies must be developed in conjunction with these technical innovations to make them work.

The thread that ties these various problems and needs together is that their solution requires the interlinked efforts of multidisciplinary teams of professionals, working together in a coordinated and synergistic way. This multidisciplinary, or "socio-technical", approach to irrigation problems which has been developed in recent years, provides an important new perspective on a variety of irrigation management issues and should lead to a new set of solutions to old problems. In addition to links between disciplines, there is growing recognition of a need to link together professionals from different institutions and organizations working on common problems so that duplication of effort is avoided and results are cumulative and mutually reinforcing.

Achieving these ends requires that resources be directed to four general areas:

1. Knowledge Building - Development and testing of new ideas, concepts and techniques.
2. Dissemination of New Knowledge - Making new understanding available to host country policy makers, researchers, donor organizations, other host country institutions and technical assistance providers to inform irrigation policy and development strategy.
3. Application of the New Knowledge - Integrating, within rational economic perimeters, new understanding into programs of irrigation development, operation, maintenance, planning and general irrigation sector support.
4. Improving Host Country Capacity - Strengthening host country and regional institutions necessary to support self-sustaining programs of irrigation development.

Irrigation and the AID Agenda

Water resource development for irrigation has played a leading role in the economic development of many countries, including the United States. Recognizing its importance, AID has long been a leader in

assisting host countries to develop their irrigation resources and, more recently, in assisting them to use these resources more efficiently. Current plans, for example, call for the channeling of nearly a billion dollars toward irrigation development and improvement projects in Asia and the Near East alone over the next 5 to 7 years. AID's efforts in Latin America and Africa will also expand considerably during the same period.

The Asia (now merged into the Asia and Near East) Bureau's Strategic Plan considers support for irrigation and water management, along with agricultural research, to form the core of its agricultural program and has an extensive irrigation portfolio in place. The Africa Bureau has a number of irrigation projects slated for design and implementation in the next few years and wants to develop the technical and institutional research base to support these efforts. The Latin America and Caribbean Bureau sees an important role for irrigation in two major efforts: (a) developing export trade in the Caribbean Basin by promoting irrigated winter vegetable production and (b) safeguarding the agricultural resource base by promoting irrigated hillside cultivation systems.

AID Experience with Centrally-funded Irrigation Support Projects

AID has developed two centrally-funded support projects since 1978. Water Management Synthesis I (WMS I), which ran from 1978 to 1983, was a modest S&T (then DSB) Agriculture effort designed to develop an information base on irrigation management, and to develop training programs and materials for use in host countries. Its focus was principally on Asia and almost exclusively on "on-farm" water management.

Water Management Synthesis II (WMS II) followed this effort in 1983. This project was jointly developed by the Asia Bureau and two S&T Offices (RD and AG), and is managed by S&T/AG, in close collaboration with ANE/TR and S&T/RD. All three offices contribute to its core funding. The project relies on mission "buy-ins" to fund more than half its technical assistance activities. WMS II also focuses primarily on Asia, but it has done substantial work in other regions as well. Examples include irrigation sector assessments in Peru, Ecuador and Chad, a mini-sector assessment in Tanzania, project design work in the Dominican Republic and Mauritania. Through WMS II, AID has gained valuable experience in addressing irrigation development and management problems, learning lessons and developing expertise that have been useful worldwide.

WMS II activities fall into four categories: technical assistance, training, technology transfer, and special studies. The project's technical assistance and training services have proven extremely

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popular with missions, and the level of assistance requests from the field is well above original expectations. These services have had a significant impact on the agency's irrigation portfolio. For example, 7 of the 9 irrigation projects developed in Asia over the past 3 years have been designed with the assistance of WMS II teams. WMS II has also recently carried out a series of technical assistance and special studies activities in Africa, supported in large part by Africa Bureau funding which will total \$1.2 million over a three-year period. The goal of this initiative is to give the Africa Bureau a foundation on which to build a program to expand and improve irrigation development and water management in the region.

The project proposed in this concept paper will be cognizant of the lessons learned from both WMS I and WMS II and will build on their strengths. However, the new project will attempt to avoid some of the difficulties faced in the earlier projects and be responsive to regional diversity and the changing needs of USAIDs and host countries in the area of irrigation and water management.

Goal and Purpose of the Project

Goal

The goal of the proposed project is to increase food production and levels of real farm income in host countries. However, it will address this goal through the narrower objective of improved economic efficiency and greater distributional equity within planned and existing irrigation systems while assuring sustained use of irrigation resources over time.

Project purpose

The project has three purposes:

1. To understand current host country irrigation development and managerial problems, anticipate future trends and problems, and develop and disseminate productive socio-technical solutions for addressing them.
2. To assist AID missions to improve host country irrigation programs and enhance host country capacity to develop and implement solutions to irrigation problems.
3. To improve the capacity of regional institutions to support irrigation improvement programs through technical assistance, training programs and applied research.

Activities under the Proposed Project

The activities of the project fall into two broad categories: General Irrigation Sector Support and Field Support to AID Missions. It is anticipated that, where feasible, sector support activities will be carried out in conjunction with regional and international research, training, and support institutions.

General irrigation sector support

This component includes a wide range of activities addressing generic problems in water management. It has three categories of functions: research, dissemination, and capacity building.

1. Research

- conduct field research
- synthesize ideas and learning
- build and expand regional knowledge bases

2. Dissemination and Networking

- support and expand existing international irrigation management network
- support cross-regional and cross-disciplinary "excursion assignments" for irrigation management professionals
- develop training courses and training materials
- develop and distribute professional materials

3. Capacity Building

- strengthen regional research and training institutions
- expand the cadre of international irrigation professionals in a number of disciplines
- improve the capacity of farmers, local organizations, private firms and public agencies to develop and manage productive and stable irrigated agriculture systems.

Field support to missions

This component, usually carried out in response to specific requests, focuses on providing short-term technical assistance to individual missions and host countries on specific topics of immediate concern in the irrigation and water management area. Examples include:

- irrigation sector policy studies
- pre-PID feasibility analysis
- PID design
- PP design
- project evaluation
- in-country training

- assistance in research design and organization of national institutions to carry out research on irrigation management issues
- trouble shooting and problem solving

Implementation Issues

WMS II has provided a foundation upon which further efforts can build. The importance of the concept of an integrated approach to irrigation problems has by now been accepted by many practitioners and organizations around the world, and a number of firms and educational institutions in the U.S. and abroad have developed capacity in the water management area. Regional organizations (especially in Asia) as well as the new International Irrigation Management Institute (IIMI), created with AID support, are also developing capacity in training, research, and provision of technical assistance. Direct collaborative involvement of these regional institutions (and IIMI) will be strongly encouraged where appropriate.

Accordingly, the proposed new project will be designed explicitly for open competition for its core contract. Bids will be solicited from private firms as well as educational institutions and combinations of the two. In accord with experience gained under WMS II, capacity to provide cost-effective management of the project, in addition to technical capacity, must be a key requirement. The objective will be to ensure that a flexible response to project requirements and a sound technical and administrative base is obtained from the best qualified sources. As in the case of WMS II, ample opportunity for missions to "buy-in" to the project for technical assistance and training services will be provided.

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Project Title and Number Irrigation Management Research and Support Project

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Inputs: (D-1)	Implementation Target (Type and Quantity) (D-2)	(D-3)	Assumptions for providing inputs: (D-4)
1. Irrigation Sector Support		project records	- funding is forthcoming
- research	25% of the total project budget		
- dissemination	20% of the total project budget		
- capacity building	20% of the total project budget		
2. Field Support to Missions	25% of the total project budget	project records	- contractor staffs up the project
3. Project Management Unit	10% of the total project budget		

September 18, 1985

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Project Title and Number Irrigation Management Research and Support Project

INFORMATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)
1. <u>Irrigation Sector Support</u>			
<ul style="list-style-type: none"> - research - reports - dissemination <ul style="list-style-type: none"> active roster active dissemination program circulating professional materials training courses and materials - capacity building <ul style="list-style-type: none"> research and training institutions more professionals active - better managed systems <ul style="list-style-type: none"> greater agency capabilities farmers organized and taking responsibility experiments with alternative user-controlled entities 		project records	<ul style="list-style-type: none"> - contractor provides adequate quantity and quality personnel in a timely way - contractor defines pertinent issues in terms of researchable hypotheses - demand for outputs exists - demand for field support services exists - contractor identifies market for output on a global basis - distribution of project efforts among different activities reflects most effective use of resources to achieve outputs
2. <u>Field Support to Missions</u>			
<ul style="list-style-type: none"> - irrigation sector assessments - irrigation development strategy papers - PIDs - PPs - project evaluations - technical support to projects 			

Project Title and Number Irrigation Management Research and Support Project

INITIATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Purpose: (B-1)	Conditions that will indicate purpose has been achieved; End of Project Status. (B-2)	(B-3)	Assumptions for achieving purpose: (B-4)
1. Understand and recipient country irrigation development and management problems and develop and disseminate better socio-technical solutions to them.	<ul style="list-style-type: none"> - An effective international network for communicating findings and ideas. - Changes in selected host country approaches to irrigation system operation and maintenance. 	<ul style="list-style-type: none"> - interviews with network members - roster of network members - research reports and newsletters - evaluations of mission projects that applied project solutions 	<ul style="list-style-type: none"> - contractor provides adequate quantity and quality personnel in a timely way - contractor defines pertinent issues in terms of researchable hypotheses - demand for outputs exists - contractor identifies market for output on a global basis
2. Assist AID missions to improve host country capabilities to develop and implement solutions for irrigation development and management problems through a well-designed bilateral program of assistance in the irrigation and water management area	<ul style="list-style-type: none"> - on-going water management programs designed and implemented by host country or regional institutions 	<ul style="list-style-type: none"> - visits to host country and regional institutions - AID mission and host country and regional institution records - evaluations of host country and regional institution programs and projects 	<ul style="list-style-type: none"> - AID missions, host countries and regional institutions support improved water management as a high priority - contractor delivers quality services - contractor develops collaborative relationship with missions, host country, regional and international institutions
3. Improve the capacity of regional institutions to support improved irrigation programs through technical assistance, training and research activities.			<ul style="list-style-type: none"> - regional and international institutions' capacity to assist in training and research is adequate and expands over time.

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Project Title and Number Irrigation Management Research and Support Project

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or sector goal: The broader objective to which this project contributes: (A-1)</p>	<p>Measures of Goal Achievement: (A-2)</p>	<p>(A-3)</p>	<p>Assumptions for achieving goal targets: (A-4)</p>
<p>Increased food/agricultural framework production and higher levels of real farm incomes.</p>	<p>Significant increase in agricultural output and real income for participants in mission projects applying methodologies recommended by project</p>	<ul style="list-style-type: none"> - mission project evaluations - mission project monitoring reports - special research studies 	<ul style="list-style-type: none"> - appropriate national policy - complementary inputs available - effective implementation of recommended methodologies
<p>Sub-goal</p>	<p>Increased productivity, better economic efficiency and improved equity of water distribution while assuring maintenance of the resource base in systems under design as well as under operation</p>	<ul style="list-style-type: none"> - increased agricultural output per unit water captured in systems concerned by project. - more equitable and timely delivery of adequate amounts of water throughout the systems concerned. - reduction of drainage problems and other undesirable ecological conditions - adequate maintenance of the physical systems as well as functioning water users associations - reduced direct subsidization of operations and maintenance 	<ul style="list-style-type: none"> - mission project evaluations - mission project monitoring reports - special research studies - field visits to mission projects
			<ul style="list-style-type: none"> - project purpose achieved - proper budgetary support and institutional framework in host country for new approaches

AGRICULTURE SECTOR COUNCIL

Minutes of Meeting May 6, 1986

Attending:

Members

Anson Bertrand, S&T/FA, Chairman
Dwight Steen, LAC/DR/Rd
Kenneth Prussner, AFR/TR/ARD
C.H. Antholt, ANE/TR/ARD
John Stovall, BIFAD/S
Donald McClelland, PPC/PDPR
Ken Swanberg, S&T/RD
Edward Caplan, S&T/MGT, Executive
Secretary

Visitors

Compton Chase-Lansdale, PRE/I
Tejpal S. Gill, S&T/AGR
Loren L. Schulze, S&T/AGR/AP
Kerri-Ann Jones, S&T/AGR/RNR
Mary Mozynski, S&T/AGR
Worth Fitzgerald, S&T/AGR/RNR
H.S. Plunkett, S&T/RD/RRD
Harvey Hortik, S&T/AGR/AP
C.H. Mullenax, S&T/AGR
Betty Roche, S&T/PO
Janine Finnell, S&T/EY

Outside Hires. In view of the Secretary of State's cable to embassies envisioning a reduced presence of the United States, the Sector Council decided to take no action at this time in regard to the selection of outside hires. Dr. Bertrand said agriculture is being left out in this area, as evidenced by Chuck Antholt's memo of April 9. The Secretary's cable, however, may result in AID cutbacks in the field.

Chuck Mullenax. Dr. Bertrand introduced Chuck Mullenax, an IPA and a veterinarian who has done a great deal of work in developing countries, mostly in Latin America. Dr. Mullenax briefed the Sector Council on his background, saying his expertise is in forage-based livestock, the main problem of which is a decrease in the nutrient value of available forage. He offered his services to the regional bureaus.

Long-Term Training. The chairman reminded council members of Jay Morris's memo of April 21, which said a person may nominate himself or herself for long-term training. The council was also reminded that Don Wadley has promised to provide the council members an outline of the process and examples of the documentation leading to an RJCC assignment for AID officers.

American Soybean Association. Loren Schulze briefed the Sector Council on the status of the relationship between the Agency and the American Soybean Association, which has been critical of some of the Agency's activities in the past. Correspondence between the Administrator and the Association has resulted in a meeting between representatives of the two groups June 12-13. The Administrator sees the blossoming relationship as an opportunity to further his private sector initiatives and to turn a negative into a positive.

The meeting is to be informal, with a purpose of exploring items of mutual interest. AID has made up a tentative agenda for the afternoon of June 12, including an overview of the Agency, briefings on regional interventions regarding crops similar to soybeans, and discussions on the Agency's expectations of this meeting. The Association will soon determine an agenda for the morning of June 13. Schulze sees some sort of positive activity resulting from the meeting, an activity requiring cooperation of the Agency and the Association.

S&T Bureau CPSS. Dr. Bertrand reported that the newest draft of the CPSS is going to Dr. Brady today and that the drafting of Action Plans was going on simultaneously. He said it is possible that the Sector Council would need a meeting to discuss S&T/AGR's submission for the Action Plan.

Dr. Bertrand's Retirement. Dr. Bertrand announced that he is retiring effective June 30 and that Dr. Duane Acker, now president of Kansas State University, has been appointed Agency Director for Food and Agriculture, effective July 1. No one has yet been appointed director of the Office of Agriculture.

PID on S&T/AGR Irrigation Project. The Sector Council took up the PID on the Irrigation Management Support and Research project. Worth Fitzgerald explained that this project in essence a re-designing of the Water Management Synthesis II project.

Fitzgerald provided a briefing on the 10-year project. The \$40 million funding will come from AFR, LAC, S&T/AGR, S&T/RD and

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S&T/EY. A working group has been revising the project since the need was first noted last July. The concept paper was approved by Dr. Brady and all bureaus have provided input.

A discussion ensued regarding a proposal by John Stovall that this project be designated a Title XII project. Several members disagreed with him, suggesting that private sector or other entities might fulfill at least part of the project requirements better than Title XII universities. It was determined that the decision over whether to designate the project for Title XII can be made at a later stage, and that was the council's consensus.

Stovall suggested that there are imaginative ways of working out combinations of private firms and universities to achieve the project's objectives. Betty Roche urged that time be taken to plan procurement and that the project not be limited by a contract as the sole means.

The PID was endorsed by all the bureaus except Africa, which abstained until additional internal clearances are made.

PP on S&T/AGR BFN Project. The Sector Council took up discussion of the project paper for the Improved Biological Nitrogen Fixation Through Biotechnology project. Tejpal Gill gave a briefing, terming the project's subject a technology that has come of age because of the high cost of nitrogen-based fertilizer. The \$20 million project will be funded half from S&T/AGR and half from buy-ins. It will provide training, research, and technical assistance.

Compton Chase-Lansdale, saying the involvement of the private sector is critical to the success of the project, called attention to the lack of mention of investigation into commercial opportunities. He cited the possibility of biotechnology firms with proprietary interests, co-financing, and commercial opportunities in distribution. Several members expressed doubt as to whether private firms would want to get involved with the small quantities contemplated, but agreed that the idea should be investigated and that the results of the investigation be incorporated into the project paper. An advisory group from the private sector was also suggested.

The project paper was endorsed.

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D C 20523

ASSISTANT
ADMINISTRATOR

Walt F
JUN 11 1986

AB
Ref # 0612-0
To: Brady
Brennan
Langmaid
Gower
Restrepo
CR

MEMORANDUM

TO: SAA/S&T, Nyle C. Brady
FROM: AA/AFR, Mark L. Edelman *mlk*
SUBJECT: IMSAR PID Approval

The Africa Bureau agrees in principle to approval of the Irrigation Management Support and Research (IMSAR) PID with no commitment of funds at this time and with the addition of the following two issues. These issues will need to be satisfactorily resolved during preparation of the Project Paper before the Africa Bureau gives final approval to this long-term investment in irrigation development in Africa.

1. Priority of Irrigation by Africa Bureau and Missions.
After the PID is approved and during the design of the PP the PID will be sent to Africa Bureau missions for comment, with a specific request that information be provided on anticipated buy-ins for the first five years. Also, we will request each mission to estimate planned foreign exchange and local currency investments in irrigation. These responses will help to guide the Bureau's own determination of the priority of irrigation and funding level possibilities within the Agency's and Bureau's budget projection. The threshold we are looking for is active involvement by 5-8 missions, and an annual total buy-in on the order of 1 million dollars. This will justify our participation on a central basis.

2. Other Donors Planned Support for Irrigation in Africa.
Other donors, especially the World Bank, Germany and EEC, should be consulted to determine their plans for irrigation development in Africa for the next decade. If the planned investments of donors are significant and in line with AID's interests, then AID resources could have a major impact to improve the development of African irrigation. Since AID will not likely be a major investor in irrigation except in a few select countries, a donor coordinated African program is essential. Do other donors welcome AID investments in African

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development of irrigation and should AID continue with its focus on the "software" (ie., training, research, management and farmer organizations) with other donors continuing the major investments in irrigation infrastructure? A positive response by other donors to this issue will favorably impact on the Africa Bureau's final decision whether or not to participate in the project during PP design.

Clearance:

AFR/TR, Keith Sherper	<u>KL</u>
AFR/DP, John Patterson	<u>J</u>
AFR/PD, Larry Hausman	<u>L</u>
AFR/EA, Steve Mintz	<u>S</u>
AFR/CCWA, Julius Coles	<u>J</u>
AFR/SWA, E. Amundson	<u>EA</u>
AFR/SA, Roger Carlson	<u>RC</u>
DAA/EA, Larry Sainers	<u>L</u>
DAA/WCA, Lois Richards	<u>L</u>
DAA/AFR, Ray Love	<u>RAV</u>

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