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Mobilizing Local Resources for Irrigation

GILBERT LEVINE AND HENRY C. HART*

Report No. 22 June 1981

AGRICULTURAL DEVELOPMENT COUNCIL

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This is an interpretative summary of a seminar held in Colombo, Sri Lanka, August 11–15, 1980. The seminar was sponsored by the Agricultural Development Council, through its Research and Training Network Program, and hosted by the Agrarian Research and Training Institute (ARTI) in Colombo.

Single English-language copies are available, at no charge, from the Agricultural Development Council. Copies of papers presented at the seminar and selected references are available only from individual authors or publishers.

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I. Introduction

The Agricultural Development Council (A/D/C) has had a deep and sustained interest in the problems of irrigation and water management in Asia for the past 10 years. Starting in 1971, there have been twelve seminars or workshops, eight under the auspices of the Research and Training Network, which have addressed a range of important questions relating to research and training. In recent years, policy questions have been given added consideration. In recognition of the interdisciplinary nature of most significant irrigation issues, the meetings have drawn together individuals from agricultural, engineering, economic, social and administration disciplines. To insure that the problems addressed are relevant to the needs of the planners, designers and operators of systems, representatives from the practioner community have been participants in most of the meetings. Generally, the participant mix in these seminars/workshops also has been guided by the A/D/C objective to develop the human resources devoted to consideration of these problems. Thus, each seminar/workshop typically has included those with varied amounts and types of experience; young scholars and practitioners have been joined by the more experienced. The seminar reported here exemplifies the problem interest and participant focus of the A/D/C.

Irrigation has been important in Asia for hundreds, if not thousands of years. Most of the early development took place in response to private and local community initiatives, using local resources. The later development in many of the countries of the region, frequently in the context of colonial interests, involved larger-scale irrigation which tapped larger and more distant water resources. The scale and timing of this development have been such that resources external to the project areas, both financial and human, have been utilized in increasing amounts, relative to local inputs.

For a variety of reasons—physical, economic, and political—irrigation is considered one of the primary vehicles for the next phase of agricultural and rural development in Asia. The estimates of irrigation and other water-based development investments for the next decade vary between 50 and 100 billion dollars (IFPRI, UN)[1], testifying to the great importance of irrigation questions. Although the development is anticipated to include a mix of both scale and type of activity, the accelerated pace of development and the degree of central planning and implementation suggest that the proportion of non-local resources used, at least initially, will be larger than during earlier periods of development.

At the same time, there is growing concern that more local resources must be obtained, both in the initial stages of project development and in the operational stages of project utilization. This concern arose initially because of financial and economic considerations, but implications for equity and efficiency of operations have also become important. However, success in mobilizing local resources for governmentally-planned irrigation development has been limited in most of the Asian countries and issues arising from this experience were selected for emphasis.

The seminar had three main objectives:

- *To provide an opportunity for the sharing of knowledge and ideas among those with different disciplinary and geographic experience; of particular interest were the South and Southeast Asian experience;*
- *To identify as clearly as possible those understandings which would be useful to policy makers, planners, and designers; and*
- *To suggest directions or areas for research relevant to the needs of those responsible for irrigation development.*

To meet these objectives, the seminar was organized to provide maximum opportunity for discussion and interaction. A theme paper was used to initiate discussion in each of the four half-day sessions; abstracts of these papers are provided in Section IV of this report. The formal discussion periods were complemented by a two-day field trip during which visits were made to a major government project, the Mahaweli, and to a minor tank project. A summary session closed the seminar. (The complete seminar pro-

[1]See, for example, Oram, P., Zapata, J. and Alibaruho, G. 1979. "Investment and Input Requirement for Accelerating Food Production by 1990 in Low-income Countries." International Food Policy Research Institute (IFPRI), Washington, D.C. and the various reports of the United Nation's Water Conference, Mar del Plata, Argentina. March 14-25, 1977.

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gram, and list of participants are presented in Appendix 1 and 2, respectively. A selected list of references is presented in Appendix 3.)

To achieve the second objective, the authors of this report drafted a set of statements, or propositions, which attempted to extract those conclusions with which the majority of the participants would agree, and which would be a relatively direct value to irrigation professionals. These were circulated to the participants for reaction and criticism. Approximately one quarter of the participants responded, with suggestions for amplification, clarification and correction. The propositions presented in Section II reflect these inputs. In a few cases, where participants disagreed with generalized conclusions, the dissenting reactions are reported in the hope that the differences expressed will sharpen our understanding of the issues. Despite our attempt to be objective, accurate, and complete in presenting these propositions and the report in general, the authors take responsibility for any errors or omissions.

In closing this introduction we would like to recognize the special contributions of the Director and staff of the Agrarian Research and Training Institute (ARTI) in Colombo. From the planning stage through the final session, the ARTI provided important counsel, excellent logistic support and very generous hospitality, for which we are very appreciative.

II. Summary Propositions

The propositions presented here are intended to be brief, explicit statements of the conclusions generally agreed upon during the seminar deliberations, and which have particular relevance for irrigation practitioners. Unfortunately, the condensation of complex ideas into short statements results in the loss of much of the detail that could enrich our understanding and which was much in evidence during the seminar. In addition, we have not tried to provide specific supporting evidence for the various propositions, though examples were cited during the discussions. The statements are presented as the considered conclusions of a group of concerned and knowledgeable individuals. A more rigorous evaluation and testing of the more controversial of these propositions would be useful.

The question of using local versus external resources in irrigation development could be addressed from the local, or farmer, perspective or from the external, frequently governmental, perspective. The use of mobilization in the seminar title, rather than participation, implies the former. This was intentional on the part of the seminar organizers, for two reasons: if the seminar results were to be of direct utility to those involved with irrigation policy and/or planning responsibilities, the external perspective would be familiar; the seminar participants necessarily were "externals" and therefore could take the perspective of the farmers only in an intellectual sense. Almost all had some measure of experience acting from the external perspective, either being involved directly in irrigation policy and planning or as consultants to these activities.

The propositions are presented under seven headings: general, types of resources, amounts of resources, techniques for obtaining resources, irrigation administration, water-user organizations and experimentation.

A. General

1. A primary objective of the mobilization of local resources usually is to improve, by the more effective use of available resources, the degree to which the general objectives of irrigation are attained. These objectives include increased long-term agricultural productivity, improved equity of water distribution and reduced overall costs.
2. The mobilization of local resources may have as an additional objective the development of increased self-reliance and greater participation by the local community.
3. Programs for mobilizing local resources should be monitored and evaluated in terms of these objectives.

B. Types of Resources

1. Governmental concerns for mobilizing local resources usually focus on economic resources to pay for operation and maintenance and to repay some share of the investment. These resources may be in the form of money (cash or in kind), contributed labor for construction and/or maintenance and land provided for rights-of-way.
2. Important non-economic resources often are neglected; these include the farmers' knowledge of the local environment and their skills in managing water at the local level.
   a. Local knowledge can be an important source of the detailed information necessary for the appropriate design, rehabilitation, and operation of minor distribution and terminal works.
   b. Centrally controlled management of water deliveries in systems serving smallholdings usually does not extend to individual holdings. The experience and skills of the farmers in managing water deliveries, singly and in groups, represents a resource that can be utilized in the operation of irrigation systems beyond the controlled turn-out level.

c. In certain situations, farmer management can extend to complete control of relatively small systems and to defined portions of larger systems.

C. AMOUNTS OF RESOURCES

1. The share of economic resources to be mobilized from farmers should reflect consideration of the benefits to others, including:
   a. National governments, insofar as they benefit in terms of foreign exchange and easing of national food supply problems; and
   b. Non-farmers, as they benefit from lower agricultural prices resulting from the increased production and the increased intensity of economic activities in the irrigated areas (e.g., the industrial sector services to agriculture).
2. Any calculation of economic surplus[2] prodnced by irrigation should consider:
   a. The production impact of the irrigation service, including the variation in impact among the farmers;
   b. The full cost to farmers of obtaining the water (including informal payments);
   c. Water-user contribution to system water management and maintenance; and
   d. The opportunity cost of foregoing more profitable irrigated crops when the cropping pattern is specified by the irrigation agency.
3. The extent of non-economic resources that can be mobilized is markedly influenced by the attitudes and approaches used in the effort. The attitudes of the irrigation departments and the farmers that are of primary importance frequently reflect the attitudes of others—the government and politicians, as well as the local community more generally.

D. TECHNIQUES FOR OBTAINING RESOURCES

1. The economic resources (labor and capital) can be mobilized through direct and indirect methods.
2. Direct methods, for example, water fees and conscripted labor, have had mixed success in Asia. In some countries, rates intended to recover significant proportions of investment and operation and maintenance costs have been implemented successfully. In others, even the recovery of operation and maintenance costs is difficult.
3. While the conditions resulting in success of the direct methods are inadequately understood, experience suggests direct methods are more successful when mobilization is for:
   a. Short durations, as in the case of channel rehabilitation;
   b. Relatively small amounts of resources;
   c. Specific water services, e.g., fuel for irrigation pump operation; and
   d. Water deliveries that are dependable.
4. Some form of coercion frequently is associated with successful use of direct techniques. However, the poor and disadvantaged generally are more easily coerced than the more powerful, and may, therefore, bear a disproportionate share of the burden. Special efforts usually are required to avoid this result.
5. Using water fees to encourage more efficient water use by the individual farmer generally has been unsuccessful in Asia. A prerequisite for accomplishing this objective is that water be measured volumetrically. The volumetric delivery of water to water-user associations, with related water charges, is feasible in concept and should be tried in selected locations.
6. Changing the level of water fees in response to changed policies, or even to reflect inflation, is extremely difficult. Where a policy change is made, successful implementation is highly dependent upon the demonstration of improved irrigation service. Accommodating irrigation fees to inflation is easier when agricultural income reflects the inflation as well. Even in this case, fixed in-kind rates (e.g., kilos of rice/hectare) can more easily meet inflationary situations than variable monetary rates.
7. Longer term mobilization of resources, especially if relatively large amounts of economic resources are involved, can occur only through the cooperation and voluntary participation of the farmers. This participation will require appropriate incentives for the farmers and usually must be accompanied by changed attitudes, policies and practices in irrigation departments and agencies.[3]

Two points of disagreement were expressed, one focusing on the ambiguities in the proposition, the other taking issue with the principle. The ambigu-

[2] See Section IV, Abstract 1.

[3] An example of an attitude that inhibits cooperative and voluntary participation by farmers is the view that the primary purpose of an irrigation system is to move specified amounts of water to specific locations rather than to provide improved conditions for the production of crops by farmers. Similarly, a policy that sets starting and stopping times for irrigation to fit the irrigation department needs (e.g., for maintenance) and ignores farmer needs, does not encourage voluntary participation. In the same way, unequal treatment by irrigation personnel and non-responsiveness to legitimate farmer requests generate farmer antagonisms.

ity concerns the length of term, e.g., labor mobilization can take place at intervals over a long period of time, but rarely is it needed continuously.[4] (For clarification, longer term refers to those responsibilities which extend over periods of years, rather than those which are of shorter duration. Thus, labor for channel rehabilitation would be considered short-term, but labor mobilized for normal channel maintenance would be considered longer-term.—authors)

The substantive disagreement focuses on the use of the word only, *and in this case a direct quotation seems appropriate. "We may individually and collectively favor a voluntary approach, and cloak our reasoning in objectivity, but in fact this is a value judgment. Coercion and extraction by a central authority is a viable alternative which could be done effectively by a strong government."* (The difference of opinion here may be only one of degree. We would agree in principle that a sufficiently strong central government with a major political commitment to the success of irrigation projects could use coercive measures to obtain local resource inputs, especially of the economic type. However, we believe that in practice there is little historical evidence in Asia of such governmental commitments.—authors)

8. Indirect techniques, such as price controls coupled with cropping pattern controls (e.g., tobacco and sugar quotas in Indonesia) or general taxation, can be effective in extracting economic resources from irrigated areas, but cannot mobilize the non-economic resources.
   a. This approach generally does not result in the most effective utilization of the agricultural managerial skills of the farmers because it gives distorted incentives concerning what crops to produce and what amounts of inputs to use.
   b. Where the crops involved are also grown on non-irrigated land, or where general taxes are applied, the non-irrigated farms will be carrying a disproportionate share of the costs.
9. Mobilization of the important non-economic resources can occur only through voluntary contributions of the farmers.
   a. Generally, the farmer informational and managerial resources must be obtained through an intermediary organization, formal or informal.
   b. To be effective, this organization must reflect participation by almost all of its members.

Participant reaction again focuses on the appropriateness of only *and* must *in the proposition. As in the preceding proposition, the argument is that sufficient governmental power and commitment could result in mobilization of the non-economic as well as the economic resources. At least one reaction goes beyond this—" . . . in fact, in some situations initiation of such mobilization may have to combine elements of coercion and 'voluntarism,' for example, where there are severe socio-economic or ethnic divisions among the people...."*

Some questions were raised with respect to the need for an intermediary group, since such groups may not be in existence prior to project development. (The counter-argument is that the relatively large number of farmers in systems designed for small-holders precludes designers from interacting with individual farmers. Thus, a concurrent proposition would be: where farmer informational and managerial resources are to be mobilized, formal or informal groups must be organized early in the development process.—authors)

The participation of a large majority as a necessity was also questioned. ". . . it is conceivable that an organization would function better if a few leaders made all the decisions and plans and others only acquiesced—that is with less participation (by a large majority). (It probably can be agreed that participation of the greater majority is desirable from the standpoints of social justice and the creation of self-reliance, as well as for the mobilization of important non-economic resources. Whether it is an essential for the last, alone, is arguable, though we hold that system equity and efficiency is unlikely to result without such participation.—authors)

10. Prerequisite to an effective direct mobilization of the economic or non-economic resources is the demonstration or accepted assurance of reasonably reliable and appropriate irrigation service.
    a. Where past irrigation service has been unreliable or inappropriate, a demonstration of improvement must take place before there will be significant change in the pattern of resource mobilization.
    b. In new areas the effort required to develop farmer participation will depend

[4]Paragraphs in italics, in this section, present the reaction of participants to the propositions which are not reflected in the revised form of the propositions shown here. Unless otherwise noted, the reaction statements are paraphrases by the authors rather than direct quotations from the participants. These reactions are provided where the authors felt a significant issue was raised.

on farmer experience with other government services.

The point was made that farmers can and do organize in reaction to adverse irrigation service, either to apply more effective pressure on the irrigation bureaucracy, or even to take over some operational aspects. Thus, certain types of informational and managerial resources are, in fact, mobilized. (This type of mobilization is unplanned and, to a large extent, uncontrolled. The proposition addresses the case of planned mobilization.—authors)

E. Irrigation Administration

1. Emphasis on mobilizing resources to improve system development, operation, and maintenance usually focuses on farmers and on the need for effective water-user organizations. Experience suggests, however, that greater emphasis and higher priority usually needs to be placed first on making irrigation departments, more effective so that conditions to induce the voluntary participation of the farmers will be present.
2. Many of those concerned with irrigation fail to recognize that initial designs seldom are totally appropriate, and hence the irrigation service provided by the systems seldom is completely adequate. Design inadequacies result from the lack of detailed topographic, soil and related information and from inappropriate assumptions about the water management capabilities of the system staff and/or farmers. Thus, specific mechanisms to identify and correct these difficulties are necessary.
3. Most irrigation departments inadequately deal with the dynamic character of irrigation systems. System conditions will change over time due to:
   a. Changes in the agricultural economic environment, resulting in changes in cropping patterns and practices;
   b. Changes in the managerial capacities of the water-users as they gain experience with the irrigation system; and
   c. Changes in the physical environment which affect either the operation of the system, or the ways in which the soils must be managed (e.g., changes in watershed conditions with resultant changes in sediment production; changes in soil conditions resulting from salinization).
4. These difficulties result from rigidities of system design, a lack of sensitivity to farmer needs, and the lack of appropriate feedback mechanism from the field to responsible staff.
5. To improve system operation, induce farmer cooperation, and to accommodate effective farmer participation, irrigation staff usually need to be retrained. This training includes technical and managerial elements for the effective operation of projects, as well as sensitization to farmers' needs and potential contributions.
6. From a technical standpoint, irrigation departments usually neglect system operation in comparison to system design and construction. This problem needs to be attacked vigorously by:
   a. Emphasizing canal operation and maintenance in the professional training of and communication among engineers.
   b. Extending and intensifying the interaction of irrigation engineers with various agricultural specialists, environmental scientists (including those knowledgeable about health implications), and those knowledgeable about local communities; and
   c. Experimenting with separate departments that deal exclusively with water utilization, to increase the attention paid to operation and enhance the status of those involved with that activity. Care must be exercised to avoid enlarging the gap between system design and system operation. Explicit feedback mechanisms need to be developed.
7. Many irrigation systems can be used before their facilities are fully developed (e.g., field drains and complete field leveling). Plans for further development should be based on expressions of need by the irrigators. In this case, farmer participation can provide both the economic and non-economic resources for this development. *If landholdings are very unequal, special provision may be necessary for effective participation of those with very small holdings.*

F. Water-user Organizations

1. When the preconditions for effective farmer participation exist, i.e., if water delivery is relatively reliable and adequate and the irrigation staff is reasonably receptive, organizations of water users can be a mechanism for developing and maintaining that participation.
2. User organizations can be graded as to the demands they make upon the collective responsibility of farmers, and the corresponding contribution they are capable of making

to overall irrigation administration. Such a gradation might be:

a. Outlet organizations to maintain field channels;
b. Outlet organizations to maintain field channels and to distribute water;
c. Minor canal organizations to distribute water among outlets;
d. Minor organizations to operate the minor system, including maintenance, and to collect user charges;
e. Minor organizations to operate the minor system, pay for water at the head gate of minor canals and collect user charges;
f. Management of small or medium scale independent systems, e.g., communal systems in the Philippines; and
g. Set water allocation policies for larger systems.

There was some feeling that water charges could be collected by even the lowest type of active organization.

3. Higher levels of responsibility should be expected only where local communities or associations are already operating simpler irrigation systems, or perhaps as a later phase of a progressively more responsible experience beginning with outlet-level organizations.
4. Water-user organizations can be developed through top-down (imposed or mandated by governmental action) or by bottom-up (farmer-initiated) efforts. Experience suggests that the ability to mobilize resources differs significantly between these two approaches.
   a. Associations formed by government-fiat generally have been ineffective in mobilizing non-economic resources. Depending upon the degree of coercive force available, they have had varying success in collecting fees, mobilizing labor and obtaining right-of-way donations.
   b. Farmer-initiated organizations, exemplified by community irrigation systems, have been successful in mobilizing both economic and non-economic resources, sometimes at high levels.
   c. The development of participatory organizations can be induced with an appropriate set of incentives, though direct assistance in community organizing may also be needed.

A number of additional points were made, some as reactions to omissions, others as points of partial disagreement. For example, it was pointed out that it is not only who initiates a water-user organization, but also how the organization is initiated. Reservations were expressed about the probability that farmer-initiated organizations would be viable in large, centrally-developed systems. It was suggested that the evidence for success of farmer-initiated groups comes from small systems, and that there is little if any evidence from the larger systems. Reservations also were expressed about the implications that there were only two approaches to organization, top-down or bottom-up. Intermediate modes, in which third parties provide assistance to farmer organizing efforts, are also said to have been used.

5. Since the fundamental requirements for an effective water-user organization are an adequate and reliable water delivery capability, an objective assessment of this capability should be made before farmers are asked to assume their responsibilities for the system.
   a. This can most effectively be accomplished by field-monitoring of actual deliveries.
   b. This field-monitoring could take place during a period of transition during which the farmers would gain experience with the system and establish the essential operating linkages with the project staff.

Some participants indicated requirements for effective water-user organization beyond those of adequate and reliable water delivery, (e.g., the need for organizational structures and procedures appropriate to the problems, tasks, and characteristics of the irrigation community). In addition, there were a number of comments about potential structures and procedures which might be utilized. (The subject of water-user organizations was discussed in some depth at the seminar, but primarily in relation to those aspects that influence resource mobilization. More general consideration of water-user organizations would be valuable, but the discussion during the seminar does not warrant such consideration here.—authors)

G. Experimentation

The original set of propositions sent to the participants was comprised of conclusions that were considered useful to irrigation practitioners. They were not intended to summarize all the topics discussed or conclusions reached at the seminar. One aspect embodied in several propositions, the need for experimentation, was identified in participant reaction as deserving greater attention. We have suggested earlier (E3) that systems are dynamic, and that management must be responsive to this characteristic. Similarly, we have suggested (E2) that the lack of adequate data during planning and design make it

almost inevitable that initial designs can only be first approximations to meeting the ultimate needs of systems. These circumstances provide the conditions that permit, and should encourage, experimentation by irrigation agencies. Some of the more important areas of experimentation can be inferred from the preceding summary propositions. A general statement provided by one of the participants presents the need more explicitly.

"There is a major need for experimentation on the types and amounts of local resources which can be mobilized for irrigation, the techniques for obtaining these resources, alternative forms of irrigation administration, and water-user organizations. In particular, there is a need for experimentation in the techniques for using farmers' knowledge of local conditions to improve irrigation project design (especially in large-scale irrigation projects, where little experience is available); in the techniques for eliciting farmer skills in water management and utilization e.g., through volumetric delivery to water-user organizations; in the organization of participatory water groups, and in patterns of irrigation administration, particularly with respect to developing separate departments of water utilization. . . ."

III. Keynote Address

The seminar was opened with a traditional Sri Lankan lamp-lighting ceremony, and with welcoming remarks by R. Wijeratne, Chairman, Board of Governors, Agrarian Research and Training Institute (ARTI), T.B. Subasinghe, Director, ARTI, and the Hon. E.L. Senanayake, Minister of Agricultural Development and Research. The keynote address was given by the Hon. Gamini Dissanayake, Minister of Land and Land Development and Mahaweli Development. This address anticipated much of the discussion that was to take place during the seminar and indicated a marked sensitivity to many of the issues. It seems appropriate, therefore, to present major excerpts from that address.[5]

Water Management and the User

GAMINI DISSANAYAKE

I am sure that Sri Lanka has been chosen as the venue for this seminar for very good reasons; but may I say that it is also a strange coincidence, because right now my Ministry has finalized two important pieces of legislation which reflect our new approaches to the subject of Water Resources Development in this country.

I refer to the draft Water Resources Act and the draft amendment to the Irrigation Ordinance, which will have a far-reaching impact on all our work in this field, and may, perhaps, be two important and historic landmarks in institutional planning in Sri Lanka.

Every government has been obsessed with the desire to provide more and more irrigation facilities and alienate more and more land to the people. But the noble egalitarian ideals, which sanctified the objectives of this policy, have yet to manifest themselves in their true meaning to the people who are the expected beneficiaries in the schemes.

In this connection, I must say that I am truly impressed and fascinated by the phenomenal involvement of social scientists belonging to different disciplines in the management of irrigation schemes and their assistance in the formulation of new policy objectives.

I am also deeply touched by the skillful manner in which their studies have surfaced and projected the human angle in the management approach, about which very little has been said in the previous studies.

Today, the entire foundation of the value system, which governed the establishment and the management of these schemes, has been challenged. Irrigation management is no longer a "no man's land."

Water management has been identified and accepted as an all-pervading issue which is at the heart of a deep human relationship between man and irrigation water, and, therefore, of irrigated agriculture and the management of its productivity.

I must confess that unwittingly we have been victims of a top-down approach in which the farmers' relationship with irrigation water was not viewed in its correct perspective.

We have been overawed more by the economic, engineering and agricultural aspects; whatever management approach we have adopted was merely designed to achieve a higher rate of productivity in the yields without counting the farmer, who should have been a key participant in the management organization. It was like the proverbial *"Hamlet without the Prince"*.

The past approaches in organizing management systems in the irrigation and settlement schemes were largely geared to the supply of inputs with the sole objective of increasing the yield, and the farmers were either cogs in the machine or else they were reduced to the level of mere passive onlookers.

There is no doubt that such organized efforts strengthened the bureaucratic hand of intervention by forging in a coordinated approach. But, they definitely militated against the development of a self-reliant participatory approach.

I believe that farmer participation in the decision-

[5]Excerpts taken from a report in the *Ceylon Daily News*, Aug. 13, 1980. The Minister's actual address included a number of extemporaneous remarks adding to the general impression of awareness and sensitivity, but the full text was not available for publication.

making process, for the management of the irrigation scheme, should be made an essential requisite in the management of schemes. The subject of farmer participation can only be effectively developed through farmer organization.

It is only through initiating the farmers into the management organization that the scheme can profitably gain, and no farmer would consent to a fruitful participation and a commitment, until he is convinced that he is becoming a beneficiary of the restructured management approach.

The top-down approach, which I mentioned earlier, often contains a mix of arrogance leading to an assertion that farmers are generally ignorant and that their judgments are either unrealistic or unacceptable.

The persistence of this attitude has been a serious problem in establishing a dialogue with the farmer community, as a result of which the irrigation bureaucracy has often earned the wrath of the farmer.

It is, therefore, not surprising that farmers, who want to air their grievances have to look for forums, such as the District Agricultural Coordinating Committee, which assemble in places far away from the place in which such matters should be discussed and resolved.

Our failure in effecting successful water management programs can be largely attributed to our failure to understand some of the key issues concerning the farmer and his relationship with irrigation water. It is, therefore, necessary that a program, which is objectively designed to reach the target group to initiate a dialogue with them, should be made an essential requisite of every irrigation program.

I know that certain experiments are being conducted in this direction in the Gal Oya Right Bank Water Management Project with a group of Institutional Organizers. It is necessary that, in all operations and maintenance work, especially in the rehabilitation of some of the channel systems, farmer consultation must be made mandatory, and, where such farmers' suggestions are not acceptable, it must not only be explained to the farmers, but a section in the project report should be devoted to incorporate all suggestions made by them.

Allocation

I now come to the draft Water Resources Act and the draft Amendment of the Irrigation Ordinance, about which I made a reference in the early part of my speech.

The concept developed in the Water Resources Act is primarily concerned with the establishment of a representative body at the national level to decide on a central allocation of water among different user agencies, such as irrigation, hydropower, domestic supplies, fisheries, industries, etc.

As the principal user of the largest body of water for irrigation purposes, my Ministry, which is allocated with the subject function of planning for water resources, initiated action on the development of our institutional framework which can effectively bring together the different user agencies and work out a policy for the planning conservation, development and management of water resources in the country.

In this connection, I wish to take this opportunity to record my deep appreciation of the consultations provided by the USAID under the Technical Assistance Program of the Water Management Project in the preparation of this draft Act.

The Water Resources Council, which is the body proposed under this Act with representatives from line Ministries concerned with the use of water, will attend to the priority of the efficient and effective allocation, planning, development and management of water resources.

The rationale for the setting-up of a central body of this nature springs from a collective acceptance of the need for such comprehensive coverage in law, and that a central representative body of water-user agencies (as envisaged by the Act) would be in a better position to place the national priorities in a correct perspective, and submit appropriate policy recommendations to the Government to facilitate a more effective coordinated effort in the development of water resources in the country.

To facilitate the speedy implementation and execution of some of the regulatory measures embodied in the draft Act, a new institution, called the Water Courts, will be established at the Primary Court Level, so that the management could take offenders before this court for speedy disposal of cases. This measure should also serve as a deterrent for others as well.

The amendment to the Irrigation Ordinance is designed primarily to bring out the participatory development approach by the involvement of farmers, at all levels in the management of all major irrigation schemes.

In this respect, a rationalization of the past experience in the management of irrigation and settlement schemes has been incorporated into the amendment to evolve a suitable institutional framework first by providing channel-based water-users' associations.

This organization is called the Jala Sampath Palaka Sabhawa (JSPS), and it will consist of farmer representatives elected by the farmers on a turn-out basis from below, federating under the auspices of this organization approximately at distributor channel level.

These associations will be collectively represented in the Project Committee which will be established at the apex level. The Project Committee will be the main governing body for each irrigation scheme.

The vertical integration of the water-user organizations, in a pyramidical structure from the field channel to the Project Committee facilitates the process of consultation and decision-making.

The District Agriculture Coordinating Committee, which is already provided under the existing Irrigation Ordinance, will be retained as the main link-body for district coordination and national level integration.

In the formation of the Jala Sampath Palaka Sabhawa, farmers at the tail end will receive weightage in the system of representation proposed in this draft. We expect a more volatile and articulate involvement by the farmers through this process in taking decisions which are essentially affecting their livelihood.

It is not intended to withdraw the bureaucracy entirely from these organizations, but the bureaucracy will have to learn to work with the organizations to promote a self-reliant approach to management.

Our past experience, in the management of special projects set up for the selected irrigation and settlement projects, leaves much to be desired, because farmers also made an input in the program for increased production.

The new responsibilities, which the farmers will carry under this organization proposed in the amendment, will be combined with the transference of adequate power to shoulder such responsibilities as expected. The collective decisions of the farming community, in regard to water issues and distribution, will have the stamp of authority similar to a by-law.

In this respect, I wish to caution the institutional planners against superimposing new models against the traditional organizations which are delivering goods in the desired manner. Such traditional organizations must be preserved provided they are fulfilling the objectives expected of them.

The traditional society has its own systems of throwing up their leaders, and where such approaches mitigate the development of a participatory approach, action must be taken to transform these traditional oganizations to develop their strength through the new approach.

In the draft amendment, I am happy to state, special provision has been made to retain such traditional organizations which are effectively operating in consultation with the farmer community.

In certain quarters, it is often mentioned that the bane of our system is that we are burdened with too many organizations, some of which exist in name only. As a result of this situation, the energies of the rural associations are dissipated.

But I must say that, basically, rural cooperation of this nature is deeply rooted in our system. Social systems and sanctions have been developed to sustain the objectives of these organizations.

IV. Theme Papers

Each of the four discussion sessions of the seminar focused on a major aspect of the general topic, and was introduced by an invited paper designed to establish the background for the topic and to raise the issues. Abstracts of these papers are presented in this section.

The first session explored the problems and potentials associated with the capture of the economic surplus assumed to be generated by irrigation development. From the external point of view, the techniques might be considered "traditional". Professor K. William Easter, University of Minnesota, prepared the theme paper for this session.

ABSTRACT: *Capturing the Economic Surplus Created by Irrigation*

Irrigation development has moved from situations in which projects were expected to repay annual operating and maintenance costs, interest charges on capital and even to provide a profit, to the present time when many projects incur losses, as a result of rising costs and declining revenues. This paper explores the options available to extract more of the economic surplus created by irrigation projects. This is done by considering four aspects: (1) the objectives of water charges; (2) types of charges; (3) factors affecting methods for financing irrigation; and (4) level of charges.

Generally, water charges are imposed to recover some or all of the cost of providing the water and/or to influence the allocation of water over time and among farmers. These charges can be applied (1) directly, based upon volume of water; (2) directly, per share of the supply or per irrigation; (3) directly, per acre irrigated; (4) indirectly, on crop outputs marketed or on inputs purchased; (5) directly, but variable over time; and (6) indirectly, as a general land or property tax. Each technique has its own set of appropriate conditions.

These conditions relate to the value of the water, dependability of supply, ability to control the flow, desires to subsidize agriculture, traditions of ownership, types and patterns of cropping, return flows, drainage problems, staff training and information available.

The level of charges may reflect target revenues, benefits, total costs or marginal costs. The appropriateness of each will vary for different projects, and even for the same project at different times in its development. Since most projects are designed to create an economic surplus, specific consideration of potential techniques for collecting that surplus should take place during the planning and design stage. It should also be recognized that the flexibility necessary for effective operation of the physical system also is necessary for the effective operation of the economic

system, and its component, the collection of an appropriate portion of the economic surplus.

The second session emphasized voluntary farmer participation. By contrast to the techniques of the previous section, which stressed the mobilization of economic resources, this session was designed to look at techniques that would permit the more effective utilization of non-economic resources. The theme paper, prepared by Mr. Carlos Isles, with assistance from Mr. Benjamin Bagadion, both of the National Irrigation Administration (NIA)in the Philippines, described and discussed a new program for water-user interaction with the NIA, which is being watched with considerable interest in Southeast Asia.

ABSTRACT: *Irrigation Organization and Social Participation: A Philippine Experience*

Experience with attempts to organize irrigation water-users, for the purposes of true rural participation or even for more limited activities relating to resource mobilization generally has been poor, and this has been true of Philippine experience. Among the reasons for this have been fly-by-night organizing; construction before organization; the use of a top-down model of organizing; and the elimination of indigenous organizations in favor of non-traditional models.

This paper describes an organizational approach being tried by the NIA, which attempts to overcome the shortcomings of earlier efforts. Basically, the objective is to develop a strong participatory organization that is active in planning and constructing projects, undertaking surveys, obtaining rights-of-way, acquiring water permits, organizing voluntary labor, and controlling project expenditures.

Key features of the NIA model include: irrigation organizers resident in the community; no construction without effective organization; farmer involvement in both institutional and technical matters; modification of NIA rules and procedures relative to planning, purchases and reporting; and utilization of existing organizations.

To learn from and to build on this experimentation, the NIA pilot projects are considered learning laboratories for NIA staff; the learning process is coordinated by a top-level working committee; process-oriented documentation is obtained; and evaluation and advice relative to both institutional and technical questions is obtained from outside research and training sources.

A number of difficulties have been encountered and a variety of obstacles are identified. While experience with the results still is limited, there is enthusiasm for continuing this approach.

Session three provided the opportunity to better understand the forces that lead to irrigation development, and to the biases in that development which have importance for the mobilization of local resources. Professor Randolph Barker, Cornell University, provided the theme paper.

ABSTRACT: *The Mobilization of Government Resources for Irrigation Investment*

The factors that influence the mobilization of local resources for irrigation cannot be understood without a knowledge of the factors that influence the development of irrigation itself, and that influence the use of government resources in this development. This paper reviews these factors, illustrating the nature of government response to economic forces. It then discusses some of the apparent sources of bias in government investment.

In Monsoon Asia irrigation intensification has evolved through a series of stages permitting land productivity to increase steadily. Wet season supplemental irrigation is followed by the development of storage facilities to permit expansion of dry season area, and by further investment in water control and management to achieve high yield potential with modern inputs.

Apparent distortions in the efficiency of this development are reflected in (1) underinvestment in irrigation in total, and in research to create complementary technology; (2) overemphasis on capital, relative to labor and management; (3) overemphasis on large scale national systems, as opposed to small scale communal systems.

These inefficiencies result from short-run thinking about long-term investments, the bias of government administrators and foreign experts toward capital rather than labor-intensive technology, similar emphases on capital rather than management-intensive technologies, a lack of interaction between national irrigation authorities and local communities resulting in an emphasis on large-scale national systems, rather than smaller scale community based development.

The results have major implications for the types and amounts of local resources which can be mobilized.

Session four developed a fundamental element of the seminar—the need for changes in the bureaucratic component of irrigation systems to achieve effective mobilization of local resources. Both from the standpoint of providing more appropriate irrigation service to water-users, considered an important, if not essential precursor to such mobilization, and from the perspective of increasing receptivity to farmer inputs of the non-economic resources, governmental irrigation operations need to be changed. Professor Robert Wade, Institute of Development Studies, University of Sussex, prepared the discussion paper.

ABSTRACT: ***Mobilization of Local Resources for Irrigation: Supportive Changes in Canal Management***

The mobilization of local resources—whether economic, knowledge, or organizational—depends on (among other things) the adequacy and reliability of water supplies to each locality. Where water supplies are inadequate in reliability and amount to sustain normal yields, efforts to induce farmers to contribute more to the cost of the project, and to manage water below tbe outlet, and perhaps take part in institutionalized arrangements to monitor main system operation, are unlikely to succeed; but on the other hand, such failure is also likely where irrigation supplies are very abundant in relation to irrigation requirement. Either way, issues of local resource mobilization lead us to look at issues of main system management, both because they are causally prior and because improvement of main system operation may be easier to effect than the deliberately concerted action of thousands of farmers.

The analysis of main system management in this paper proceeds by using the distinction between water control capacity and water control capacity utilization, applying the distinction to two canal systems in South India. Although the direct measurement of canal system performance is problematic (whether in agricultural or hydrological terms), an examination of how canal managers use water control capacity, in terms of their principles of decision-making, information feedback, and enforcement of decisions, suggests that there is a large potential for improving the way that the existing physical control facilities are used. Anthropological techniques of participant observation are useful for making this kind of examination.

APPENDIX 1

Seminar Program

AUGUST 11

Inauguration

CHAIRMAN: R. Wijeratne, Chairman, Board of Governors, ARTI

WELCOME: T.B. Subasinghe, Director, ARTI

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KEYNOTE ADDRESS: Hon. Gamini Dissanayake
Minister of Land and Land Development and Mahaweli Development, Sri Lanka

SPONSOR'S ADDRESS: A.M. Weisblat, A/D/C

SEMINAR INTRODUCTION: A.M. Weisblat

SEMINAR CONTEXT AND OBJECTIVES: G. Levine, Cornell University

Traditional Approaches

CHAIRMAN: T. Sivaganam, Secretary, Ministry of Mahaweli Development

THEME PAPER: *Capturing the Economic Surplus Created by Irrigation*
K.W. Easter, University of Minnesota

MODERATOR: H.C. Hart, University of Wisconsin

AUGUST 12

"Induced" Farmer Participation

CHAIRMAN: Dr. C.R. Panabokke, Director of Agriculture, Sri Lanka

THEME PAPER: *Irrigation Organization and Social Participation: A Philippine Experience*
C.D. Isles, Philippine National Irrigation Administration

MODERATOR: E.W. Coward, Jr., The Ford Foundation

"Induced" Governmental Participation

CHAIRMAN AND MODERATOR: Dr. W.M. Tilakaratne, Secretary, Ministry of Finance and Planning, Sri Lanka

THEME PAPER: *The Mobilization of Government Resources for Irrigation Investment*
R.A. Barker, Cornell University

AUGUST 13–14

Field Trip: Mahaweli "H" Block Development Project and the Village of Kunchikulam, Anuradhapura Region

AUGUST 15

Supportive Changes in Administrative Organization

CHAIRMAN AND MODERATOR: Ivan Samarawickrama, Additional Secretary, Ministry of Lands and Land Development, Sri Lanka

THEME PAPER: *Mobilization of Local Resources for Irrigation: Supportive Changes in Canal Management*
R. Wade, Institute of Development Studies, University of Sussex

Summary and Conclusions

CHAIRMAN: G. Levine

Summary Remarks
H.C. Hart
B. Bagadion, Philippine NIA

RAPPORTEURS: E.J. Vander Velde
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APPENDIX 3

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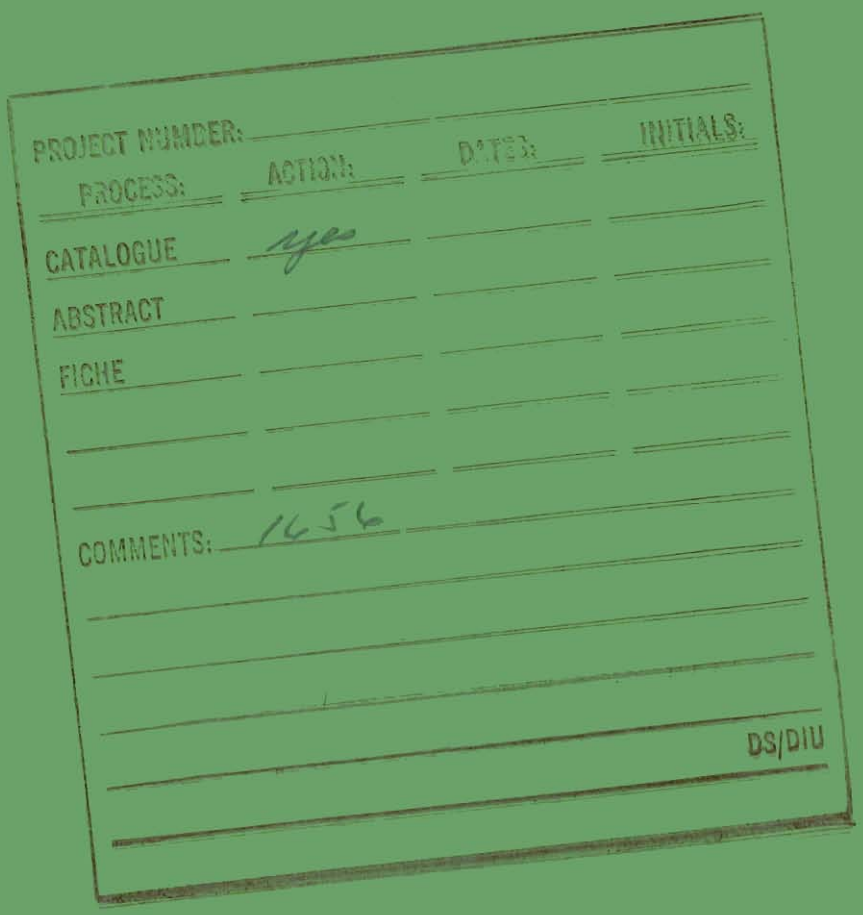

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