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Enhancing Irrigation Through Water User Associations: Ecuador

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SUMMARY

Private irrigation is traditional in the highlands of Ecuador. In more recent decades, irrigation has expanded throughout coastal areas as well. Private sector water user associations have been organized to administer, co-ordinate and manage the distribution of this water.

In addition to private sector irrigation activities, the government has, since the 1940s, engaged in the development and exploitation of large-scale irrigation projects in both highland and coastal areas. However, during this period of expansion of the public sector into irrigation development and control, there has been little interaction or co-ordination with private sector efforts and, in effect, parallel systems of irrigation water management and delivery are currently operative.

This paper explores recent recommendations extended to the government of Ecuador vis-a-vis its philosophy toward private sector irrigation and suggests that the strengths, human resources and widespread social legitimacy of private user organizations can be a vehicle for promoting and enhancing water development and improved water distribution and use in the country.

INTRODUCTION

In the latter half of 1982, USAID/Ecuador and the *Instituto Ecuatoriano de Recursos Hidráulicos* (Ecuadorean Water Resources Institute), known

as INERHI, requested the assistance of an interdisciplinary team of consultants (the author was a member of this five-man team) to propose strategies for the development of irrigation in Ecuador during the decade of the 1980s. Their report⁶ contains a number of recommendations which could be both informative and valuable in assessing water management in circumstances similar to those in Ecuador. It is the author's intention to synthesize, describe and comment upon a portion of those recommendations; specifically, those which directly deal with private irrigation organizations. The primary aim of this paper, then, is threefold:

- (1) To describe the circumstances surrounding Ecuador's private irrigation institutions.
- (2) To review the government's rôle vis-a-vis private sector irrigation.
- (3) To describe and analyze a plan for improving private sector irrigation given existing circumstances.

OVERVIEW OF PRIVATE IRRIGATION ORGANIZATIONS

Irrigation delivery by the private sector in Ecuador is extremely important since it is responsible for some 77 per cent of the current total irrigation in the country.⁸ Much of private sector irrigation is performed by fairly large landholders and commercial enterprises acting independently of other water users. These independent irrigation operations are *not* the subject of this paper, which focuses on the large number of private user *organizations* which distribute irrigation water.

Historical setting

The author has previously recorded¹ that the vast majority of private irrigation organizations are in the *sierra* (highland Andean region), where farming and irrigation have been traditional for centuries. This is the area of predominant Indian ancestry where communal organization and mutual co-operation have long been customary. Even prior to the colonial period, many Indians of the highlands practised irrigation in some form. Crude irrigation systems were constructed and operated by the Inca Empire, whose northern headquarters was located in Quito. Nearly all the old canals and ditches were later destroyed. Consequently, virtually all the irrigation works in operation today have been constructed

in the post-colonial and modern eras. At present, irrigation entities operate many canal systems throughout the *sierra*, and are most common among small- and medium-class farmers.

The oldest of the modern-day water user organizations date back to the 1930s, but some continue to be created even at the present time. They are most commonly known as *Directorios de Agua* or *Juntas de Usuarios*, hereafter referred to as water user associations. Systematic research among these user associations³ demonstrates how important they are as irrigation distribution organizations within the private sector. Indeed, they are by far the most numerous of all formal irrigation institutions, public or private. Furthermore, for the most part, water user associations function well and enjoy the firm support of their memberships. They are viewed by *campesinos* as viable and legitimate rural institutions.

Irrigation Organizations of the *Sierra*

In post-colonial history, crude user associations began to form when *campesinos*, especially small landowners or *minifundistas*, came together into groups for the common purpose of jointly acquiring water for irrigation and then administering that water among themselves. Clusters of potential users thus began to become organized in order to secure and administer an independent source of water which they would acquire and use as a group. This custom of banding together into private water distribution organizations is common throughout the *sierra*.

Today, water user associations consist of anywhere from a handful to several thousand users.³ Many of these associations have now been organized according to legal statute and are recognized by extant law as legal entities which have power to enter contracts and agreements.⁶ Others, however, have traditionally existed as non-legalized organizations, without formal by-laws or other regulating documents.

Water user associations are entirely financed through assessments levied upon each shareholder according to a set rate on the volume of water used or the number of hours specified in the shareholder's use right. Both cash fees and labor assessments are levied. Cash assessment amounts vary with each organization and are usually fixed by an elected Board of Directors. One important point is that the cash assessment is generally very low. These organizations commonly operate on low budgets with relatively few expenses. Consequently, the cash cost per shareholder per year is not burdensome.³

The economic impact of the labor provided by each association member for infrastructure maintenance must also be taken into consideration. The labor assessment is also generally minimal and is calculated on the volume of water corresponding to each user. Therefore, association members only pay in cash the amount necessary for basic administrative matters. They provide voluntary labor for the cleaning and maintenance of the distribution works, and most association officers serve without monetary remuneration. These factors help keep the cost of operation down. The organizations were originally created for acquiring and delivering water, and to do it at a reasonable price. For the most part, they do this quite effectively.³

The principal characteristic of the irrigation networks utilized by these associations is their simplicity. They are generally not too large or extensive, and, almost without exception, have rudimentary diversion works and unlined ditches.³ Water is usually distributed to members by hours, which is the total volume of water in the ditch for a specified number of hours every so many days. The number of hours needed is calculated by the size of the plot to be irrigated and/or past customary practice.

Coastal private institutions

The development of private irrigation institutions on the Ecuadorian coast has been quite different from the more traditional patterns of the *sierra*. Irrigation, in general, has a shorter history on the coastal plain and, therefore, so do private irrigation organizations. Indeed, until some 40 years ago, no irrigated agriculture existed in the *costa*. Although today there is a significant amount of coastal private irrigation, most of it has been developed by individuals acting on their own initiative, or by private business enterprise such as the large private sugar and banana plantations. These private landowners and commercial enterprises are autonomous in their irrigation operations. Consequently, relatively few entities composed of various private irrigators are in existence on the coast.

Olsen and Anderson¹⁰ have described how, in 1972, several (approximately 22) agricultural co-operatives were created under a Ministry of Agriculture (MAG) program funded at the outset by USAID through the National Development Bank (*Banco Nacional de Fomento*). These co-operatives constructed limited irrigation canal systems as part of their overall production activities. They are still some of the few private farmer organizations engaged in irrigation known to exist on the coast.⁸

To summarize, the diversity in patterns of agricultural development between the *sierra* and *costa* of Ecuador has affected present-day differences in irrigation and irrigation user level organizations. The *sierra*, the highland area of traditional habitation and of long-standing agricultural production, is characterized by large numbers of small canal systems and water user associations. The heavily vegetated and humid *costa* is an area which, for many years, was unattractive agriculturally. In recent decades, however, both rainfed and irrigated agriculture have expanded rapidly in this zone. Nevertheless, the water user associations which have enjoyed a long tradition in the *sierra* are virtually unknown in coastal areas. Irrigation delivery is much more independent and individualistic.

PUBLIC SECTOR OBLIGATIONS TO PRIVATE IRRIGATION INSTITUTIONS

The law creating INERHI details four obligations which INERHI has toward irrigation institutions in the private sector. Specifically, they are the following:

- (1) "Project, study, construct and develop irrigation and drainage systems, within the national territory, on its [INERHI's] own accord or in co-operation with other institutions or entities.
- (2) Promote organizations or entities comprised of water users and establish, through regulations . . . standards for the administration and conservation of irrigation canals. . . .
- (3) Promote the establishment of private or mixed public and private irrigation enterprises, including allocations of capital, and the stimulation of capital investment in irrigation works.
- (4) Lend technical assistance to public or private entities or to private persons. . . ."

The first of these obligations indicates that INERHI, in its official capacity of "superintending the best use and protection of the nation's water resources" can work in co-operation with other bodies, be they public or private, in the fulfilment of its duties. INERHI does, in fact, allow other public funded agencies to develop and administer irrigation systems under its general supervision. However, these kinds of collaborative effort have been, to date, exclusively with public sector organisms. With regard to this particular provision of the law, INERHI,

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in reality, has placed a predominance of fiscal and human resources effort on the part that states 'on its own accord'. This is evidenced by the large number of irrigation projects and systems INERHI is unilaterally designing, constructing and operating directly under its own control.

The second and third of INERHI's obligations are both focused more directly at privately controlled and operated irrigation organizations. Clearly, some of INERHI's efforts are to be directed at strengthening private sector irrigation by promoting and assisting, even to the point of financial aid, private irrigation enterprises. These may be *directorios de aguas*, indigenous communities (*comunias*), or co-operatives. Indeed, one of its obligations is to stimulate the investment of private capital in irrigation delivery systems. In order to satisfy the demands of effective and proper administration and conservation of the resource, INERHI is empowered with the right to establish standards to which these private organizations are to adhere.

The fourth of the obligations which INERHI has toward private sector irrigation is to provide technical assistance in water management and use to individual water users and to private organizations. It must also do the same for other public entities. In essence, this sub-article of the law sets forth INERHI's extension duties—duties which, heretofore, it has not been able to carry out to any significant degree.

To summarize, the law creating INERHI makes it clear that the private sector is recognized as a viable vehicle for irrigation development in the country and that it is to be assisted by the public sector in this regard. However, this has not generally been the case. Private sector irrigation development, with few exceptions, has occurred with no direct assistance from INERHI or other public agencies.

PROPOSED REDIRECTION IN PUBLIC SECTOR EFFORTS

Keller *et al.*⁸ proposed that the government of Ecuador, with INERHI as the lead agency, should adopt a new approach to irrigation development. A major portion of this new approach would necessitate and require a significant degree of interaction with private sector irrigation organizations. This represents a radical departure from current practice in which INERHI designs, constructs and operates irrigation delivery projects *without* local input. Socio-economic surveys are generally

performed in predetermined project impact areas and are designed to merely ascertain 'what's there'. They are not used as an input to decision-making.

The recently proposed new strategies call for the public sector, primarily INERHI, to implement its mandate *through* the private sector. Rather than continue to create and operate projects entirely through its own means, it should endeavor to develop future irrigation throughout the country with the co-operation, collaboration and assistance of private sector user groups. The following points are the major tenets of this reorientation in current philosophy.

One, INERHI would develop water sources which are, for topographic or other reasons, so difficult as to be beyond the capability of private investors and irrigators to develop without public assistance. INERHI is equipped to design and construct diversion works and conveyance structures in larger streams, rivers, *quebradas* (deep ravines) and the like, which private water users, on their own accord, would be unable to develop.

Secondly, INERHI, however, would only initiate such works in areas where (1) the needs and benefits of irrigation can be clearly demonstrated; and (2) in which the future project beneficiaries have demonstrated their willingness to participate by previously joining together to form some type of legitimate water user organization. This latter point would be a requirement. The user organization's purpose would be twofold: (1) to be responsible for the construction and development of the delivery system beyond the primary canal or diversion constructed by the government and (2) to administer and manage the entire system once it is in operation.

Thirdly, INERHI, or other implementing agency, would also offer assistance to the new water user group in the design and construction of its delivery infrastructure where required, without becoming directly involved in the construction itself. The new organization would be free to use INERHI's advice and assistance or to work with private engineers and contractors. However, all design and construction would be approved by INERHI. One significant vehicle for INERHI assistance could be in the form of supervised credit to newly formed organizations.

In summary, INERHI would construct a 'limited' system that could take the water from a difficult source, such as a large river, and convey it to a point where the water user organization could then take the water and put it to beneficial use. The public sector would thus assist private sector

irrigation by, in essence, providing a ready and accessible source of water. In this fashion, the government would aid the user organization as it begins to function without becoming directly responsible for the construction, administration and continued operation and maintenance itself, as has been the case in the past.

User organizations would have several incentives to collaborate in such ventures. A few immediate advantages would be: (1) free system engineering and design advice; (2) technical assistance on water use and other agronomic practices; (3) timely adjudication of a water use right by INERHI (INERHI is the public agency charged with the responsibility of registering and adjudicating all use rights in the country); (4) a secure and sure water source; (5) government assistance in dealing with local contractors and (6) credit, with convenient terms and payback periods.

The new approach can be followed with any form of user level organization that could exist under current law. Moreover, it is equally applicable to newly formed organizations as well as 'old' (now existing) systems. For example, in this latter category, there are literally hundreds of small private systems nationwide which could greatly benefit from an infusion of technical and financial assistance from the public sector. Those which now operate poorly could thereby be improved and those which operate well could perhaps become even more effective, thus improving efficient water management and use across the private sector.

An example of such assistance could well be the straightening and lining of canals and the general improvement and modernization of infrastructure, including the construction of permanent diversion works where possible. This would be a general upgrading that would stabilize the availability and security of the resource. Such investments by the public sector would also be to its own benefit since permanent diversion works would greatly enhance INERHI's ability to regulate and manage water use along a given watercourse—something that at present it is not able to do.

The suggested redirection in approach capitalizes on the entrepreneurship, initiative and manpower of viable user level organizations both for the creation of new irrigation systems as well as for the upgrading of pre-existing ones. Over time, a great deal of irrigation has been developed in the country, primarily through group action and without any government intervention. The preceding suggested plan of action, or philosophical reorientation, would keep this momentum in the private sector. The public sector, in its rôle as overseer of the nation's water resources,

'manages' water nationwide by providing a proper level of assistance and incentives to private water users.

INTERACTING WITH PRIVATE INSTITUTIONS

The proposed shift in the basic philosophical approach to irrigation project development will require a parallel capacity and ability to successfully interact with private water users and their delivery organizations. The following paragraphs, therefore, outline the review team's recommended general philosophy about how best to interact with user level organizations in a manner that will yield positive results.

There are some important points that government agencies should keep in mind, points which help orient their plan of action when working with rural institutions. First, Ecuadorian *campesinos* (the small farmer/peasantry class) are generally skeptical of promises of assistance from the government. Consequently, agencies should not come on too strong, too fast, and should be careful not to offer more assistance than they are able, willing and intend to provide. And, once a project is under way, agencies ought to finish it as quickly as possible and move on.

In addition, agency personnel should approach *campesinos* from their (the *campesinos*'s) viewpoint. Program designers and practitioners should endeavour to determine accurately what is in the *campesinos*' best interest, especially when it may conflict with what assistance or development agencies feel would be in their interest.

Related to the preceding point, public agencies should avoid the assumption that they 'know' how farmers think and what they want. They probably don't, because most public officials have never been farmers! Agency field personnel should ask for, seek out and be receptive to, *campesino* opinions, and desires, and incorporate their ideas into project planning.

Another suggestion is to keep assistance as uncomplicated, yet as helpful, as possible. Each case is considered separately to determine the best level of assistance and approach under that individual circumstance. Again, aid is simple, direct and appropriate to the group's needs. Grandiose or complicated schemes may be misunderstood and perceived as a threat to the status quo. *Campesinos* may want meaningful help, but not to be overwhelmed by it.

Assistance programs should take advantage of group dynamics and

involve the water user group in every way possible. This includes utilizing its manpower, creativity and dynamism whenever feasible in order to successfully reach project goals. Group participation in the project is vital to its long term success.

Another point concerns attitudes. From the outset, the assistance project should not be viewed as a 'public' project. It is the *group's* project and is for *its* benefit. The public agency is only *assisting* the group. This is a crucial point. The assistance agency and its representatives must have the proper mind-set. When the project is completed, it is the user group who will operate the system and have to be happy and satisfied with it. The agency will merely move on. Therefore, practitioners should do everything possible to make it the client group's project.

Another important aspect of assistance is this. Public officials working with rural peasant organizations and their members should first endeavor to gain group confidence and trust, then work to maintain them. This is an attitude of friendship, of sensitivity to local conditions, and of sincerity in service. Field personnel should demonstrate that they want to help. They must also possess commensurate technical skills. These will give the change agent and the assistance agency much needed credibility with recipient organizations.

One of the key ingredients to success may be to find, and lock into, the local, and oftentimes informal, lines of communication and authority within the recipient group or impact area. Yet another key factor is to locate an individual in the client group who has the confidence of his neighbors or fellow organization members. Once identified, this type of person can be a great ally to the project. This individual, or one selected by the group at large, may even be utilized as the primary contact person (local promotor) for formal interaction between the assistance agency and the group.

The foregoing may require that an agency should recruit and employ individuals in key supervisory and field positions who are sensitive to this issue and who have had past successful experience in interacting with *campesino* level groups. In-service type training on extension methods, interpersonal communication skills and group dynamics would be of valuable help to technical personnel, many of whom have little formal training in the social sciences.

Past experience, worldwide, has shown that government assistance programs in rural areas are consistently more successful if the above types of considerations are followed in project planning and execution. They

delineate a philosophy conducive to success, one which can be applied to any program of extension or technical assistance. Unfortunately, these issues are often not recognized or may be ignored by those offering assistance.

DISCUSSION AND OBSERVATIONS

Ecuadorian water user associations enjoy the legitimacy of long-standing, well-recognized social institutions. Recent work demonstrating the benefits of such organizations to effective irrigation development has been documented and summarized.^{4,5,9} Furthermore, the author has presented extensive research data^{2,3} indicating the strength and acceptability of these organizations in Ecuador, as well as in other Andean nations.

The plan presented in this paper for interacting with irrigation organizations draws upon several well-recognized properties of knowledge dissemination and innovation transfer theory. Rogers and Shoemaker¹¹ have defined the crucial elements in the diffusion of new ideas as '(1) the innovation, (2) which is communicated through certain channels, (3) over time, (4) among the members of a social system' (p. 18). In this case, the innovation to be diffused is direct assistance to private sector irrigation institutions by the public sector, something that has not heretofore occurred in Ecuador.

The preceding recommendations for interacting with private sector institutions emphasize the human element in change and the viability of organizations as conduits for innovation. They also incorporate important concepts concerning group pride, participation and consensus, legitimacy, feedback and credibility. Add to these local leadership utilization, sensitivity to local customs and conditions, and the proper use of incentives for inducement. In short, they define a government rôle which will hopefully facilitate progress in the nation's irrigated sector.

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