The Role of Farmer Organizations in Irrigation Management

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1. Introduction

Irrigation management can be defined as: "the process in which institutions or individuals set objectives for irrigation systems; establish appropriate conditions; and identify, mobilize and use resources to attain these objectives; while ensuring these activities are performed without adverse effects" (IIMI 1989). While other definitions of irrigation management may exist, most can be found to aim at achieving five objectives identified by Uphoff (1986):

a) Greater production or productivity in terms of crop yield, area cultivated and/or cropping intensity;

b) Improved water distribution in terms of greater reliability and predictability and greater equity;

c) Reductions in conflict among users and with government agencies;

d) Greater resource mobilization --- both material and human;

e) Sustained system performance.

Evidence from a variety of systems supports the proposition that these irrigation management objectives can be furthered by the participation of farmers in system management. (Uphoff 1986, FAO 1989, Pradhan 1989, Pant & Verma 1983). It is also widely accepted that farmer participation becomes more predictable, productive and sustainable if water users participate in groups through some form of organization rather than on an individual basis. It is in this context that the study of farmer organizations has been receiving increasing attention from irrigation specialists.

The nature and dimensions of the irrigation activities which a farmer organization might perform will depend on the type of irrigation system, the method of irrigation, the ownership of the irrigation system, and on many socio-economic, institutional and cultural factors. In Bangladesh there are both traditional and modern methods of irrigation. Traditional methods include swing

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baskets, doons¹, dug wells, etc. The modern methods include lift cum gravity systems, deep tube wells (DTWs), low lift pumps (LLPs), shallow tube wells (STW) and manually operated shallow tube wells The share of traditional methods in the total area (MOSTI). irrigated in the country is only 10 percent (Bangladesh Bureau of Statistics - BBS 1990) and this has been found to be declining over the years in both relative and absolute terms (Navin Jr. and Khalil 1989). There are both formal and informal farmer organizations to participate in the management of modern methods of the management of traditional methods irrigation. In of farmers participate both individually and in irrigation, an organized manner. Adnan (1989), reports organized participation of farmers in some traditional methods of irrigation systems in Chittagong district.

While a large number of studies in Bangladesh have been conducted on farmer credit cooperatives, the study of farmer organizations involved in irrigation management has been largely ignored. While studying credit cooperatives, however, some authors have touched, at least superficially, on irrigation management activities. Other studies, investigating the capacity utilization of irrigation systems, have also sometimes mentioned farmer participation in irrigation management. But in very few of these studies was there a major focus on the role of farmer organizations in irrigation management. This lack of research emphasis is in contrast to the long-standing formal importance ascribed by the government of Bangladesh to the participation of farmers in the management of irrigation systems.

For the cooperative irrigation managment research group involving IIMI, IRRI and BRRI many of the specific topics under study during 1989 through 1991 have tended to re-emphasize the importance of farmer participation in the improvement of system performance. This present, rather preliminary, study is an attempt to draw together some of the farmer organizational work that has come out of the research group's other activities. The emphasis here is, perforce, on groups in publicly owned systems simply because very few private systems happen to have been included in the broader inter-institute research design.

2. Objectives of the Study

The present study is exploratory in nature and is meant, hopefully, to be followed by more in-depth research on aspects of farmer participation and group management. The major emphasis of this study is to identify the present role of farmer organizations in irrigation management in at least some irrigation systems in Bangladesh and to explore the possibility of undertaking applied

² Doons are canoe shaped containers usually 10 to 15 feet long, used for lifting water.

research on methods to enhance the capability of farmer organizations operating in publicly owned systems to participate in irrigation management so as to improve system performance. More specific objectives are:

a) to investigate the origins of farmer organizations operating in publicly owned irrigation systems;

b) to identify important characteristics of farmer organizations;

c) to ascertain socio-economic characteristics of water users and their leaders;

d) to determine irrigation management and other functions performed by farmer organizations.

e) to identify key issues and problems of farmer organizations requiring policy intervention and further research.

3. Methodology

3.1 Research Area

Field work for the study took place in three locations of the north and the north-west of Bangladesh --- Thakurgaon, Rajshahi and Kushtia and involved both ground water and gravity irrigation systems. Ground water irrigation systems included DTWs only and were chosen from the Thakurgaon and Rajshahi areas. From the Rajshahi region examination was made of three different management systems of DTWs where farmer organizations have been been involved in irrigation management functions. These included rental, rental-RAKUB and BIADP systems. ("Rental" refers to wells rented from BADC, "RAKUB" denotes the Rajshahi Krishi Unnayan Bank and "BIADP" stands for the Barind Integrated Area Development Project.) The DTWs under all of these systems are owned by the Bangladesh Agricultural Development Corporation (BADC). In Thakurgaon, the study included farmer organizations dealing with tubewells of the North Bangladesh Tube-well Project (NBTP). The gravity irrigation system involved in the study was that of the Ganges - Kobadak Irrigation Project (G-K) located in the Kushtia area. These latter two systems are owned and operated by the Bangladesh Water Development Board (BWDB).

3.2 Choice of Study Farmer Organizations and Respondents

A total of 39 farmer organizations were selected for the study. Of these organizations, 16 were from NBT near Thakurgaon, 12 from Rajshahi and the final 11 from G-K, Kushtia. Of the 12 farmer organizations of Rajshahi, six were at BIADP tubewells, three at

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rental and three at rental/RAKUB wells³. A total of 336 farmers and 197 leaders (chairmen/mangagers plus executive committee members) were randomly selected at the various study locations.

3.3 Data Collection

Data/information collected for the study Source of Data: incorporated both primary and secondary sources including: cultivators/farmers; farmer leaders; agency officials; official records and studies and research reports; and farmer-groups' records. Data were collected from February through August 1990 by field staff, field officers and research team members themselves. Field information was gathered through: discussions with officials, farmers and farmer leaders; structured interviews with farmers and farmer leaders; participant observation; and crop cuts for yield data.

4. Discussions and Findings

To create a framework for the analysis of the role of farmer organizations in irrigation management one can identify some activities of a general nature. Uphoff (1986), for example, provides a list of such activities. He begins with three broad categories of activities. The first relates to water use, the second covers physical system activities and the third includes organizational and management functions. These three categories are themselves broken into sub-components. The water use activities include:

- a) Acquisition of water from surface or sub-surface sources;
- b) Allocation of water by assigning rights to users;
- c) Distribution of water among the users;
- d) Drainage of excess water.

The physical system activities cover :

- a) Design of structures;
- b) Construction of structures;
- c) Operation of structures;
- d) Maintenance of structures.

The organizational activities include :

- a) Decision making;
- b) Resource mobilization;
- c) Communication;
- d) Conflict management

³ For a more detailed description of the systems see "Deep Tubewell Irrigation under Alternate Management" - a paper presented in the present workshop.

All of these activities of irrigation management are, of course, highly interrelated. Some ways in which farmer groups might become involved in these functions are among the recommendations of Taylor and Wickham (1976). They are:

- 1. Taking responsibility to pay more of the costs of irrigation;
- 2. Assuming more responsibility to organize and perform 0 & M tasks;
- 3. Giving more feed-back to irrigation officers on the field performance of systems;
- 4. Exerting greater influence on decisions involving water allocation and scheduling.

Other studies (such as those by Svendsen and Small, 1990 and by Ogunwale, Early, Sison, Depositario Cuyno and Spalco, 1984) also identify group irrigation management activities similar to those already mentioned.

Many of the important irrigation management activities identified above are of use in examining the farmer organizations int this study.

4.1 Origins of the Farmer Organizations

The origins of the various farmer organizations under this study are linked with the introduction of irrigation facilities at their respective locations. The NBTP system was put into operation in the mid sixties. The farmer organizations in that project area were organized after the operation of the project was started. Likewise the farmer organizations in the G-K system were organized after the system began to provide irrigation services. In the Rajshahi area, one of the preconditions to farmers getting a BADC DTW was for those farmers to organize themselves into groups formal or informal. Thus, at least the nominal organization of farmer groups preceded the operation of the Rajshahi rental DTWs.

The basic distinctions between the farmer organizations in the NBTP and G-K systems on the one hand and those in Rajshahi area are:

a) In the GK and NBTP systems farmers were organized by the government agencies apparently in an attempt to make efficient and equitable use of the water, while in the Rajshahi area farmers themselves organized into groups with very little support from the government agencies;

b) In the GK and NBT systems farmer organizations were not required to make any effort to acquire water (water was made available to them by the public agency), while in the Rajshahi area the acquisition of water was the primary objective of farmer groups.

4.2 Farmer Organization Characteristics

Legal Status: All of the farmer organizations of the G-K and NBTP systems are formal in the sense that they are registered societies - registration given by the Registrar of Directorate of Cooperatives (DCO). They have bye-laws or a constitution defining their areas of operation, membership requirements, functions, management procedures etc. In Rajshahi all DTWs around which farmer organizations have been organized are BADC owned. As required by BADC, farmers organized themselves into informal groups and acquired DTWs. After receiving DTWs, 3 of the 12 sample groups acquired formal legal status by achieving registration from the Registrar of Cooperatives, and the remaining 9 are still operating on an informal basis. Of these 9 groups, 6 are under BIADP and the other 3 are under the rental program. Registration was planned for the BIADP groups and for that a bye-law was prepared. Such registration has not, however, taken place as yet.

The bye-laws of the organizations suffer from several possible weaknesses. First, they appear not to have been framed while keeping in mind the internal needs of the groups. They are, in general, carbon copies of bye-laws prepared by Bangladesh Jatiya Samabay Union to meet the needs of farmer cooperative societies whose main function is to provide credit services to their members. The bye-laws management model provided in these does not necessarily fit into the irrigation management activities. As a result, these bye-lays do not elaborately and clearly mention irrigation management functions of farmer organizations and also do not delineate irrigation responsibilities of group leaders and members. Nor do these documents define the relationship of farmers with irrigation agency officials. In other words, they do not provide any legal framework for agency and farmer interaction, cooperation and collaboration for better irrigation management. Tn addition, the bye-laws do not apply principles such as those emphasized by a number of authors (see Bromley, Taylor and Parker; 1980) to protect the interests of the more disadvantaged irrigators.

Organizational Structure: The formal farmer organizations in all of the study areas have two tiers - one at the village/command area level and the other at the Upazila level. The village/command area level organization is known as the KSS (Krishak Samabay Samity or Farmer Cooperative Society) and the Upazila level tier is known as the Upazila Central Cooperative Union (UCCA). The latter is the federation of the KSSs. The major function of a UCCA is to coordinate the activities of its KSSs and to help them get credit and other agricultural inputs. UCCAs have not been observed to perform irrigation management activities to any considerable level. The bias of UCCAs in the NBTP system is towards credit functions. a UCCA would have great difficulty taking In G-K, part in irrigation management activities (even if it tried) because of an inherent design characteristic. These associations ware formed on the basis of administrative boundaries rather than on the basis of the hydrological features of the system. In a canal system one can identify three hydrological tiers where farmer cooperation and interaction is needed for efficient and equitable water distribution. These tiers are : Outlet/turnout, tertiary canal and secondary canal. Political/administrative boundaries are not designed to match these tiers. Therefore a three-tier farmer organization based on the hydological features of the irrigation system is likely to be much more appropriate than the two tier farmer organization based on non-hydrological factors.

<u>Management of the Farmer Organizations</u>: The management of farmer organizations under this study includes both a general assembly of members and a management committee that is drawn from among the members and is elected by the members. This organizational characteristic is common to all of the farmer organizations, both formal and informal.

The assembly of general members is supposed to meet once a week to discuss and make decisions about various issues related to irrigation, credit, improved cultural practices, member savings and shares and a host of other things. It has been observed that none of the organizations under study met every week. In many of the organizations meetings are not held for months at a time except in the beginning of the irrigation season.

The Managing Committees (MCs) consist of 6 to 11 members and include one chairman, one vice chairman and one manager. The most important functionary of an organization is the manager. In order to carry out the functions of an organization, the MC is mandated to meet at least once in one to two months. This meeting too, it has been observed, is not held regularly. In the G-K and NBT projects the MCs have been found to have met only when they needed to get credit. In the Rajshahi area they also meet when irrigation is started. The manager and a few members of the MC run the show. They convene weekly or monthly meetings to legitimize their actions, (not infrequently, <u>ex post</u>).

The bye-laws lay down rules for regularly writing down the proceedings of the meeting but such recording is seldom done. The proceedings that can be found in the books of records are the resolutions for taking loans and deciding irrigation fees.

The bye-laws also have detailed rules for the changing of MC members and the manager but such rules, it would appear, are largely not followed. It has been noted that the same manager and the same members of MCs have continued to hold their positions for the past many years. During one field visit it was found that the manager of one of the societies had not been changed since the birth of the society --- more than twenty years ago. That longevity of leadership had not appeared to aid in the functioning of the organization.

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<u>Management Accountability</u>: Two major methods of making management accountable to the societies are: a) through a functioning general assembly of farmers; and b) via the auditing of the accounts by the DCO. As a result of the great irregularity in the holding of weekly meetings of KSSs, direct accountability of management to the general members seems to be largely absent. Accounts, however, have been audited fairly regularly.

4.3 Membership and Area of Operation

The farmer organizations in the study areas include both irrigation-community/command area based and village-community based organizations. The existing groups in G-K and NBTP, as well as the formal groups in the Rajshahi area are village-community based. In many cases the irrigators in a command area or in a village are not members of the relevant organization. In the majority of the sample organizations, the number of members is smaller than the number of irrigators (Table - 2). The informal Rajshahi groups along with the organizations associated with the BIADP are irrigation-community based and composed of irrigation neighbors.

4.4 Socio-Economic Characteristics of the Managers, MC Members and Farmers :

Age: The average age of the group managers is in the low forties. Seemingly it is not a position dominated by the village elders. (Table 3).

Education: As might be expected, the mean years of schooling of group managers is higher than that of either the managing committee members or of the general group of farmers (Table 4). Managers, especially, need some education in order to make entries in various record books, write proceedings of meetings, interact and maintain liaison with officials, etc. As a result, relatively educated people are chosen as leaders. Even their mean years of schooling, however, varies only from 7 to 9 years. It can be noted that education is not an absolute requirement for managing committee membership as in all systems there are examples of illiterate farmers who have become members of the MCs.

<u>Family Size</u>: The average family size of all of the sample farmers, MC members and group managers was large --- with Managers and MC members possibly having larger families than the general farmers (Table 5).

<u>Operated Land Holding</u>: In the Rajshahi and Thakurgaon areas mean land holding size of managers is higher than that of MC members --- which is, in turn, higher than that of the general farmers (Table 6). This land holding pattern conforms to the general pattern in the country --- the leaders having the greatest amount of land. In the Kushtia area the sample of group leaders' land holdings does not seem to differ much from that of the other

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irrigating farmers.

Occupation of Leaders: The primary occupations of group leaders have been presented in Table 7. It can be seen that, as expected, agriculture is the major profession of the overwhelming majority of leaders in all systems although traders and service professionals do lead a few of the groups. Leadership of farmer organizations seems still to be with farmers although they have relatively more land than others.

<u>Membership of Leaders in other Social Organizations</u>: In rural Asia, the same elite category of people are generally found to dominate the management of all rural organizations. Among the sample of irrigation group leaders in this study it can be seen that these leaders are often active in other social organizations -- although this characteristic is particularly dominant only in the G-K system and in the Rental-RAKUB parts of the Rajshahi sample (Table - 8). Where this is true there can be a concern that, apart from equity considerations, a person having leadership positions in many organization may not be able to give sufficient managerial attention to any one of them.

Distribution of Leaders by Farm Size and Irrigation System Location: Contrary to expectations, leadership is fairly equally distributed among different farm sizes --- the majority of them belonging to small and middle farm families (though, as noted earlier, average leaders' holdings are larger than those of other categories of irrigators) (Table 9a). Similarly, leaders are also fairly equitably distributed in various irrigation locations head, middle and tail (Table 9b). From this, however, little can be conclusively stated about the degree of the democratic character of the management composition. More information is needed about the social and economical relationship between the large farmer leaders and the small- farmer leaders. If they are related to one another by blood or bonded in a dependency relationship, then this apparently democratic character of the composition of management may have little real meaning in terms of the protection of the This information is not interests of small and tail farmers. presently available for the study groups. A further complication to analysis is that not all persons who formally fill positions of leadership are, in fact, the real managers of their respective irrigation groups. Real managerial action seems to be restricted to a sub-group of those identified as leaders.

5. Irrigation Management Functions of Farmer Organizations

The farmer organizations under this study seem to play only a minimal role (if any) in actual irrigation management. Irrigation management functions <u>are</u> performed by the so-called group managers or by the managers and some of their confidants. Farmer groups or associations, as such, often do not seem to have any meaningful

participation in those activities, however. Managers (and their people) frequently use the name, seal and symbol of their nominal farmer organizations in order to legitimize their activities. Tn six cases (outside BIADP) in the Rajshahi area the organizations DTWs failed to continue to manage which acquired the the irrigation. Management functions were adopted by other people in the area who are not necessarily accountable to the farmer groups. These persons manage the tubewells virtually as private groups. Similar cases have also been reported by Adnan (1989). Such considerations should be kept in mind during the following discussion of farmer-group irrigation management functions.

5.1 Acquisition of Water

Among the groups under study the function of water acquisition is presently being done by farmer organizations only in the Rajshahi area. In all of the Rajshahi systems the groups had to mobilize the support of their members, apply to BADC and do other necessary work in order to get DTWs sunk and commissioned in their respective areas. In their work they were, of course, supported by staff and officials of BADC, the Agricultural Extension Department and, in some cases, by local level government organizations. After these groups received their DTWs, they (or their successor "groups") have performed the operational functions necessary to get water. In the G-K and NBTP systems, the nominal farmer groups do not now play any appreciable role to acquire water. The Water Development Board (BWDB) made and makes water available to them. It is unclear what role farmer groups may have played at the initial stages of these two systems though it is possible that such groups may have cooperated with the BWDB to implement the projects and thus they may have played at least some role in the acquisition of water.

5.2 Allocation of Water

In Bangladesh any farmer with land within the command area of an irrigation system is entitled to get a share of the water as long has he abides by the rules and norms decided by the management of the system and pays the water charges fixed by the management. The farmer groups, then, do not have a role in establishing irrigators' legal rights to water --- but these groups could be expected to have a definite role in protecting the water rights of individual members. Among the study tubewells in the NBTP system it has been observed that the water rights of various farmers have been infringed upon by others. The farmer groups, however, were found to have played no role in defending the rights of their Similarly, in the G-K system, such violations of rights members. take place with great frequency --- the head farmers denying water to tail farmers. The farmer organizations in the area, again, do not normally play any role in defending tail-enders rights. In the Rajshahi study wells no serious violations of water rights were observed --- indicating, possibly, that the groups were fulfilling their rights-protection functions. A more complete explanation of this relative lack of violations in the Rajshahi tubewells may have to do with the relationship between effective water rights and the responsibility to pay the volumetric operating cost in order to use the water. In both the G-K and NBTP systems the farmers are charged a small seasonal area-based flat fee and, as a result, infringing on someone else's water rights costs nothing. In the BADC rental and BIADP systems, however, irrigators pay for the fuel costs of running the pumps during their hours of utilization --- a condition under which it is quite likely that the person using water out of turn may well have to pay for it.

5.3 Water Distribution

The nominal farmer groups in Rajshahi were observed to play an important role in the distribution of water. In general, they seem to distribute water adequately and in a timely and certain manner. Except for one DTW under the BADC rental system, all groups follow some sort of rotation to distribute water. In the G-K system, by contrast, the farmer organizations under study play no role in water distribution. In Thakurgaon, water distribution is done largely by the DTW operator (paid by BWDB) and by one assistant of the operator, appointed unofficially by the operator and paid by the farmers (again, by an unofficial arrangement). Farmer groups play only a minimum role, if they play any role at all.

5.4 Design & Construction of Structures/Canals

In the Rajshahi area the farmer groups have considerable say in the choice of sites for the location of DTWs, but they have no role in choosing the particular brand/design of engines and pumps. Farmers, however, bear the entire responsibility of designing and constructing the irrigation channels. In the NBTP around Thakurgaon, design and brand of DTWs are chosen by the project The authority also designs and constructs major field authority. channels. The groups design and construct only the sub-branch In the G-K system design and construction of canals channels. through the tertiary (sub-lateral) level is the responsibility of the project authority. Farmer groups have been given the task of constructing the field channels and plot channels. It has been observed along the sample tertiaries that farmer groups seldom actually undertake this work.

5.5 Operation & Maintenance

In the Rajshahi area operation and maintenance of DTWs under the Rental and Rental-RAKUB systems are the responsibility of farmer groups --- a function they generally fulfill. In BIADP, the project authority incurs part of the maintenance responsibility of DTWs while farmer groups bear the entire responsibility of the operation of the wells, the maintenance of channels and a major part of the maintenance of the wells. In the NBTP system the responsibility for the operation and maintenance of the wells lies with BWDB and so farmer groups do not bear such responsibilities. The maintenance of the main channel is also not the responsibility of the farmer groups. The groups' responsibility is to maintain branch field channels. Again it has been observed that most farmer groups do not perform their assigned responsibilities in this respect. In the G-K system the operation of the entire project and the maintenance of canals through the tertiary level are the responsibility of the project authority. Farmer groups are responsible for maintaining field and plot channels. Yet again, farmer groups have seldom been observed to do these tasks.

5.6 Planning

Planning, an important function of management and one which is a major form of decision making, is not performed by G-K and NBT farmer groups. In all of the systems under study in the Rajshahi area, however, some form of planning of a very ad hoc variety is done by all groups.

5.7 Resource Mobilization

In the Rajshahi area groups under all of the observed systems mobilize both human and material resources to carry out their irrigation management activities. They collect money from farmers in the form of an irrigation fee or water charge to pay for O & M costs. In some cases they mobilize farmer labor to construct field channels. In the G-K and NBTP systems, however, mobilization of resources is almost absent. Almost the entire O & M costs in these latter systems are paid by BWDB and therefore the need for mobilizing resources for O & M does not arise. The project charges only a nominal irrigation fee --- the collection efficiency of which is also very low.

5.8 Communication

For effective irrigation management, communication is needed among the farmer groups themselves and between farmer groups and staff and personnel. major objective of this agency A communication is coordination in order to solve problems and to help establish the conditions for smooth and efficient management. In all of the systems observed under the study there seem to exist the necessary institutional infrastructure for both types of communication --- but because farmer organizations are often ineffective, communication related to irrigation management is not meaningfully taking place in any of the systems except in the BIADP of Rajshahi. In the G-K and NBTP systems there is communication to perform credit related functions but very little to enhance irrigation management.

5.9 Conflict Management

Whenever there is any conflict of interest with regard to the sharing of water or the payment of water charges or any other issue, farmers in general, rather than their farmer irrigation groups, try to resolve it. When these efforts fail to resolve the conflict, project/agency officials are invited to intervene. The farmer irrigation organizations were not observed to play much of a role in conflict management.

5.10 Other Functions of Farmer Organizations

Besides irrigation management activities, the farmer groups have other functions. In fact their bye-laws mandate them to perform quite a number of such functions. Important among these are:

a) Mobilizing shares and savings so as to build up some degree of self sufficiency in regards to future capital needs;

b) Meeting credit needs of those of their members desiring to borrow from institutional sources.

As is shown in Tables 10 and 11, the G - K and NBT farmer groups seem to have been ineffective in performing these savings and credit functions. The accumulated savings and shares of the members are too small to meet even a minor portion of potential credit requirements. Credit taken from central associations have not been repaid --- about fifty percent is overdue (Table 12).

6. Problems of Farmer Organizations :

As is evident in the preceding sections, farmer irrigation organizations in the systems under study have often played only minor roles (if any) in irrigation management functions. Even in Rajshahi there is scope for broadening their involvement. A number of major constraints facing these farmer groups' attempts at irrigation management participation can be noted.

6.1 Inadequate Irrigation Management Bias

The formal farmer organizations have an inadequate orientation towards irrigation management. They are more credit oriented societies --- following the principles of the early credit cooperative societies which were later restructured along the lines of the two-tier cooperatives developed by the Comilla Academy. Their bye-laws do not mention irrigation management functions clearly and adequately. They also do not outline the organization of irrigation management functions.

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6.2 Water Availability

One of the major incentives for farmers to participate in irrigation management is assuring the availability of adequate water in a timely and certain manner. Too much or too little water is available --- both of which situations discourage farmers from participating in irrigation management. The relationship between water availability and incentives for participation might be represented by an inverted U curve --- farmers' willingness to participate being low at either extremes of water abundance or scarcity (Uphoff 1986). In the groups covered by this study, poor farmer participation is largely explained by water availability. In the G-K system it was observed that the tail farmers did not get water in a sufficient and timely manner. They did not have enough water to manage. Head farmers, on the other hand, got (or managed to get) so much water that they felt no need for organized efforts to conserve and manage the resource. In the NBTP system the situation is similar to that in G-K while in the Rajshahi area the problem is not as severe.

6.3 Ownership

A sense of ownership or of belonging in regards to the system pre-requisite for farmer is an important participation in In all systems under this study, the irrigation management. facilities are owned by the government. In Rajshahi, however, the de facto ownership of DTWs, to a great extent, lies with farmer Furthermore, the fact of the public agency (BADC) owning groups. the wells is not as pervasive and visible as in the GK and NBTP In fact, it is likely that the ownership of DTWs in systems. Rajshahi area will eventually be given to farmer groups under the implementation of the privatization policy of the government. ٠In sum, farmers' sense of belongingness within a system is relatively As a result, farmers display greater in the Rajshahi area. relatively more participation in Rajshahi. In the G-K and NBTP systems, scope for farmer participation is limited by project In both places BWDB is supposed, by design, to perform design. almost all irrigation management activities. There is no talk of turning over any degree of ownership of these systems to the Furthermore, the presence of BWDB officials the farmers. in project areas is all pervasive.

6.4 Factionalism

Farmer organizations for irrigation management are not free from the problems of factional conflicts. Problems of family or lineage-based factions are reflected in their management. Factions that dominate the management often eliminate the participation of other factions to the detriment of the widespread participation of a broad spectrum of farmers.

6.5 Training

The training of farmer group leaders on irrigation management has generally been either absent or inadequate. Also absent is training of agency personnel to motivate them to accept farmer participation as an essential component of improved system performance.

6.6 Lack of Participation of all Irrigators

In the systems under study it has been noted that only irrigators are members of the farmer organizations in the BIADP DTWs and the informal groups associated with the Rajshahi DTWs. In these systems there is no legal barrier for irrigators to become members of the organizations because the organizations are irrigation community/command area based. In the case of formal groups among Rajshahi rental DTWs and in the G-K and NBTP systems. however. exist are village or residential what groups that community based --- precluding non-resident irrigators from becoming members.

6.7 Disadvantaged farmers interests are not safe-guarded

Since there is no legal provision to safeguard their interest and ensure their representation, disadvantaged farmers (especially the tail end and small farmers) have little incentive to join the organizations. Without their participation the organizations have no internal pressure to perform equitably.

7. Future Action :

In order that farmers' organizations might fulfill their potential role in irrigation management, various actions or reforms might be considered.

a) The existing organizations could be reorganized and their constitution/bye-laws changed so as to give them the character of true irrigator-farmers organizations. Irrigation would then be their primary function.

b) The number of tiers in the structure of the organizations might best be based on the hydraulic features of the irrigation system in the case of the G-K. In the NBTP system, BADC rentals and BIADP, the present two-tier systems having a federation tier at the upazila level might be retained pending further investigation of the possibility of creating a middle tier at the union level in order to facilitate communication, coordination and conflict management The upazila headquarters are often relatively distant from a given village.

c) In those systems where water delivery to the group is problematical, improvements in main system water supply could

make participation seem more worthwhile to farmers.

d) To increase farmers' sense of belonging to their irrigation system, farmer organizations might be given more irrigation management responsibilities at the field level in the NBTP and G-K systems and the groups might also be involved in selected aspects of main system management. In those systems a fee rate (that is actually collected) approximating O&M costs may well increase farmers interest in managing a resource they would then be paying for. They could also be involved in rehabilitation work whenever practicable.

e) To free the organizations from the domination of big farmers and to ensure participation of disadvantaged irrigators, the bye-laws, if possible, might be made to provide for sufficient legal protection. There might be legal provisions for proportionate representation of farmers of all locations and categories. Literature on the subject (e.g. Parker 1979) has noted that if farmer organizations are allowed to become the tools of the most powerful people, the groups will not fulfill purposes for which they were created.

f) To improve the quantity of participation of farmer groups, training of farmers on technical and social aspects of irrigation management would be useful. Agency personnel could also be trained with a view toward affecting their acceptance of farmer participation in irrigation management.

g) Changes, to whatever exent possible, can be most effective if they, themselves emerge from a participatory process involving farmers. Institutions and behavior cannot always be legislated.

The implementation of any of the above-mentioned possibilities for the strengthening of irrigator organizations is likely to encounter a number of difficulties. Action research projects regarding some of these strategies, therefore, might be particularly useful in facilitating their success.

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Table 1:	Sample Farmer	Organizations,	Farmer	Leaders	and	Farmers	by	System	and
	Location			•					
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	- A					· · · · · ·			

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System and Location	Organization (Number)	Leaders ^f (Number)	Farmers (Number)
G-K ^a Kushtia	. 11	66	78
NBTP ^b Th a kurgaon	16	80	144
Rental ^C Rajshahi	3	14	29
Rental-Rakub ^d Rajshahi	3	12	32
BIADP ^e	6	25 .	53
Total	39	197	336

- ^a G-K = Gangeg Kobadak. It is the biggest gravity irrigation system in the country.
- NBTP = North Bangladesh Tubewell Project
- Rental = Farmer groups here operate deep tubewells (DTWs) rented from the Bangladesh Agricultural Development Corporation (BADC).
- Rental-Rakub = Here also farmer groups operate BADC rental DTWs. The groups here receive credit from Rajshahi Krishi Unnayan (Agricultural Development) Bank (RAKUB) for irrigation management activities.
- ^e BIADP = Barind Integrated Area Development Project. The project is being implemented by BADC. The farmer groups here operate BIADP/BADC owned DTWs in payment of yearly irrigation fee.
- ¹ Include Chairman/Manager and Executive Committee Members.

Table 2:	Ratio o	of Members	to	Irrigators	in	Sample	Farmer	Organizations	in
	Kharif	1 Season c	of 1	990.					

System and Location	Organizations (Number)	Average Number of Members per Organization	Average number of Farmers Irrigating Land in Command Area	Ratio of Members to Farmers Irrigating Land in Command Area
G-K Kushtia	11 ^a	53	N/A	-
NBTP Thakurgaon	14 ²	58	60	0.97
Rent al Rajshahi	3 ^b	13	99	0.13
Rental-Raku Rajshahi	b 3 ^c	9	140	0.06
BI ADP Rajshahi	6 ^{&}	. 10	38	0.26

⁴ All are formal organizations in the sense that they are registered by Directorate of Cooperatives.

^b Of the 3 organizations, one is formal and other two are informal

^c Of the 3 organizations, two are formal and one is informal

Table 3:

Age of Sample Farmer Organization Managers, Managing Committee (MC) Members and Farmers (Average Age in Years)

System and Location	Managers	MC Members	Farmers
G-K Kushtia	40.1	44.2	47.9
NBTP Thakurgaon	47.5	46.8	42.7
Rental Rajshahi	38.3	43.5	40.7
Rental-Rakub Rajshahi	44.7	34.7	39.1
BIADP Rajshahi	43.0	44.2	43.8

Table 4:Education of Sample Farmer Organization Managers, Managing Committee
(MC) Members and Farmers (Average Years of Formal Schooling).

System and Location	Managers	MC Members	Farmers
G-K Kushtia	9.6	6.8	6.0
NBTP Thakurgaon	9.0	5.9	6.9
Rental Rajshahi	9.7	5.9	2.8
Rental-Rakub Rajshahi	7.3	5.3	3.6
BIADP Rajshahi	6.7	6.2	4.0

System and Location	Managers	MC Members	Farmers
G-K Kushtia	8.6	8.4	8.9
NBTP Thakurgaon	8.4	6.5	7.2
Rental Rajshahi	8.7	9.0	6.5
Rental-Rakub Rajshahi	7.0	6.4	6.1
BIADP Rajshahi	11.7	9.5	8.0

Table 5: Family size of Sample Farmer Organization Managers, ManagingCommittee (MC) Members and Farmers (Average size).

Table 6: Land Holding^a of Sample Farmer Organization Managers, Managing Committee (MC) Members and Farmers (Operated Holding in Hectares)

System and Location	Managers	MC Members	Farmers
G-K Kushtia	4.14	3.93	1.74
NBTP Thakurgaon	6.69	3.61	2.53
Rental Rajshahi	5.05	2.30	0.97
Rental-Rakub Rajshahi	3.79	2.36	0.97
BIADP Rajshahi	3.13	1.36	1.09

² Operated holding = (owned land + rented in land) - rented out land.

Table	7:	Major	Occupation	of	Sample	Farmer	Organization	Leaders
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System and	OCCUPATION						
Location	Agriculture	Business	Service	Artisan	Total		
G-K Kushtia	63 (95.5)		3 (4.5)	-	.66 (100)		
NBTP Thakurgaon	72 (90.0)	5 (6.3)	3 . (3.8)	-	80 (100)		
Rental Rajshahi	13 (92.9)	1 7.1)	- .	-	14 (100)		
Rental-Ralub Rajshahi	8 (66.7)	4 (33.3)	-	-	12 (100)		
BIADP Rajshahi	21 (84.0)	1 (4.0)	2 (8.0)	1 (4.1)	25 (100)		

Note: Figures in the parentheses represent row percentages=

Table 8:	Distribution of Small Farmer Organization Leaders by Memberships in	a
	Other Local Organizations.	

System and Location	Those having Membership in other organizations	Those not having membership in other organizations	Total
G-K	48	18	66
Kushtia	(72.7)	(27.3)	(100)
NBTP	10	70	80
Thakurgaon	(12.5)	(87.5)	(100)
Rental	3	11	14
Rajshahi	(21.4)	(78.6)	(100)
Rental-Rakub	8	4	12
Rajshahi	(66.7)	(33.3)	(100)
BIADP	7	18	80
Rajshahi	(28.0)	(72.0)	(100)

Note: Figures in the parentheses represent row percentages.

System and Location	Small Farmer	Medium Farmer	Large Farmer	Total
G-K Kushtia	30.5	63.4	6.1	100
NBTP Thakurgaon	38.8	33.8	27.4	100
Rental Rajshahi	16.7	58.3	25 · O	100
Rental-Raku Rajshahi	b 50.0	28.6	21.4	100
BIADP Rajshahi	40.0	52.0	8.0	100

Table 9a: Distribution of Sample Farmer Organization Leaders by Landholding Size⁴ (In percentage)

Operated Holding = (owned land + rented in 'land') - rented out land. Small farmer: Having operated land from 0.02 to 1.01 hectare Medium farmer: Having operated land from 1.02 to 3.03 hectare Large farmer: Having operated land from 3.04 hectare and above

Table 9b:Distribution of Sample Farmer Organization Leaders by Location from
the Head of Deep Tubewell (DTW) and head Gate of Canals (In
Percentage)

System and Location	Head	Middle	Tail	Total
G-K Kushtia	34.8	43.9	21.3	100
NBTP Thakurgaon	28.7	51.3	20-0	100
Rental Rajshahi	20.0	40.0	40.4	100
Rental-Raku Rajshahi	b 35.7	50.0	14.3	100
BIADP Rajshahi	29.2	50.0	20.8	100

Table 10: Savings of Sample Farmer Organizations and Members	as	of	1988-89"
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System ^b and Location	Organizati ons (Number)	Members (Number)	Total Savings (Taka)	Savings per Organization (Taka)	Savings per Member (Taka)
G-K Kushtia	11	583	20978	1907	36
NBTP	14	813	14310	1022	18
Total/Average	25	1396	35288	1422	25

^a Most of the organizations were organized in the late sixties

5 Similar information for different systems of Rajshahi are not available.

Table 11: Shares of Sample Farmer Organizations and Members

System and Location	Organizat ions (Number)	Members (Number)	TotalShare perSharesOrganization(Taka)(Taka)		Shares per Member (Taka)	
G-K Kushtia	11	583	44961	4087	77	
NBTP	×14	813	55960	3997	69	
Total/Average	25	1396	100921	4037	72	

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System	Organisations	Period of Loan	Loan taken	Loan Repaid	Loan Overdue	
Location		(Taka)	(Taka)	(Taka)	Amount	%.
	Ballavpur Uttarpar KSS	1970-1989	90275	51585	38690	42.9
G	Ballavpur KSS	1972-1989	63900	39450	24450	38,3
K	Valuca Utlarpara KSS	1970-1989	97145	73388	23757	24.5
	Valuca Purbapara KSS	1979-1989	85000	33075	51925	61.1
P	Laxmipur Bahalbaria KSS	1976-1989	117800	95900	21900	18.6
к U S H Т I А	Joth Valuca Uttarpara KSS	1977-1989	84800	24670	60130	29.1
	Nagorkoa KSS	1970-1989	47850	12534	35316	26.2
	Bohalbaria KSS	1979-1989	48000	16277	. 31723	66.1
	Khurdu Valuca Purbapara GK KSS	1979-1989	100500	24644	75856	75,5
	Daha Kota KSS	1972-1989	99500	33500	eé000	66.3
	Rosul KSS	1970-1989	129112	84081	4503,5	34,9
	Total/Average of G-K		963882	489104	474777.5	49.3

System	Organisations	Period of Loan Transaction (Taka)	Loan Taken (Taka)	Loan Repaid (Taka)	Loan Overdue ·	
ana Location					Amount	7.
	DTH No. 89 KSS	1987-1989	52300	24400	27900	53,3
N	DTH No. 90 KSS	1972-1983)	83949	Nil	83949	100,0
B	DTH No. 94 KSS	1979-1988)	10200	Ni I	10200	100.0
ŀ,	OTH No. 97 KSS	1972-1981+	35228	Nil	35228	100.0
r.	DTH No. 133 KSS	1970-1989)	68690	31240 -	37450	54.5
I H A K U R G A O N	DTW No. 135 KSS	1970-1989%	34100	22600	11500	33,72
	DTW No. 156 KSS	1970-1989)	72010	28080	43930	61.0
	DTW No. 162 KSS	1970-1989 }	70025	44325	25700	36,7
	DTW NO. 211 KSS	1968-1989≄	122740	73225	49515	40,3
	DTW No. 212 KSS	1969-1988≽	84750	70800	13950 -	16.5
	DTW No. 214 KSS	1970-1989≽	105910	29910	76000	71,8
	DTW No. 216 KSS	1971-199 0 x	102825	69525	33300	32.4
	Total/Average of NBTP		842727	394105	448622	53,2
	Total/Average GK and NBTP		1806609	883209	923400	51,1

2.4

a = Similar information for Raishahi area is not available

- KSS : Krishak Samabay Somity (Farmers Cooperative Society)
- NBTP: North Bangladesh Tubewell Project

DIM . Deep Tubewell

Ganger. Kobalak. CIK =