After estimating the quantity of water available, the assembly, on the same day, demarcates the area that would be cultivated during the current cultivation period. Once it is demarcated, a suitable channel system to distribute the water efficiently is determined.

The assembly then elects a committee representing all castes holding land (no restriction based on size) to allocate land within the demarcated area in proportion to the area they owned previously. Some of the cultivators who get small fractions as their share, are grouped according to family name and land given collectively to the families of the same lineage. In such instances, a member of the family group may forgo his/her quota in favor of another member for a particular season, in exchange for a quota next year.

The other method practiced is to allocate fragments of demarcated land. Each fragment of land with a bund all around is called a “key.” The area of a key or keys allocated is equal to the area of the share under the Damoosi system. Those whose shares are smaller than the area of a key will be grouped so that the total area of shares in a group equals the area of a key which is allocated to that group. In doing so, kinship is given preference over friendship. Those whose shares are negligible are allocated land in the tail end so that they too can have an opportunity for cultivation. The farmers have the freedom to request land in a particular location within the demarcated area, and the committee will try to accommodate this.

In Damoosi, the task of water release and distribution is given to a person called Niraganti. He is the key person who makes the system a success by exercising constraints in the use of water. To this end, one method he employs is to release a quantity of water sufficient to maintain a good level of soil moisture, and he never allows water to stagnate till the crop reaches flowering stage. From the flowering stage to that of grain formation, the Niraganti impounds water in the fields up to a depth of one-and-a-half inches, and no more.

The other method used by the Niraganti is to stagger the different growth stages in the entire command area, so that the impounded water in some fields (crop in fruitstage) will automatically provide the necessary soil moisture to the neighboring field (crop flowering or younger) through seepage. Fields which are located closer to the bund or the canal are fed with little or no water as the seepage they receive will be sufficient to maintain the crop till the flowering stage. As the Niraganti receives a part of the crop grown in each field as his payment, he carefully discharges his duties to ensure a good produce for everybody.

Farmers are allowed to dig wells within the tank bed to draw water in case the water in the tank fails to flow out. In this instance the members of each family-name group collectively own the well.

No well owner is allowed to use water from any well located within the command area. If the well is located outside the command area, the owner can irrigate the area available around that well, but is not entitled to transport water beyond that area.

Needs of FMIS in Bangladesh
Bangladesh has approximately 3.35 million hectares (ha) of irrigated land of which 97 percent uses modern irrigation methods of varying degrees of sophistication. Of these, 70 percent is irrigated with shallow tubewells and deep tubewells with designed discharges from 0.5 to 2 cusecs. Most of these pumps are diesel-driven and can irrigate from 8 to 30 ha. These small-scale irrigation systems are managed by formal or informal groups of farmers who are responsible for almost all important irrigation management functions.

One of the major problems of tubewell irrigation (as well as of canal systems) is under-exploitation. A series of nine field workshops were conducted in nine villages of the Upazila subdistrict in order to determine remedial measures. Field workshop participants included farmers, farmer leaders, local government leaders, subdistrict officials and faculty members.

The following problems were identified as causes for the under-exploitation of shallow and deep tubewells and appropriate recommendations were then discussed. Field observations reveal that the nature and dimension of the problems as identified in the workshops have not changed much since 1988.

1. Insufficient supply of spare parts: The Bangladesh Agricultural Development Corporation (BADC), which contributed most to the development of small-scale irrigation systems in the country, deliberately limits the supply of spare parts in pursuance of the government policy of turning over irrigation systems to local ownership.

[Continued on page 4]
farmers. The local market, however, has not been able to meet the demand, partly because of its inexperience and inability to estimate the demand and partly due to the multiplicity of makes and models of machines available.

2. Insufficient service facilities: Service personnel to meet the increased service demands are inadequate. The government's policy is to minimize the role of the BADC, promote private sector involvement, and encourage privatization of the farming system.

3. Increase of O&M costs: The per hectare O&M cost has been rising mainly due to: a) increases in the prices of fuel/lubricants and the cost of services; b) reduction in the irrigated area because of violation of established rules in spacing tubewells by influential farmers who indiscriminately sink new wells within the command areas of existing wells; and c) loss of water by seepage and percolation from unlined open irrigation channels.

4. Theft of shallow tubewell (STW) engines by organized gangs of thieves.

5. Inadequate groundwater availability: This happens due to sinking of STWs in unsuitable sites with no consideration to aquifer conditions resulting in a low groundwater table, and also due to violation of rules with reference to spacing of wells.

6. Problems of farmer organizations: Since most farmer organizations managing deep tubewells (DTWs) are credit oriented, they lack experience in irrigation management. Positions of leadership are dominated by rich farmers and the rights of the average farmer are not protected.

7. Underdeveloped communications: Most roads were constructed before the irrigation channels were planned and channels cut across roads (there are no proper culverts yet). This has created problems, especially during the monsoon, in transporting fuel/oil and fertilizers as well as officials and extension workers on field visits.

Solutions to the problems

Although farmers need government support to solve their problems, they did not wish to remain dependent on the government. The areas of public support needed are:

a) Supply of spare parts. The BADC should continue providing spare parts till such time as the private sector can takeover supply in a phased-out program.

b) Training. Unemployed youth should be recruited and given training in repairing and servicing of pumps. Also, they should be provided the initial capital to purchase tools to start their own business. Training in management, accounts and book keeping, channel construction, maintenance procedures, etc. should be provided to leaders.

c) Transfer of technology. Farmers should be given technical guidance on the selection of technology appropriate for the aquifer and soil characteristics of the area, as existing facilities for transfer of such technology are inadequate.

d) Strengthening farmer organizations. Necessary legislation should be enacted to make farmer organizations irrigation-community based rather than village-community based and to ensure small farmers are represented at management level.

e) Protection against theft. Farmers should organize night watch teams and vigilance teams on a voluntary basis to prevent theft of tubewell engines.

f) Lining of irrigation channels. The feasibility of obtaining long-term interest-free bank loans or government funds for the lining of irrigation channels or for laying underground pipelines should be explored.

g) Developing communications. The government should construct new roads, improve existing roads, and provide culverts at appropriate places to enable free movement of people and machines.

h) Irrigation and water management cells should be created at subdistrict level, to plan and contain the increasing demand for water from limited resources without seriously affecting the ecology of the system.

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