

Proceedings
OF
Seminar
ON
“ Water Users Associations
FOR
Improving Irrigated Agriculture ”

Islamabad, June 24, 1978

Sponsored by :

**MINISTRY OF FOOD AND AGRICULTURE,
GOVERNMENT OF PAKISTAN, ISLAMABAD.**

With the assistance of :

**UNITED STATES AGENCY FOR INTERNATIONAL
DEVELOPMENT, ISLAMABAD.**

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INTRODUCTION

A series of five Seminars on 'Water Users Associations for Improving Irrigated Agriculture' was held in all the provinces and the Federal Capital. The question of setting up of 'Water Users Associations' for achieving efficient water management was discussed at these Seminars, and all the Seminars recommended the setting up of these associations. Legal and other aspects, required to support these associations, were also reviewed. Farmers and representatives of relevant departments/agencies were invited to participate in the Seminars.

Various committees at Provincial Seminars discussed the following in detail :

- (i) Ways and means to organize the farmers in Water Users Associations.
- (ii) Responsibilities of Water Users Associations.
- (iii) Role of government departments in helping to promote the setting up of Water Users Associations.
- (iv) Legal frame work essential for the establishment of these institutions and
- (v) Possible changes in Canal and Drainage Act, 1873 and other Irrigation Acts.

The recommendations of various seminars are contained in the body of the text.

PROGRAMME

SEMINAR ON " WATER USERS ASSOCIATIONS FOR IMPROVING IRRIGATED AGRICULTURE "

Venue : Islamabad Hotel, Islamabad.

Date : June 24, 1978.

- 1730 Talawat.
- 1735 Welcome by Mr. Manzur Ahmad, Additional Secretary, Ministry of Food and Agriculture.
- 1745 Inaugural Address by Dr. Amir Muhammad, Adviser to CMLA for Agricultural Affairs.
- 1800 Dr. George E. Radosevich presents " World Wide Case Study—Applicability to Pakistan ".
- 1900 Director OFWM Punjab presents the recommendations of Faisalabad Seminar.
- 1910 Discussions.
- 1930 Director, OFWM Sind presents the recommendations of Hyderabad Seminar.
- 1940 Discussions.
- 2000 Director, OFWM NWFP presents the recommendations of Peshawar Seminar.
- 2010 Discussions.
- 2030 Director, Agriculture, Baluchistan presents the recommendations of Quetta Seminar.
- 2040 Discussions.
- 2100 General discussions and finalization of recommendations.
- 2130 Dinner.

WELCOME ADDRESS

BY

MR. MANZUR AHMAD,

Additional Secretary, Ministry of Food, Agriculture and Cooperatives

ADVISER TO CMLA FOR AGRICULTURE,
DISTINGUISHED PARTICIPANTS,
LADIES AND GENTLEMEN,

I consider it a privilege to have been given an opportunity to address this distinguished gathering of senior administrators, eminent scholars, front line agriculture and irrigation experts, our international friends and well wishers, and the leading representatives of our enterprising farming community. On behalf of the Ministry of Food, Agriculture and Cooperatives ; I extend to you all, a most hearty welcome to this Seminar, being held on a topic of vital concern to the economic development of our country.

2. The importance of holding a seminar like this can hardly be over-emphasised. Our agriculture has, by and large remained traditional, with productivity at perhaps the lowest level in the world. Though we claim to possess the largest irrigation complex on this globe, we have still to import large quantities of foodgrains every year to feed ourselves. We have made massive investments in developing water resources. We have built Mangla and Tarbela, amongst the largest dams in the world, the longest and the widest fresh water canals but the flow of benefits has not been commensurate with the scale and dimensions of these works. To my mind the desired impact has been lacking due to the absence of farmers participation or their insufficient involvement in the production effort. Or perhaps, we have not been able to carry the message of the latest technology to them by practical demonstration.

3. Our farmer is always ready to accept any innovation and stick to it, provided he is first properly convinced. This is the approach that we are adopting in our On-Farm Water Management projects, which are designed to improve the watercourses, promote precision land levelling of the fields and encourage the

use of the latest agricultural technology of crop husbandry. This is done in close collaboration with the farmer and for this purpose, before the improvement of a watercourse is taken in hand, a Water Users Association is formed to work as a management body for the planning, designing, realignment and construction of the watercourse. Technical assistance and supervision by specialists is provided by the government. We are getting encouraging response from the water users and in the case of watercourses already improved, we have found that a quarter of water otherwise lost has been saved. Though this saving has reduced general complaint of water shortages, it has not been a source of additional crop per acre, because of the problems of fixed cropping intensities and warabandi.

4. We feel that for improving the irrigated agriculture, the establishment of a close and strong liaison between the departments of agriculture and irrigation and the farmers is quite vital for any action to remove these bottlenecks. We are in search of a suitable framework to bring these elements together on one platform. We are interested in hearing the suggestions from the persons concerned and the experts. We think that the water users associations if given permanent status will achieve this objective since these are being tried at the construction stage of the watercourses and have been successful.

5. We are keen to develop our agrarian economy since the overall development stems from the growth of the agriculture sector. We count on our irrigated agriculture to contribute a lions share to this process. The development of agriculture is of prime importance. Government is, therefore, anxious to put all proven theories into practice : though with same caution so that they are modified and adapted to resonate with the conditions prevailing in Pakistan.

6. We have already held such seminars at the provincial level and this is the culmination of the series. It is our fervent hope that this national level seminar will not merely aggregate the recommendations already made but distil from them what are practicable and can be universally adopted. We would like to have a workable solution. We are confident that the trouble, Dr. Radosevich has taken to travel from Fort Collins to Pakistan, will not go in vain. I am confident that he will be able to find a compromise between his vast experience and the views expressed by the Pakistani participants and put forward a model of Water Users Association, that will fit nicely into our socio-economic framework and will have inbuilt flexibility to respond to the changing needs.

7. I am thankful to CMLA's Adviser for Agricultural Affairs, who himself is an eminent scholar of agriculture and has a great contribution to agriculture development to his credit, for gracing this occasion with his presence inspite of his other pressing activities.

8. I once again welcome you all, ladies and gentlemen, specially Dr. Radosevich and our friends from USAID, FAO, WFP and other international organizations to have found time to attend this Seminar. I hope we shall gain from their experience. Their suggestions will be most gratefully received.

9. With these words, I would request the Adviser to CMLA on Agricultural Affairs to kindly inaugurate this Seminar.

INAUGURAL ADDRESS

BY

DR. AMIR MUHAMMAD,

Adviser to CMLA on Agricultural Affairs

DISTINGUISHED GUESTS, LADIES AND GENTLEMEN,

Today, we have gathered here to hold a Seminar on Water Users Associations as instruments for the improvement of irrigated agriculture.

Pakistan has one of the most extensive and highly integrated irrigation water distribution systems in the world. I am told that if the canals and watercourses are put end to end, they will go twice round the globe. However, the Pakistani farmers are not well organized to obtain and apply the irrigation water from this vast network in tune with the complex demands of modern agriculture. The on-farm delivery of irrigation water is not efficient due to a variety of factors.

Neglect of the watercourses and their poor maintenance is one of these factors. The World Bank told us in 1976 that, if action was initiated to fully enforce the provisions of the Canal and Drainage Act (1873), the farmers on the 80,000 watercourses in Pakistan, would have been saving five million acre feet of water annually by this year without making any capital investment. If the farmers were to continue with the cleaning operations and the proper upkeep of the watercourses, annual saving would go up to 10 million acres feet by 1982 at no cost to government. Taking Rs. 360 as the value added per acre foot, Pakistan would be increasing its agricultural production by Rs. 360 million annually.

Forty-five to fifty percent of the water entering the canals is lost before reaching the farmers field. The loss in the watercourses alone ranges around 15% of the canal withdrawals. These figures underline the imperative need of improving the watercourses in a scientific way to minimise this loss. A few farmers working independently in an unorganized fashion cannot accomplish this objective on a sustained basis.

If a campaign is launched to save even one percent of water in all the watercourses, additional one million feet of water will be available across the country. If the farmers were to realize that this saving is possible, and were determined to act accordingly, immediate and tangible benefits will accrue to them as well as to the nation.

The water lost through seepage and spills also aggravates the twin menace of water-logging and salinity which have already assumed stark proportions. Though reuse of some of this lost water is possible by putting in tubewells, it will not only cost more but will also not offer a real or lasting solution, because the quality of water degrades in some aquifers. Organizing farmers to improve watercourses, and attend to their regular maintenance will have significant short and long-term advantages by way of reducing seepage and spills and non-accentuation of the salinity and water-logging problems.

Absence of precision land levelling at the farm is yet another factor which erodes the field efficiency, which can be as low as 25%. In other words, more water has to be supplied to the field than is strictly required to meet the evapotranspiration needs of the crops. If the land is levelled before application of water, the intensities of cropping can be raised a great deal. Over the country as a whole, it means building of several Tarbelas without having to face the problems of tunnels, spillways, sinkholes and cavitation.

The Government has accorded the highest priority to attaining self-sufficiency in foodgrains and developing and expanding agriculture. In order to achieve these goals, the use of modern agricultural inputs *viz.*, quality seed, fertilizers, pesticides, credit and extension has to be greatly increased and at an accelerated pace. The most important and the most critical input is the irrigation water itself because of its high complementarity with other inputs. Irrigation creates conditions for the rapid expansion in the use of other modern inputs. The expansion of irrigation has, therefore, been one of our basic strategies to develop our agriculture and raise production to meet the rapidly growing needs of our burgeoning population.

Mere creation of irrigation facilities is not enough. The justification of our investment of scarce resources in constructing these facilities depends very much on the optimum use of irrigation water by the farmers. Our experience shows that there has been gross under-utilization of the capacities of irrigation facilities already created and there is heavy wastage of irrigation water at the farm level. Water management and control is, therefore, one of the critical problem areas in developing irrigated agriculture.

The Government of Pakistan has, therefore, launched a massive programme of on-farm water management. This programme provides for improvement of watercourses on cost-share basis. Use of labour intensive methods lies at the heart of this programme. The start of any watercourse improvement is based on the joint efforts of the water users on that particular watercourse. The farmers come closer together for their own greater good and forget about the age-old rivalries over water shortages and pilferage of each others' share.

The construction of pucca nakkas eliminates the possibility of unauthorised cuts and increased availability of water causes satisfaction in the hearts of farmers over the arrangements of water distribution. However, the watercourse improvement is not an end in itself. The water that we save has to be used judiciously and it makes the activation of farmers organizations all the more necessary.

Government is aware of the need for the organization and the productive grouping of farmers at the grass root level. Lack of viable farmers organization may be one of the missing links in improving agricultural development. The need of such an organization has been articulated at all levels, but the fundamental question is to find out the type and kind of a structure that will be compatible with our socio-economic environment. It is imperative that this experiment in self-help and self-reliance must succeed so that it can be widely adopted all over the country.

On-Farm Water Management Projects are establishing informal water users' associations for the construction phase of the watercourse. Whether the informal associations will continue to function for the maintenance and operation phase as well and achieve the ultimate objectives of the programme is our main concern today.

At present, about 100 Water Users Associations are functioning on voluntary basis. They need professional guidance and technical support. The Provincial Governments and the University of Agriculture, Faisalabad have introduced training courses in On-Farm Water Management. This has provided a missing link in the training of agricultural extension workers. These courses will have to be kept under constant review and their scope will have to be increased from time to time to meet the changing situation.

I visualize these organizations to develop into viable associations, which do not confine their activities to only one aspect of agricultural development, *i.e.* to the one input of water alone, but venture into other fields as well. I hope they grow into multi-purpose societies, motivating their members to adopt the latest agricultural technologies for their own welfare and prosperity in particular, and national progress and development in general, by pooling their resources and combining their efforts.

I am confident that the participants of this seminar, with their experience and insight, would come up with a solution, which is practicable and has a lasting impact on our future development. Let this be the first step towards organizing our farmers around an activity *i.e.* agriculture and around an entity *i.e.* watercourse.

I sincerely hope that you, Dr. Radosevich and the distinguished participants, would make a valuable contribution towards identifying the critical elements of our problems and evolving meaningful recommendations to solve them.

USAID have helped us to organize this seminar. We gratefully acknowledge this assistance.

Finally, I would like to thank you all and have great pleasure in inaugurating this seminar. I wish it all the success.

WATER USERS ASSOCIATIONS : WORLD WIDE CASE STUDY APPLICABLE TO PAKISTAN

BY

DR. GEORGE E. RADOSEVICH

*Advocate and Associate Professor of Water Law and Economics, Colorado
State University Ft. Collins. Colo. USA*

Role of Water Users Associations

Agriculture is the backbone of the economy of Pakistan and most other countries, and yet it is the sector that is most vulnerable to changing geoclimatic, economic and political conditions. In Pakistan, research and demonstration have provided technological improvements in three areas : reduction of water conveyance and application losses, increased production from land levelling and improved agronomic practices and extension capabilities.

These improvements are being made available through the On-Farm Water Management Programme. The focus of this programme is on *water* and how to help the farmer get the most out of his allocated supply. But in order to be successfully implemented, there is a definite need for an institutional structure to represent the irrigators in carrying out the activities. In some 37 countries examined, this local entity is often called a Water User Association, Irrigators Association, Community of Irrigators or some similar name. The name is not important, but the objective is. The basic objective should be to operate, maintain and rehabilitate the water distribution system in as efficient and effective manner as possible and assist in proper application of water on the farm. From this objective we can evolve many secondary objectives.

It is necessary to provide the water users with the incentive to improve their water use and the mechanism by which they can implement new technologies, practices and programme. Material support *e.g.* equipment, loans, construction materials and obvious benefits would form the incentive. The mechanism at the grass-roots level is the water users association.

The role of the association is as follows :

1. To serve as the *legal device* for the water user contracting with the government in order to undertake watercourse and land levelling improvements.

2. To provide *assurance* that the watercourse will be properly *operated, maintained and improved* after construction of the physical components.
3. To provide a *vehicle for farmers to gain an important* identity in the country and an opportunity for them to develop and assume individual and collective responsibilities in the use of the nation's natural resources.
4. To enable water users at the watercourse level to gain *economies of scale* in the use of all resources available to them.
5. To reduce the risk of all users *by simultaneously spreading the responsibility* in a more equitable fashion.
6. To resolve disputes over water within the watercourse and seek proper assistance from Irrigation and Revenue Departments or Civil Courts.
7. To serve as a channel of communication between the water users and the water managers *i.e.* Irrigation Department.
8. To increase the water supply by having association tubewells strategically located throughout the watercourse, where necessary.
9. To expand the benefits of cooperation and collective action into other related activities common to the irrigators, *e.g.* obtaining credit and purchasing sprayers, seeds, fertilizers, etc.

What is Happening in Other Countries ?

Problems of water supply in arid areas are similar throughout the World *e.g.*, more land that can be cultivated than water to irrigate, conveyance and application losses and disputes between competing water users. Water laws in almost all countries attempt to set out the policy for water use, basis and method of allocation of water, distribution requirements and use conditions.

At the local level, countries with the more successful irrigated agriculture have adopted some form of Water User Association. And, although many of the physical problems are similar, a review of the approaches taken provides a wide variety of examples to examine in light of the conditions in Pakistan. The organizations generally occur either from spontaneous or independent action of the water users and hence develop over time and become recognized as having customary law significance ; or are government influenced or induced. When they can be traced to being sanctioned by the government, they may be created either the top-down approach, which is mandatory formation through some development scheme ; or bottom-up approach, which is a voluntary organization of water users at some level according to a law or regulation, especially providing for their creation. The organizations may range from private to public, simple to complex and single to multi-purpose.

Although a number of irrigation organization approaches were examined for applicability of their features to Pakistan,¹ only the approaches of two countries, Spain and the Philippines, will be briefly discussed here.

Spanish Community of Irrigators

The hierarchy of the irrigation associations begins with a very simple entity serving a small area from a lateral or sub-watercourse to a federation of irrigation associations on the river. At the base of the hierarchy is the simple community (simple comunidad). The next level is the general community (comunidad general) which takes on very formal organizational characteristics and consists of simple communities and users served from a public canal and diversion works. The general community must defend the interests of the simple communities within their water delivery area. They are also responsible for the control and distribution of the community waters.

The communities may be organized voluntarily by action of water users of a common canal or watercourse, or by direction of the Comisario de Aguas in the basin.

When the waters are granted to a *community* it is charged with the control of the distribution of the water among its members. It administers the waters. If a person leaves the community he loses his right because he is leaving the lands. The right to use the waters is on the members of the community. The community, even when granted the water, performs only a distributive function.

The organic structure of the community of irrigators illustrates a logical functional diversion of activities particularly relevant to water control and management. It consists of three organs :

1. Junta general (general assembly).
2. Sindicato de Riego (board of directors).
3. Jurado de Riego (jury of water users).

Each member of the community must pay the assessments allocated to him according to the quantity of water delivered. Although the water is not metered, a "duty of water" for various types of crops is established by the sindicato. That quantity is distributed through canal outlets calculated to deliver a certain flow for a certain period of time. The junta approves the budget and fees charged to the members.

There are four basic concepts of the association which enable local control and self-imposed management.

- (a) An association's existence is justified by a need to deliver water to a specific parcel of land in a more efficient and effective way.

¹For approaches of other countries see Water Users Organization for Improving Irrigated Agriculture ; Application to Pakistan, Radosevich, 12/75.

- (b) Concept of proportional distribution, practiced in Pakistan under the warabundi, theoretically favours no man, but rather provides to each irrigator a portion of water according to the size of the holding.
- (c) Concept of individual responsibility to community for maintenance of his part of the watercourse and duty not to waste water makes each irrigator unique and significant. Infractions may result in fine or non-delivery of water.
- (d) Concept of collective responsibility through internal organs of the association placed the capability and success of effective control and management upon the irrigators themselves.

One final feature of the Spanish system of water users associations is their method of resolving disputes and how it ties to Pakistan. When the Moors invaded the Iberian Peninsula in 892, they brought with them the Islamic principles of water use, the system of local administration, and the Islamic custom of resolving disputes at the entry way of the mosque. The principles of community property and equitable apportionment of water are reflected in the community of irrigators as well as local self-determination. To resolve disputes, the presidents of the community of irrigators of Valencia (there are eight) would meet before the entry of the mosque or just inside, at noon on every Thursday, and listen to complaints, accusations and rebuttles from the irrigators. This "Tribunal of Waters" would decide the disputes expeditiously and fairly before the eyes and ears of God.

When the Spanish Christian conqueror, El Cid, recaptured Valencia in 1232, he was so impressed with the Muslim practices, that he decreed they should be adopted. The mosque was however, replaced with the Apostles Cathedral and the "Tribunal of Waters" moved to the door of the Cathedral for its weekly "trials". Today, over one thousand years later, the Tribunal of Waters meets every Thursday at noon of every week to hear complaints and other problems of water use and to resolve these disputes.

Philippine Irrigation Service Associations

The Spanish system has been tried and tested for over ten centuries and has stood up well, serving as a model for many countries in North and South America. In 1975 the Philippine government created an autonomous organization, the Farm Systems Development Corporation (FSDC) to implement a government policy of increasing self-reliance and productivity of the small farmer and to expand his participation in country development.¹ A program called Barangay Irrigators Service Associations (BISA) was adopted with two major components—improve the efficiency of communal gravity flow irrigation

¹Summarized from Project Paper—Philippines—Small Farmer Systems, USAID, Philippines, March, 1978.

systems and introduce small pumps, properly located to provide supplemental water supply or in some cases, the sole source.

To implement the program, approximately 70 farmers in an area of 100 to 200 acres could voluntarily create an Irrigator Service Association (ISA). The ISA was eligible for loans and grants to carry out the work, with the irrigators providing at least 10% of the cost sharing through labour or cash, and repaying the loan over 10 years after a 10-year period of grace.

Formation of the ISA is voluntary, but once agreed upon by a fixed % (*i.e.* 70 or 80%) of shareholders, membership is mandatory. All irrigators, whether land holders or tenants, are members. The members make up the General Assembly. Every 70 farmers along a lateral elect a representative to the Executive Board. The ISA is legally constituted and is registered with the Securities and Exchange Commission. At first the ISA is single purpose, *i.e.* delivering water, but can later expand to obtaining credit and purchasing sprayers, seed, fertilizer, etc. Ditch tenders and pump operators are employed and the ISA is responsible to operation, maintenance and rehabilitation of the watercourses.

It was difficult to get the program started the first year because the FSDC staff had no examples to show the farmers the benefits of the program, often the pumps were late arriving or didn't work and it was a new experience also for the staff. The staff had to persuade the farmers to participate on faith and trust. By December 1977, 40,000 farmers were organized into 600 ISA's, however.

The benefit for Pakistan of the experiences other governments and farmers have had to carry on a successful program of productive and efficient irrigated agriculture are :

1. concentrate on a concrete goal that can be achievable in a limited time *e.g.* on farm water management improvements which include improving water conveyance ;
2. focus on a goal or task that an individual is unable to do himself but collective action of those with common bounds can accomplish ;
3. limit the size of the group to those with a common relationship ;
4. start with a simple program and let it evolve to the complex if the water users so agreed ; and
5. Without considerable and conscientious inter-departmental cooperation of government agencies, the program will be short-lived. A " Memorandum of Agreement " is considered important for commitment to this inter-departmental cooperation.

What Can be Done in Pakistan ?

Informal executive committees have already been organized on many water-courses participating in the OFWM Program in the Punjab, Sind and N.W.F.P. The receptiveness of their charge indicates this informal approach can be used to implement the scheme—in the short term.

To insure long term success of the program *and* effect upon the country's agricultural output, it is highly recommended to formally organize the associations by giving legal recognition to their creation and existence. This can be done by amending (1) the Cooperative Societies Act or (2) the Companies Act or (3) enacting a separate special Water User Association Act.

The key to a successful improved irrigated agricultural program in Pakistan rests with six steps :

1. *perception* of the problems,
2. *guidance* to determine solutions and programs.
3. *guidelines* formed to carry out the programs.
4. *commitment* of the government and irrigators to program benefits.
5. *attitude* of cooperation and role each person, whether government official or farmer has in increased production, and
6. *interaction* to carry out the program objectives.

How to Organize Water Users Associations ?

Level of Formation

Based upon an evaluation of the most efficient means for organizing water users and a preliminary evaluation of village surveys, it is recommended that the associations be formed *at the lowest possible unit which would be the watercourse level, or, where feasible, at the village level if there is only one watercourse serving the village or where farmers on more than one watercourse are roughly of equal size.*

Nature and Structure of an Association

There are in existence in Pakistan many *de facto* organizations for distribution of water among local users. The *de facto* organization which exists by virtue of customary practice in agreement among the users should always remain a viable possibility to the water users. However, it is suggested that a *formal de jure entity* be formed in order to give it legal status. This status would enable the entity to sue and be sued, seek loans for improvements, undertake programs offered by the government such as the water management loan program, and in general, give the organization a legal characteristic equivalent to the rights and obligations of an individual.

The structure of the water users association should consist of two bodies performing three functions. The first body would be the assembly consisting of all of the water users in the association. These water users would be shareholders and members of the association. The primary functions are the election of officers to the second body, which would be the board, and raising and deciding issues of common importance to the association.

The assembly would act as a *general directive body*. All the members would elect a board, approve organizational policies, approve assessments and collection of assessment, select collectors and ditch walkers, etc.

The second body would be the *board of directors* or watercourse committee. *The board would have two functions.* The first, to manage the association according to the creating documents and by-laws enacted by the assembly, and supervise construction and maintenance of the physical structures, which would also include hiring the necessary personnel to undertake this work.

The second function of the board would be quasi-judicial.—This function is to resolve disputes within the watercourse among the water users. In this sense, they perform similar functions to the Community of Irrigators in Spain.

The board of directors would manage and operate the water users association, exercise normal powers to carry out the purposes of the association and have emergency powers for water regulations. The board would be responsible for contracting with the government on the programs, disseminate information on water availabilities, and other types of information pertinent to the farmers and carry the issues raised by the farmers back to government officials in the promotion of the association's interest.

The board would be organized into the offices of the chairman, the secretary and treasurer—the chairmanship should be rotating. Regardless of the office held by any representative, the representative would have no additional power or authority by virtue of holding that office over other representatives.

Functions and Powers

As a general proposition in the formation of the association, the following functions and powers should be granted :

1. Rehabilitation of watercourse, as under OFWM program ;
2. Operation and maintenance of the main watercourse ;
3. Sanctions for upgrading and maintaining farm field ditches and outlets ;
4. Improving on-farm water management practices to include land leveling ;

5. Establishing water delivery schedules and supervising water allocation within the watercourse ;
6. Consideration of tubewell placement in order to optimize the water resources from both surface and ground sources in a conjunctive manner ;
7. Set assessment methods and rates, and then collect assessments ;
8. The association must be granted the power to conscript membership and make assessments in order to undertake emergency repair work ; and
9. In general, promote improved water control and management by water users in an effort to reduce the unnecessary losses and increase agricultural output.

Membership

The *formation* of the association should be *voluntary* in order to leave the ultimate decision in the hands of the water users and to psychologically stimulate their reaction to improving their water use. However, once formed, membership in the association should be *mandatory for all farmers cultivating lands commanded by the watercourse*. Membership may include not only the absentee and operating landlords, but also the tenants in such a manner that through their membership they can voice their opinion on issues concerning water delivery, use and removal.

Voting

Voting privileges is one item of extreme importance in order to encourage participation in the decision-making process and protect the interests and rights of all water users. The system varies among the water users associations in other countries, from number of votes per person directly proportionate to size of irrigated landholding in the community, to one person/one vote for the working landowner or tenant. It is not suggested that either of these approaches be applied because of the obvious favouritism to either large holding landowners or multitude of small holding farmers.

The graduated voting rights system is a more ideal and equitable approach. Graduated voting will protect the interest of the small landholder or tenant by ensuring that he has a minimum number of votes. A minimum acreage should be set to qualify for a vote in order to discourage further fractionization of land holdings.

Election of Representatives

Representatives who will serve as officials on the board should be elected by members of the association and have a *geographic distribution throughout the watercourse*. It is recommended that one representative be elected from the

head, two from the middle and two from the tail end of the watercourse. In the case of larger watercourses, the number may increase in proportion to this scheme.

Another consideration is the minority group, or the *system of baradri* (brotherhood). In this case, it may be decided that a representative would be elected by a baradri holding a certain percent (e.g., 20 percent) interest in the watercourse, or the baradris may be given additional votes in a graduated system of voting.

Assessments

The authority to levy assessments must be granted to the association. *The assessments should be based upon the construction, operation and maintenance costs for improving the system and allocated among the water users either according to the water they used or the acreage under their control. The latter would coincide with the voting rights of the members.* Payment of the assessment should be made either in cash or in kind (i.e., some product that the farmer is producing).

Registration Requirements

It is recommended that all associations be *registered with the Provincial Irrigation and Agriculture Departments*. If the association is formed under the Companies Act it would also be registered with the Registrar of the Companies. A roster or registry of associations will greatly facilitate communications between government agencies and users.

Hierarchy of Associations

The next level in the hierarchy of the agriculture sector of water users association is the federation of associations. It is suggested that the water users federation should be formed either at the village level where the watercourses are organized into associations, or the association could be organized at the minor canal or distributary level.

The Chairmen of the water users associations within the federation area would serve as the federation board. The primary purpose of the federation would be to gain greater economies of scale for improvements in the larger area where this is necessary and to serve as the channel of communication at the distributary and higher canal levels.

Summary

Water Users Associations can become the most important instrument in Pakistan to implement improved technologies and techniques in irrigated agriculture. They can, as they have done so in many other countries, be the instrument that keeps the water distribution system at the farm levels in as efficient condition as possible under the varying conditions and constraints faced by the irrigator. Efficient water use over time is what is important. This fact, plus proper use of other inputs, make a nation's agricultural sector viable.

WHY WATER USERS ASSOCIATIONS ?

A.M.H. KANGO*

Pakistan's irrigation system below distributary or minor canal head regulator is designed to operate at a constant discharge basis and does not respond to irrigation demand. It is, therefore, not felt necessary for the irrigation authority to get involved in water management at water course level. The area of watercourse command is function of recommended application rate, the designed crop intensity and average seasonal crop water requirements. At the time, when the existing irrigation systems were designed, modern theories of irrigated agriculture were not known and the quantity of water required was estimated from the experience of climate, soil and theoretical water requirement.

Water supplies are distributed on a time rotation basis or "warabandi" with each farmer taking all the water supply by turn in proportion to the area owned. The time allowance in "warabandi" is the water right of a farmer and is carefully protected and regimented by legislation. This makes irrigation an inflexible system.

Under this system, agricultural performance or benefits, as assessed by present standards, can not be accrued. The significance of matching water supply to crop water requirements over a cropping cycle is not realized and use of water is totally left to the farmer.

The original design characteristics are still an integral part of the existing irrigation system and have a fundamental effect on system efficiency. Any proposed technical change to improve water management and yields in irrigated agriculture must consider the social, legal and operational factors built into the design. The fundamental problem is that the critical link in the massive irrigation system between investment and benefits is a private irrigation system run by voluntary cooperation between farmers. Either the status of this link is to be changed so that Government can act to enforce higher standards of water management or farmer should be encouraged through incentives to value water and use it more effectively.

The provision for the former is available in Canal Act or Irrigation Act, but ineffective implementation has led to litigations and more time of the farmer is spent in court of law rather than on his farm. The enforcement

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of rules and regulations is so time consuming, that the irrigators have taken law in their hands and on the spot decisions have led to quite a few murders. This leads to trial of the alternatives *i.e.* encouragement of farmers through incentives to value water and use it more efficiently.

The earlier studies have led to conclusion that magnitude of irrigation efficiency is not only extremely variable but difficult to appraise for the future. Even though the consumptive use is calculated with considerable accuracy, the application efficiency is poor. The diversion requirements should include conveyance losses. Sufficient field studies are required to obtain a reasonable estimate of the water application efficiency that can be expected under different cropping conditions.

Water management within a watercourse command should be considered in detail. The Leiflink report substantiated that irrigation system efficiencies were so low, that an option for lined watercourses was an ultimate objective. The major losses however occur not in watercourses alone but field losses are also substantial. Improvement of existing earthen watercourses and irrigated cultural practices are considered a package. More basic changes to the operational characteristics of the existing irrigation system mean that the involvement of farmers in voluntary management of the conveyance system is necessary. Changes in the social and legal parameters would be necessary to accommodate increased institutional involvement. The traditional warabandi procedures would need modernising so that a command area could be operated to match crop water requirements in time and space. The task of dealing with watercourse conveyance losses is easier than field improvement or adoption of modern cultural practices, because it involves collective and not individual rights and action. Immediate action programme that has gained success is improvement of watercourses.

Individual farmer can not take initiative because change in water management on water course command basis is wholly a collective enterprise. A major social problem, with high technical backing, is that water rights belong to land owners and personal relations between owners and their relative power in the local social structure is an important factor influencing actual water distribution. Land owners seldom plan water distribution for tenants or 'haris'. Cultivators have no say in the matter of distribution of water and hence they do the crop planning in consultation with the owners. Nothing can be done for tenants under the existing laws.

Some authorities apprehend that an informal social grouping of farmers cannot operate the system efficiently through voluntary cooperative, since at certain stage vested interests surface and kill the spirit of association. It

seems inevitable that if water management and irrigated agriculture are to become more efficient, government will have to be involved within the watercourse command.

Radical changes in laws governing water use are needed to match modern agricultural objectives. The existing legislations need to be updated to efficiently cope with water management, water rates and incentives—including penalties to reduce misuse of water—to match a changing system leading to ultimate development objectives. These laws should involve more decision making by the farmers on watercourse command basis and bring about a more closer collaboration between irrigation engineer, agricultural extension agent and the farmer.

Development, operation and maintenance of irrigated agriculture systems run by farmers are now self-contained enterprises. The knowledge to plan and operate a system by the farmers themselves is the need of the hour but instead of changing over the hands over night, careful phasing shall have to be necessary to shift the responsibilities to them.

The On-Farm Water Management Project involves farmers participation at the construction stage of the watercourse. It is simple enough, to make farmers' involvement so easy that success has been achieved in almost all watercourse commands taken in hand so far. Once farmers are convinced that the programme is worth-while, the success of the programme is guaranteed. Evidence shows that Pakistani farmers accept change provided ideas are sound, leadership is strong and the enterprise is profitable *viz.*, increased water availability and resultant benefits through higher agricultural production.

Whereas it is felt necessary to provide adequate facilities and services at field level and to give enough powers to departmental staff to discipline water users, who deliberately try to hinder government effort, the voluntary participation of farmers should be acquired through extension methods and education. When governmental functionaries work with the farmer and not for him, nor they just give directions but show by practical demonstration that whatever they are striving for is for the betterment of the farmer, there is no doubt, the farmers join hands and listen to their counsel.

Many a system have been tried in Pakistan to gain farmers participation in planning and execution of programmes of their immediate concern, but these have failed to show tangible and lasting results since the active participation of the people was either lacking or no professional and technical assistance was coupled with financial support.

The deplorable condition of 80,000 watercourses and undulating farmers fields in the Indus Basin require the development and implementation of an effective strategy for their improvement. It may take a programme many

years continuity to achieve the desired objective, but an effort for a crash programme on the national basis may take just one season to improve all the watercourses. This is possible only when strong determination of the government is translated into reality by the nation building departments like revenue, irrigation and agriculture : of course with active participation of the farmers.

The task that has been termed colossal and for which suggestions have been made to conduct research of academic nature requires just a determined effort of the nation to accomplish it. The kacha improvement of watercourse is estimated to save at least 10 MAF/annum.

The construction and maintenance of the watercourse is the responsibility of the water users. A canal officer, however, with Canal Act in hand, can make the water users fulfil their commitments, but this, he prefers not to do. Watercourse problems are mostly technical and mainly influence the agriculture for which the watercourse provides the crucial input of water. The technical know how made available to the farmer can prove motivating force to improve the watercourse and the water users association can play important role to put the theory into reality.

The On-Farm Water Management Projects provide experimentation with different types of Water User Association. A research programme is underway at Agricultural University, Faisalabad to determine the social and economic influences that can bring the farmers together. The experience with informal Water Users Associations has demonstrated that these associations are possible. However, immediate action is needed to formalise these associations. The farmers themselves have expressed desire for a legal cover and more say in the matters of water distribution and its application. It is however evident that new patterns should emerge to supply water as and when needed and to the extent it is necessary. The technical people have, therefore, a mission to accomplish, *i.e.* to spread the latest technology as quickly as possible.

It is felt that time is ripe for organizing immediately Water Users Associations, one on each watercourse, and entrusting them with responsibilities beyond the watercourse construction and maintenance. In the meanwhile, we need to put in motion the steps to evolve a legal frame work to formalise these associations, so that a pattern, within which they exercise their authority and become fully cognizant of their responsibilities, may emerge. This may culminate into introduction of entirely new irrigation pattern and totally different agricultural practices.

RECOMMENDATIONS OF THE SEMINAR ON WATER USERS ASSOCIATIONS FOR IMPROVING IRRIGATED AGRICULTURE HELD AT FAISALABAD ON JUNE 11-12, 1978

1. Establishment of Water Users Associations (WUA) is necessary for each watercourse.
2. There is necessity of framing a separate WUA Act as legal foundation for WUA. A Committee including people from OFWM and farming community should frame this Act.
3. WUA Act should include :—
 - (a) solutions to specific problems such as trees, conflicts and delays, maintenance.
 - (b) Registration Authority since cooperatives have failed and registration with the Cooperatives Department may obstruct progress.
4. WUA should focus on water and may get involved in other activities like seed, fertilizer, etc. later on if they wish and feel capable.
5. If 70% of farmers on a watercourse agree to form WUA, others must join. 50% of executive committee members should be changed by elections each year.
6. Abiana rebates for tubewell installation should be enhanced for WUA to 50% to help the small farmers.

RECOMMENDATIONS

A 2 days Seminar on "Water User Associations for Improving Irrigated Agriculture" was organized by the Punjab, On-Farm Water Management Development Project with the assistance of Federal Ministry of Food and Agriculture (Water Management Wing), Agricultural Research Council and USAID at Faisalabad on 11th December, 1978. About 200 participants including delegates from USAID, different Nation Building Departments, representative of Federal Ministry of Food and Agriculture (Water Management Wing) and members of the Executive Committees of the informal Water User Associations organized by Punjab On-Farm Water Management Development Project attended the Seminar.

In order to achieve concise and comprehensive recommendations of the Seminar, the participants/delegates were divided into 5 Groups dealing with different disciplines of On-Farm Water Management *i.e.* :—

- (1) Agriculture.
- (2) Irrigation.
- (3) Cooperative.
- (4) Revenue.
- (5) Water Laws.

The 5 groups of the Seminar discussed in detail the problems pertaining to organizing Water User Associations for Improving Irrigated Agriculture ; the function, legal status and the effective organizational set-up. The groups also made certain recommendations in the light of the terms of reference provided to each group for making recommendations for planners and Policy Makers, for coordinating Departments and for the farmers. The recommendations of individual groups were discussed in the concluding session of the Seminar. The final recommendations of the Seminar in respect of each group are as follows :

Group 1—Agriculture

(A) Proposed Objectives of Water User Associations

- (1) To assist and cooperate with the Department of On-Farm Water Management in their task of improvement of watercourse through motivating and organizing the farmers for collective work.
- (2) To supervise and arrange the cleaning and maintaining of the watercourse, from the head to the tail and, through fixing individual and collective responsibilities of each farmer on the watercourse.
- (3) To bargain for the procurement of strategic inputs (fertilizer, pesticides, improved seed, implements etc) complimentary to the use of additional water in increasing agricultural production, on behalf of the members of the association and deliver them before the sowing time.
- (4) To search and exploit additional sources of irrigation water such as tubewell near the cattle pond or collecting sewerage water and pumping to the watercourse.

(B) Laws

- (1) An act should be enacted to give a legal status to the activities of the Department of On-Farm Water Management. This act should also provide for the creation of a water user association in each of the village where watercourses are improved or to be improved.

- (2) The Water User Associations should be recognized as legal entities and preferably all farmers on the watercourse should be members of the association. This association should have an Executive Committee for achieving the objectives given at 'A'. The members of the Executive Committee should be elected by giving the representation to various "Biradries/Patties" on the mogha. The strength of membership in the Executive Committee from each Biradri/Patti should be in accordance with the number of farmers in each Patti.
- (3) The Executive Committee should be empowered to punish the defaulters in the use and management of water and encourage the efficient use of water.
- (4) One nominee from the On-Farm Water Management should be the *ex-officio* member of the Executive Committee. His job would be to provide technical guidance.

Group 2—Irrigation

- (1) The Irrigation Department will provide Chak Plans showing levels of fields, alignment of watercourses with location of nakkas, and other relevant record to On-Farm Water Management staff. The canal patwari will be directed to render cooperation to Water Management staff in the field and in implementation of the improvement programme. The Water Management staff can obtain any type of help from the Divisional, or Sub-Divisional Canal Officer including supply of authenticated statistics, record and in the solution of any co-related problem.
- (2) Irrigation Department should direct canal patwaries to attend the meetings of the Water User Associations and the Water Management staff, held in connection with the improvement of watercourses.
- (3) The Irrigation Department should give special consideration to the demands of the Water User Association regarding change of nakkas, mogha etc. On a request from Water User Association, the Divisional Canal Officer should take immediate action under Canal and Drainage Act against the defaulters who do not maintain the improved watercourses.

The Committee also strongly recommended that considering the magnitude of watercourse improvement work all over the Punjab, the On-Farm Water Management activities should be expanded.

Group 3—Cooperatives

- (1) The name of the Society will be "Water Users Cooperative Association" and will be registered under the existing Cooperatives Act

of 1925, for the time being. In the mean time the University of Agriculture is requested to conduct research in this regard and suggest some better and viable arrangements.

- (2) Every water user will be the member and share holder. If 70% of the members agree to join the association, the rest will be bound for that.
- (3) There may be separate association for each watercourse.
- (4) Funds will be collected on the basis of land holding and contribution rate will be decided by members themselves.
- (5) Donations and Government Aid will be used through the Association.
- (6) Warabandi should be proposed by the Association and the Irrigation Department should approve the proposal of the association.
- (7) If there is a shortage of canal water the association will manage to instal the tubewell provided the subsoil water is fit for irrigation. The Irrigation Department will provide all the facilities to the association as provided to individual even with respect to rules and regulations.
- (8) Any problem related to watercourse or mogha concerning any Department will be moved through the association.
- (9) The association shall have the authority to fine or give some other punishment to the non-cooperating member.
- (10) Training courses should be organized for the farmers to acquaint them with the importance of On-Farm Water Management.
- (11) The functions of Water Users Cooperative Association should be vital for the present but other services such as provision of agricultural inputs could be introduced later on when the association is well established.

Group 4—Revenue

- (1) A 5 members Executive Committee of the Water User Association should be constituted on each watercourse to get necessary coordination from Revenue Department, Irrigation Department and On-Farm Water Management Development Project. This Committee will also be responsible for improvement and maintenance of the improved watercourses.
- (2) In case of non-coordination from any member of the Water User Association regarding Watercourse Improvement and Precision Land Levelling, the Committee should have the right to impose fine

and in case of non-payment, the matter should be reported in writing to the On-Farm Water Management authorities and the Revenue Department for realization of this fine with land revenue. It is further proposed that some legal foundation should be provided to this Executive Committee for getting work from members of the Water User Association.

- (3) The fine will be collected by the Revenue Department and deposited in the committee account for utilization on the watercourses. It was also proposed that some legal representation should be given at the district level to facilitate the implementation of decisions against defaulters and effective collection of fine etc. imposed against the defaulters by the Committee.
- (4) The Revenue Department should appoint some patwaries who should specifically give particulars regarding alignment of watercourse and identify the removable trees owned by different agencies on the watercourse. They should also be responsible for providing information and verification of ownership required for precision land levelling and watercourse improvement.

Group 5—Water Laws

- (1) Without changing the existing laws as such, a separate and special law should be enacted to establish the Water Users Association in which all matters with regard to their establishment, constitution, power and appeal should be provided. Proposed changes in existing laws should also be incorporated in the same special law. The rules of operation will also be made under the same Act.
- (2) The legal foundation will be provided by enactment of the special law mentioned in recommendation (1) above.
- (3) The registration of Water Users Association may be made under the new Act mentioned in (1) above with the Water Management Wing of Agriculture Department.

RECOMMENDATIONS OF THE SEMINAR ON WATER USERS ASSOCIATIONS FOR IMPROVING IRRIGATED AGRICULTURE HELD AT HYDERABAD ON JUNE, 14-15.1978.

1. The basis of water users associations should be voluntary. Additional provisions/enactment are necessary to legalize these associations. Other acts may be amended accordingly.

2. There should be a separate water users association for each water-course. These should be federated in larger organizations on the basis of distributaries and canals.

3. Possibility of involving, 'Haris' (tenants) in these association may be explored.

4. Initially the water users associations must concentrate and focus attention on water related activities such as improvement and maintenance of watercourse and increase in field efficiency. As they acquire management capabilities, they should be encouraged to pick up additional functions such as installation of tubewells and provision of other inputs to the members.

5. The water users association should collect abiana taxes, etc., from the members and deposit in Government treasury and be allowed service charges. This will help cover the operational cost of the water users association.

6. Various departments *viz.* Revenue, Agriculture, Cooperative and Banks should give preferential treatment to the water users associations for their efficient functioning.

COMMITTEE NO. I—AGRICULTURE

In the Province of Sind we have agriculture based on (a) irrigation, (b) inundation, and (c) rainfall. All these systems are supplemented by ground water wherever usable ground water is available.

Here we can not resist mentioning that the owners of small holdings have not yet been able to put to use any supplementary ground water, even if it is available. This programme is most needed in tail end areas or wherever there is shortage of surface water. Our intention therefore is first of all to conduct this programme where water, whatever is available, is either not economically used or where the wastage percentage is much higher only because of handling and misuse of available sources.

We, therefore, strongly recommended that the programme of forming "Water Users Association" be first started in such areas where the agricultural produce has the greatest potential for improvement by proper water and farm management.

(A) Water Management

We strongly feel that any such association only at the watercourse level will not be that effective unless a bigger association or an organization is planned for that particular minor/distributary on which such associations are based.

We suggest that such association be formed at watercourse level, with restrictions of having one vote per member irrespective of size of holding. He must be present at the meeting to cast his own vote.

This association has to be given a legal frame work, which "Law Committee" is going to recommend.

The Chairman and the Secretary elected by the members of this association will be *ex-officio* members on higher organization or a minor/distributary committee which shall also have the Irrigation Department's official concerned as members. This Organization or Distributary Committee will be responsible to maintain and efficiently run the distributary and settle any disputes arising out of the distributional system. A share of all funds collected on this particular minor/distributary should go to the organization. Allocated funds can be used for silt clearance, re-modelling, improvement and maintenance of that particular minor/distributary.

(B) Farm Management

We are strongly of the view that water alone can not improve production unless all other inputs are properly, adequately and timely provided for.

Therefore this Association should have means to obtain and regulate the requisite inputs alongwith credit facilities.

It is also essential that the produce thus obtained should fetch a reasonable price in the market and also storage facilities for storing all inputs including seed and surpluses be arranged and managed by this Association.

The Agriculture Extension Department can play an important role in such Associations by recommending cropping pattern for the proper economical use of all inputs by water users through the availability of irrigation water.

COMMITTEE NO. II—IRRIGATION

1. The executive committee of water users association should consist of the representation of head, tail and middle of watercourse.

2. The SDO from Irrigation Department will be *ex-officio* member and will assist in calling meeting of irrigators on a watercourse to form Water Users Association. The representation of On-Farm Water Management Project is essential to explain the objectives, benefits and responsibilities of water users associations.

3. The Association shall be guided and governed by the Irrigation Act.

4. The technical suggestions for improvement of watercourse and better utilization of irrigation water should be enforced and implemented by the Water Users Association.

5. The representation from Water Users Association should be given due considerations to solve their problem by the respective departments.

6. All the notices under the Irrigation Act should be served to individual through water users associations.

7. The Executive Engineer should be given legal power to acquire the land for re-aligning the watercourses after joint inspection of Water Users Association executive committee, and representative of On-Farm Water Management Project. The final appeal should lie with the Superintending Engineer.

8. Maintenance of watercourse is the responsibility of a Water Users Association. In case of default by any member the matter may be referred to Irrigation Authority to be dealt with under the Irrigation Act.

COMMITTEE No. III—COOPERATIVE

1. The basis of the Association should be voluntary. The object of the Cooperative Act is better living, better business, and better methods of production. Therefore, the Act would be used for the purpose. However, additional provisions in the rules may be made for the attainment of the objectives. Special type of bye-laws should also be prepared for the purpose. It is recommended that a committee consisting of Secretary Agriculture, Cooperative and other officers may be appointed to work out the details.

2. We suggest that there ought to be a separate Water Users Association on each watercourse. Provision must be made for Water Users Association to be able to become federated into larger organizations. This could be done, first on a distributary or minor basis, then at the main canal level. These organizations should be co-extensive and in conformity with other nation-building departments.

3. Khatedar or holder of land will have one vote. Haris of such Khatedar will select one hari as a member, who will also have one vote. If the Khatedar holds land in 2 or more societies, he will be member of each society.

If a hari, works land on more than one watercourse he can be a member of the hari group which is allowed one vote, if the group works for one Khatedar.

4. Initially the water users' association must concentrate and focus attention on water related activities such as improving watercourse and maintaining it, as well as other water management activities to increase agriculture production. As they acquire the capacity, the organizations should be encouraged to pick up additional activities and functions such as installation of tubewells, providing inputs to the members, handling equipment like tractors and marketing and storage.

5. The management will be vested in the general body of the organization which holds meeting once a month. Special general meeting can be convened on short notice as and when required. The general meetings will elect managing committee/executive committee every year. It should be ensured that all classes of people are represented on the committee. The retiring members shall not be eligible for re-election for at least a period of 18 months.

The organization shall collect abiana taxes etc. from the members and will deposit in Government treasury. The Government will allow operational charges to the cooperative association in lieu of the service rendered by them.

The Government will bear the cost of training of the official and non-official workers and allow subsidy for a period of 3 years.

6. The cooperative training institute will provide training with the cooperation of On-Farm Water Management Project to the office bearers, members of the WUAs. The Cooperative Department can also undertake the membership education in collaboration with OFWM. The additional cost will however be borne by the project.

COMMITTEE No. IV—REVENUE

1. Difference in survey maps with Survey Department and Revenue Department should be eliminated. Rectangulation and consolidation of holding should be carried out at the cost of Government.

2. The water users who do not join Water Users Association, should be persuaded by the Mukhtiarkar to join the Water Users Association.

3. Preference should be given to Water Users Association for distribution of agricultural inputs and other necessities like cement, sugar, etc.

4. Part of land revenue may be placed at the disposal of Water Users Association to appoint a Chowkidar on Watercourse and to meet maintenance cost.

5. Water Users Association should be given preference for credit facilities and other incentives like taccavi, subsidy on tubewells, purchase of tractors etc.

COMMITTEE NO. V—LAW

1. That the Sind Irrigation Act of 1879 should be reviewed and amended in light of modern agricultural needs and water distribution practices and capabilities. The amendment should also consider a section on rights, responsibilities and liabilities of the Government which provides in effect that the Government has the responsibilities (1) to deliver the available water to the users according to the delivery scheme provided them ; and (2) the liability to the extent determined for crop losses due to mis-management of delivery facilities or mis-allocation of water from the delivery schedule.

The review committee should consist of representatives from Departments of Irrigation, Agriculture, Law, Irrigation Water Users and others as determined essential.

2. An independent and special Act should be prepared and adopted by the Government to provide legal authority for creation of Water Users Associations. This Act should include the constitution, powers, duties and operational procedures of the Association including guidelines for internal structure : and provisions for registration with the Directorate of On-Farm Water Management. A copy of the registration should be filed with the Irrigation Department. Whenever there exists a conflict between this Act and existing laws, the provisions of this Act should prevail. The Act should include provisions for federations of Associations and stressing the need for cooperation between Agriculture and Irrigation Departments to assist the irrigators in increasing their proper water use and food production.

RECOMMENDATIONS OF THE SEMINAR ON WATER USERS ASSOCIATIONS FOR IMPROVING IRRIGATED AGRICULTURE HELD AT PESHAWAR ON JUNE 17-18, 1978

1. The name of Water Users Association should be Water Users Cooperative Association. but the Cooperative Department should treat these associations as specific purpose organizations.

2. All the concerned departments especially police, revenue and irrigation may be represented on call, as non-voting members on the executive committee of water users association if the executive committee so desires.

3. The decisions of the executive committee should be put into effect expeditiously by the department involved or member concerned.

4. The formation of water users association shall be voluntary ; however if 75% of water users on any watercourse decide to form water users association, membership of all water users shall be compulsory.

5. The water users association should be registered with the Cooperative Department under Cooperative Acts, amended as necessary to state the purposes, duties and responsibilities of the membership and to provide for federations of associations along hydrological lines.

6. Water users association may expand as multi-purpose society to cover other inputs. This flexibility should be provided for in the amendments.

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RECOMMENDATIONS OF THE SEMINAR ON WATER USERS ASSOCIATIONS FOR IMPROVING IRRIGATED AGRICULTURE HELD AT QUETTA ON JUNE 20, 1978

1. In order to assure water supply in the Karezes and avoid deepening of Karezes every year due to fall in water table, tubewells should be installed in each Kareze and special assistance should be provided by the Government for this purpose.

2. For conserving flood water and recharging underground water, embankments and delay action dams, wherever deemed fit, may be constructed.

3. Electricity may be supplied on a large scale for the development of water sources.

4. More emphasis should be laid on levelling of lands. Machinery and technical know-how required for this purpose should be provided on a large scale.

5. Water users associations already existing on Karezes should be given legal coverage and might take on additional functions such as tubewell operations, handling inputs and other such activities in the future.

6. These associations should be registered with other departments such as Banks, IRDP, Agriculture, Irrigation Departments etc., so that adequate support and assistance can be provided to the associations.

7. Since these associations are already governed by local tribal laws, there is no need for the promulgation of any act beyond providing a legal cover for existing and new associations formed under local tribal law.

**SEMINAR ON WATER USERS ASSOCIATIONS FOR IMPROVING
IRRIGATED AGRICULTURE HELD AT ISLAMABAD
ON JUNE 24, 1978**

CONCLUSIONS

The recommendations made at the provincial seminars were discussed during the seminar held in Islamabad on 24th June, 1978.

It was unanimously agreed that the formation of Water Users Associations was vital for the promotion of the cause of water management. There was lengthy discussion on the question whether these associations should be formalized and some legal cover in the form of an act was necessary. The majority of the participants was of the view that since the On-Farm Water Management Project was in the pilot stage, it was premature to consider legalization of the Water Users Associations.

The provincial seminars considered the need of the recognition of the Water Users Association with the nation building departments so that these associations could tender advice, put forward proposals or make representations on behalf of their members, and with mutual understanding and co-operation, discuss and decide matters relating to water management between themselves. A legal framework was therefore necessary to keep the associations operational even after the improvement phase of the watercourse.

The project paper prepared for the negotiations of loan agreement for On-farm Water Management Project gave due recognition to the requirement for farmers on a watercourse to participate in the programme so that they organise formally or informally to request help and carry out the work. At present farmers are participating in the planning, implementation and evaluation of all improvement activities, through informal water users associations.

Specific responsibilities are : Planning, arrangement and supervision of labour, agreements with contractors and artisans, purchase of supplies, assessment of cash, arrangements for cooperative use of equipment, settlement of disputes plus the establishment of a routine maintenance programme.

The object of the seminar was to carefully evaluate the effectiveness of the existing informal organisations. A judgement was sought whether to continue with informal associations or to seek the development of more formal watercourse entities. The seminar at national level gave a verdict viz. they will continue as informal associations for the time being.

Dr. George E. Radosevich during his speech proposed a legislation to authorise the formation of Irrigation Association in Pakistan. This is given in the Appendix and forms a part of his speech. This is his suggestion and was not discussed in the Seminar due to general consensus that the Water Users Associations should continue to work on informal basis. This is therefore kept on record till time is ripe for its consideration.

**SEMINAR ON WATER USERS ASSOCIATION FOR IMPROVING
IRRIGATED AGRICULTURE, ISLAMABAD**

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**PROPOSED LEGISLATION TO AUTHORIZE THE FORMATION
OF IRRIGATION ASSOCIATIONS IN PAKISTAN**

**BY
DR. GEORGE E. RADOSEVICH**

INTRODUCTION

The Government of Pakistan has accorded high priority to increasing food production and simultaneously helping the small farmer improve his quality of life. On repeated occasions during the past decade, new programs have been introduced and increased efforts undertaken to identify specific ways to achieve these goals through research and demonstration. One such effort has led to the identification of the vast amounts of water lost through present conditions of conveyance channels at the watercourse level and current application practices for water use on the farms. This effort has culminated in the newly authorized On-Farm Water Management Program. The focus is upon water as *one* of the essential ingredients to a prosperous irrigated agriculture. The focus also recognizes the uniqueness of this flow resource by directing attention to the area commanded by the source of supply—the outlet or tubewells.

Improved conveyance technologies and application practices have been developed that will significantly increase the efficient use of water throughout the country, making more water available for existing crops and/or expansion of cropping intensities. These improved technologies and practices include (1) watercourse rehabilitation by installation of pacca drop and check structures, nakkas, and lining, as well as significant reduction of seepage and evapotranspiration losses through kacha improvements; (2) land levelling to maximize water utilization and crop growth; and (3) improved agronomic practices and extension services.

These technical improvements are essential, but as has been found in many other countries as well as in Pakistan, there is an equally essential need to adopt a local institutional structure to implement the technological program. Without a local organization of the irrigators sharing the same source of supply, widespread adoption of the program will not occur. To initiate the On-Farm Water Management Program, an informal "executive committee" structure has been employed in three Provinces. In the Punjab approximately 90 executive committees are in operation, realigning and improving their watercourses, installing pacca nakkas and check structures and levelling their land. The experience is new and the direct benefits are still readily apparent. However, an informal organization can be compared to a string: it frays and breaks easily under pressure. The real test will be whether the informal association can not only improve the watercourse and level the land on a one shot basis while under

the supervision of the water management personnel, but whether it will continue in the future the necessary operation and maintenance to retain the efficiencies gained. Preliminary indications are that these informal organizations may be unable to maintain improved watercourses over a long period of time.

The conclusion from observing and studying programs and local water institutions in many different countries is that a legally constituted water user association is essential to provide the identity, incentive and capability of irrigators to adopt improvements in use of water and related input. But to successfully introduce a program such as the On-Farm Water Management Program in a country like Pakistan, it is not only the obligation of the irrigators to embrace the benefits but absolutely essential that the government make a *real commitment* to the program efforts by providing the mechanism and means for implementation. In this regard, where the informal association can be compared to a string, a formal association can be compared to a rope. It may still fray under pressure, but it can withstand more stress.

Upon the completion of the four Provincial "Seminars on Water Users Associations for Improving Irrigated Agriculture" held during the first two weeks of June 1978, there was unanimous approval of the need to legally constitute some form of association. For this reason a proposed draft of an Irrigation Association Act or Order has been prepared consistent with the recommendations. On June 23 and 24, Dr. George E. Redosevich, Advocate and Professor of Water Law, Mr. Itikhar Ali Qureshi, Chief Engineer, Faisalabad, and Mr. Douglas Merrey, Social Anthropologist, prepared the attached draft. This draft is cognizant of the current suspension of legislature bodies and for this reason provides either for an *Act* or *Order*.

The fundamental reason for recommending a special Act or Order is not to add to the myriad of laws but rather to provide the mechanism and guidelines to facilitate those irrigators who voluntarily desire to formally organize. The law would not require mandatory formation of associations, for the basic purpose is only to organize, whenever the irrigators can obtain a benefit from doing so. The law is designed to provide a mechanism to aid irrigators in resolving their disputes, which should lead to a reduction of appeals to the civil and administrative courts.

The proposed Act or Order is comprehensive and complete. There are many provisions that provide features and programs available under the Canal and Revenue Acts. For this reason, if it is considered desirable, a commentary explaining the purpose and basis of each provision will be prepared.

With this introduction, the following provisions are proposed as a guideline for framing the legal basis of irrigation associations.

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AN ACT OR ORDER

to provide for the formation, operation and promotion of irrigation associations

PREAMBLE

WHEREAS the Government of Islamic Republic of Pakistan considers it to be of the highest priority to increase food production and the quality of life in rural areas, particularly for the small farmer, by improving the efficient use of this Nation's natural resources, according to the tenets of Islam,

AND WHEREAS water is a unique input to agricultural production that requires recognition of its hydraulic characteristics and the common element that binds irrigators receiving water from the same outlet,

AND WHEREAS the Government desires to promote the maximum benefit from proper use of surface and ground waters through an increased efficiency in distribution, delivery, application and removal of water by providing for encouraging, and facilitating the legal recognition, formation, and operation of irrigation associations that will enable the irrigators to act collectively and co-operatively to improve the productivity of irrigated agriculture,

AND WHEREAS the Provincial Assemblies of the Provinces of Baluchistan, the North West Frontier, the Punjab and Sind have passed resolutions under Clause (1) of Article 144 of the Constitution of the Islamic Republic of Pakistan to the effect that Parliament may, by law, regulate the formation, working and promotion of irrigation associations :

(If this Act or Order is enacted under Martial Law, the final paragraph above may be replaced by :

“ NOW THEREFORE, in pursuance of the proclamation of the 5th day of July, 1977 read with the laws (continuance in force) Order 1977 (C.M.L.A. Order No. 1 of 1977) and in exercise of all powers enabling him in that behalf the President is pleased to make and promulgate the following Ordinance. ”)

It is hereby enacted as follows :

CHAPTER 1

PRELIMINARY

1. **Short title, extent and commencement.**—(1) This Act may be called the Irrigation Association Act, 1978,

(2) It extends to the whole of Pakistan, and

(3) It shall come into force at once.

2. **Act to over-ride other laws.**—The provisions of this Act and rules promulgated under its provisions shall have effect notwithstanding anything contained in any other law, and where Provincial water laws and other laws provide for the action of " persons " or " applicants " under the provisions of those laws, it shall be understood that an Irrigation Association organized under this Act shall be included under the definition of those terms to act on behalf of the Association membership.

3. **Definitions.**—In this Act, unless there is anything repugnant in the subject or context :

" bye-laws " means bye-laws of the association ;

" association " means an irrigation association, (anjuman-e-abpashi) organized under this Act ;

" Irrigator " means the *operator* of a separate farm, whether he is an owner of land, tenant or rentor. In case of jointly owned and/or operated farms, the joint owners or operators shall have one vote and they should choose one representative from among them to act in the general assembly on their behalf ;

" general assembly " means the collective body of membership of the association ;

" membership " means those irrigators entitled to participate in the general assembly ;

" Board of Directors " means the governing body of representatives elected by the general assembly ;

" watercourse " means the main channel from the canal outlet (mogha) and laterals ;

" outlet/tubewell chak " means that portion of land irrigated from a particular canal outlet or government tubewell ;

" association chak " means that area of land irrigated from the source of water developed and/or utilized by the association ;

" Collector " means Collector Revenue Department as defined in the Revenue Act ;

" Canal Officer " means Canal Officer as defined in the Canal Act.

" member in good standing " means any member whose payment of assessment is not in arrears by more than one year, under conviction for a criminal offence, or a minor.

" association in good standing " means an association that is not in default of a *bona fide* legal obligation.

CHAPTER 2

PURPOSE, POWERS AND FORMATION

4. Purpose.—(1) The primary purpose of the association shall be the operation, maintenance, improvement and rehabilitation of the watercourse, improvement of water supply from surface or ground waters, and improvement of On-Farm Water Management,

(2) The secondary purposes of the association to be undertaken when the membership feels capable of so doing, include expanding activities to obtaining other agricultural inputs and performing functions that benefit the economic and social well being of the membership.

5. Associations to be bodies corporate.—An association shall be a body corporate by the name under which it is registered, having perpetual succession with power to hold property, both moveable and immoveable, and shall by said name sue and be sued.

6. Powers of Association.—In carrying out the purposes of the association it shall have the following powers to be generally construed :

- (1) improve, rehabilitate, operate and maintain the watercourse ;
- (2) improve the water supply from surface or sub-surface sources ;
- (3) locate, own, operate and maintain tubewells and lift pumps in the name of the association ;
- (4) sanction upgrading and maintenance of farm ditches and field outlets ;
- (5) encourage adoption of improved on-farm water use and management practices and other improved land and agricultural input practices ;
- (6) participate in programmes to improve watercourses, land levelling and agronomic practices, and lease, own, operate and maintain equipment, structures and other matters associated with improvement efforts.
- (7) establish water delivery schedules and supervise water allocation and distribution in the association chak area in such a manner so as not to interfere with canal water delivery ;
- (8) set and collect general and special assessments ;
- (9) conscript labour for emergency repairs on watercourse ;

- (10) locate, install and maintain drainage facilities for fields :
- (11) remove obstructions in watercourse during realignment, operation and maintenance :
- (12) enter into contracts for obtaining loans and grants and setting a repayment schedule :
- (13) insure that all members' rights under the law are respected, and that each member gets his fair share of water in a timely fashion ; and
- (14) insure that all members of the Association contribute their fair share of labour, money, etc., for improvement, maintenance and operation of the watercourse.

7. **Duties of Irrigators.**—It is considered essential that the irrigators recognize and assume, individually and collectively, the following duties :

- (1) to respect and up-hold the water laws of the Province,
- (2) to respect and uphold the rights of irrigators to water,
- (3) to cooperate with other irrigators in the improvement, maintenance, operation and rehabilitation of the watercourses so as to achieve a high level of efficiency, and
- (4) to use the water allocated to the irrigator wisely and efficiently.

8. **Formation of Association.**—(1) Whenever at least 51% of the irrigators on a watercourse agree to formation and operation of an irrigation association (anjuman-e-abpashi), they shall make application to the Director, On-Farm Water Management through his Field Officer.

(2) Upon receipt of application, the Field Officer will review the application and convene a meeting for all irrigators in the watercourse command area.

(3) If 75% of the irrigators consent to formation of the association, membership of the non-consenting irrigators shall be mandatory.

(4) Upon receipt of a complete membership list, the Field Officer shall approve the application, register the association by entering the name and particulars of the association in a registry, send one copy of the list to the Provincial Director, On-Farm Water Management, and provide the association with a certificate of formation as evidence of the legal existence.

(5) The membership list must be kept current by the association. The Field Officer shall examine and approve the membership list. He shall determine that each member is a *bona fide* land owner/operator or tenant. If his decision is contested, it shall be appealed to the Collector, whose decision shall be final.

(6) The list of associations and names of association officers will be sent to the Irrigation, Agriculture, Revenue and other requesting departments. This list will be made current annually.

(7) The association must, within 30 days of the approval of the membership list, convene a meeting of the General Assembly, elect the Board of Directors, adopt bye-laws and open a bank account.

(8) The level of formation of an irrigation association shall be at the outlet chak or tubewell chak. The association may increase its irrigated area by tubewells, and associations sharing a common government or private tubewell may make provisions in bye-laws for operation and maintenance of same.

(9) Whenever the area of an outlet or tubewell chak is changed by the Irrigation Department, the membership of existing associations shall change accordingly. If membership changes by 25%, there shall be an election of the Board of Directors.

(10) In formation of irrigation association in the tribal areas of Baluchistan and NWFP, the association is required only to submit an application and upon approval and registration, may adopt the existing customary water practices of allocation, distribution, delivery assessments and resolving disputes.

CHAPTER 3

GENERAL ASSEMBLY

9. **Composition.**— The irrigators of an association shall constitute the general assembly.

10. **General meetings.**— Every association shall call an annual general meeting of the membership and not less than one other general meeting per year.

11. **Special meeting.**— On request of not less than one fifth of the members of the association or at the request of the Board of Directors, the Chairman shall call a special meeting of the membership.

12. **Duties of General Assembly.**— The General Assembly shall elect the Board of Directors, and jury, make and/or approve organizational policies, and plan of operation, approve and amend bye-laws, approve assessment and budget, approve selection of ditch tenders and assessment collectors, approve adoption of improvement programs and leasing, purchasing or otherwise obtaining equipment, pumps, seeds, fertilizers, chemical and other like products, and to do and take all other necessary duties and actions to carry out the purposes of this Act consistent with the association bye-laws.

13. **Voting.**—(1) All Irrigators shall be entitled to vote on issues requiring voting in carrying out the duties of the General Assembly.

(2) A 2/3rd vote is required of all actions of the General Assembly.

14. **Resolving Disputes.**—(1) The general assembly may either elect a special body (jury) to, or delegate to Board of Directors the authority to, hear and decide disputes between irrigators of the association.

(2) The decision of the Board or Jury shall only be punishable by a fine, not suspension of water delivery unless approved by the general assembly.

CHAPTER 4

BOARD OF DIRECTORS

15. **Composition.**—(1) There shall be elected by the General Assembly, using secret ballot, a Board of Directors consisting of not less than 5 members of the assembly in good standing.

(2) The General Assembly is to decide and include in the association bye-laws whether the representatives to the Board of Directors are to be elected from geographic portions of the watercourse (*i.e.* head, middle and tail) or by social group (*zat, beraderi*) or at large.

(3) No member elected to the Board of Directors shall enjoy any benefits greater than any other member by virtue of his elected position.

(4) Members of the Board of Directors shall be elected for 2 year terms, except in the first election after organization when one-half or thereabouts shall be elected for 1 year. Thereafter half or thereabouts shall be elected annually. A person may not serve more than two consecutive terms on the Board of Directors.

16. **Chairman and Officers.**—The members of the Board shall annually choose a Chairman, Secretary and Treasurer. If the bye-laws specify, the Chairman may be by rotation and Vice-Chairman also appointed.

17. **Quorum.**—Action by the Board of Directors shall require 2/3rd vote of the total Board of Directors.

18. **Oath.**—Members of the Board of Directors must take an oath to uphold the purposes and duties of the association and the tenets of Islam.

19. **Duties of Board of Directors.**—The Board of Directors shall be responsible for carrying out the general purposes of this Act, association bye-laws and more specifically :

(1) manage the association activities in delivery of water ;

- (2) develop a plan of operation for operation, maintenance, improvement and rehabilitation of the watercourse :
- (3) supervise the construction and maintenance of the watercourse and other improvement activities :
- (4) employ and discharge ditch tenders, *collectors*, and construction personnel :
- (5) exercise emergency powers to repair watercourse breakages :
- (6) negotiate and contract with government agencies and other institution for improvement programs acceptable to the general assembly :
- (7) serve as the communication link between government agencies in dissemination of information and all matters representing the views and requests of the irrigators :
- (8) maintain the financial and organizational records of the association ; and
- (9) call special meeting of the general assembly for any matter involving original expenditures and other important issues involving the general membership.

20. **Duties of Chairman.**— To call and conduct meetings of the Board of Directors and general assembly and to otherwise act on behalf of the association in all other matters. The Chairman may designate a temporary Chairman in case he is unable to perform his duties. The Chairman and Secretary must sign all contracts and other obligations of the association.

21. **Duties of Secretary.**— To keep a record of minutes of the association.

22. **Duties of Treasurer.**— To keep and maintain financial records of the association. The Treasurer may make deposits in the association account, but all withdrawals must be co-signed by Chairman and Treasurer.

23. **Assistance to the Board.**— The Board of Directors may appoint a person competent to perform the duties of Secretary and Treasurer to assist the Secretary and Treasurer in the performance of their duties.

CHAPTER 5

FEDERATION OF ASSOCIATIONS

24. **Distributary Associations.**—(1) On each distributary all the water-course-level Irrigation Associations may form a federation of associations. These federations shall be called (*name of distributary/minor*) *Distributary Association* (—————Anjuman-e-Rajbah).

(2) When more than half of the watercourses on a distributary are organized into Irrigation Association they may form a Distributary Association. As Irrigation Associations are formed on other watercourses they shall immediately become constituent members.

(3) Each Irrigation Association shall send one representative to the Distributary Association. The Chairman of the Irrigation Association will act as the representative of his Association to the Distributary Association. The Distributary Association members shall select a Chairman and other officers as needed.

25. **Canal Associations.**—(1) On each major canal all the Distributary Associations may form a federation of canal associations. These federations shall be called (*name of canal*) *Canal Association* (—————Anjuman-e-Naher).

(2) When more than half the distributaries on a major canal are organized into Distributary Associations they may form a Canal Association. As Distributary Associations are organized on the remaining distributaries they shall immediately become constituent members.

(3) The Chairman of each distributary association shall be the representative to the Board of Directors of the Canal Association.

(4) The Canal Associations members shall select a Chairman and other officers as is needed.

26. **Registry of Distributary and Canal Associations.**—The Distributary and Canal Associations shall be registered with the Director of OFWM Project. A copy of the registry and name of Chairman shall be provided to all other concerned departments.

27. **Duties and Powers.**—The Distributary and Canal Association shall have the following duties and powers :

- (1) each Distributary Association shall represent its members in issues and problems related to its distributary. The Canal Association shall represent its members in issues and problems related to more than one distributary or the whole canal ;
- (2) represent their respective constituent members to the Departments of Irrigation, Agriculture, and any other Departments ;
- (3) serve as channels of communication between the Irrigation Department and the constituent members of the associations ;
- (4) participate actively with the Irrigation Department in the improvement, maintenance, and operation of the distributaries and canals ;

- (5) make recommendations and requests for distribution of water into a minor or distributary on a demand or fixed delivery basis ;
- (6) make recommendations and requests to the Irrigation Department for construction of bridges, regulators, drop structures, new minor canals, etc., at association cost or cost-sharing ;
- (7) maintain financial records and minutes of meetings, levy assessments upon member associations and exercise collection authority on a voluntary basis or in case of default by certifying the amount for collection to the Collector, Revenue Department ; and
- (8) make bye-laws and rules of operation.

28. **Capital expenditures and improvements.**—Prior to a federation committing or making any major capital expenditures or improvements the members of the Board of Directors of the federation must first obtain the approval from the membership of their respective Irrigation Associations.

CHAPTER 6

MISCELLANEOUS PROVISIONS

29. **Evidence of Land Ownership.**—Membership in the association as a representative of joint owners or as tenant does not imply relinquishment or *prima facie* evidence of title to land.

30. **Transfer of Membership.**—In the event of a transfer of any type of an irrigator's holding to another irrigator who previously was not a member of the Irrigation Association, membership in the association is also transferred.

31. **Assessments.**—(1) *General assessments* are those only to carry out the primary purpose of the association.

(2) *Special Assessments* are those levied to carry out the secondary purposes of the association.

(3) Assessments should be allocated in proportion to cultivable lands in the association chak.

32. **Credit.**—Credit will be extended to a legally constituted association responsible for its debts and actions and being in good standing. The association will have no power to encumber the land in the command area without unanimous consent of the land owners.

33. **Auditing of Accounts.**—The association must have the financial accounts audited every year by an auditor selected from the government list of approved auditors.

34. **Fines for Abuse.** The Association shall adopt a schedule of fines in the bye-laws, which fines shall be either commensurate with the damage caused and/or benefit received, or levied in proportion to acreage irrigated on the watercourse. Fines should be set sufficiently high to deter abuse of the association bye-laws and purposes.

35. **Enforcement of Fines and Fees.** The Board of Directors may certify to the Collector, Revenue Department, the amount recoverable from a member of fines or fees for which the member refuses to pay on demand, collectable as arrears of land revenue. The Collector shall recover said amount so certified and reimburse this amount to the association.

36. **Acquisition of Lands.** The association may acquire lands necessary for location or relocation of watercourses and installation of tubewells on a voluntary basis, with compensation to be paid accordingly for the land so acquired.

37. **Canal Laws Applied.** Whenever a dispute or serious disagreement among the irrigators arises on matters covered by the Provincial Water Laws and Regulations on such issues as setting the warabandi, realignment of watercourses, or other matters requiring approval of the Canal Officer, the Board of Directors shall refer the issue to the Irrigation Department.

38. **Contract Water and Water Rates.** The association or federation of associations at any level may contract with the Irrigation Department for the supply of canal water on a contract basis at the outlet, or contract or volumetric rate basis at the minor or distributary canal, as provided in the canal rules, instead of the crop rate basis commonly used. In this case, the association will collect and pay the agreed rate to the government.

39. **Improvement of Distributary.**—Any association or federation of associations which desires to improve the distributary or participate in improvement process on the distributary or canal must first have the approval and supervision of the Canal Officer.

40. **Preferential Treatment.**—The Departments of Irrigation, Agriculture, Revenue and Cooperatives, and Credit Institutions, shall give preferential treatment to irrigation associations organized under this Act to facilitate their efficient functioning.

41. **Power to Make Rules.**—The Provincial Government may make rules for carrying out the purposes of this Act and the Directorate, On-Farm Water Management shall prepare necessary forms to expedite and facilitate formation of irrigation association and federation of associations.