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IMPLEMENTATION OF PARTICIPATORY IRRIGATION MANAGEMENT IN PAKISTAN. ITS ENGINEERING, LEGAL AND FINANCIAL ASPECTS

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IMPLEMENTATION OF PARTICIPATORY IRRIGATION MANAGEMENT IN PAKISTAN: ITS ENGINEERING, LEGAL AND FINANCIAL ASPECTS

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ABSTRACT

Irrigation net work of Punjab is more than 100 years old. It came into existence when sub-continent was the colony of British Empire. This irrigation system has been deteriorated due to a number of factors. Now, major changes in the irrigation management have been agreed upon by Federal and Provincial Governments as proposed by IMF and World Bank.

The institutional reforms also consist of introduction of concept of Participatory Irrigation Management (PIM), first time in Pakistan. PIM refers to the association of farmers in operation and maintenance of irrigation systems. The intensity of PIM may range from minimal user involvement to the transfer of nearly all management functions.

This paper describes about the scope of implementation of PIM with particular reference to engineering, legal and financial aspects of irrigation system of Pakistan. Results of a survey conducted at Lower Chenab Canal Circle which is proposed to be converted into pilot Area Water Board to assess the perceptions of farmer about PIM, are also included.

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INTRODUCTION

Pakistan is basically an agricultural country. It has the largest contagious irrigation system in the world, irrigating more than 33 million acres of agricultural land, with a total canal length of about 65000 kilometers. Present irrigation system came into existence when sub-continent was the colony of British Empire. It was the need of the say to design such a system, which could feed vast tracks of land with limited supply to avoid any situation of famine in sub-continent. Method of water allocation is "Imposed" and distribution of flow is "Proportional". There is no much flexibility for irrigators to cope with crop water requirements to achieve the better yields. Ground water is abstracted to supplement the canal water supply. Due to lack of maintenance and natural factors overtime, degradation of irrigation system occurred affecting their functional ability. Some factors which worsened the irrigation system are political interference, no farmers participation, lack of staff discipline, weal management of irrigation system, low level of O & M funding, water theft, seepage losses, inequitable access to irrigation water etc. all these factors contributed in stagnating agricultural productions. Now major changes in the irrigation management system has been agreed by Federal and Provincial Governments as proposed by donor agencies e.g., World Bank, I.M.F. etc.

Following set of institutional reforms was agreed upon in a meeting chaired by President of Pakistan and attended by the Prime Minister and the for Provincial Ministers in August 1995.

1. Conversion of existing Provincial Irrigation Department (PIDs) into Provincial Irrigation and Drainage Authorities (PIDAs). This conversion was legislated by Provincial Assembly in 1997.

2. Transformation of one of the existing Irrigation Circles of each PID into financially self-accounting Area Water Board (AWB) on a pilot basis.

3. Formation of farmer-controlled Fos on pilot basis. These formations would play an increasing role in the operation and maintenance of distributaries and minors.

These institutional reforms also consist of introduction of concept of Participatory Irrigation Management, first time in Pakistan. PIM refers to the association of farmers in the operation and management of irrigation systems. The intensity of Participatory Irrigation Management may range from minimal user involvement to the transfer of nearly all management functions. The main objective of PIM is to improve irrigation management by providing a better irrigation service to the farmers, ensured physical sustainability of the irrigation infrastructure, and to promote a sense a partnership between farmers and Government Agencies. There are various aspects of PIM that include planning, design, construction, operation and maintenance, financing and policy matters. Similarly, PIM can be implemented at various levels according to the environment, technical complexities of the irrigation system and needs of the society at large. These levels include quaternary, tertiary, secondary and main, where PIM may be

practiced. The examples of project level Participatory Irrigation Management can be found in the United States, France and Japan, where irrigation users have largely replaced the state management. At the lower end of the spectrum, the state continues to dominate most aspects of irrigation down to tertiary or even quaternary levels, as in the case of Morocco, India and Pakistan etc. (World Bank 1997).

PROSPECTS AND CONCERNS ABOUT IMPLEMENTATION OF PIM

It has been observed that different agencies involved in running the present irrigation system have diverse opinion about the implementation of PIM program in Pakistan. The agencies, having different opinion on this subject, may be identified as the concerns shown by staff of irrigation department, the consultants and the farmers. The main concern about success of PIM programme is that influential people may monopolize farmer organizations. It is very difficult to hold politically transparent elections. There are always some farmers who remain in contact with Irrigation Department and other government agencies. It is feared that these contact farmers and politically influential people will get hold of the farmer organizations.

Another big concern is the doubt about FOs management capabilities. Due to management transfer/turnover problems, no pilot at distributary level including Fordwah Eastern Sadqia System (FESS) has reached at this stage. Success of PIM programme in Pakistan depends open testing of FOs management capabilities in real terms. Provincial Irrigation and Drainage Authority (PIDA) plans to establish 120 FOs by the end of year 1999. However, no farmer organization has come into existence in Punjab irrigation network by November 1999.

It would be the first experience in the world of a large irrigation system management transfer. It is programmed at first, to convert Lower Chenab Canal (East) and Lower Bari Doab Canal Circle of Punjab irrigation system into Area Water Boards (to give autonomy to these irrigation Circles) and to run PIM programme in these Irrigation Circles on pilot basis. It is worth mentioning at stage that total area of LBDC and LCC-East Circle (i.e. LCC-East about 1.6 million acres and LBDC Circle about 1.4 million acres)is about the same as that of Mexico's irrigated area of which irrigation system was given to the private sector. It is interesting to note that total irrigated area of Mexico is 5.5 million hectares. 2.5 million hectares (about 46%) was already being maintained and operated by water users. Irrigation management of remaining 3 million hectares was the responsibility of the Mexican government. In mid eighties, the system operated by the government was also handed over to the irrigators. In contrast, up till now, users are managing no channel in Pakistan, in real terms.

Illiteracy of irrigators is also a big hindrance for successful implementation of PIM programme. Social awareness and discipline comes with education. Literacy rate in all the countries where PIM programme are being implemented, is more than Pakistan. If education level of farmers is increased then they will become more disciplined and

civilized. This will be helpful in successful implementation of PIM programme in the country.

There is also a lack of knowledge about institutional reforms and PIM programme among farmers, irrigation department staff and other concerned agencies. Confusions and misconceptions should be removed among those who are involved in running the present irrigation system. Moreover, only one pilot project at distributary level, to assess the success of implementation of PIM programme at Bhukan Distributary and Bahadarwah minor of 4-r Hakra Branch of Fordwah Eastern Sadqia System (FESS) by IIMI is being carried out. Replicability of this pilot project, for whole of the Indus Irrigation System is at doubt.

Expenditure incurred by IIMI on this pilot project is quite high. Lots of funds are required to carry out a number of pilot projects at different locations of Punjab and Sindh Irrigation Systems to assess the success of implementation of the PIM programme in the country.

Attitude towards the PIM programme of those who are involved in running the present irrigation system is also in question. SDOs, Xens, and other staff of irrigation department perceive that they will loose their jobs. PID staff is custodian of centuries old irrigation system. Their expertise should be used for successful implementation of PIM programme.

There are also advantages/prospects of successful implementation of PIM programme, such as, successful PIM implementation will improve the farmers' awareness about irrigation management. Any illegalities can be more readily be accounted for. Similarly cohesion, among the farmers will be increased. Any bottleneck in the system can be taken care of at grass root level. Sense of ownership of irrigation network among the farmers will be increased. O & M charges may be reduced through mobilization of local resources. Moreover, interaction with different government agencies may be improved by effective working of farmer organizations. Further, representatives of FOs may communicate the different agencies more efficiently, so resulting in more speedy solution of the problems.

Accountability process will also be improved, as FOs will keep an eye on working of government agencies. Similarly, within farmer community, fear of accountability will be increased. FOs utmost survival and their self-respect depends upon not to indulge in bad practices. Further, competition among different FOs may give better quality service to the end users. Similarly, efficient use of resources on O & M would be ensured so as better-cost recoveries can be ascertained. Higher "Aabiana" charges may be collected from farmers through farmer organizations.

PERFORMANCE MEASURES TO ASSESS THE SUCCESS OF IMPLEMENTATION OF PIM PROGRAMME

Following performance measures can be studies to assess the success of implementation of PIM programme.

1. Financial Performance
2. Quality of O & M

FINANCIAL PERFORMANCE

Aspects of financial performance of irrigation management that are more related to PIM are as following:

a) Cost of irrigation to the government.
b) Cost of irrigation to the farmers.
c) Reduction in management staff.
d) Water charges and fees collection rates.

A) COST TO GOVERNMENT

One of the main reasons governments promote transfer programs is to save money by reducing the cost burden of irrigation management as shown in the following examples.

In the Philippines, the move to make the National Irrigation Administration (NIA) financially autonomous and to turn over irrigation system management to farmers by 1990 gave the government annual savings of US $ 12/ha from cash and in kind contributions (Korten 1991). In Sri Lanka, government expenditures on O & M were reduced from US $ 14.80/ha in 1985 to US $ 6.50/ha in 1994 due to implementation of PIM programme. In Uttar Pardesh, India, the transfer of a typical public tube well to farmer management reduced government subsides from US $ 876 to $ 656 on each tube well, after the implementation of PIM programme. Similarly, as a result of Mexico's large-scale management transfer programme, annual government subsidies for irrigation O & M fell from US $ 40 million in 1989 to zero by 1993.

From the above examples, it is evident that the cost of irrigation to government is decreased by PIM implementation programme.

B) COST TO FARMERS

It has been noted that where significant subsidies that existed before the transfer is dropped, the cost of irrigation to farmers may rise substantially. High cot systems, such as pump irrigation, are especially likely to significantly increase the cost of water to

farmers. Lift irrigation systems seem to be the most financially vulnerable after transfer (Vermillion, 1998).

In Senegal, project reports indicate that due to a loss of government subsidies, water charges rose 200 to 400 percent, despite a 50 percent decrease in the cost of electricity for pumping. (Meinzen, 1997). In Indonesia, water charges to farmers of pump schemes were increased five-fold to seven-fold when government subsidies were lowered and PIM programme was implemented (Johnsons, 1993). Reforms leading to local, financial and managerial self-reliance in the Bayi and Nanyao irrigation districts in China resulted in increased in annual surface water cost in Bayi from US $13/ha to $ 36/ha and in Nanyo from $ 24/ha to $ 60/ha in 1992 (Zhang 1994). In six irrigation districts of Mexico, an immediate and consistent increase in water fees after irrigation management transfer to farmers (ranging from US $ 2.25 to $ 7.79/100m3) have been reported (Johnsons, 1996).

Studies in USA (Vermillion, 1994) and the Philippines (Lauraya, 1994) report an engineer's concern that tendency of farmers to push cost-cutting to extreme after irrigation management transfer to them, may accelerate system detritions. Moreover, it may be noted from the above-narrated studies that there is a tendency to rely on data about costs or irrigation to the government or costs of irrigation to farmers, without combining the two to derive the total cost of irrigation. Combined evaluations are needed to get a complete picture on financial impacts of irrigation management transfer to farmers.

C) MANAGEMENT STAFF

In countries, where transfer is intended to reduce the government expenditures, reports generally indicate that irrigation agency staff size diminished following implementation of PIM programme, either at system or administrative levels. This decline is often gradual however as governments wait for staff to retire.

In the Philippines, the number of employees of the NIA at regional level and system level throughout the country was reduced while the service area per staff member improved from 38.5 ha/staff in 1976 to 100 ha/staff by 1985, as a result of management transfer to farmers (Kloezan, 1995). In Columbia Basin Project in USA, there were 612 Bureau of Reclamation staff members in 1969 i.e. the year of transfer. By 1985 only 83 remained. Staff decline was even steeper in the Irrigation Land Management Division where staff members dropped from 277 in 1969 to only 22 in 1985 (Vermillion, 1994). In Mexico, total irrigation staff fell slightly after transfer but government staff dropped from 7742 before transfer to 4450 by 1993. (Johnsons, 1996).

When the government policy is to reduce or eliminate irrigation management staff when carrying out transfer programs, the government usually relocates staff members into system that are not being transferred. As in Indonesia and Sri Lanka they do not fill posts when staff members retire. As in Philippines, it encourages farmers associations to hire former agency staff members after transfer. As in Colombia, it may transfer staff member into non – O & M activities, such as construction of new system (as in Turkey), or revise

the agency's overall mandate, such as in USA where the Bureau of Reclamation shifted into environment regulation after the end of construction era.

C) WATER CHARGES AND FEE COLLECTION RATES

It is evident from the different studies that feel collection rates increase after implementation of PIM programme as shown in the following examples.

In the Philippines, fee collection increased from 20% before to 81% in 1989, after irrigation management transfer in a NIA system in Southern Luzon (Kloezen, 1995). In Mexico, water fees collection rates rose from only 15% before transfer to 80 to 100% afterwards (Gorriz, 1995). Similarly in China, total water fee collection throughout the country increased from U $ 51 million in 1984, when reforms were just starting, to $ 415 million in 1992, partly because collection rates increased from 30% in 1984 to 70% in 1991 (Zhang, 1994).

In summary, the typical financial impacts of management transfer are lower overall costs of irrigation to government, an increase in the cost of irrigation to farmers. and higher rates of collection of water charges from farmers.

It is worth mentioning that the financial viability of post – transfer organizations is more apparent in areas where agricultural and economic productivity of irrigated agriculture is high (such as in the USA, Mexico, Chile and Colombia). The most problematic financial situations appear to be where the cost of irrigation to farmers is already high (as in lift schemes in India, Bangladesh, and Indonesia) and where either the government is dropping a subsidy or where the profitability of agriculture is not high. It may be noted that policies about who will be responsible for future rehabilitation and modernization are normally quite unclear. Similarly, though should be given about raising of capital repayment fund as only very few FOs have established such funds. (Vermillion, 1994).

In Pakistan, financial management is yet to be handed over to FOs at distributary level, so no statistics can be ascertained about financial performance of FOs.

QUALITY OF OPERATION AND MAINTENANCE

Mixed opinion about quality of O & M may be build after comparing the studies conducted by researchers working on different projects where irrigation management is transferred to farmers.

Oorthuizen (1995) reports that water distribution became less equitable and maintenance conditions worsened in surface irrigation schemes in the Philippines after management transfer to farmers. Similarly Johnsons (1993) reports that deterioration of pump sets accelerated after management transfer in lift irrigation schemes in Indonesia. IIMI and BAU (1996) reports about declining number of farmers reporting adequate and timely water delivery, higher break down rates in smaller pumps however spare parts and repairs

are easier in lift irrigation schemes after management transfer to farmers in Bangladesh. Aziz (1994) reports about surface irrigation schemes in Egypt that irrigation time is reduced and adequacy of water is improved after management transfer. Musa (1994) reports about surface irrigation schemes in Nigeria that equity is improved and 12% more water reached in middle and tail reaches after irrigation management transfer.

Kloezen (1995) reports on a case or irrigation management transfer to farmers in Southern Luzon, the Philippines, where financial autonomy prompted farmers to take cost-cutting measures that negatively affected maintenance conditions of system. Similarly, Vermillion (1994) for the USA and Graces – Restrepo (1996) for Colombia report a similar tendency of farmer elected boards of directors to cut costs to the point of comprising O & M performance.

Following inferences can be deduced from study of different research reports:

1. Accelerated deterioration of infrastructure is most often reported in pump irrigation schemes, where government subsidies are withdrawn.

2. Favourable maintenance conditions are reported in locations where the economic value of irrigated agriculture is relatively high such as USA and Colombia.

3. There is another program embedded in several of the attempts to attribute improvements in operational performance to management transfer. In many countries, such as the Philippines, Nepal, Sri Lanka, Indonesia and also in Pakistan, transfer programs include physical rehabilitation and repair of irrigation infrastructure. In such cases, improvements in operational performance may be more due to the result of physical improvements than that of management reforms. (Vermillion, 1996).

4. For several years, Water Users association has been promoted as both a governing and management body for irrigation systems. Community organizers have helped water users association to develop constitutions and by laws, select leaders approve plans and budgets, and apply sanctions. Water Users association then directly manages operations maintenance and finance. This model is probably not well suited for management at higher levels or larger systems or in more complex management environments as in the case of Pakistan. Accountability between farmers and leaders, especially in finances, is often weak, and water users associations generally do not have professional staff. As a result, many conclude that transfer can only occur at small scale of management. (Vermillion, 1996).

To assess the scope of PIM in Pakistan, following aspects of implementation of PIM programme have been studies in detail:

(i) Engineering aspects
(ii) Legal aspects
(iii) Financial aspects

These aspects are discussed as follows:

ENGINEERING ASPECTS OF PIM

SYSTEM CONSTRAINTS:

The irrigation system of Pakistan is "protective" which aims at maximizing the return per m^3 of water. Farmers over a vast area are supplied with little irrigation water and they are supposed to select the cropping pattern that will survive under these circumstances. Decision making procedure for water allocation may be categorized as "Imposed Allocation" as O & M agency determines on the irrigation water allocation to the farmers without consultation of Water Users associations or farmers.

Flow control of Indus Irrigation System may be categorized as "Proportional Control" which divides and distributes the water according to a pre-set and fixed ratio. It always provides a proportional distribution of water in case of unintended excesses or shortages in the system. Its construction and operation is simple. However, this flow control system cannot be used efficiently for different crops with different water needs, since the flow cannot be regulated. Pakistan, as a whole is situated in a water short environment and constituents of irrigation system are built up taking into account of this single but most important factor.

One of the major tasks in case of semi-demand/On Demand systems of Water Users Associations is "Water Indenting" according to crop water requirements. In our system, one can foresee that FOs have no rule in water indenting based on crop water requirements. Water indenting is a major assignment for FOs in other systems in other parts of the globe but this is insignificant in Pakistan's system.

SYSTEM SEGMENTATION FOR FARMER MANAGEMENT

Determination of irrigable areas and alignments of distributaries and minors depends upon topography of the area. There are a number of small channels serving a few hundred hectares of taking directly from main canal as topography of the area is such that it can only be fed from the main canal, not from any branch and distributary. For instance, in Lower Bari Doab Canal (LBDC) system, command areas of distributaries and minors vary from 355 ha for the 16 AL distributary to 96, 924 ha for the 10-R (Jahanian) distributary (Nespak Feasibility Report, 1995).

Under the proposed PIM set up, farmers' organizations will be responsible for operating, maintaining and managing the irrigation system in manageable units. In order to avoid disputes between such units, concerning the distribution of water, these units should be independent hydraulic units with their own intake points. At this point, measured volumes of water would be delivered to the units for distributions to the farmers' fields.

An optimal size for farmer operated units is estimated to be around 10000 ha for reasons of internal communication, social control and convenience of management (LBDC Feasibly Report, Nespak 1995).

Consider the example of LBDC, where Is, however, a considerable variation in the command areas with independent intakes; the branch canal and 13 of the distributaries having CCA, substantially in excess of the preferred 10, 000 ha. It would therefore be necessary to sub-divide the larger distributary commands into units of around 10, 100 ha. Two options were considered for this sub-division.

For option I, the existing configuration of the canal system is left unchanged. Only the most upstream farmer operated unit on a distributary would have an independent off-take; which would also have to carry the discharge for all units further downstream along the distributary. Thus a downstream unit would have to depend on one or more upstream units for its supply or irrigation water.

In option II, the larger distributary would be converted into branch canals and new parallel distributaries/minors would be constructed, each of which would supply only one unit approximately of 10,000 ha. The head regulator of such a distributary/minor would be provided with a gate and measuring device. Where necessary, several smaller minors could be combined to form one unit of about 10,000 ha.

Option II outweighs due to the following reason: -

- Each FO operated unit would have one independent intake at which measured volumes are received from the main canal agency.
- FOs would receive their supplies directly from the utility and not through other units, thereby avoiding disputed over the stealing of water and maintenance of common canal sections.
- The highly inaccurate determination of volumes based on the difference between upstream and downstream discharge measurements can be avoided.
- Social control and convenience of management of this homogenized FOs unit will be easier.
- This option could much better supports the principle of transparency of distribution, which is considered the key to the success in introducing farmer management in the irrigation system.

However it can be foreseen that implementation of option II is very difficult due to the following reasons:

- Lot of expenditure has to be incurred to construct independent canal intakes and new branch and distributary channels.

- Disruption in the irrigation system during construction is quite considerable.
- There will be vast tracts of land left which cannot be fed from these proposed new channels due to the command problem as these can only be fed from direct supply from main canal.
- Acquisition of agriculture and residential land from inhabitants of the area, may prove to be a big hindrance for implementation of option II
- Extensive resettlement plans may be needed for people dislocated from their agricultural and residential property. The cost of these resettlement plans would be quite high.

From the above discussion, it can be visualized that present irrigation network is not capable to support the principle of transparency of distribution of water amongst farmers which is considered the key to success of implementation of PIM. However, construction of alternate system is not only very expensive but also due to command problems along with the resettlement problems will not give the desired results.

LEGAL ASPECTS OF PIM

The legal framework for the establishment of WUAs, and for enabling them to operate and maintain such parts of the irrigation system, consists basically of three sets of legal instruments, namely:

- The enabling Law
- The bylaws of the WUA, and
- The transfer agreement between the irrigation agency and the WUA.

THE ENABLING LAW

For a WUA to be established as a legal entity there has to be a law authorizing its establishment. Punjab Irrigation and Drainage Authority (PIDA) Act, 1997 will act as the enabling law for the formation of WUAs in the province of Punjab.

BY LAWS OF THE WATER USERS ASSOCIATIONS

Whether established under a separate law or under an umbrella of enabling law, the WUA would normally be required to prepare and agree on its bylaws before it can be registered as a legal entity. These bylaws may be balled "Regulations", "Constitution Charter" or "Articles of Associations." The issues that such bylaws need to address include: -

i) Objectives of WUA
ii) Criteria for becoming a member of the WUA
iii) Number of farmers required for the establishment of a WUA.
iv) Operation and maintenance.
v) Water charges.
vi) Rights and obligation of the members.
vii) Establishment of a Federation of WUAs.

Punjab Government has made rules (1999) under Section 16 of PIDA Act, 1997 to establish Pilot Farmer Organizations. These rules give directions about membership, territorial jurisdiction, constitution and registration of pilot farmer organizations. These rules also describe about functions and powers of Farmer Organizations. These rules also pertain to cancellation of Registration, suspension and dissolution of Farmer Organizations. These rules also give details about election procedures of Farmer Organizations. Details about financial resources and expenditures, accounts, and audit procedures are also given.

THE TRANSFER AGREEMENT

The transfer agreement is the agreement between the WUA and the irrigation agency in which irrigation agency agrees to transfer to the WUA responsibilities for operation and maintenance of certain part of the irrigation system and the collection and remitting of water charges and the WUA agrees to carry out responsibilities numerated as below:

i) Area and irrigation system to be transferred

The agreement would need to define clearly the irrigated area to be transferred specifying the size of the area, and the command under which it falls, including the irrigation system existing there that is being transferred. The irrigation system to be transferred may be of tertiary, secondary or primary level including drainage of such areas too.

ii) Interim Joint Management

Some arrangements may provide for a joint management of the irrigation system for a short period of time by both the irrigation agency and WUAs. This interim joint management will prepare the WUAs for taking over full responsibility of operation and maintenance of such irrigation systems.

iii) Transfer of the Irrigation System

Transfer of the irrigation system to the WUA will be proceeded by a number of actions, including the preparation of an inventory of the works, structures and equipment to be transferred, joint inspections of those works and structures, carrying out of necessary testing and repairs, If any, at the irrigation agency cost and handing over management of the system along with all necessary documents and instruments to the WUA.

iv) Responsibilities of the Irrigation Agency

The agreement would spell out clearly the responsibilities of the irrigation agency which may include handing over the system in a reasonably operating manner, delivery of water to the WUA in bulk at the agreed time and providing the WUA with an agreed upon financial assistance and other benefits.

v) Responsibilities of the WUA

A number of responsibilities of the WUA are usually spelled out bylaws of the WUA, but may still be included in the transfer agreement to clarify the obligation of the WUA towards the Irrigation Agency.

COMPARISON OF DIFFERENT ACTS AND ORDINANCES WITH REFERENCE TO FORMATION OF WUAS

Following are the Acts and Ordinances which are being used in managing the Punjab Irrigation System and can be examined to assess the implementation of PIM programme in Punjab.

1. The Canal and Drainage Act (1873)
2. The Punjab Minor Canals Act (1905)
3. The Soil Reclamation Act (1952)
4. The Cooperative Agriculture Act (1976)
5. The Cooperative Societies Act (1920)
6. The Punjab Water Users' Association Ordinance (1981)
7. The Punjab Irrigation and Drainage Authority Act (1997)

The Canal and Drainage Act (1873), the Punjab Water Users' Associations Ordinance (1981) and the Punjab Irrigation and Drainage Authority Act (1997) are directly related with irrigation and Water Users Association, so comparison of these laws in context of formation of FOs is given as below:

The Canal and Drainage Act (1873), which is the principal legislation for irrigation in the Punjab Province, has no scope for the Water Users' organizations. Whereas the Punjab

Water Users Associations Ordinance (1981) provides for such associations only at watercourse level, but these associations are under tight beauratic control. Moreover this ordinance does not provide for any Water Users Association at the higher (i.e. distributary and branch canal) levels.

The Punjab Irrigation and Drainage Authority Act (1997) provides for establishing Farmers Organizations (FOs) at distributary and minor level, with functions as assigned to them by the Provincial Government. The Act will, therefore, govern the FOs at distributary and minor levels, while the associations at the watercourse level will be covered under the Punjab Water Users Associations Ordinance (1981).

PRESENT LEGAL FRAME WORK FOR IMPLEMENTATION OF PIM PROGRAMME

The enabling law for formation of FOs have been established as PIDA Act, 1997. Bylaws of WUAs and FOs have been framed under the PIDA (Pilot Farmer Organizations) Rules, 1999.

However, transfer arrangements between the irrigation departments and FOs system have yet to be finalized. PIDA has desired to establish 120 FOs by the end of this year (i.e. 1999) but no FO has been established till the end of November 1999. Further necessary documentation for transfer agreements has, yet, to be completed.

It is worth mentioning that, although legal enactment are necessary, these should be "enabling legislation's" to support WUAs once they have framed and after they have gained some initial momentum. It is preferable to have FOs, which exist and operate first and foremost as social realities, which are subsequently reinforced by legal identity and backing. Reversing the sequel-creating laws that have later to earn public support is less likely to produce useful results.

It is dangerous to use a purely legal approach to set up FOs. Legal provisions tend to be uniform, prescribing sizes and numbers. The FOs set-up under such uniform prescriptions may not be appropriate to each particular setting.

FINANCIAL ASPECTS OF PIM

(a) Operation and Maintenance (O & M) Charges of Punjab Irrigation Department

It is beneficial to review the financial figures of operation and maintenance expenditures of Punjab Irrigation Department. Table 1 gives Budget Demand by PID for the year 1997-1998.

Table 1. PID's Demand Budget for the Irrigation Network for the Year 1997-98 (Rs. Million).

SPENDING HEADS	ESTABLISHMENT	MAINTENANCE &REPAIRS	TOTAL DEMANDED BUDGET
Administration	126.499	0.000	126.499
Canals	666.225	1132.275	1798.500
Mughalpura Irrigation Workshop	22.168	0.442	22.610
Bhawal Irrigation Workshop	13.104	0.690	13.794
Director Design	3.671	0.085	3.756
Tubewells	266.248	1893.181	2159.429
Flood Control & Drainage	141.539	230.329	371.868
Dams	19.872	7.792	27.664
Excavator & Store Div:	24.065	0.244	24.309
Research Institute	29.706	2.640	32.309
Administration (Direct. Of land Reclamation)	14.076	9.850	23.926
Water logging Salinity Control	40.999	1.450	42.449
Canal (Revenue establishment)	349.460	0.000	349.460
Punjab Eng. Academy	5.000	0.000	5.000
Grand Total	1722.632	3278.978	5001.610

Source : Mehmood (1998)

Half of the establishment's flood control and drainage expenditure may be charged to the canal network for estimating reasonable relevant expenditures on canal network. Similarly administration spending is to be shared by the canal network in proportion to the expenditure on the canal related establishment to that of the total spending on establishment, which is about 56% of the total establishment expenditures.

The total establishment expenditure demand for 1997-98 was Rs.1723 million of which Rs.960 million was related to canals as shown in Table2

HEAD OF EXPENDITURE	ESTABLISHMENT BUDGET DEMANDED BY PID (RS.MILLION)	PERCENT APPLICABLE TO CANALS	ESTABLISHMENT EXPENDITURES TO BE CHARGED TO CANAL SYSTEM (RS.MILLION)
Administration	126.499	55.75	70.532
Canals (Executive)	666.225	100.00	666.225
Mughalpura Irrigation Workshop	22.168	100.00	22.168
Bhawal Irrigation Workshop	13.104	100.00	13.104
Director Design	3.671	100.00	3.671
Tube wells	266.248	0.00	0.000
Flood Control & Drainage	141.539	50.00	70.770
Dams	19.872	100.00	0.000
Excavator & Store Div:	24.706	100.00	29.706
Research Institute	29.706	100.00	24.065
Administration (Direct. Of Land Reclamation)	14.076	100.00	14.076
Water logging Salinity Control	40.999	100.00	40.999
Canal (SPtl Reveue)	349.460	0.00	0.000
Punjab Eng. Academy	5.000	100.00	5.000
Grand Total	1722.632		960.307
CCA (acres)			20,829,396
Cost per CCA (Rs/acre)			46.10

Source: Mehmood (1998)

Break up of the PID maintenance budget for the year 1997-98 for canal related expenditure heads is given in Table 3.

Table 3. Break up of the PID Maintenance Budget for 1997-98 for Canal related Expenditure Heads.

ITEMS	MAINTENANCE & REPAIRS	PERCENT APPLICABLE TO CANALS	MAINTENANCE & REPAIRS OF CANALS SYSTEM (RS.MILLION)
Canals (Executive)	1132.275	100.00	1132.275
Mughalpura Irrigation Workshop	0442	100.00	.442 s
Bhawal Irrigation Workshop	0.69	100.00	0.69
Director Design	0.085	100.00	0.085
Tube Wells	1893.00	0.00	0.00
Flood Control & Drainage	230.32	50.00	115.16
Dams	7.79	0.00	7.79
Excavator & Store Division	0.244	100.00	0.244
Research Institute	2.64	100.00	2.64
Administration (Direct of land Reclamation)	9.85	100.00	9.85
Water Logging Salinity Control	1.45	100.00	1.45
Canal (SPtL Revenue)	0.000	0.000	1.45
Punjab Eng. Academy	0.000	0.000	0.000
Grand Total	3278.978		1262.83

Source: Mehmood (1998)

Reasonable O & M costs for the Irrigation infrastructure of the Punjab Irrigation System is given in Table 4.

Table 4 Reasonable O & M Costs for the Irrigation Infrastructure of the Punjab Province for the year 1997-98

EXPENDITURE BASIS	ESTABLISHMENT	MAINTENANCE & REPAIRS	TOTAL O & M EXPENDITURE
Canals System (Rs.million)	960.307	1262.80	2223.13
Average expenditure (Rs./acre of CCA)	46.10	60.62	106.72

b) Estimation of O & M Expenditures at Distributary level by IIMI (1998)

Mehmood and Khatri (1998) IIMI has carried out and exercise to work out O & M expenditures on Hakra 4-R Distributary. Based on the observations in 1997, financial estimates were prepared to reapir the said damages at 4-R Hakra distributary. Mehmood & Khatri has worked out annual maintenance cost (Rs./CCA acre) based on these financial estimates which is equal to 30.29. Similarly operational cost per CCA was worked out by Mehmood and Khatri was Rs.25.89 / acre after assessing the staffing requirements, traveling expenses, office rent and other utilities.

Mehmood and Khatri worked out total O & M expenditures as Rs.56/CCA acres upto distributary level. It means that the total liabilities of the farmers are calculated to be around Rs.106.72 per CCA acre per annum (Table 4) of which about Rs.56.00 are to be incurred on the distributary itself by FOs and remaining Rs.56.72 would be available for the maintenance of main system above distributary level by AWB/PIDA.

Financial management has not yet handled over to FOs in any part of Pakistan till the end of October, 99 in spite of pIDA plan to establish 120 FOs by the end of this calendar year. So validity of the exercise carried out by IIMI to work out the O & M expenditures at distributary level, is yet to be tested.

By examining the performance measures to assess the implementation of PIM in different countries (Article 3 of this paper), one can conclude that cost of irrigation to the government will decrease whereas cost of irrigation to farmers will increase. It is also evident that water charges and fees collection rates will be increased after implementation of PIM programme in the country.

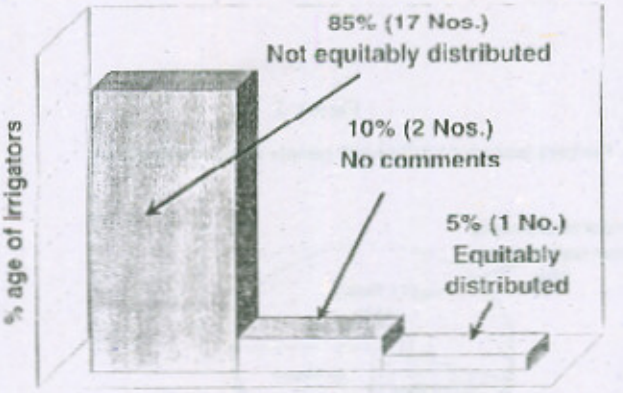
FARMERS' PERCEPTION ABOUT PIM IN LCC (EAST) CIRCLE

A study has been carried out to assess the farmer perception in PIM programme. Area selected for the study was Lower Chenab Canal (East) Circle. Results of the study are as numerated below.

There was almost consensus on the issue that after is not distributed equitably in the irrigation channels. Farmers' perception about inequity of water is given in figure 1.

Figure 1

Farmers opinion about equitable distribution of water



Reasons for inequity of water are tempering of outlets, mismanagement by PID staff, cutting of channels by culprits at upper reaches, wara-shikni by zamindars and kuccha watercourses. Farmers' perception about technical reasons for inequity of water are given in the following Table 6

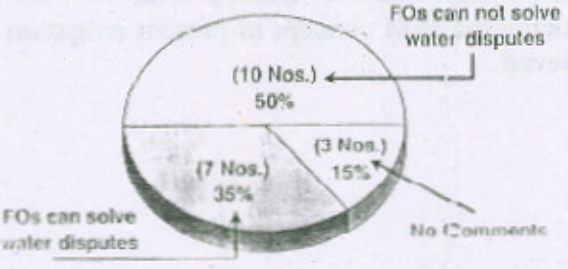
Table 6. Farmers' perception about technical reasons for inequity of water

FARMER PERCEPTION ABOUT TECHNICAL REASONS FOR INEQUITY OF WATER	%AGE OF FARMERS
Siltation of Channels	40%
Weak Canal Banks	20%
Tampered Outlets	25%
Others	15%

When farmers were asked about FOs ability to resolve the water disputes among the farmers, 50% of the farmers said that farmers couldn't solve their water disputes among themselves due to social rural culture of farmers' society. 35% of farmers said that farmers could solve the water disputes among themselves as shown in figure 2 below.

Figure 2

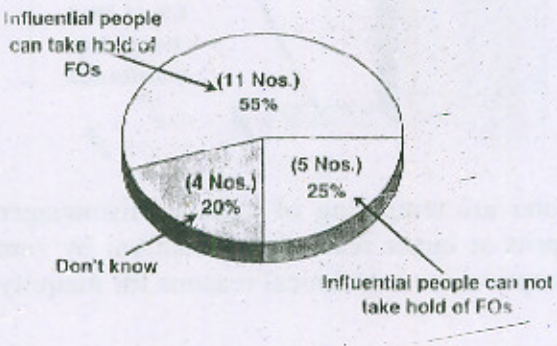
Farmers Perception about Water disputes resolutions by FOs



Similarly 55% irrigators fear that FOs may not work effectively as influential people will get hold of these FOs and weak people will be deprived off the benefits as shown in the Figure 3 below:

Figure 3

Farmers fear about influential people to take hold of FOs



About 45% of farmers also fear that expertise for operation, maintenance and management would not be available to farmers so these FOs may not be as useful, as shown in Table 6.

Table 6 Farmers' Willingness to Perform the Maintenance Activities*

Can perform the maintenance activities	35% (7 Nos.)
Don't know at this stage	20% (4 Nos.)
Can not perform the maintenance activities	45% (9 Nos.)

Maintenance activities include slit clearance, back strengthening, killa bushing, repair and modifications of structures, repair of services roads etc.

About 25% farmers are of the view that FOs will not be taken over by influential people and these FOs will work eficiently. Similarly, about 35% of farmers think that management of irrigation system can be handed over to FOs. These irrigators are confident that by introducing the PIM concept in present irrigation management system, better results can be achieved.

RECOMMENDATIONS AND SUGGESTIONS

For successful implementation of PIM programme in Pakistan, following recommendations and suggestions are proposed.

1. It is suggested that PIM concept should be implemented by adopting a programme approach instead of a project approach through integration of engineering, legal, financial, social and agricultural components. The ultimate goal should be to facilitate water users by providing better irrigation service.

2. Farmers' participation in irrigation management can be best achieved by following a gradual and phased approach. If PIM programme is implemented though a gradual and phased process, it would appear to be more realistic and implementable in Pakistan's social set-up and the system constraints.

3. There should be a continuous process of monitoring and evaluation through all the phases of PIM implementation programme. Consider the example of Egypt, the process for establishing WUAs has seven phases, which build upon each other in a flexible time sequence. The Irrigation Advisory Service evolved a flexible but systematic process for helping farmers to form their private WUAs. This has been revised each year as lessons learned are fed back into the process for refinement through continuous monitoring and evaluation.

4. Provincial Irrigation Departments are custodian of the world's largest contagious irrigation system. The history of Irrigation Departments is more than hundred years old. It will be beneficial if PIM programme is implemented through Irrigation Departments so as their experience as expertise are effectively utilized.

5. Several pilot projects of PIM programme are being run in all the four provinces of the country. It is felt that best way to expand the PIM programme is that water users of adjoining areas made their own WUAs by inspiration through success of WUAs of pilot areas. This process of inspiration and self-motivation countries till social awareness about benefits of PIM programme is spread over the whole country.

REFERENCES

1. Asrarul Haq, 1998, IIMI, Case Study of Punjab irrigation Department.

2. Dil Muhammad, 1998, IIMI, Legal Framework for Irrigation Management in Punjab and Sindh Provinces, Pakistan.

3. Dougls L. Vermillion, 1996, IIMI, Impact of Irrigation Management Transfer: A Review of Evidence.

4. Economic Development Institute of the World Bank., September 1997, Hand Book on Participatory Irrigation Management.

5. Mehmood-ul-Hassan, Nov., 1998 Preliminary Business Plan for the WUF of the Hakra 4-R Distributary.

6. Nespak, 1995, Final Report on Feasibility Study of 2nd Irrigation and Drainage.

7. Sukh Bias/Lower Bari Boab Canal Project.