PROSPECTS, PROBLEMS AND LESSONS FROM INSTITUTIONAL SET-UP FOR THE SUCCESS OF DRAINAGE TECHNOLOGY FROM HARYANA IN INDIA[1]

K.K. Datta[2]

ABSTRACT

Sustainability of irrigated agriculture is under threat due to waterlogging and soil salinity. In India, about 36 percent of irrigated lands have been damaged due to waterlogging and salinity whereas world over it is about 24 percent. This disappointing picture caused due to faulty irrigation development has now resulted in the planners giving grater attention right at the planning stage to include irrigation improvement intervention as a preventive strategy. However failure of institutional aspects of implementing the improvement strategies, lack of provision of drainage coupled with social aspects relating to ineffective communication between farmers and the agencies have all contributed to failure of our efforts to prevent the growing problem of waterlogging and salinity. Despite the wide acknowledgement the preventive strategies like irrigation improvement intervention have only a limited scope for immediate benefits to the farmers whereas curative measures like subsurface drainage (SSD) are needed to tackle the problem of water logging and salinity. The results from small scale as well as large drainage area from Harayana, Gujarat and Rajasthan showed that it is possible to obtain several farm-level benefits through installation of sub-surface drainage. These include (i) substantial increase in farm income, (ii) crop intensification and diversification towards high value crops, (iii) generation of employment opportunities, (iv) high internal rate of return justified investment in sub surface drainage and (v) Narrowing of income inequalities across farm producers. In spite of economic, social and environmental benefits, the sustainability of the sub surface drainage technology is always questioned due to absence of appropriate institutional arrangements. The specific reasons may be classified into two broad aspects viz., (a) technical reasons and (b) social reasons. Technical reasons are mainly due to (i) indivisible nature of the technology, (ii) unforeseen nature of weather, (iii) unpredictable uprise of watertable. Social reasons are (i) lukewarm collective action by the beneficiaries, (ii) conflicting objectives among beneficiaries, (iii) growing numbers of free riders and (iv) fegile efforts for institutional support. To minimize those problems, institutional arrangement in the form of collective action has taken place to facilitate the conduit. Lessons from such type of organization were highlighted. The analysis revealed that the technology without institutional arrangement might not yield desired results. A technology with high potential benefits may not make a difference and can be abandoned in the absence of required institutional arrangements.

Key words: Free riders, Indivisibility, Conflicting Objectives, Fegile efforts, and Sustainability

1 INTRODUCTION

Now a day, there is a fashion to talk about farmer's "participation" in irrigation and drainage management. However, what is wrong with the traditional system? Most of the traditional system failed to deliver the goods effectively and efficiently. May be second defense is needed for efficient system management through participatory approach. Participatory approach may help to run the system more effectively and efficiently, reduce the O & M cost and reduces the conflict.

Keeping in mind, that participatory approach will help the users to maintain transparency, accountability and supporting incentives to the users by managing, operating and maintaining of drainage system. The main draw back in the system that it assumes free market mechanism will work implicitly i.e., well-capitalized and market-oriented farmers will take care the operation and maintenance. However, in reality it is difficult because the inherent drawback of unsatisfactory performance of irrigation and drainage system. It is mainly due to non-fulfillment of the target, incompatible rational action with collective rationality and finally quantity-constrained behaviour compelled the individual to adjust his or her own private decisions. Even if the market fully reflects the values for individual goods and services, the market would still allocate less than a socially optimum amount, as the farms are unable to fully appropriate the gains from it. Without internalization of environmental externality and holistic approach, only shifting the power will not improve the system. Recent study (Brewer, 1997) from five Indian states about irrigation management transfer concluded, " Irrigation Management Transfer (IMT) has not proceeded very far in India. Even in those states that have formulated a clear policy such as Maharashtra, there has been little progress of actual transfer to group of farmers. There is not yet clear-cut evidence to prove that IMT will achieve these goals. However, the indications are that IMT can achieve these goals completely or in part. To do so IMT policies and programs must be designed to provide clear benefits to farmers as well as to the state, and the policies and programs must actually be implemented as designed". The focus of this paper is on farmer's participation for the reclaimation/prevention the waterlogged saline soil by involving farmers in the building up institutional set-up. Hardly any evidence of evaluation yet on participatory drainage development. In India, Haryana state was selected for our study area where subsurface drainage (SSD) was installed in 1000 ha in Gohana and 500 ha in Kalayat area in Sonepat and Jind districts under Indo-Dutch Collaborative funds.

2 EXTENT OF THE LOSSES

Several scholars have highlighted the extent of water logging and secondary salinisation due to mismanagement of irrigation. Worldwide the extent of damage due to salinisation is ranging from 36 to 12 percents. In India, the damage of irrigated area due to salinisation is more as compared to top five world wide irrigated countries (Rydzewski, 1992). In the global level, the annual loss from 45.4 mha salt affected lands in irrigated area has been estimated as US $ 11.4 billion (Ghassem et al., 1995). In India, estimated loss varies in different command areas. Cropwise the pure effect of soil salinity in declining yield ranged from low level of about 3 to 1 percent for sugarcane and wheat in parts of western Yamuna canal and the Bhakra system. An high level of about 74 to 64 percent was noticed for paddy and all crops in the Sharda Sahayak Irrigation Projects (Joshi et al 1995). In the Chambal irrigated command area it was about 21,000 ha (Ajmera, 1997). In Western Yumana Canal and Bhakra system the annual income losses due to water logging and salinity ranges from Rs. 2550 to 8300/ha (Datta, 1996). Recent estimate shows that the annual economic loss from the waterlogged saline area in Harayan is in the tune of Rs 1640 million (Datta and De jong, 2002). The variation of losses mainly depends on the degree of degradation of land. It is interesting to mention that farming community is still not worried about the dimension of the problem, because the severity of the problem is not uniform. Major losses due to waterlogging and soil salinity at farm level threats the sustainability of land resources, decrease the farm production by abandoning of crop production; decline in resource productivity and cut-back in resource use. At the regional level, the consequences are displacement of labour from agriculture, wider income disparities and affect the sustainability of secondary and tertiary sectors. At national level the negative effect of waterlogging and salinity are in the form of decline in agricultural production, affect the gross domestic product, bring down export of important crops and increase import bill (Joshi el al, 1995).

3 TECHNOLOGICAL OPTIONS

Various remedial measures such as better water management, consumptive use of canal and ground waters, improvement of surface drainage, on-farm development, forestry and shallow ground water management were suggested. Increasing the ground water discharge and controlling the water table can be effective by vertical (skimming well) or horizontal drainage. In the Tenth five-year plan (2002-2007) in India, it is proposed to improve the efficiency of end-use of water through adoption of water-efficient devices and promote consumptive use of surface and ground water. The entire attempt, which was mentioned, was present and initiative was taken for a long time, but all of a sudden calls for an organized solution by means of public intervention. Those solutions are not thought to require testing and modification for sustainability in long term. An attempt is always required in terms of diverting fund from one specific scheme to another alternative options. However as a preventive measure for short run, those solutions may be effective but for long term, subsurface drainage (SSD) has been proved to be the only option to reclaim the waterlogged saline lands, where salts are accumulated both in soil and ground water. In Egypt SSD has been provided in 1.75 million ha of its irrigated area and in Western U.S.A 25-30 percent irrigated area was covered under SSD. Pakistan also has embarked on a big programme of providing SSD in its irrigated area. Although the history of horizontal drainage in India started in 1925 at Chakanwali (now in Pakistan) and in 1928 at Baramani in Maharastra, the concept of SSD is new. It is now been realised that SSD is most important component of irrigation system management to maximize the benefits from irrigation investment. The cost of installation of SSD mainly depends on soil type, depth and spacing of drains, location under drainage and the type of the drainage material used. At present (1994-95 prices) the cost of manually installed SSD varies from Rs.22, 310 to Rs. 18, 525 per ha in Haryana (Datta and De Jong, 1997).

4 CONSTRAINTS OF THE TECHNOLOGY

In the saline environment, due to fragility, low accessibility, internal resource heterogeneity and marginality of biophysical resources, the farm families' sustain themselves through adaptation to harsh biophysical environments without dependable and effective external links on extensive scale. The people have to live with limited, high risk, low productivity options. To evolve their sustenance strategies through adaptations of limited natural resources, they included seasonally and spatially diversified land base activities. Despite internal inequities and occupational specific differences in gains, everybody's close dependence on local resources created an integrated collective stake in their activities. Despite yielding high dividends, collective action is required to realise the potential benefits from SSD due to indivisible nature of the technology. The study from several small scale as well as large scale (SSD) area in Haryana and Gujarat visualises several constraints in its adoption levels (Datta & Joshi, 1993). These are (i) indivisible nature of the SSD technology, (ii) no attraction to an individual farm household on investment to prevent or cure the degraded lands, (iii) increased economic differentiation and socio-political factionalism and (iv) internal heterogeneity and inequities. The technical and economic issues relating to curative or rehabilitation of land in the saline environment depends on its productivity. Evidence shows that people care more about more productive unit than unproductive unit. Reconciliation of interests of diverge groups is foremost for the success of SSD. Major improvements could readily be achieved by rehabilitating the existing degraded lands. However, the benefits would be rapidly vanishing when they are subsequently not well maintained.

In the technical side, farmers realized that SSD creates a problem by quickly removing water before plant had an opportunity to use any water from shallow ground water and made irrigation less efficient. Farmers opine that SSD systems should help to manage the

watertable at a potential level by holding water in the profile for plant use so that it may make irrigation practices more efficient. Secondly, in Indian condition the pumping of drain water is required during wet (rainy) season. Since most of the farmers grow paddy in the wet season, they require stagnant water in their paddy field. But SSD system remove the stagnant water quickly and hence frequent irrigation is needed for the paddy field which is more cost intensive and hence make effective irrigation less efficient. Thirdly, field investigation tells us that the paddy grown farmers frequently pump the drain water from the 'manholes' as and when needed for irrigating their near by fields as well as distant fields also. This practice automatically created a conflict between head and tail ender of the drainage boundary. As pumping the 'manholes' water reduces the watertable of the nearby fields and creates additional demand of irrigation for protecting the paddy field. For instance, in the Gohana area of Haryana, majority of the farmers wanted to grow paddy whereas the small or marginal farm size groups prefer to produce jowar for their livestock. Rice growing farmers blocked the lateral for maintaining the moisture in the paddy field. On the other hand, the tail-ender of the lateral block of SSD deprived to maintain such moisture in their field. For such reason, a differential crop-mix in a drainage area lead to conflicts amongst the beneficiaries. Thus, major problem arises when not all villagers subscribe to similar use or same product from SSD. Differential resource endowments mainly created the incompatibility of rational individual actions with collective rationality. Any kind of formal or informal group approach to manage problem soils will have to assure each individual participant that decisions of other individuals will not cause any negative eternality.

Participation of beneficiaries is widely accepted as the key for successful management of the drainage activity. It has been realised that mere planning and executing the drainage systems to manage saline and water logged soils by government agency may not yield the desired results unless there is a positive attitude and strong will of the beneficiaries to participate in the programme. If the conception, design and implementation of external intervention like SSD is not clear at the grass root levels, then such intervention will finally lead to disempowerment of the communities, disintegration the community stakes and marginalised the local knowledge system and institutional arrangement. From the study in Haryana and Gujarat, it was revealed that persuasion, education and demonstration of the beneficial role of farmers' participation is crucial for the successful operation in managing such type of problem soils (Datta and Joshi, 1993). Problems, lessons and prospects of setting up the organisation structure for drainage society in Gohana area will be discussed in details in the subsequent section.

5 OPTIONS FOR DRAINAGE ORGANIZATION

The process of transformation through technology has a strong interface with the existing as well as emerging institutional structures. Institutions are formed in order to bring an aggregate change in the use of factors and facilitate the production process. For the management of SSD, focus on bottom-up approach, sensitization of the decision-makers to local people's participation through participatory approach, identification and incorporation of rationale of traditional practices into new technological and institutional measures planned should be encouraged. Three interrelated concepts, viz. common goods, the SSD technology and empowerment of people's organization are the focal points from the inception of the organization. The centrality of common good, therefore, is expected to trigger off new processes that are self-balancing, both socially as well as environmentally. State should work as a promotional role to support the SSD developments. Each SSD blocks should compete for better service provision and production. It should neither the state promoted co-operatives nor the state-owned collectives. It should be self-governance where values like freedom, autonomy and dignity matter a lot along with material well being. The question may be raised that who will organise farmers to come together to manage their problem soils. The task may be taken-up by the government as well as non-government agencies. A preliminary review of the institutional options for creation of drainage organisation capable of implementing large scale SSD in Haryana reveals at least five distinct possibilities.

- The recognition/ restructuring of the Soil Conservation Office and incorporating the operational pilot drainage project nucleus organization to undertake large scale SSD.
- Incorporating operational drainage project into an existing Haryana Land Reclamation Development Corporation (HLRDC) or with Haryana State Minor Irrigation Tubewell Corporation (HSMITC).
- Creation totally new non-governmental organization exclusively for the implementation and monitoring the SSD.
- Creation of new department of agriculture, which will solely, charged with reclamation of wastelands where operational drainage project will work as a nodal organisational unit.
- Creation of drainage co-operative like Pani panchayats in Maharastra may be the another form.

In brief, three general directions for long-term establishment of a drainage organization appear possible, placing it in a governmental context or a non-governmental organization or a corporatised public enterprise environment. To recognise government agency seems pragmatic because of the pressures to minimize expansion of the public sector generally. But scaling up the existing drainage staff from department of agriculture, to a level sufficient to meet the challenges of large scale SSD could be accepted since this would be a budget neutral solution, consistent with the policy of restraining growth in the public sector.

Involving of some Non-Government Organisation (NGO) was recommended in order to mobilise and participation of farmers with a view to cover larger drainage area. The major constraints of NGO's is non-existing of such system in Haryana, out-siders NGO has its own problem of communication, lack of accountability on the part of NGO. Lack of knowledge of SSD, understanding the nature of the problem, and getting access to different interests groups for developing strategies to evolve solutions.

Other alternative is in the form of drainage co-operative like in Gujarat, which was registered as 'Saline land agricultural development Co-operative' in 1989-90 under the Gujarat Co-operative registration Act of 1860. The main activity of this co-operative was to share O& M cost. Widen the activities of drainage co-operative is essential for its sustainability. As the need for soil improvement will not be uniform in the entire drainage area, it varies across farms. The farmers located in disadvantageous position may not be enthusiastic to participate in such co-operatives in the long run (Datta and Joshi, 1993).
Place the Haryana Operational Pilot Project (HOPP) in the semi-governmental corporation. This could be accomplished by either creating a new organization with exclusive mandate for large-scale mechanized SSD works or to integrate the same into existing corporate entity as HLRDC or HSMITC. A move in this direction would potentially have advantages over the government locus. However, its success mainly depends on commitment and motivation of the staff.

6 APPROACH TO INVOLVE THE FARMERS

How farmers' involvement can contribute in SSD and thereby to improve their farm income in a sustainable way is the major issue, which rise in this section. Collective action was taken care (since collectors link and serve several farm units) to describe the process and consequences of individual decisions to voluntary coordinated behaviour. In reality, individuals associate themselves for a collective action with an objective to face the uncertainities and to search for solutions wherever possible. The individual not only gets an identity but also security in the process of collective action. Since individuals face a number of problems, unsolvable on their own they tend to assessable together to find solutions and this becomes an immediate necessity rather than a choice. The major issues that were addressed for setting up drainage society in the drainage areas of Haryana are:

1. Motivation and organization of farmers and preparing them for the selected activities;
2. Identification of activities and tasks where there seems to be scope for farmers' involvement and the nature of this involvement;
3. Assessment of the actual effects and benefits of the increased involvement and lessons learned for future similar projects.

It must be realized that the boosting of farmers involvement to irrigation is already a problem in many instances. The problem may be even bigger for drainage, because usually farmers do not attach much importance to drainage, let alone to maintenance of drainage systems. Ample attention must be paid to the factors involved in stimulating or jeopardizing the success of such an undertaking. Farmers' involvement can refer to different activities and levels, namely:

- Co-operation during installation of drainage,
- Maintenance of link and filed drains,
- Disposal the drain water as and when it is required and
- Maintenance of the structures at various levels in the system.

In the Gohana HOPP project area, it is assumed that farmers will not ask any compensation during the installation stage of SSD and they will allow as and when machine will move for installing the drainage. Cleaning and maintenance of collector drain will require at long interval say at 10-15 years interval and needs technical guideline. The main responsibility should be with the drainage and irrigation department and farmers' involvement on it to arrange labour as and when it requires. Pump the drain water as and when it requires is the main activity for which farmers have to organize and collect the fees for running the pump. Generally, it is needed during monsoon (wet) season. Participation of all drainage stack holders may reuse the drain water as and when they required it.

Since participation, power and well being are the key factors for the success of any technological intervention, from the beginning bottom-up and countervailing actions by the farmers to influence decision making through direct and informal means has given priority in Haryana Operational Pilot Project area. Participatory approach besides co-lateral relations and linkages at all level has been emphasised. The most distinguishing and striking part of SSD in Haryana is its vibrant and constant interaction with farmers, or rather all stakeholders. A full scale farmers' participation section (FPS) was created just to ensure that farmers and other stakeholders developed a basic awareness about SSD, what are waterlogging and salinity, what are their pernicious influences and how to design the works. Aim of the FPS was to bring the potential of farmers in a group who knows each other and band together to manage community resources.

In FPS, there are community Organizers (CO's). Their main task is to help the farmers to analyze their resources, and organize themselves into drainage society. A very well defined system of mass awareness coupled with gender focus was developed through FPS section. Farmers have been sensitized and enlightened about SSD. This section is always in touch with the village Pradhan (village head man). FPS section also developed good rapport with the progressive farmers, key and effective persons in the villages in order to settle any disputes arising during the process of installation of drainage who has good rapport with the villagers. Parallel Women's informal organization emphasized.

Farmer's participation is based upon bottom up, de-centralized, democratic, strategy in which farmers have the sense of owners of the drainage system. Flexible and learning approach to inculcate their maximum participation and interaction at every stage, consensus and co-operation of farmers is also essential to keep the construction process smoothly. Their co-operation also contributes to reduce the conflict during construction. To keep in such sprit it was decided consciously that the component of crop compensation need not be persued in view of the large-scale implementation of similar projects in the state. This policy decision helps to monitor the farmer's opinions about the involvement in the scheme. In the FPS section, the important role of the Community Organiser and Women mutilators in conflict resolution, when drainage block farmers are resistant during field construction activities. It also works as a second-line defense for Farmers' Drainage Society (FDS). In the course of installation of drainage, it was observed that neither a single farmer raised the issue of its crop compensation nor they resist installing the pipe.

7 APPROACH TOWARDS ORGANIZATION OF FARMERS

FPS section acts as an interface between farmers and the project. In the beginning, FPS section start the sessions to familiarize the local people in the area with the project objectives and activities. FPS section also selects those local people who are interested and sensitive to participate in the process. To motivate and for mobilization a written agreement is with all farmers on a drainage block basis. Farmers realize that major beneficiaries would be whose lands are covered under SSD. Drainage Block of about 50 ha was made in order to maintain optimum group of persons. Since larger groups, higher the transaction costs of bringing them together, and hence the higher the tendency to free rider. In order to avoid it, the number of farm families kept in a group is quite small. The number of farm families in FDS blocks ranges between 30-35. Detail of it given in Table 1. The societies are registered under Societies Registration Act 1860 under Section 21. Profile of the drainage society of Gohana is given in Table 2. The main objective of the FDS is to take care of operation and maintenance of the SSD system. There are about 22 FDS blocks planned in 1000 hectare (of saline waterlogged area) in Gohana. The preliminary task of each block of the FDS is to pump the initial drainage saline water (effluent) from the sump. Accordingly, they have created their own by laws so that the group's activities address the felt needs of the group members. The group has enough solidarity in compelling other people and organization to cooperate with them in addressing the common needs of the group members. FDS tends to be strongest when (i) it collects members' monthly or yearly fees in order to strengthen the financial position of the society (ii) the members of the society should give time as and when it is needed for the success of the group (FDS) and (iii) it provides credit facilities to their members through a carefully planned, mutually accountable credit programme.

Already most of the societies are registered and made functional. Most of the societies operated smoothly for initial pumping. Several review committees of the project observed that participatory aspect is encouraging and turnover of the operation and maintenance responsibilities to farmer's societies. In fact, the efforts are mainly to break down the old culture of dependence on public sector subsidies. FDS require common fund to prolong the O& M works on a sustainable basis. The effectiveness of first drainage Block is precedent for the subsequent efforts made in this direction. It is a learning process and must be stepped up systematically. An apex body of all the FDS was established to co-ordinate and pulls the experiences at the project level. The vitality of the FDS's will mainly depend upon considerable follow up required by the FPS with each FDS. Since the actual status of the turnover in different drainage block was unclear in the beginning, it is imperative that a clearly defined system has to be formulated before handing over to FDS. For instance in FDS block 12, even though installation of SSD was over for a long time, still the pump set for the pump is in unfunctional and no clear cut guidelines for disposing the drainage effluent. Similarly, in FDS block 13, the surface drainage through which effluent passes has not enough capacity. Overflowing of the saline effluent drainage water spoiled the paddy crops during 1998 to the nearby farmers' field. In FDS block 14, due to negligence of supervising role and management, pumping activity was neglected. Even then, record shows that the expenses for pumping are going on. But there are lot of malpractices going on since the beginning, even though the village Pradhan who is also the president of FDS block 14 appoints pump operator. Like that, there were lot of seepage of canal water directly to the sump and reducing the confidence of SSD technology to the farmers. In due course, all such types of problems were taken care properly. Success of FDS primarily depends on the strong determination and commitment of the personnel of the project authority to demonstrate exceptionally good performance and to solve farmers' problems regarding waterlogging and soil salinity in their field and that was the lesson we derived after taking care of all those problems.

Alternative to Farmers' Drainage Societies, it was recommended to involve some of the Non- Government Organisation (NGO) in order to mobilise and participation of farmers with a view to cover larger drainage area. In the process, NGOs may not only focus on selling their own perspectives and approaches but tend to build their own space and indispensability that will help the state, which neither understands the rural communities well enough nor can deliver promised goods and services.

8 LESSONS LEARNED

Since drainage technology is indivisible in nature, to an individual farmer adopting the technology in isolation is financially non-viable. It requires certain institutional arrangement. Whatever may be the form and its nature, drainage by its very nature requires huge investment. In addition to that, additional cost for its O& M is needed. Unless such costs are recovered from beneficiaries, the state has to incur large subsidies. In the study area, farmers are willing to pay for the drainage service, at least for the operation and maintenance costs. This is the more positive, because they are only becoming slowly aware of the fact that they have a serious problem, which they cannot tackle individually.

Secondly, the issue is whether drainage will be treated as public or private goods. It should be mentioned here that under Indian conditions, it should be public goods and should be linked with irrigation. It is clear that the farmer cannot bear the full burden of the cost of drainage. However, since the deterioration of valuable agricultural land has to be controlled for the sake of the farmer and society as a whole, land drainage is a joint responsibility of the Government and the farmers'. In India, irrigated lands in the arid and semi-arid area should be drained as soon as the need arises.

Finally, in conclusion it may be mentioned that though the process of salinisation is very slow, its intervention in terms of drainage investment must be needed from the beginning instead of it makes no sense to let the farmers suffer great losses over long periods before an unsustainable situation is corrected. Drainage investment in this case will be treated as conservation of natural resources. In that case, subsurface drainage projects would become economically feasible before the land is seriously affected and farmer suffers great income losses. Because as conservationists all over the world advocate, the required return on the invested capital for conservation and environmental protection should be lower than for other investments, say 6 per cent.

Table 1 Detail profile of Farm families in the Drainage Society HOPP Gohana, Haryana, India

		Number of Beneficiary farm families			Categories of farm families			
Block No	**Area in hectare**	**Males**	**Females**	**Total**	**Marginal (0-1ha)**	**Small (1-2 ha)**	**Medium (2-3ha)**	**Large (> 3ha)**
E -1	43,36	25	3	28	15	9	3	1
G - 1	35,45	22	6	28	15	8	3	2
G - 2	51,47	25	1	26	12	5	1	8
G - 3	66,31	35	3	38	16	11	6	5
G - 4	52,04	38	1	39	20	10	6	3
G - 5	42,83	36	1	37	16	12	4	5
G - 6	27,64	21	2	23	13	6	1	3
G - 7	89,97	78	9	87	54	23	6	4
G - 8	59,64	26	3	29	5	12	7	5
G - 9	55,47	47	5	52	28	18	6	0
G - 9/6	34,23	35	2	37	21	13	2	1
G - 10	44,79	19	0	19	8	3	4	4
G - 11	43,70	19	1	20	5	6	3	6
G - 12	65,67	31	0	31	16	8	3	4
G - 13	61,14	21	0	21	3	4	6	8
G - 14	56,40	23	3	26	5	7	8	6
G - 15	86,69	23	2	25	12	2	2	9
G - 16	49,86	30	1	31	15	10	1	5
G - 17	54,84	35	6	41	22	5	9	5
G - 18	55,09	37	2	39	22	10	3	4
G - 21	45,25	28	4	32	18	5	7	2
G - 22	50,81	37	0	37	20	12	1	4
G - 23	84,03	42	2	44	19	8	6	11
Total	1213,32	708	54	762	365	198	95	104

Table 2 Profile of the drainage Society in Gohana area of Haryana, India

Particulars	Description
Name of the Society	Farmers Drainage Society
Registration Act	State co-op Registration Act, 1860

Area of Operation	Saline and waterlogged area belonging to the farmers of the Framers Drainage Society Block
Objective	i) To regulate the pumping of the saline water and discharge the effluent from the outlet to the main drain;
	ii) To operate and maintain SSD system
	iii) To raise resources through collection from the members for meeting the O& M cost
	iv) To arrange loans, subsidies, grants etc. for the society towards reinvestment in the development of SSD, agricultural productivity and reclamation of saline soils
	v) To take any official and legal action deemed necessary to achieve the above mentioned objectives
Aims	1. Increasing agricultural production and reclamation of saline land,
	2. Adoption of improved methods of water and land management,
	3. Monitoring the ground water level; quality of land and water and crop yields,
	4. Reuse of the effluent for irrigation,
	5. Involving women of the member households in the management and functions of the society,
Membership	Farmers both men and women who own or have land under their control under the jurisdiction of the Society and their spouse, above 18 years of age and sound of mind are eligible for membership, Members have to pay non refundable fee of RS. 21/-, Farmers and their spouses who lose possession of land automatically ceases to be members
General Body	All members together constitute the General Body and any decision of the General Body is binding and final. The General Body has the power to prepare and amend the bylaws,
An annual meeting of the Society will be conducted during September every year. Special meetings can be convened whenever need arises. At least seven days notice will be given for holding the meeting. To pass proposal for amendment of the bylaws, vote of at least sixty percent of all members present is required.	
Executive Committee	The general Body will elect at least seven members to the Executive Committee for each financial year, The ADO from APO office will be ex-official member of the society who will be responsible to check the registers and other records maintained by the society. The ADO (Soil Conservation) of the respective area shall be the ex-officio member of the society.
Funds	Funds can be raised by the Society for its functioning in several ways, such as :Membership fee, annual fee, or land fee; Proportion of crops; Fines; Donations from well wishers; Loans from banking institutions, etc. Funds from HOPP, Govt. and other agencies
The Functioning of the society will be on a no-loss and no-profit basis.	
Relation to HOPP and Government	HOPP–Deptt of Agriculture Haryana officials shall have the right to verify the records and accounts of the society at any point. On the dissolution of the Society, all its assets and liabilities shall vest with HOPP-Dept. of Agriculture Haryana. The society is registered under the societies registration Act, 1860 and all provisions of the said act are applicable to the society.

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[2] ICAR Research Complex for NEH, Umroi Road, Umiam-793103, Meghalaya, India, E-mail: datta@icarneh.ren.nic.in