2. FARMER PARTICIPATION IN IRRIGATION MANAGEMENT: AN OVERVIEW

In this Chapter a general survey of literature relevant to Farmer Participation in Irrigation Management is given.

2.1 IRRIGATION MANAGEMENT

The book written by Robert Chambers (1986) entitled "Managing Canal Irrigation - Practical Analysis from South Asia" is an authoritative work, as it is written on the basis of his studies in India, Bangladesh, Nepal, Pakistan and Sri Lanka for more than 12 years. The book which is divided into four parts, gives prominent reference to India. The first part examines links between canal irrigation and the poor, and suggests objectives and criteria for canal irrigation management. The second part examines how knowledge of canal irrigation systems has been gained and applied and how normal research professionalism and policy have been interacted. Major gaps identified in the canal irrigation management - main system management, irrigation at night, activities above the outlet and motivation of irrigation managers are analysed in the third part. Finally, actions needed to improve performance on canal irrigation systems are discussed.¹

According to Chambers, irrigation and irrigation management are difficult to handle effectively due to three reasons - (i) Canal irrigation systems are exceptionally complex, with physical, bioeconomic, and human domains with linkages within and between these and with many forms of variance over space and time; (ii) Water is ubiquitous and elusive, a maddening compound which mocks measurement and it is difficult to capture, store, transport, and
deliver to a myriad of small fields and applied for crops to grow; and (iii) Canal irrigation management demands special methods, like performance monitoring, diagnostic appraisal, action research, water scheduling and delivery and farmer participation, which are not part of the normal professionalism of the past. After analysing various aspects of the subject, he concludes, "Participation by farmers and farmer groups, the establishment of legitimate expectations and rights to water, and better communications between managers and farmers and farmers' groups, appear essential for long term high performance management of most South Asian Canal Irrigation Systems."^3

Norman Uphoff (1985) analyses 50 case studies from different parts of the world, including six from India which is the largest number he has studied from a Country. In his work, "Getting the Process Right: Farmer Organisation and Participation in Irrigation Management", he maps out possibilities for supporting more productive farmer organisation and participation in water management. Arguing that irrigation is a 'Socio-Technical Process', combining people and material elements, the author observes that management of water requires cooperation of many persons. He categorises activities involved in irrigation management into three groups namely, (i) that focus on water (acquisition, allocation, distribution and drainage); (ii) that focus on structures (design, construction operation and maintenance); and (iii) that focus on organisation (decision making, resource mobilisation, communication and conflict management).^4

It has been realised that any amount of stepped up activity in irrigation development can not produce optimal results unless irrigation system as a whole, from the source of water upto the farm level, is managed well.
Irrigation management, which is the most important process for achieving increased agricultural production, therefore means, "adequate control of allocation of available supplies, reliability of water delivery at the farm level and equity in distribution within the entire command with participation of farmers in the operation and management of irrigation systems." 

Walter Coward Jr (1977), while discussing the irrigation management alternatives, points out three categories of actions needed in irrigation management, namely, (i) improve the irrigation technology and engineering structures used in new and existing systems; (ii) to create economic incentives through water pricing as a means of improving water management; and (iii) to give emphasis to organisational dimensions of irrigation management, particularly organisation of water users' association in the outlet level. 

2.1.1 Criteria for Irrigation Management

Daniel Bromley (1987) describes the goals of management of irrigation systems as, (i) productive efficiency; (ii) equity; (iii) order and predictability among irrigators over time; and (iv) ability to permit change. Chambers (1988) identifies, (i) productivity; (ii) equity (fairness in the distribution of resources and benefits); and (iii) stability (performance over time), as the criteria for irrigation management. 

Arakeri (1980) points out the tremendous potential of Indian agriculture, mainly because, (i) the present levels of productivity are very low as compared to the levels obtained in other parts of the world; and (ii) land, water and other resources are much better than those possessed by many other countries. While discussing the necessity of Action Research in
irrigated agriculture, Leaf (1988) opines, "in order to improve productivity in irrigated command areas, it is necessary to do three things, (i) understand the present constraints on production; (ii) formulate intervention to reduce or eliminate these constraints and to evaluate likely results; and (iii) implement the interventions, monitor the implementation and adjust the design as experience accumulate".12

Based on the study conducted in the Kuttiyadi Irrigation Project in Kerala, Varadan et.al. (1989) observed that the introduction of the canal irrigation has not made any marked change in the cropping pattern or adoption of high yielding varieties in the area.13 The study conducted by Pushpangadan and Kannan (1989), mainly for evaluating the effect of irrigation on agriculture in Kerala, especially on the major crop, rice, found that the contribution was negligible. According to them, irrigation alone will not increase rice production unless cost reducing technology is introduced.14 But according to Jacob (1989), it is the enthusiasm of the people and their determination that will give high productivity and profitability to irrigation projects.15

Seminar on Policy Issues in Irrigation Management held in 1985 in Goa suggested that considerations of equity should take precedence when the question of productivity versus equity arises.16 Equity does not mean exactly the same quantity of water per hectare per farmer. It is ensured by a set of procedures and behaviour, and not by water receipts. Conditions for equitable distribution of water as stated by Bromley are, (i) Each irrigator possesses equal right to water; (ii) Prevailing institutional system (rules and procedures) must be fully understood by the irrigators; (iii) Existence of shared concept
of justice; and (iv) Existence of a system of formal enforcement for allocation, maintenance and other activities.\textsuperscript{17}

Sundar (1989) argues for equity in irrigation distribution because, "public funds are invested in the system for facilitating increased agricultural production for the benefits of the State, and the Country, everyone engaged in cultivating the lands in the command should benefit reasonably equally. If this is accepted, one should talk of efficiency of the system only after equity reasonably was well achieved." Water may not be a scarce resource for a farmer, unless it is rationed allocated and distributed equitably.\textsuperscript{15} According to Jayaraman (1980), Rotational Water Supply has to be instituted in all irrigation projects as part of a strategy to ensure equity in distribution of irrigation benefits to all farmers.\textsuperscript{20} The failure to consider equity from farmers' point of view is a major cause of poor performance associated with modernisation of irrigation systems.\textsuperscript{21} Water users perceive a pattern of water allocation as equitable, if claims to water are based on some social principles that are accepted as fair or right.\textsuperscript{22}

Two doctrines found throughout the world, as far as equity is concerned, are 'prior appropriation' and 'proportionate equality'. In the former case, whoever first exploit a resource establishes a right to continue to do so, and as a result inequality occurs in the denial of the resource to others. In the latter case, equity is identified with the supply of water in proportion to land surface area. Here inequality of the land holdings is accepted and water is allocated to each farmer in proportion to land holding size.\textsuperscript{23} Allocation of water on the basis of priority in time, in which the first user has the first right, is prevalent in Taiwan and in Sri Lanka. Allocation proportionately on the basis of land area are more typical in Asia. In some systems in Sri Lanka...
labour contribution decides the share of water supply. In Nepal, farmers' share of water is based on contribution of cost met. A different principle, allocation of water on the basis of family size, is practised by the Pani Panchayat System in Maharashtra. A special type of equity arrangement made in the Goody tank of Rayalaseema region in Andhra Pradesh is reported. There farmers use water only when the tank is full and the principle adopted is 'either all or none'. This has resulted to noncultivation in the command in some years. It is interesting to note that the tank was not full during 1986-90 and therefore, irrigation could not be effected.

2.1.2 Constraints in Irrigation Management

The most important constraints identified in irrigation management are, (i) the weak physical system; (ii) lack of involvement of farmers in the operation and maintenance of the system; and (iii) uncertain deliveries at the outlet and resultant nonconfidence of the farmers in the system. Leaf (1989) identifies five major problems in irrigation management at the operational level, namely, (i) scheduling; (ii) farmers' involvement in design and preserving integrity of physical system; (iii) coordination of irrigation with other inputs; (iv) communication and dispute resolution; and (v) staff training and farmer training in water use and system monitoring. The responsibility of the irrigation officials ends with the supply of water up to the outlet level. The farmers are expected to convey water from there to each and every field and to apply it in their fields. But this does not always happen since the farmers argue that the construction and maintenance of the water courses are the responsibility of the Department. Thus as pointed out by Robert Hunt (1955), the physical and social space between the outlet and farmers' field,
remains as a space for which neither the farmer nor the bureaucracy has direct design or operational responsibility.\textsuperscript{23}

While reviewing the short comings of existing irrigation systems and modifications required to them to suit the modern farming requirements, Alwis (1986) asserts, "the most important and difficult part in irrigation management in developing countries is that of determining and enforcing the most productive and equitable manner of distributing water to the command of each farm outlet and evolving and executing a cropping pattern most suited to that pattern of water distribution."\textsuperscript{29}

According to Sundar (1984), our projects have been 'administered', not managed. In support of this view he argues that our irrigation systems have never been evaluated for knowing their performance, which is a prerequisite for management.\textsuperscript{30} It is a fact that the primary users of irrigation, i.e. farmers, have no control over its administration or delivery and those whose livelihood is not dependent on the efficiency of distribution of water are controlling it.\textsuperscript{31} If a farmer does not have control over a predictable and timely water share, there is little reason to expect water management efficiency.\textsuperscript{32}

The study conducted by George and Nair (1982) in Neyyar, Periyar and Malampuzha, revealed the gross underutilisation of the irrigation potential created. Major reason pointed out by them for this situation was the absence of proper organisational arrangements for distribution and regulation of water for agricultural use.\textsuperscript{33} As observed by Ananthakrishnan (1982), beyond letting water into the canals, branches and distributaries, or enforcing a turn system, no other management worth mentioning is being done in the canal system in
Kerala. As a result, the field channels have become a kind of 'no man's land.'

2.1.2.1 Main System Management

Chambers and Wade (1980), Uphoff (1985) and Chambers (1988) describe the poor conditions of main system management (MSM), which focuses on management of the capture, allocation, scheduling and delivery of water on main system down to and including the outlets, and disposal of water in drains. They consider the main system management, which is the responsibility of officials, as the central gap in the project success and a precondition for farmer participation.

Gomathinayagom and Gopalakrishnan (1989) observe that the present laws governing irrigation management in the southern States of the Country (Kerala, Tamil Nadu, Andhra Pradesh and Karnataka) are inadequate and they relate only to assessment of water cess, betterment levy etc. Due to an effective irrigation act it is very difficult to plan irrigation management. According to Bromley (1987), there is an 'institutional vacuum', referred as those situation in which there are no recognised rules to guide the allocation of water present at the project level.

2.1.2.2 Tail-End Deprivation

According to Hart (1978), unequal distribution of water and anarchy like situation prevalent in almost all the irrigation systems are affecting the system efficiency. Farmer in the tail-end -- tail-end of main canals, branch canals, distributaries, minors and field water courses -- will have to
suffer more often due to receiving too little water, unpredictable, and late.\textsuperscript{41} Not only this will affect the total water supply, irrigation intensity, crops grown, cultivation practices, yields and income, but this will create tensions and also quarrels.\textsuperscript{42} It was observed in 1983 that the disputes were nearly four times as common in the tail as in head for three years in the Lower Bhavani system in Tamil Nadu. Palanisami (1984) found that inequalities in water distribution create conflict between farmers, resulting in underutilisation of the potential.\textsuperscript{43}

The problem of tail-end deprivation is showing an upward trend. While Hart (1978) estimated 10-30 per cent of the CCA suffer due to nonavailability of adequate water supply in Indian canals.\textsuperscript{44} Chambers (1988) calculated that 25-40 per cent of the CCA in India suffer due to tail-end deprivation alone.\textsuperscript{45} Head reach farmers are usually wealthier and more influential than tail-end farmers. They may try to prevent any development measures as they fear that developments may affect their 'privileged' water receipts.\textsuperscript{46} According to Lusk (1991), to change the situation, all the users of the system cooperate with some method of allocation that is fair and proportional.\textsuperscript{47} A decline in the area and production of rice has been noticed in the Kuttiyadi Irrigation Project in Kerala, in the tail reaches, compared to the middle and head reaches.\textsuperscript{48}

2.1.2.3 Free Riding

One major problem faced in irrigation management is that of free riding. A free rider, as defined by Leaf (1989), is "a person who can not be denied the benefits of a public good even though he does not bear part of the cost of producing it."\textsuperscript{49} Individuals acting alone will always find it economically rational to be free riders. The first preference of an individual is to free ride.
while others do not, so that he continues to get the collective benefit which their restraint produces. Unification of individual interests through organisation is suggested for defeating free riding. Many social scientists believe that if irrigation organisations do not control the free rider, it will question the existence of the organisation itself. According to them, the mechanism for controlling the free rider must begin at the local level, but must be supported at all levels.

Lowdermilk and others (1989), while describing the social and organisational factors for irrigation management, observed that farmer organisations and collective actions are required essential for the creation and maintenance of improved water management technologies. According to them, "water courses require collective action, because, if any single farmer makes an investment and others do not, one's sacrifice is wasted. On the other hand, if all other farmers do make investments of time, money and labour in improving a water course, the noninvesting 'free rider' enjoys the benefits of other investors' sacrifices. The solution is disciplined local social organisations that will insure that free riding is eliminated and that benefits are distributed according to mutually acceptable rules. Such organisation can thereby create a social climate for water course improvement and maintenance."

2.1.2.4 Fragmentation of Holdings

Fragmentation and sub division of farms are said to be one of the major problems in irrigation management. Sinha (1981) attributes this as one of the serious causes in perpetuating the poverty of the people in the developing countries. The socio-economic survey conducted by WALMI, Orissa found that the small size holding is the main bottleneck in adopting improved
package of practices and in adopting scientific water management. Need for farmer cooperation is thus stressed.\textsuperscript{55}

Referring to Toennis interpretation of 'Social Collectives', Alikhan (1980) points out that small farmers are not 'Social Collectives' and hence stand to suffer. It was found that while big farmers are powerful to protect their interests, the small farmers are divided among themselves in terms of caste, size of land, quality of land etc.\textsuperscript{56} According to National Commission of Agriculture, "Various studies have shown that small and marginal farmers, if helped with necessary resources and guidance can increase their crop production considerably; the small size holding is not a constraint."\textsuperscript{57} Noted agricultural scientist, Swaminathan (1988) views a small farm as ideal for knowledge intensive agriculture.\textsuperscript{58}

"As the holding shrinks to support nothing beyond subsistence farming, its cultivator operates at a survival level and generally does not take any risk by departing from well tried and traditionally sound practices." Based on this, Chacko (1980) questions the argument that small farms are more productive, as raised by government writings, and that technology is neutral to size of the holding, and therefore farms of any size could apply modern technology and apply high productivity.\textsuperscript{59}

Beardsley et.al. (1959) describes how successfully the problem of fragmentation of holdings in irrigated agriculture is tackled in Japan, by group operations.\textsuperscript{60} Khadi and Lusk (1988) report a model for land consolidation, known as 'Rotational Lay Out' which is operational in Morocco, to facilitate the introduction of modern farming and water distribution practices. In this model fragmented holdings are consolidated and reshaped
into rectangular blocks of 30 hectares each. Water is delivered on rotational basis and charged on the basis of volume of water delivered to the field headgate.

The problem of fragmentation and subdivision of land is a very serious problem in Kerala, especially in rice farming. A decline is observed in the area of rice cultivation. It declined from 742000 hectares in 1952-53 to 604000 hectares in 1987-88. Besides this, the average farm holding in Kerala is only 0.43 hectare. 93.3 per cent of these holdings comes under the category of less than 0.8 hectare and this category accounts for 77.1 per cent of the total area. According to Gopalakrishnan (1989), as this tiny holdings are not capable of generating sufficient income and employment opportunities, a new class of 'part-time' or 'week-end' farmers is emerged. He suggests group farming as the only solution to mitigate this problem and help rice farming in Kerala. He is optimistic about the scope of increasing productivity of rice, since the potential yield of rice production is 4.9 tonnes per hectare, whereas the present average yield is only 1.8 tonnes per hectare.

2.1.2.5 Corruption

Robert Hunt (1989) finds a vast system of informal exchange going on in the operation of canal irrigation system in India, affecting the efficiency of the system. He introduces the concept of 'assets' and 'bundle of assets' for describing and analysing the capacity of various individuals and groups to engage in these exchanges. Based on the studies conducted in one of the States in South India, Robert Wade (1982) described how some of the irrigation engineers raise vast amount of illicit revenue from the distribution of water and contracts, and redistribute part to the superior officers and politicians.
Due to this corruption, (i) productivity and equity are affected; (ii) no interest is being shown by engineers in scientific principles and operational reforms; (iii) credibility of the irrigation department falls; (iv) no increase in water rates; (v) maintenance suffer badly; and (vi) search for new projects. For controlling corruption, he suggested (i) institutionalise a market; (ii) inspect, audit and check; and (iii) strengthen the user side of irrigator-official relations.

Chambers (1988) describes the 'transfer trade' existing in India in the transfer and posting of irrigation staff, controlled by the politicians and which ultimately lead to widespread corruption of the staff. Adverse effects of corruption identified are, (i) costs to farmers; (ii) bad physical works; (iii) bad canal management; (iv) indiscipline of field staff; and (v) demoralisation and distraction. To mitigate the problem of corruption he suggests, (i) vigilance (investigation and inspection by outside bodies); (ii) political reform (less control or no control over transfers by politicians); (iii) discipline (tightening management); (iv) separate operation and maintenance cadres; (v) rights and information for farmers; (vi) incentives and accountability of managers; and (vii) enhanced professionalism.

2.1.3 Improvements to Irrigation Management

Various types of action to improve the performance of existing canal irrigation system are outlined by Chambers (1983) in his work, 'Rapid Appraisal for Improving Existing Canal Irrigation Systems'. They are mainly, (i) action research; (ii) administrative practice and law; (iii) farmer organisations; (iv) main system works and maintenance; (v) physical problems and potentials; and (vi) work at and below the outlet.
Bromley (1987), Wade (1987a), and Chambers (1987) advocate organisational reform for better irrigation management. Lusk and Parlin (1988) and (1991) propose a model, utilising Rational Choice Theory, for building up organisation for better irrigation management. It suggests three concepts to be used to design irrigation organisations - democratisation, decentralisation and privatization which can be applied to both water user associations and the larger institutional frame work of irrigation development. They argue that to avoid resource depletion, State monopoly, corruption and inefficient management, privatization, democratization and decentralisation of irrigation technology, farm land, irrigation organisations and water shares are required. The strategy implied by this approach to institutional reform will specifically suggest, (a) implementation of civil service rules and sanctions which are promptly and equitably enforced; (b) replacement of the culture of bureaucracy with the rules of meritocracy; (c) design of 'representative bureaucracy'; (d) development of corporate water management organisations in which users are 'stock holders'; (e) clarification and adjudication of water property rights and entitlements; (f) emergence of decentralised segmental irrigation project management; (g) codification and enforcement of the rights and responsibilities of water users and officials; and (h) optimisation of use through water marketing and user fees.

Traditional irrigation systems which are successfully managed by farmers are found all over the world. Singh (1989) gives a very good account of farmer managed traditional systems found in most part of India. He emphasises the cooperative efforts of the farmers in these systems in procuring and acquiring water, its distribution, contributing materials and labour for its maintenance and resolving problems. According to him, in the bureaucratic system, farmers are not actively involved in any function except
the application of water to fields. Therefore a sense of collective responsibility for the maintenance of the system is not felt among the farmers, which is the 'most striking feature of traditional systems'.

2.2 PARTICIPATION OF FARMERS

2.2.1 Objectives and Benefits

It is observed that, "in the long term, Government can not take the responsibility for the delivery of water to individual farmers due to the magnitude of the task and prohibitive administrative cost. Farmers have to play a role and it is necessary to find ways of giving farmers a sense of ownership". Based on the data of the study conducted in the Sone Irrigation Project in Bihar and reviewing various studies conducted elsewhere, Pant and Verma (1983) in their work, 'Farmers Organisation and Irrigation Management' find that local collective organisations of farmers have been effective in irrigation management process in terms of distribution of water, maintenance of supply structures and resolution of conflicts at the local level. Satish and Sundar (1990), presenting five case studies from Gujarat, Uttar Pradesh, Andhra Pradesh and Karnataka in their work, 'People's Participation and Irrigation Management' stress the value of farmer participation in irrigation management.

Jagannathan (1978) in his paper, 'Public Administration and the Citizen' said,"The local association of irrigation farmers consisting of users of the same water course can be effective institutional means of not only solving local irrigation problems, but may also work as a pressure group to safeguard their interests. This is equally important in the scene, where the idea seems to be
gaining ground that instead of public administration, we have pressure administration, ie, administration working only under pressure of different kinds. That without pressure, administration does not move.\(^{14}\)

Cheong (1971),\(^{15}\) Ali (1978),\(^{16}\) Fresson (1979),\(^{17}\) Riley and Capener (1988),\(^{18}\) Parlin and Lusk (1988),\(^{19}\) Comley (1989),\(^{20}\) and Singh (1989)\(^{21}\) find participation of farmers as a solution to the problems of poor water management. Based on the experience from various Indian projects, major gains obtained from farmer participation listed out by Singh (1989), are (i) increase in the net area irrigated and the number of irrigators supplied water; (ii) improvement in the quality of maintenance (iii) early settlement of disputes in water sharing; (iv) require less supervision of irrigation staff, except in matters of water supply, repairs to canal and illegal tapping of water by upstream farmers; (v) easy collection of water charges; and (vi) increase in farm investment and income.\(^{92}\) Handbook on Irrigation System states that the successful farmer participation will lead to, (i) elimination of inequitable distribution of water; (ii) development of good social practices by farmers enhancing the utility; (iii) prompt and efficient use of water on the farm by way of construction and maintenance of field channels and adoption of improved practices; (iv) a sense of system ownership by farmers; (v) more effective implementation of distribution policies; and (vi) an atmosphere of coordination, confidence and credibility.\(^{13}\)

The study conducted by Fransisco Rowland (1979) on public participation in rural supplies in Mexico concluded that user involvement will lead to (i) better and cheaper maintenance of the system; (ii) community motivation and institution building; (iii) catalysing other development action in the community; and (iv) more efficient collection of water rates.\(^{14}\) Community participation will
also increase public accountability of the programme implemented. Involvement of farmers in irrigation system management will develop confidence among the farmers. It was found to have more impact on the adoption of diversified cropping pattern in the irrigated area. Through participation people will gain willingness and ability to protest and to demand assistance as a right, which is found effective in securing services from Government staff, Leonard (1977) named it as 'squawk factor'. Oxy and Bottrall (1983) observe that participation of farmers will improve bureaucratic efficiency by enabling farmers to bring pressure on officials. According to Kaushal (1990), farmers act in a group, in a cooperative way, may be able to bring social pressures on each other for improved maintenance and management in distribution of water.

Institutions facilitate the aggregation of resources beyond an individual's capacity and the application of resources to the solution of problems for the benefit of many. Institution is defined as, 'complexes of norms and behaviours that persist over time by serving collectively valued purposes.' Ferror and Lucero (1988) believe that institutional development is necessary for improved irrigation management. According to them, "Irrigation users should be organised to facilitate communication and a working relationship with irrigation management. Organised irrigators' associations should serve as channels for feedback and feed-forward information so as to improve the performance and services provided by Operation and Maintenance irrigation personnel. Quoting Lewin's Theory on the 'driving and restraining forces' which influences individual and group decisions, Burke (1987) points out that it is more efficacious to direct changes at the group level than at the individual level. He quotes the arguments of Lewin, "As long as group standards are unchanged, the individual will
resist change more strongly the farther is to depart from group standards. If the group standard itself is changed, the resistance which is due to the relation between individual and group standard is eliminated. Murrey and Rust et al. (1984) based on the Sri Lankan experience observe, "farmers who are selfish in private - who waste water and will not make an effort to use water more efficiently as long as no issue is made of this - will be more generous when everyone's behaviour in using water is made public issue through group discussions and decisions."

The objectives of the participation of farmers in irrigation management are classified into five categories by Uphoff (1985), namely, (i) greater production and productivity in terms of yield, area cultivated and cropping intensity; (ii) improved water distribution with greater reliability, predictability and equity; (iii) reduction in conflicts among users, government agencies etc.; (iv) greater resource mobilisation; and (v) sustained system performance. According to Singh (1988) dependency and system depreciation are two characteristics that call for cooperation between farmers. Satish and Sundar (1990) observe, "if the Irrigation Department can perform its assigned functions effectively, there will be no felt need among the Irrigators to mobilise themselves into a water users organisation."

According to Seventh Five Year Plan document, "Farmers participation in construction activities such as land levelling and shaping, construction of field channels and equitable distribution of water would be encouraged. In order to effect close coordination in the implementation of the CAD programme, representatives of the farmers' cooperatives or outlet committees will be fully associated with the performance. In addition to the responsibility for the
distribution of water within their jurisdiction, the farmers’ cooperatives would be encouraged to take up the responsibility for irrigated agriculture and also for marketing the produce."

2.2.2 Participation through Farmer Associations

Robert Hunt (1985) in his study 'Appropriate Social Organisation - Water Users' Associations In Bureaucratic Canal Irrigation Systems', finds water users' association as a solution to many problems involved in the large canal irrigation systems, mainly the tail-end problems. But he observes that they are not working properly. Reasons are also mentioned by him. "The first is that there is no component policy recognising that there are systematic connections among the various tasks to be performed. The second consideration is the social and organisational context in which the water users' association finds itself. Irrigation communities, it will be remembered, form a single tune of authority upto the headgate of the system. Rights and duties form an unbroken chain from top to bottom. In the bureaucratic context, this condition usually does not apply. Third, the benefits which are an integral part of the irrigation community are simply not mentioned for these water users' associations. It seems obvious that water users' associations will not produce bottom up leaders, and the farmers will not do the dirty work, without access to sufficient rewards.""

The factor that complicate the process of establishing water users' association, as pointed out by Carruthers et.al. (1985) are, (i) the roles and the expected objectives of the associations are inconsistent with each other or unfocussed; (ii) role expectations are unrealistic, given the resources and authority of the associations; (iii) the responsibilities of the associations are
too trivial or undesirable to generate farmers' commitment; (iv) farmers and officials have inconsistent or conflicting definitions of their respective roles; (v) groups are too heterogeneous or too large to function; (vi) farmers do not have enough technical knowledge to enable them to make reasonable decisions; (vii) officials are unwilling to share information or authority; and (viii) farmer leadership is weak, inexperienced or faction ridden.\textsuperscript{113}

Karajagi (1987) observes that water users' associations in India have been successful only in areas of cash crops, like sugarcane.\textsuperscript{114} Freeman and Lowdermilk (1981) opines that if it is formed after a system has been designed or after settlement, they tend to fail.\textsuperscript{115}

According to Singh (1983), the establishment of water users' association is not an easy solution to irrigation management problems. "It requires intensive government efforts, appropriate training, staff who stay in a district long enough to become familiarise with its social structure and to gain experience in the techniques of building up farmers participation, and consequent policy over the terms of years necessary for new social institutions to acquire their own norms and legitimacy."\textsuperscript{116}

The Commonwealth Workshop (1978) suggested that the most effective way of developing farmer organisations is on the basis of village or of the irrigation channel.\textsuperscript{117} According to Wade (1987b), the right unit of water users' association is the whole village. Formation of it around each canal outlet is likely to be futile, if such a group does not already do other things together.\textsuperscript{118} Singh (1986) opines that irrigation associations have a dim chance of success, if the outlet command is the geographical unit for such an organisation,\textsuperscript{119} because it is too small an area to provide managerial
challenge or to yield a reasonable income to meet common expenses. Therefore it is suggested that the area to be managed by water users' association should be relatively self-contained as a hydraulic unit, covering the entire area commanded by a minor, a distributary or an equivalent hydraulic unit. The most viable size suggested for members is between 40-150. If it is too small with 10-15 members, it is not viable, even though they have the advantage of easy formation and more cohesion.120

Major factors that lead to failure of cooperation over the distribution of water listed out by Palmer and Mandal (1986) are, (i) widespread factional conflicts among farmers; (ii) the conflicting interests and relationships between large and small farmers; and (iii) the understandable suspicions that are held of the motives of richer farmers who typically come to control water supplies.121 Factors mentioned by Pant and Verma (1983) are, (i) ignorance about the spirit of water users' association; (ii) lack of committed local leadership; (iii) nonfrequent interaction between farmers and officials; (iv) hasty and unforeseen steps by agency; (v) frequent transfer of officials; and (vi) formation of water users' association at a premature stage.122 Esman and Uphoff's (1982) study on the performance of 150 local organisations found a 'negative correlation between government initiative in forming them and their subsequent performance compared with those formed on the initiative of members and/or leaders.'123

Chackacherry and Jayakumar (1989)124 and Chackacherry (1990),125 while reporting an evaluation study conducted in the Kuttiyadi Irrigation Project in Kerala on the present position of involvement of farmers in irrigated agriculture, observe that even though the farmers were quite involved in group activities for about 10 years, they lost interest in it when
the officials involved in the programme were withdrawn. The water user associations formed, onfarm development works carried out, group farming system introduced etc. lead to a double fold increase in rice production in the area, during 1979-88. But neither the water user associations, nor the group farming system could sustain even after an year, when the study was conducted. Major reason pointed out by the farmers was the lack of guidance from the officials.126

Based on the experiences of pipe committees in the Sri Ram Sagar Project in Andhra Pradesh, Singh (1986) observes that so long as Government officials took interest, the committees functioned better than when the officials withdrew or moved on to new areas. In all the villages where the extension contacts were good, they were more active and effective.127

Jayasekhar and Karunakaran (1989) report a case of Women Cultivators’ Association successfully functioning in Madurai District of Tamil Nadu, which undertakes all activities in irrigation management. There are no inconsistency in roles, unrealistic role expectations, noncommitment and group heterogeneity among the cultivators, lack of technical knowledge of inexperienced leadership, reported.128 Kathleen Kilkeely (1986) observes active participation of women in the irrigated agricultural production in Sri Lanka.129

2.2.3 Components and Models of Participation

Duncon Miller (1978) describes three characteristics or components of participation - (i) participation in decision making; (ii) participation in the implementation of actions; and (iii) participation in the sharing of benefits to be derived from the actions and the cost to undertake that actions.130
Farmers can be involved in irrigation projects in many ways, at different stages -(i) in identifying major problems; (ii) in developing and testing solutions; (iii) in planning activities for implementation of improvements; (iv) committing time, labour, cash and personal resources while implementing a project; (v) by leading the rehabilitation of farm systems, i.e. settling disputes, organising community labour, supervision in construction etc; and (vi) by being responsible for the operation and maintenance of improved systems.131

Intensity of community participation is categorised into, (i) information sharing for collective action; (ii) decision making; (iii) initiating action and management; and (iv) equitable distribution of benefits.132 As given by Howel (1979), the degree of participation varies depending on the capacity and willingness of farmers to accept responsibilities.133 Cerena (1985) emphasises the need for 'Social Engineering' of participation for effective social action. "Social engineering consists of attempts to use the body of sociological knowledge in the design of policies or institutions to accomplish some purpose".134

As opined by Sharma (1989), models for participation of farmers can neither be prescribed nor standardised and these will have to be evolved according to social-cultural norms of the society, perceived critical problems and local conditions.135 But Uphoff (1985) proposes two models for participation in irrigation management, (i) that driven by 'division of labour' approach; and (ii) that driven by the concept of 'collaboration'. When negative options are strong, division of labour approach may minimise conflicts and be the best arrangement. Collaboration may be a best approach when relations are better or when mutually respectful attitudes arise.136
The stages of development of the cooperatives, as given by Pant and Verma (1983), are, (i) persuading the farmers for formulation of the society, voluntary consolidation and onfarm development works; (ii) expectation of social justice from societies; (iii) distribution of water in a just way and alternate provision when the canal system falls; (iv) intermediary role between government agencies and farmers; (v) keeping watch over anarchic practices of cultivators; (vi) providing ‘human capital component’ for better water management; and (vii) usage of high yielding variety inputs in agriculture. Yoganarasimhan (1989) proposes steps for farmer participation in three phases, (i) Initiation Phase, in which proposal for participation is publicised to gain popular support and efforts are taken for creating an atmosphere of confidence in the feasibility of local participation, (ii) Continuation Phase, in which formal organisation are established and a group atmosphere of collaboration and cooperation is created; and (iii) Preparation Phase, in which farmers are assigned in maintaining their level of participation and increasing its intensity.

Bhaskaran (1980) attempts to develop a model for community action for trial in Kerala. He suggests the development of community resources as its first step. In addition to physical resources, these resources include, a sense of community identity among its members; the skills required by at least a few of its members to develop helping relationships; and the ability to participate in the group processes in order to develop the new skills required to solve the problems confronting them. ‘Community Seminar Method’ proposed by Newman et.al. is suggested for bringing to light the powerful resources already in existence in the community, as well as the weaknesses to be tackled. Open workshops, microcounselling, skill learning techniques etc. are also proposed for developing the community resources.
2.2.4 Prerequisites for Participation

Pant and Verma (1983) observe that certainties in irrigation supplies were chiefly responsible for farmers coming together. The success of cooperation are dependent on, (i) subsidy provided by Government agencies; (ii) value of local leadership; (iii) knowledge of the onfarm development works and its benefits; (iv) frequent contacts between officials and farmers; (v) easy unanimity among farmers; and (vi) personal interest of local officials. The adequacy and reliability of water supply is often the main factor which influence participation of farmers in irrigation management. When water is abundant there is little need for collective action. So also if water supply is too scarce or unreliable and collective action will not yield improvement in water supply, participation is unlikely. Satish and Sundar (1990) are of the opinion that the genuine felt need of the users and the scarcity of water decides of participation of farmers. Groups come into existence when individuals find that except through group action, certain goals can not be achieved. The individual will remain a member of the group if he finds that only by such membership he stands to gain certain benefits or can avert some losses. Absolute minimum condition, as noted by Leaf (1989), for a group to be viable, is its identification and character must be accepted by both members and relevant nonmembers.

"A farmer in the command area would use irrigation water if the returns he would get exceeded the cost he had to incur. If not, he may prefer rainfed agriculture. Likewise farmer will not join groups unless the benefits from membership outweigh the costs," says Patil (1987). Oxy and Bottrall (1983) opines that the development of active participation by farmers is unlikely to occur on a significant scale without substantial encouragement and assistance.
from the Government side. But Patil and Datye (1986) view the confidence in the ability of farmers to manage their own productive activities as a prerequisite for the success of participation. The prerequisites identified by Singh (1990) for efficient and sustained functioning of farmer organisations are, (i) self sufficiency and initiative (resources and leadership to manage, nondependence on agency for carrying out activities); (ii) management costs and common services (income generation for common maintenance); (iii) dependability of water supplies; (iv) social viability (socially capable of functioning as a group); and (v) agency support. From the Sukhomajri experience in organising water users' association for preserving the watershed, it is evident that participation do not come from exhortations or persuasion, but from the realisation by the people that their own welfare is tied to it.

The study conducted in Madhya Pradesh found that a system which can provide a dependable water supply, along with appropriate physical system, with full support of Government will provide congenial atmosphere for the sustainability of irrigation panchayats. Good leadership, volumetric supply of water and progressive farmers were the main reasons for the success of Mohini Water Cooperative, as reported by Shah (1986). The basic skills needed for community action are skills in team building, skills in cooperation in the promotion of effective change strategies, or, in some cases, even providing inputs towards the creation of an alternative new group or programme. Strength of an organisation is decided by, (i) degree of commitment of its members, which is decided by their needs to be met; (ii) norms to which people conform and the degree of that conformity; (iii) how power is exercised; and (iv) their decision making process. Jose (1986), in his study, on People’s Participation and Intensive Rural Development
Programme in Kerala, found that the level of literacy, political consciousness, local leaders and communication media were contributory factors for participation.\textsuperscript{155} The study conducted by Suresh and Joseph (1990), “Public Participation in Rural Development - a case study conducted on the nongovernmental organisation in Kerala”, concluded that though administrative and organisational personnel had satisfactory level of perception regarding participation, attitude towards the same was below the minimum desirable level. The degree of participation was determined by the socio-economic characteristics of participants, nature of programmes and type of organisations.\textsuperscript{156}

Gopalakrishnan (1989), while discussing on the need for group farming in Kerala, gives the steps that are to be taken before any group action, (i) systematic discussion of the common felt needs of the community; (ii) systematic planning to carry out the difficult programmes that have been selected by the community; and (iii) mobilisation and harnessing of physical, economic and social potentialities of the community.\textsuperscript{157}

A major factor in organisational success is incentives given to both farmers and officials. A predictable water supply, input and services for improved production possibilities, flexible attitudes of irrigation authorities, profits, food security and a sense of ownership in the project, are all incentives to farmers, as opined by Riley and Capener (1988).\textsuperscript{158} According to Menon (1988), no programme of crop production can succeed unless the farmers are properly motivated and fully involved.\textsuperscript{159} As observed by the Seminar on Policy Issues in Irrigation Management the timely information to farmers about the availability of water supply and assured delivery of the same will contribute to improve the system performance.\textsuperscript{160}
Irrigation Water Management observed that efficient and dependable communication facilities will eliminate many of the operational difficulties in efficient control and management of canal irrigation system in India.\(^{161}\)

Coward (1977) remarks that identifying and maintaining leaders is a major problem with developing organisation for the terminal unit. Agency-directed local leaders always fail to achieve the important linkage required between the water users and the water authorities.\(^{162}\) In contrast to this, he points out the pattern of irrigation leadership found in traditional systems, which he named as 'Accountability Model', since relatively small groups of water users are to be served by the irrigation leaders, they are selected by the users themselves and compensation is being given by the group itself.\(^{163}\) Mobilising new leadership and talent into positions of responsibility is crucial for improving water management.\(^{164}\) In agrarian societies, as opposed to industrial societies, social life is governed to great extent by 'persons' than by rulers, so says Betrille (1974).\(^{165}\) Chacko (1980) observes an evident lack of village leadership for development, in India. According to him the 'jungle of bureaucracy' extinguishes the possibility of local initiative outside the approved system and undermines self reliance.\(^{166}\)

Wade (1987a) argues for separating 'Operation and Maintenance (O&M) Organisation' from 'Construction Organisaation' of the Irrigation Department for improving the O&M efficiency.\(^{167}\) 'Handbook for Improving Irrigation Practices' (1989), also is of the same thinking.\(^{168}\) Jayaraman (1980), who examines the state of art in irrigation management in India, finds that a professionalist's approach to water management with concern for client's interests and specialised functions, is lacking in our project administration. This is because the O&M personnel do not desire to be permanently associated with it.\(^{169}\) For
majority of them is a temporary phase. Based on a study conducted in Gujarat, he points out the major reasons given by engineers for preferring Construction than O&M. They are, (i) construction offers more promotional opportunities and job satisfaction; (ii) construction gives high degree of independence; and (iii) water management needs additional skills. Considering this built in prejudices against O&M, Jayaraman proposes to have a new ‘water management cadre’ by creating a department of its own.\textsuperscript{174} Nag (1989) suggests a new interdisciplinary department of irrigation water management consisting of specialists from all related components of irrigated agriculture, for eliminating the evils of the present interdisciplinary approach in the field of irrigated agriculture. The present approach suffers from the presence of superiority feeling of certain disciplines, conflict of leadership of command area development, lack of procedural clarity, lack of training, water tight compartment of disciplines etc.\textsuperscript{171}

As observed by Uphoff (1985), "it is not reasonable to expect farmers to demonstrate more positive activities and attitude towards water management unless and until agency personnel change their activities and attitudes which are quite often negative towards farmers."\textsuperscript{172} Leaf (1989)\textsuperscript{173} and Singh (1989)\textsuperscript{174} point out that the problem of involving farmers more effectively largely devolves into the problem of modifying the rules, organisation, and ways of working of Irrigation Department themselves so as to promote this. Lack of continuity of officials at higher levels, lack of training at intervals to expose to new skills, knowledge and attitude, and lack of providing motivation for better performance, contribute to the ineffectiveness of the irrigation bureaucracy, as observed by Sundar (1984).\textsuperscript{175} Many experts have suggested "bureaucratic reorientation" as a method of improving the relationship between irrigators and bureaucrats.\textsuperscript{176} The history of relations
between farmers and officials are not of appreciable level. As Uphoff puts it, "to the extent the farmers and engineers are willing to look self critically at their own past performance, the prospects for future cooperation are improved."

According to Hart (1979) and Wade (1987b), there is a 'Syndrome of Anarchy' at work in the canal irrigation sector in India, causing underperformance of the system. The anarchy occurs due to lack of confidence in both the sides of farmers and irrigation officials. The farmers lack confidence that they will get water on time if they are keeping away from stealing water, breaking the structures and bribing the officials. The officials on the other hand, lack confidence that farmers will keep away from rule breaking, if they sincerely take efforts to get water delivered on time. It is a syndrome as the behaviour of each party tends to confirm the negative expectations held by the other. Each is the headache of the other. Only way to get rid of this syndrome is to strengthen the physical system and assure reliable and expected amount of water. Bottrall (1981) opines that weak and irregular contacts between officials and farmers are one of the contributing factors in poor utilisation of an irrigation system. Acharya and Lodha (1986) in their socio-economic study conducted in Rajasthan found that a crisis of confidence exist among farmers about the irrigation system. There is a question of power exists between officials and water user groups, as noticed by Patil (1987). Officials want some of their management headache to be taken away by groups, but groups are willing to take responsibility if it helps and benefits them.

Singh (1988) criticises the inflexible and shortsighted attitude of administrators in irrigation management. Ananthakrishnan (1982), based on
his vast experience in Kerala in the irrigation sector, asserts that there is very little contact between the irrigation engineers and the farmers. They are practically strangers working in isolation for a common purpose. Bisht (1989) says that the image of the public of the administration is not only negative, but often alienated and therefore he stresses the need for changes in administrative structure, because what matters most is not a good scheme, but sincere implementation. Many good development schemes fail for the nonseriousness of the officials.

2.3 DIFFUSION

Participatory approach to canal irrigation management is relatively a new concept. According to Rajagopalan and Jaspal Singh (1971), new ideas or innovations are basically conditioned by the culture of the people. As noted by Betelle (1974), agrarian societies in every part of the world place a high value on the hereditary principles. Sachchidananda (1972), in his study on diffusion of agricultural innovation found that the adoption index goes up with rise in the size of the holding. Farmers accept a new technique only as long as the risk does not endanger the subsistence level, according to Otiz (1971). But, Dasgupta (1989), who has reviewed over 300 books on the diffusion and adoption of modern agricultural technology by farmers in India, does not believe that economic profitability alone determine the decision of the farmer to adopt or reject a practice recommended to him. Social and cultural factors will also influence the decision.

Ralph Linton (1940) observed that new items, cultural or material, were adopted on the basis of evaluation of their utility, compatibility and prestige. While Bisht (1989) opines that the response of the farmers to the
modern methods and new ideas and institutions depends on their aspirations, willingness, resources and capabilities.\textsuperscript{103} According to Mundra (1989), in the field of irrigation management, there is a tremendous gap between the knowledge production and its utilisation. It is estimated that no more than 15 - 20 per cent of the available technology reaches the Indian farmers, as against 80-85 per cent in some of the developed countries.\textsuperscript{104}

2.3.1 Training

The importance of training in irrigation management is well conceived. Varade (1989) believes that one of the most important gap identified in the nonutilisation of water created, is ill-preparedness of the irrigation and agricultural departments, as their staff members have been inadequately trained to achieve the objectives.\textsuperscript{105} Rathora (1989), Flammer (1989)\textsuperscript{106} and Buch (1989)\textsuperscript{107} emphasise the need of training in shaping the responses of farmers and officials for better irrigation management. Sundar (1988) views training as a tool to impart skills, knowledge and attitude to persons who have the right motivation.\textsuperscript{108} Roy (1989) stresses the need for upgraded skills and changes in attitudes and perceptions from farm to the policy making level, for efficient water management and points on the training efforts to attain this end.\textsuperscript{200} Dandekar (1989) opines that proper training of the personnel engaged in irrigation and water resources development is the only way to ensure high efficiency in this sector. The reason for the scant attention given to training aspects of personnel engaged in irrigation management is that 'apex persons in the sector are not completely convinced that training in irrigation management is really needed.' Most of them believe that, 'direct experience is the best educator' and that is enough.\textsuperscript{201}
Ghosh et al. (1989) note lack of water literacy as the major reason for many of the prevailing problems concerning water. A water literate person is one who is well conversant about the physical, chemical, biological and hydrological aspects of water and its positive and negative impacts on the society and environment in general. Water literacy is needed for making farmers more participation oriented. Training, seminars, feedback assessment etc. are means to attain this. Palaskar et al. (1989) report the success obtained in training the farmers right in their agricultural environment, tried by the Water and Land Management Institute, Maharashtra. Intodia (1989) suggests to have needbased intensive training programme for different field level functionaries and farmers, as it is a prerequisite for effective transfer of technology in crop production and water management.

2.3.2 Catalyst

Experiments carried out in Sri Lanka and in the Philippines, inducting 'catalyst' or 'organisers' for stimulating involvement of farmers in irrigation management were found successful. These catalysts were qualified professionals and trained in irrigation systems, irrigated farming, cooperation, organising farmers and in building confidence among farmers to take up active part in better system performance. Parlin (1991) examines the case of the two major projects, namely, Mahaveli Development Scheme and Gal Oya Colonisation Scheme, which demonstrate contrasting results in achieving participation, due to difference in their approaches. In Mahaveli, 'irrigation assistants' organised the turn out groups and they were assigned with various tasks. But they did not work well because of the 'top down' bureaucratic approaches and 'pseudo participation'. Whereas in Gal Oya the experiment with 'institutional organisers' was successful. They lived with the
farmers and won their confidence. Farmers were given direct participation.206

Bhaskaran (1980) suggests to have trained 'Community Counsellor' to be appointed in each area for ensuring participation. The counsellor can be withdrawn at a time when the community itself can organise well.207 Patil and Datye (1986) argue for a cadre of 'mediators' or 'Institutional organisers' to take care of the interface of the activities of the farmers' groups and the irrigation authorities above the outlet.208

Fernandez (1985) spells out the main conditions under which the external catalytic agents should work in a community for obtaining participation. They are, (i) entry point which will create an atmosphere of confidence; (ii) choice of strategy suited to the local conditions; and (iii) selection of appropriate ideology based on the study of the local, social, economic, political and cultural situations.209

It is believed by many writers that cooperation will be unlikely without an external agent to enforce agreements.210 One of the strong supporters of this argument, Maicom Olson (1971) in his 'Logic of Collective Action' asserts, "Unless there is a coercion or some other special device to make individuals act in their common interest, rational, self interested individuals will not act to achieve their common or group interests".211 Wade (1987b) strongly criticises this proposition, based on his studies conducted in 41 villages in Kurnoor district of Andhra Pradesh. According to him, "The analytical basis for this pessimism is weak at least for the village based use of common property resources, like irrigation water. In most of these villages local joint arrangements have nothing to do with outside bodies, either Government or voluntary agency.212 He found that cooperation and noncooperation are
depended on high and low collective benefit, rather than any coercion. Joint action was found high, when individual benefit from joint action was high.\textsuperscript{211} However, Wade (1987) views their proposition in the way that it warns the project administrators that teaching people about their common interest and common problem alone will not ensure collective action. "Rules backed by a system of punishment will definitely necessary to assure each individual that if he follows the rules he will not be cheated and which at times of crisis can directly deter violations."\textsuperscript{214} Possible mechanism for enforcing organisational discipline pointed out by Satish and Sundar (1990) are social forces, value system of the individual members and the deterrence available to it provided by the State.\textsuperscript{215}

2.3.3 Motivation

As reported by Begum (1985), the primary incentive for participation of farmers is economic. Participation and reciprocity is primarily a function of opportunity structures.\textsuperscript{216} Lawler (1973) states that the people will be highly motivated when they believe that their behaviour will lead to certain rewards, which are worthwhile and valuable and that they are able to perform at a level that will result in the attainment of the rewards.\textsuperscript{217}

According to Sundar (1988), what motivates individuals is a complex interaction of the range and strength of their needs, level of maturity in relation to the issue at hand, and their past experiences.\textsuperscript{218} It is not easy to change the traditional and age old practices in irrigation management. Strong resistance will have to be faced from the group of farmers, especially in the head region, who are benefitting from the present inequitable distribution.\textsuperscript{219}
As reported by Chackacherry (1990), in the study in Kerala, unlike the existing notion, the farmers do not feel that 'incentives' are the only attraction for getting their involvement or cooperation in scientific agriculture and water management. Besides, they need assured supply of water and support and guidance from the officials and initiative from farm leaders.220

2.4 STRATEGY FOR IRRIGATION MANAGEMENT THROUGH PARTICIPATION

2.4.1. CADA

India's change in the irrigation development strategy is widened from the setting up of Command Area Development Authority (CADA).221 Command area development implies a very large expansion of governmental influence at outlet level, with the objective of bringing about not only physical, but also institutional changes. Institutional components involved are, (I) consolidation of holdings; (II) rotational irrigation; and (III) water user associations.222 The primary objective of CAD programme is to bridge the gap between the creation of irrigation potential and its utilisation and to make the best use of the available land and water resources to increase agricultural production.223 The content of the programme has been to give attention to onfarm development works, so as to provide available water in an equitable manner to the crops grown, to arrange for extension and impart services which would help the farmer in securing optimum production from irrigated land and also to provide infrastructural facilities which would assist in the marketing of the produce secured.224

Singh (1978) identifies wide Inter State differences in the composition of CADA and also in the extent to which coordination has been attempted in their functioning, while studying the adequacy of them to serve the objectives.
as envisaged. The study conducted in four States, namely, Rajasthan, Uttar Pradesh, Andhra Pradesh and Gujarat, found that all the CADAs were quite vulnerable with regard to their ability to link with people, to learn and to solve their problems, and to get cooperation for self management. Large majority of CADAs are, 'structurally deficient due to the tradition of departmental isolation and exclusiveness buttressed by the vested interests of senior officials in safeguarding encroachments on their official preserve.'

Commonwealth workshop preferred to have the CADAs recruit their own staff rather than obtain on deputation from other departments, as done at present. Considering the importance of motivating the staff, it suggested to have, (i) regular personal contact between staff at all levels for maintenance of their morale; (ii) financial inducement avoiding the creation of jealousies between staff or anomalies in salary structure; (iii) opportunities for training; and (iv) real prospect of promotion to staff at all levels.

The basic problem with CAD programme, as opined by Niranjan Pant, is that it is based on a technical diagnosis of the problems and has neglected institutional considerations, such as operational procedures of irrigation bureaucracy and farmer participation in the programme. Singh (1978) suggests to have a cell in each CADA under the charge of an experienced officer whose main job would be to keep in touch with people, their problems, the activities of field level functionaries and to experiment with ways through which farmers can be organised as a self-managing groups.

Even though increase in the utilisation of irrigation potential and productivity has been resulted from CADA activities, due to some inherent bottlenecks intended result are not obtained. Saksena (1986) lists out them as,
(i) lack of necessary and required trained and motivated organisation; (ii) want of coordination between CADA, Irrigation, Agriculture and other departments; (iii) nonavailability of necessary finances for CAD programmes and for the modernisation and maintenance of canals; and (iv) want of involvement of the beneficiary farmers in the command. An effective organisation has yet to be set up for CADA.230

2.4.2 Rotational Water Supply

Rotational Water Supply is one way of both saving water and reducing uncertainty.231 Certainty of water deliveries will tend to benefit small farmers relatively more than big farmers.232 Analysing the performance details of 27 selected projects, which are located in 10 States, Ramanujam (1986) concludes that rotational water supply is an essential requisite for efficient and equitable water management.233 Vaghela (1989) gives description of different types of water distribution in India, namely, Shejpali prevalent in Maharashtra; Warabandi in Punjab, Haryana, and Rajasthan; and Vara Varam in Tamil Nadu. There is a general agreement that, for the present, Rotational Water Supply, like Warabandi (wara means turn and bandi means fixation), is the most suitable organisational method for distributing limited resources among large number of farmers reliably and equitably,234 and it is widely accepted as a programme under CADAs.

All India Workshop on Warabandi held at Hyderabad in 1963 defined Warabandi as, "System of equitable water distribution by turns according to a predetermined schedule specifying the day, time and direction of supply to each irrigator in proportion to his holding in the outlet command." Malhotra (1982) views it as a classic example of the joint state/farmer...
management of irrigation water with each party having its well defined sphere of action.\textsuperscript{231} According to Singh (1980), equity, dependability, adequacy, coverage, discipline, common destiny and economy are its characteristics.\textsuperscript{231} As noted in the Manual of Warabandi, in addition to equity in distribution and efficient management of water on the farm, Warabandi presently take into consideration the cropping pattern, the crop water requirements and soil conditions.\textsuperscript{233} Preconditions for Warabandi noted by Chambers (1983)\textsuperscript{233} and (1988)\textsuperscript{240} are, (i) accurate identification of land holdings and land holders; (ii) bringing of streamflow direct to farmers’ fields; (iii) stable water scarcity; and (iv) a constant flow through the outlet, at predetermined times.

2.4.3 Rationing and Charging

Regarding rationing and charging of water, Bansal (1990) observes that the lack of individual and group incentive to conserve water is the major cause for the misuse and wastage of surface water. “Since the water charges are neither related to income from the irrigated land nor to the prevailing supply and demand conditions, they do not reflect either the use value or the scarcity value of water. Further, as the water charge is assessed on a per hectare basis, there is no incentive to economise the water as the farmer has to pay the same amount as determined by his farm size, regardless of whether he consumes water or not. He will always try to play safe and use the maximum water he can lay his hand on.” He suggests rationing system for an optimum utilisation of the existing water resources.\textsuperscript{241} Based on the study conducted in the Mula command in Maharashtra, Varade (1986) stresses allocation of water in volume in relation to land.\textsuperscript{242}

Jayaraman et.al. (1983) found private lift irrigation system in the Mahi Right Bank Canal command doing roaring ‘water trade’, although they charge
eight to 10 times more than the canal irrigation. As noted by Sharma (1989), when irrigation is from private sources due to cost attached to irrigation and security for availability of water, farmers are conscious of the economic use of water. But in canal irrigation, due to the absence of restriction over quantum of water or charges according to area irrigated there is lot of wastage of water. Free or very low cost of water encourages overuse, reduces the incentives to cooperate and participate in irrigation organisation, lowers system productivity due to over application and poor conservation practices.

Irrigation water being a costly resource, the Commonwealth Workshop (1978) recommended to have a reasonably high water charge, mainly for, (i) encouraging farmers to use water more economically; (ii) increasing government revenue; and (iii) taxing the relatively privileged section of the agricultural community which is benefitting from irrigation water. The Workshop suggested some 'quasi-volumetric charging', either charge the farms according to the amount of time they receive water, or a group of farmers on a single outlet or minor might be charged collectively. However, the Government of India itself is not optimistic about the volumetric supply and charging of water. CBIP publication 'Warabandi System and Its Infrastructure', even though agrees theoretically that the system of charging by volume is most scientific, holds the opinion that being the average holding size of farms are very small, it is impracticable to supply water by measurement to individual farmers. It is feasible when sizeable areas are under a single crop, as sugarcane block in Maharashtra or Gujarat.
2.5 CONCLUSION

The survey of literature gives us an understanding of the concept of Farmer Participation in Irrigation Management and describes various aspects of it with a sociological perspective. Many authors have opined that irrigation management is a neglected subject and the role of the user involvement is often ignored. Most of the Social Scientists referred in the Study, on the basis of their observations in different Countries, point out the advantages of participation of farmers in irrigation management and several preconditions for its successful sustenance.

The irrigation management activities in India was focused with the emergence of the Command Area Development Authorities in various States. Due to inherent lacunae, CADAs could not, in fact, pave way for an improved irrigation management. But, wherever efforts are initiated to enlist cooperation of farmers by the bureaucracy, with an open mind, the results are encouraging.

As seen from the literature cited, studies on the canal irrigation in Kerala is very few. Since participation is closely related to the socio-cultural set up of a region, generation of data is essentially required. It is in this background that farmer participation in irrigation management in Kerala is studied.

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