

Water Users Associations in Irrigation Management: Case of Andhra Pradesh,
South India
Opportunities and challenges for collective Action

Paper Submitted to
The 9th Biennial Conference of
The International Association for the Study of Common Property
Victoria Falls, Zimbabwe 17-12 June 2002.

Theme
The Commons in an Era of Globalization.

By

BALA RAJU NIKKU
Doctoral Candidate

Irrigation and Water Engineering Group,
Wageningen University
Nieuwe Kanaal 11,
6709 PA Wageningen,
The Netherlands
Fax: 31 (317) 48 47 59
Email: nikku21@yahoo.com

Water Users Associations in Irrigation Management: Case of Andhra Pradesh, South India

Opportunities and challenges for collective Action

BALA RAJU NIKKU¹

ABSTRACT

Andhra Pradesh, a southern state in India, has been in the forefront in implementing irrigation sector reforms in the Country. Reforms in irrigation sector are seen as a vital to both the welfare and economic development of the State. The Participatory Irrigation Management Program (PIM), widely known as the 'AP Model of Irrigation Reforms' was initiated with the enactment of the Andhra Pradesh Farmed Managed Irrigation System Act (APFMIS Act) in 1997. The Act enables the transfer of rights over the canal water and its assets to the newly constituted 'Water Users Associations' (WUA's). In the state, 10,292 WUAs have been 'declared' as constituted covering the major, medium and minor systems. The reforms aim to achieve higher production, efficiency and equity. It is widely perceived that the program receives stronger political will and bureaucratic support. The State aims to build the capacity of the newly formed local level institutions in land and water management and transferring the management to these institutions for better. This program is based on the assumption that the transfer of 'rights' from the Irrigation Department to the WUAs would result in better management of the system. This inherently assumes that the transfer of 'rights' to the newly crafted institutions by the State would lead to better management through collective Action. There are institutional and social arrangements, which are responsible to deliver the services to the users of irrigation water in the past. Traditional local institutions (*Neerukanti, Klava Pedda*) responsible for water distribution and management under canal and tank irrigation lost their presence and relevance when the State came up with the formation of WUAs. As new institutions crafted by the State and empowered by a legislative Act, these new WUAs started functioning at local level with an assured funding from the State in the initial years of formation. The main functions of these institutions as seen by the newly elected representatives were to carry out repairs, rehabilitation of the canal, supervision of the water distribution, settling conflicts if any and raising internal resources to sustain these associations on their own. By bringing successfully a legislation, the State had shown its commitment to transfer the powers and duties of the traditional Irrigation Department to these new institutions to manage and own resources, so that these associations shall function better and be responsible to safeguard the canal resources. The paper documents how the common property resources like canal water and structures are being managed in the past and present, and argue whether the new local institutions are able to address collective Action by acknowledging the equity and livelihood concerns of the resource poor users. The primary knowledge about these institutional functioning, rules and practices could influence in the thinking process and policymaking in the state. The paper concludes the opportunities for the reform processes and presents recent field evidence to highlight the constraints faced for effective collective action in the management of major irrigation systems.

¹ Doctoral Student, Irrigation and Water Engineering Group, Wageningen University, Nieuwe Kanaal 11, 6709 PA Wageningen, The Nether Lands. Fax: 31 (317) 48 47 59, Email: nikku21@yahoo.com
Field Address: Bala Raju Nikku, Jeevana Bharati, Budithi -532 427, Srikakulam District, Andhra Pradesh, South India.

INTRODUCTION

The Andhra Pradesh Farmers Management of Irrigation Systems Act was initiated by the government in ruling in the year 1996 and secured the legislative assembly approval in 1997. Since then it has been implemented through out the state. The Act provides legal sanction for a state recognised institution. The different provisions of the Act explain the duties and powers of the Farmers Organisation at different levels and it's representatives and ordinary members. This provides right to get information relating to water availabilities, allocations, opening and closing of canals and outlets, period of supply, frequency from the agencies involved with irrigation management. The Act authorises a member to receive water as per the specified quota for use in other words the share of the water and freedom to grow any crop other than prohibited by the law. The State by bringing the Act and the will shown to implement the Act, suggests the approach taken by the government to facilitate the users participation in the management of the irrigation systems. The State through the WUAs wanted to conserve the canal water resource and use the resource in the most efficient manner. The PIM programme in the State met the legal arrangement in place. To summarise the basic orientation of the Act was to reform the irrigation sector and accelerate the sectors performance. This has provided new space for the farmers' participation in the management of the irrigated water resource, which is the main input for the irrigated agriculture. With the Act came into force in the year 1997, in total 10,292 water users associations have been formed covering all the irrigated area of the state under major, medium and minor irrigation system in the same year through democratic elections. The approach taken by the state was known as a top down approach in forming the associations. There have been significant changes in the irrigation sector after the introduction of these associations and new leadership roles have emerged. The Act has not changed the practices of the Irrigation Department, which was traditionally playing the role of provider and derives power out of its nature of the position. Today it supposed to be playing the role of a facilitator, meaning sharing the power and needs attitudinal change in the ranks and file of the department, which had its roots in the British India.

Can the newly formed Water Users Associations facilitated collective action for canal water management? Does these organizations function as self-regulating and gained control over the canal water distribution and supply? What will be the outcome of State regulations in Resource Use? Can a Government, by bringing legislation /act effectively create organizations for resource conservation? In other words a state promoted organizations can they be successful in regulating the users behavior and hence rational exploitation of the scarce resource? If the answers to sustainable resource management were so simple then there would not be any great need for the intense research that is growing in the area of commons. In this paper I wish to focus on the evolution of the APFMIS Act in the state of Andhra Pradesh and discuss whether the state through creating a favourable legal environment in resource management forge Collective Action through its institutions? What happened to the existing institutions after the formation of the new Act? What role-played by the farmer organisations in canal water distribution and supply? Whether the organisations facilitate the collective Action among its members to manage the resource rationally? What are the strengths and limitations of these institutions formed through an Act? The newly formed farmers organisations and their role in managing the canal water resource provide evidence to answer these questions raised. There is a vast literature

available on the role of the institutions in resource management emphasising the need for the involvement of the users for better management of the resource and to share the benefits.

In this paper I intent to explain how a state promoted farmers organisation function in canal water management and draw lessons whether such organisations are successful in achieving their objectives. It attempt to answer the policy lessons that can be drawn by studying these organisations in canal water resource management. The paper reports on the basis of the fieldwork conducted on the Madhira Branch Canal in the Nagarjunasagar Left main canal irrigation system, Andhra Pradesh, India. This paper is divided into two main sections. The first section describes collective action theories that underline the paper's analysis of institutional development, the opportunities and the challenges. Section two is the discussion on alternative institutional models. The paper concludes with the opportunities and challenges before the Andhra Pradesh Irrigation reform programme in its implementation.

SECTION I

1.1 Institutional Innovation and Development: A theoretical frame work

Institutions are defined and understood and argued in many ways in the vast body literature available on Management of Commons. (Olson 1965; Hardin, 1968; Uphoff, 1986; Wade 1988, Bromley, 1989a; Ostrom, 1990,1992; North, 1990; Eggertsson, 1994; Gupta, 1985a, 2000). Even before the Hardin's theory of tragedy of commons, it was the famous philosopher Aristotle who observed that "What is Common to the greatest number has the least care bestowed upon". The three influential models Hardin's Tragedy of the commons, the Prisoner's dilemma game, and Olson's logic of collective action have been influential and used to justify the policy recommendations in natural resource management sector. In the paper I have discussed the nature of the Water Users Associations and presented them as organizations at local level with a vertical network to the higher-level organizations. Understanding these newly crafter associations is important and has policy relevance. In this paper I classify these associations as organizations, which are evolving rather treating them as institutions.

Institutions can be defined as rules that are embedded in the socio cultural and religious worldviews of the members in a society. The Institutions are instruments of coercion, providing assurances to actors about the range of each other's behavior, and also helping in laying down ground rules for deviating from the norms. Institutions provide rules and rule aiming processes that are necessary for both individual and collective action. North (1990) made a critical distinction between institutions and organizations. He defines institutions as "the rules of the game in a society or, more formally, the humanly devised constraints that shape human interaction" and defines Organizations as "groups of individuals bound by some common purpose to achieve objectives." North also further defines institutions broadly into formal and informal. In other words, institutions are clusters of roles, norms and societal concepts.

Norman Uphoff argues "*Organizations*, whether institutions or not, are structures of recognized and accepted *roles*, while *Institutions*, whether organizations or not, are complexes of *norms and behaviors* that persist over time by serving collectively valued purposes" Organizations are

usually an expression of, but are not synonymous with, institutions. All institutions need not to have an organizational manifestation. For example marriage is an institution but not organization. A particular family, a local church, a specific co-operative or a regional market are organizations but not institutions. The central bank, the Supreme Court, the family are institutions that are organizations and vice-versa (Uphoff, 1995). Where as an organization evolves into an institution when internal commands within individuals replace the external demands made by the organization in which they work (Gupta, 1985a).

In understanding the role of institutions involving collective action in the management of commons, institutions are understood as regularized patterns of behavior between individuals and groups in society, or complexes of norms, rules and behaviors that serve a collective purpose (de Janvry et.al, 1993). Cultural endowments have an impact on what kind of innovations people demand. An example in this case is the large irrigation systems in India. When tail end farmers fail to get irrigation water for years together, due to lack of maintenance in the middle and head reaches of the distributary system, they demanded an alternative system of irrigation rather than the improvement of the existing system. This is mainly due to the fact of the absence of traditional norms of cooperation. In irrigation management farmers have realized that it would be difficult to bring in a change in attitudes of the middle and head reach farmers. In fact, farmers in the tail ends fail to get water even after their efforts to maintain distributary systems through collective action due to the non-cooperation of the middle and the head reach farmers. Though farmers are aware that proper maintenance of distributaries will bring water to their fields, they opt for putting political pressure to get lift irrigation schemes for which they are ready to pay even the capital costs. The source of water for the lift irrigation schemes is the overflow of excess water in the middle and head reaches, which feeds into a stream (Reddy, 1995a).

Individuals or groups innovate institutions in order to reduce these transaction costs (North, 1990). There are claims that the government of Andhra Pradesh had introduced the Participatory Irrigation Programme by forming the Water Users Associations to reduce the state's expenditure. The State probably found these institutions as vehicles of change and means to share the responsibility of managing the irrigation systems, which are decaying. Formal as well as informal institutions coexist. The Water Users Association enjoys and legal recognition and hence can be termed as a formal organization. Where as the presence of Neerukanti can be seen as an informal institution, which enjoys the support from the community members.

The informal institutions in resource management are in the form of cultural and religious practices and other social norms. The community members will devise the rules and norms, where as in the formal organization the rules are framed externally which may be modified locally to suit the existing conditions. These modifications are subject to approval by the external agency, which framed the rules. The sustainability and performance of these institutions depends on their coping strategies and adaptability to the changing socio economic and political changes. One cannot simply assume that a reasonably well functioning institution in one place or time will be delivering the same in another place. Effectiveness of these formal and informal institutions in managing Commons needs to be defined in order to classify them as efficient or inefficient institutions.

1.2 Studying Water Users Associations: Applying collective action principles

The prime objective of any irrigation system is to provide canal water to farmers for increasing the agricultural production and hence increase in the household incomes and hence contributing to the development of a state. All major irrigation system can be defined as public systems and are meant to serve the public. The role of the state is a vital in managing these public entities for which it needs right policies and an appropriate legal environment, which gives the state with the necessary power to control and manage the resource. An act is necessary to define the rights and duties of the users and the state. The rules framed under the act enforce the provisions of the act. Where as administrative orders or Government orders regulate the principles and procedures of the irrigation management in the present context (PMU, 1992).

1.2.1 Nature of the resource:

The public good nature of the irrigation systems will be operated in a situation of conflicts among the different users with their conflicting interests. Operating the system needs decisions made at different levels by individuals responsible for the management of the irrigation system. The system managers want to operate the system to meet the design objectives. Where as the farmers wants to gain as much benefit as they can derive by receiving canal water to their fields. The state wants to protect the interests of all the users. This is where the policy declaration of the government in power is relevant.

1.2.2 Right to canal water

None of the earlier acts in implementation, including The Andhra Pradesh Irrigation Utilization and Command Area Development Act of 1984 provided the right to water by the users. The APFMIS Act of 1997 provides the right to irrigated water to all the users meaning not only the landowners in a command but the tenants and other users in a command. But the question is whether the users enjoy the Rights provided by the Act? Whether the state succeeded in facilitating the environment where the users can enjoy their rights and do their duties? Do the farmer representatives and farmer members are able to exercise their rights? Do the Irrigation Department recognize and respect the rights provided to the user of the canal water? These are some of the questions I tried to seek answers during the one-year fieldwork. The evidences collected suggested that there is no awareness of the rights provided to the users for the first time in the state history of irrigation management. It is due to the prevalent illiteracy among the farmer members and their representatives. The state government tried to publicize the rights of a user through the public meetings, political statements, training materials and literature directly supplied to the representatives. The understanding over the rights and duties given by the APFMIS Act was not realized at the individual users' level. Among many other reasons, one important reason could be the ignorance about the rights provided to the user, no access to information, the institutions involved do not want to share the power by accepting the right to water by a canal users who till yesterday had been the receiver and at the mercy of the Irrigation Department. No specific right or title to the use of the water has been vested with the farmer in the past and hence the farmer had been the receiver than the owner of the resource. Hence there is a need for a forum or an active institutional support by which farmer members can be explained about their rights and duties and the ways to exercise the right.

1.2.3 Membership and size

Olson (1971) has challenged the generally held view that groups of individuals having common interests come together to achieve the common objective. Olson argues '.....unless the number of individuals in a group is quite small, or 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 group of interests'. Applying the theory of Olson to the membership of the functioning WUAs it was found that the membership size of a WUA ranging from 175 to 1958 recognized members in the formed WUAs.

The membership in a WUA is based on the ownership rights over a particular land in the localized ayacut of the system. According to the APFMIS Act of 1997 a landholder means 'an owner and or tenant recorded as such in the record of rights under the Andhra Pradesh Record of Rights in Land Act of 1971, in respect of land in the notified ayacut area of an irrigation system'. Therefore the membership identity is determined by the legal ownership to a land title. In the state there are variations existing across the three regions in the land title registration procedures. The state government had also introduced a system of pass book in which the type of ownership, extent, the type of land and other details about the loans taken will be noted by the Village Assistant. In the beginning of the reform process, to contest in the elections held for the WUA office, the rule that who ever posses the passbooks as a proof of the land ownership was allowed to contest and recognized as the members. Implementing this rule many farmers were left out because, either some of the users do not posses these passbooks or the name of the ownership still lies with their forefathers. The registration process is a tedious and needs hard cash to pay in the form of government fees and unofficial charges to the staff involved with the registration process. Hence, the land is being cultivated by a farmer who enjoys the hereditary legal ownership but not recognized in the formal law. The result was many farmers who are cultivating the land in the command were not recognized as formal members to participate in the WUA activities. The following table suggests the membership size in the WUAs in the Distributary committee no 14 in Kalluru Division.

Table 1: Membership Size in the WUAs – DC no 14, Kalluru Sub division

WUA No	Total Command In acres	Total Members	Elected Members	Remarks
172aKorlagudem	3684	920	6 +1	One TC vacant
172b Chundrupatla	2958	620	4+1	
175Chennuru	6047	896	10+1	
176 Erramadu	5734	1016	10+1	
174 Vavilala	6299	1080	10+1	Two TC vacant
173 Chundrupatla	2961	NA	NA	Election not held
169 Kalluru	5471	1958	10+1	
170Mittapalli	3699	170	8+1	
171 Muddunuru	4031	175	8+1	

Source: Records from Kalluru Sub division Nagarjunasagar Project

The above table reveals the extent of the WUA jurisdiction and the members recognized as voters. As explained above, many of the farmers don't possess the legal requirement and hence did not recognized as members and did not participated in the elections that were held in the year 1997. Though they are not recognized as the members they do influence the WUA functioning and activities. The discussions with the WUA president and the department staff show that about half of the farmers were left out and hence the membership of the farmers in a WUA is much more than what it is on paper. In addition the Act also provides membership to the tenant farmers. But again in practice the tenancy agreements were only oral but not on paper meaning the actual number of the WUA members is much larger than reported.

Free riding problem

As Olson theorizes the larger the group the less the noticeable the actions of its individual members, the higher the transaction costs of bringing them together and hence higher the tendency to free ride. Hence Olson concludes that large groups frequently fail to provide collective goods for their members. Though Olson did not specify how small the group should be but he asserts that the group should be small enough so that 'the individual actions of any one or more members are noticeable to any other individuals in the group'. The idea of small group may be that there will be possibility for supervising each members behavior by the other members and can be corrected through coercion and other methods to regulate the behavior of the violator which is not effectively possible in the large groups.

Punyapuram Major

This study on formation and groups' size of the WUAs functioning in the larger canal systems reveals that WUAs are formed on the basis of hydraulic boundaries, because of the nature of the resource. For example a major canal Punyapuram with a command of total 5342 ha had been divided into three associations' jurisdiction namely WUA 169 Kalluru with 2214 ha and 1958 recognized farmer members, WUA 170 Mittapalli with 1497 ha with 170 members and WUA 171 Kesavapuram with 1631 ha of command and 175 membership. The three associations formed on the Punyapuram major, which is of 15.037km length as head, middle and tail reach respectively. The study of three associations reveals that less membership has not lead to the efficiency of the association. The actual membership of these associations is also high but the rules that framed to recognize the member had denied a large group of farmers to become as members.

What I argue here is apart from the membership size it is the location of the association and the nature of the resource and access levels to the resource that influence collective choice of the members. The members from WUA 171, who are from tail reach of the major are convinced that water will come to their field only if the needs of upper reach farmers are fulfilled to some extent. Since the upper reach farmers grow the wet crop and these tail reach farmers grow irrigated dry crops the water need, requirement and timing is different to these crops. The tail reach farmers had changed their cropping pattern to the irrigated dry crops because the access to water is very low when compared to the head reach farmers. Even after the WUAs formed the farmers reported that there is not much difference in the access to water but with the involvement of the department the assurance to get water has increased marginally. When enquired for the

low participation of users in the WUA activities to get their due share of water, the members and the president expressed that there is no benefit or results that they can achieve even though they participate. The head reach farmers use more water than their due share and nobody controls them and their association can not influence. There were conflicts in the past for water. Within the WUA also the same rule applies. The farmer in the tail reach of the minor or sub minor also face the same tail end issue. The fact is that the location of the plot play an important role to the access to the canal water and hence the participation of a member.

1.2.4 Participation in meetings and decision making

According to the APFMIS Act, the General Body² shall meet at least twice in a year, once before the *kharif* and once before the *rabi* season. The general body may also be called at any time by the president or managing committee members through a majority resolution or by members of the organization through a requisition signed by not less than one third of the members with voting rights. The general body meeting shall also be held on receipt of a direction to do so from the Government or from the Commissioner, Command Area Development or by the next higher tier of the farmers' organization in respect of matters relating to urgent public importance.

The above provisions provided in the Act suggest the importance of conducting the General body meeting by the WUAs formed under the Act. However the power of the Government to call for General body meetings to be conducted by the WUAs seems to check the behavior of the farmer organizations and lack of trust on them by the state. Studying the role of WUA in organizing the General body and the Managing Committee meetings show a poor performance.

The statistics suggest that minimal participation of the members in the general body meetings conducted by the WUA. The same question was asked to the WUA representatives to documents the reasons. Most of the WUA presidents who were interviewed explained that they could not reach all the members of the WUA because of the huge number and they do not have any manpower to mobilize the members to participate. According to the Act the General Body should be conducted in the identified headquarter of the WUA. The presidents are not from the head quarter designated of the WUA and hence arranging logistics had become difficult. Even to organize the managing committee meetings formally had become difficult because of the time and lack of resources to organize the meetings every month. The farmer members do not show interest in attending the meetings. To validate any resolution taken in the General Body meeting at least one third of the members should present. Even achieving this criterion had become difficult. Government had passed an order that if the quorum is not achieved in the specified day of the meeting and then the meeting can be postponed to the next day or any other date and the

² Notice for the General Body meeting shall be sent at least 7days in advance of the date of the meeting along with the agenda to all the members. Notice may be sent by hand/ post/ publication/ beat of tom and display on the notice board of the Organization according to the Act. But I found that none of the WUA has their offices. Each WUA draw its members from more than five neighboring villages. The WUA do not have any paid staff. The TC members of the WUA supposed to be responsible to convey the message to his /her territorial constituency members. It was found that the TC members themselves do not show any interest in the meetings and reported that they themselves do not aware of such meetings because even the Managing Committee meetings were not held as per the requirement of the Act. The Managing Committee should be held once in every month at the office of the Organization. The meeting may however be held frequently if it so requires and the proceedings of the committee shall be recorded in the minutes book and a copy of the minutes sent to the authority of the next higher tier.

resolutions can be passed with the members present. The WUA presidents claimed that the farmers only approach them if there is no water available in the canal otherwise they are not interested in the meetings to discuss the problems.

Table2: Meetings held by WUAs in between 1997-2000

WUA	Total Members	General Body Meetings held (1997-2000)	Members' attendance percentage	Managing Committee Meetings (1997-2000)
172aKorlagudem	920	30.3.1999 2.6. 1999 2.10.1999	37.93 5.76 33.80	2
172b Chundrupatla	620	30.3.1999 30.5.1999 10.10.1999	8.97 34.72 4.32	3
175Chennuru	896	20.3.1999 30.5.1999	30.85 31.22	8
176 Erramadu	1016	29.3.1999 31.5.1999 28.9.1999	30.25 30.68 35.68	10
174 Vavilala	1080	30.3.1999 30.5.1999	33.70 31.10	10
173 Chundrupatla	Not formed in the supervision of DC President			
169 Kalluru	1958	16.11.1997 29.3.1999 25.9.1999	2.55 3.30 5.81	4
170Mittapalli	170	30.5.1999 25.9.1999	11.76 35.53	8
171 Muddunuru	175	30.3.1999 31.5.199	5.71 34.29	5

Source: Formats prepared for Inspection Report on the Working of WUA/DC April /2000, kalluru Subdivision

Factors influencing the participation in WUA

The tenants though recognized as members by the Act but do not possess the legal claim, are not participating in the WUA activities. The tenants mostly come from the lower caste in the hierarchy of social status and are marginal and small farmers who have the labor resource but not the land. The small and marginal farmers who work as agricultural labor do not show interest in participating the meeting of the WUA since it costs to their daily wage earning, in addition to the cultivation.

Women members got the membership in the WUA, because some of the land was registered on their name by their husbands to get an exemption from the land sealing. Usually these women represent higher caste groups in the village and found that they are not interested in the WUA

and do not participate in the WUA activities. The third group identified is the absentee landowners who are not present in the village and at the same time their tenants are also not allowed to participate. The fourth group that was identified as the members who own land in the command and stay in the village but their primary occupation is not agriculture and is a business and other formal employment.

1.2.5 Applying Buchanan and Tullock's theory

Water Users Associations formed under major canal irrigation represent a large membership size with a heterogeneous group composition. Understanding the nature of the collective action and reasons for better or lack of collective action can be explained by Buchanan and Tullock (1965) theory. They emphasize the central role of individual behavior in collective action. Collective action emerges when individuals cannot fulfill their needs through individual actions and then they come together and choose a collective mode of action when each of its individual members finds it profitable to act collectively rather than individually. In other words the perceived individual costs are less than the perceived benefits out of the collective action. This can be explained by the organized demonstrations that held by the canal water users. Groups of users from different WUAs had come to the Irrigation Department and registered their protest with the higher officials in want of water to their fields. The analysis of these groups show that, these farmers belong to the tail end reaches of the branch canal, major and minors. The farmers' participation can be explained by their success to get a promise from the concerned authority for release of water. Here the group size of the Water Users Association does not matter but the individual's decision-making and choice to participate in the anticipation of assured water to his/her plot.

1.2.6 Leadership of the WUA

The villages in the command fall into more than one Mandal, the second level of revenue administration. The social hierarchy through the caste system still exists if not practiced dominantly than in the past. The dominant groups derive the power by their land ownership and access to the political institutions. The analysis of leadership pattern that exists within the WUA, show the evidence that, these groups had captured the positions in the WUA. Here I am presenting WUA 176 selected randomly out of nine WUAs in Kalluru Subdivision.

Table3: Leadership and Caste Representation in the WUA

WUA174	Age	Caste	Education	Mode of election	Village	District
President	35	FC	SSC	Contested	Vennavalli	Khammam
TC 1	50	FC	Primary	Contested	Vennavalli	Khammam
TC 2	40	FC	SSC	Unanimous	P.Korukandi	Khammam
TC 3	30	FC	SSC	Unanimous	Telagaram	Khammam
TC 4	35	FC	Up. Primary	Unanimous	Vennavalli	Khammam
TC 5	52	FC	Primary	Unanimous	Erramadu	Krishna
TC 6	60	FC	Primary	Unanimous	Erramadu	Krishna
TC 7	Vacant	-	-	Vacant	---	--
TC 8	40	FC	Primary	Unanimous	Mustikuntla	Krishna
TC 9	60	FC	Primary	Unanimous	Erramadu	Krishna
TC 10	30	FC	SSC	Unanimous	Gollaperi	Krishna

Source: WUA records and Primary interview

The total command of the WUA is 2549 ha the highest out of the nine WUAs formed in the DC 14 on Madhira Branch Canal. However I could not collect the exact land ownership pattern of these members. It was evident from the discussions that all of them can be categorized under big and middle farmers. The President of the WUA owns about 40 acres of irrigated land. He also served as the Village Panchayat President in the past. He lives in Khammam, the district headquarter for the education of the children and other business purposes according to the president. The leadership is in the hands of the communities represented as higher castes. It is also observed that from a single village there is more than one TC member got elected. This could be explained if a farmer member owns his land many places in the same command of the WUA. He can contest from any of these places. It was found that under a particular pipe outlet the farmer who owns more land became the TC member unanimously. The decision-making was influenced by the land ownership in many of these cases. I argue that if the ownership of the land becomes the criteria to get a position in the WUA, the benefit sharing will also be on the basis of landownership. The landownership reflects in terms of the caste affiliations. The forward caste group owns larger portions of the command. Land ownership in rural life gives the social prestige, status and power.

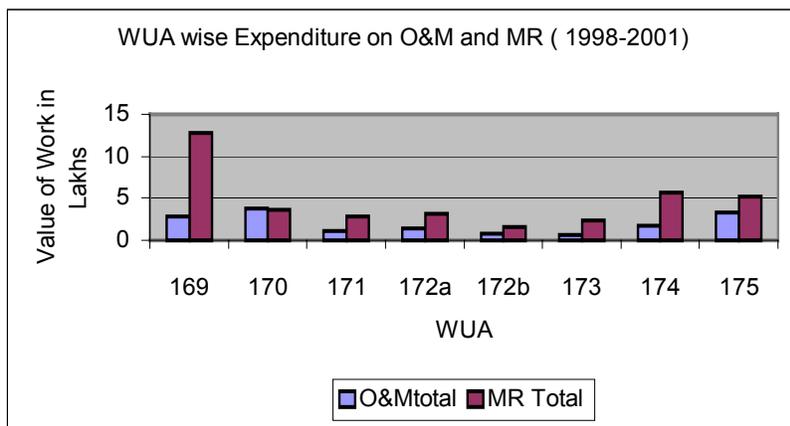
Power and participation

The analysis shows that the leadership of these organizations is with the higher caste members who enjoy social status and power. McClusky (1970) in his theory of participative behavior defines power as, "resources such as abilities, possessions, position, allies etc. which a person can command in coping with the load", which otherwise known as the theory of margin. He defines margin as a function of the relationship of load and power. 'Load' he defines as the 'self and social demands by a person to maintain a minimum level of autonomy'. Lupanga (1988) derives a hypothesis to explain how load and power influences the participation levels of the members in development projects in the third world. The members have heavy load and little power to cope with and hence they are too preoccupied with mere survival of their own than to participate meaningfully. This can be explained as *the higher the margin between the load and power the lesser the participation*. The theory is applicable to the Water User representing big, middle, small, marginal farmer groups. The small and marginal farmers represent majority of the members in a WUA but they are preoccupied with earning their livelihoods. Where as the other smaller but powerful group of farmers do not need an affiliation to the WUA because they can influence the Irrigation Department and fulfill their needs of water requirement if necessary they also influence the WUA Activities to meet their needs. Hence the role of the WUA is either balance the power equations or by reduction of the load to the small and marginal farmers which is not evident in the field.

1.2.7 Creation of Livelihoods: O&M and MR works by WUA

The budgets allotted to WUAs to carry out Operation and Maintenance which is essentially labour intensive and create more labour days. Where as Minimum Rehabilitation works that are carried out by the WUAs are less labour oriented but material intensive. Under MR works provisions for building new structures and repairs to old ones was allowed. Where as under the O&M earthen work like removal of silt and weeds, jungle clearance and canal earthen bunds can be carried out. The analysis of the works carried out suggests, in the last four years only two

years O&M work was carried out where as MR works were carried out in all the years. The funds were allotted to WUA on the basis of the command under each WUA and hence more the ayacut more the funds. Of the funds made available under the heads of O&M and MR about 29 percent average was spent on O&M and the remaining 71 percent budget was spent on minimum rehabilitation works on which about 80 percent will be spent on the materials. Even to carryout the O&M works machines like Hydrological excavators were used to clear the mud, silt and weed clearance. It resulted in the further reduction of the source of employment for the landless, small and marginal farmers. The WUA could have used the opportunity to create more labour days and hence involvement of the farmer members which may enhance the collective efforts. Budget allocations on the basis of Command of the WUA has also its own demerits. If the Tail reach WUA has more command than the head reach WUA, the funds available for the head reach WUA will be less and if the repairs do not take place in the head reach of the canal the water will not flow to the tail though the works were carried out. Hence there should be a poll of resources available and can be awarded on the basis of the need but not on the basis of command that a WUA represents.



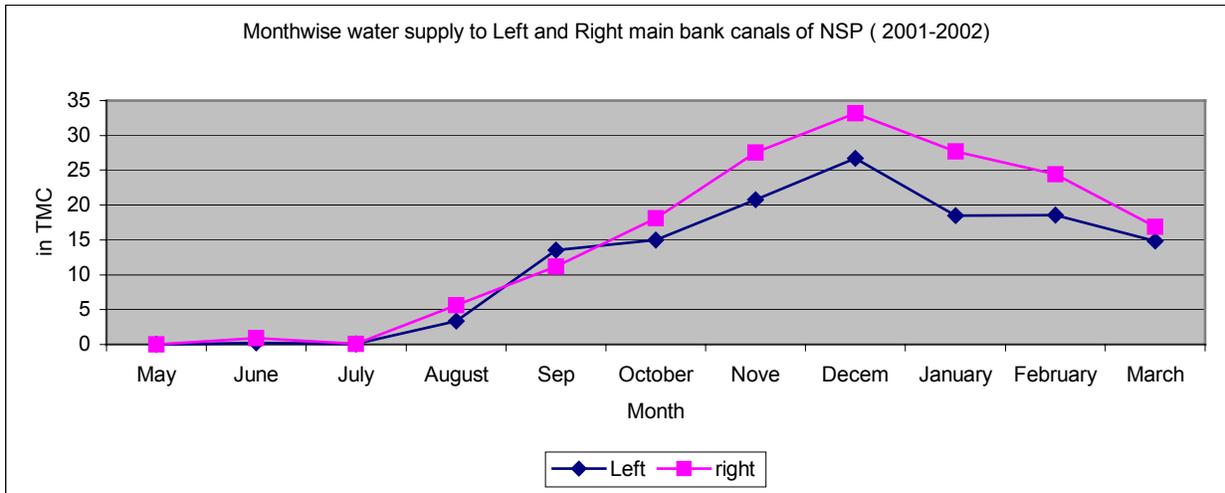
WUA No	Command in Ha	O&M Total Lakh	MR Total
169	2214	2.81	12.72
170	1497	3.77	3.57
171	1631	1.08	2.92
172a	1491	1.47	3.08
172b	1199	0.77	1.6
173	1803	0.61	2.29
174	2549	1.8	5.7
175	2447	3.24	5.17
176	2309	1.38	5.26

Source: Sub Division Records, Kalluru Sub Division

1.2.8 Water allocation and distribution

Water Distribution and supply is a complex activity in the management of the canal system. The absence of the project level committee at third tier level, the representatives of farmers organizations were not participating leaving the decision making of water supplies at the system level with the Department alone. There is criticism on the allocation of water from the reservoir to the right canal which serves to the Andhra Region and the left main canal which mainly serves the Telangana region. In this paper I am not looking at the irrigation disparity issue but how decisions which are often influenced by the political motives dilute the institutional role in local resource management. Here I use the water distribution at scheme and distributary level data to show the pattern of water supply and the reliability of supply which is needed for the better functioning of the WUA at local level.

Graph 1: Month wise Water Supply and Distribution at Scheme Level in TMC (2001-02)

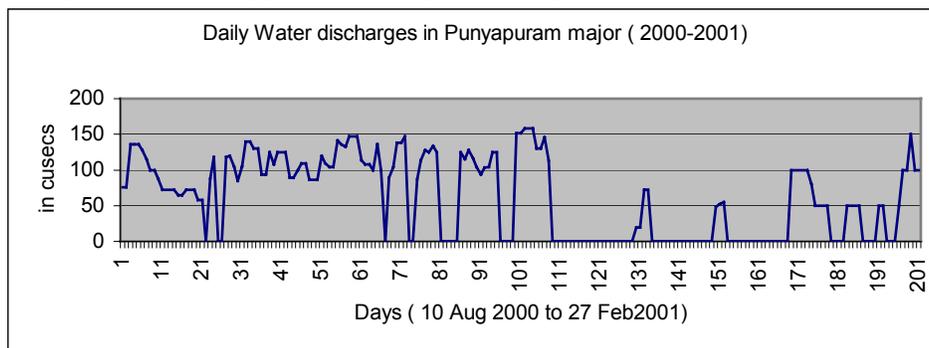


Source: Wireless Office Records, Kalluru Division office, NSP

The system level water supply for the two main canals suggests that there are difference in the quantity of water supply and the timing to the right and left main canals. Adding to these differences the decisions made at different levels results water supply as the most complex activity. Studying the water distribution at supply at major canal level the supply line of water shows a high flexibility. The more the reliability of water the less the water thefts and hence the water will flow to the tail reaches of the canals. But the existing situation suggests that the water supply is erratic and reliability is less and hence people tend to appropriate more water. Hence the water is being consumed more in the head reaches and hence no equitable distribution. The WUA at the lowest level cannot influence the decisions at the higher levels alone.

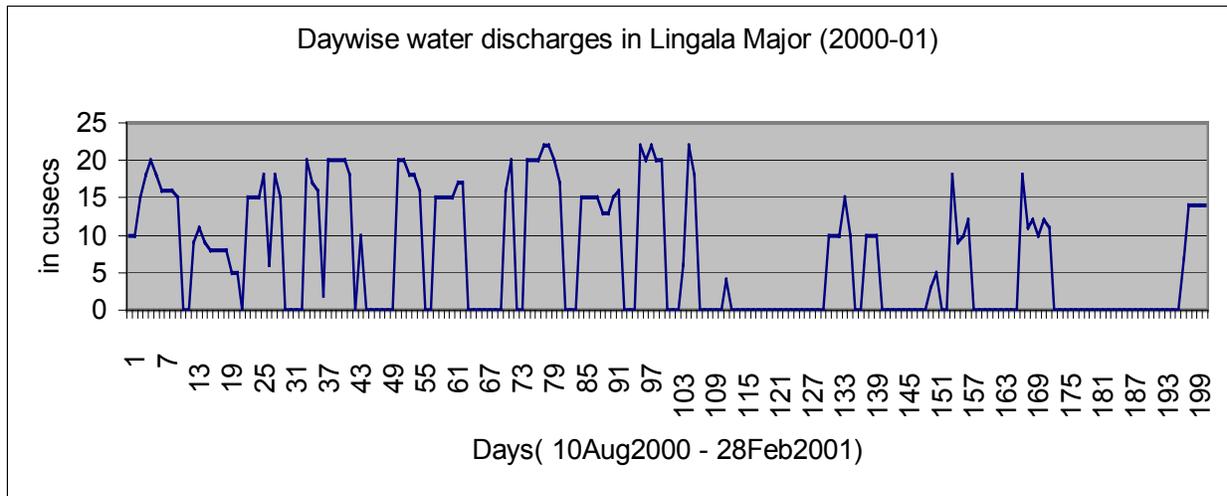
Punyapuram and Lingala both originate on the Madhira branch canal at 2.62km with a design discharge of 189cusecs and at 3.63km with a designed discharge of 22.2 cusecs. Though there are variations in the design and the length of the majors the supply pattern should be more or less same if there is the same principle being followed while supplying the water. It was found that the supply to the major is being influenced by the powerful WUA representatives and political people from the area. Hence there was no co-ordination among the WUAs on the same branch canal between the head reach and tail reach WUAs. In the absence of these coordination principle the very objective of formation of WUAs is getting defeated.

Graph2: Water supply to Punyapuram Major on Madhira Branch canal:



The water supply to the punyapuram major on which three Water users association formed show that the supply was more or less stabilized between the days 31 to 71 i.e about 40 days out of 201 days. When there is no reliable supply there will be chaos and users try to appropriate more. On the same branch canal the Lingala major show that the water distribution is highly fluctuating.

Graph3: Water Supply to Lingala Major on Madhira Branch canal



Source: Daily water readings Record, kalluru Sub Division

1.2.9 Process of joint azamoish and cess collection: role of the WUA

The process of joint azamoish has been introduced in the year 2000-2001 to increase the accountability of participating organization in raising the resources. Traditionally the Revenue Department used to collect the water cess with it's own administrative machinery. Where as in the Joint azamoish there is a role that WUA can also play. The WUA , Irrigation Department and the Revenue Department now together inspect the area irrigated under each pipe outlet and the type of the crop will be noted down. According to the survey the cess charges will be collected from the farmers. To sustain the WUA financial resources and as incentive to participate in the Cess collection a share of the water cess collected will be given to the WUA . These returns can be used for the Operation and maintenance works in the WUA jurisdiction. With the better joint survey and motivating the farmer members to pay the cess regularly, the WUA can raise its resources. The system however is facing it's own hurdles due to the involvement of many organizations and their different needs to accomplish. I have analyzed the reasons for gap the Irrigation Department statistics and revenue department statistics in a separate paper. Here the tables suggests that in some of the WUAs the Joint azamoish statistics are about 90 percent tally with the Irrigation Department which is a good indication of the Joint azamoish system but in the same WUAs the actual cess collections are less than the actual demand. How can we explain this? In other WUAs where there is a huge gap in the JA statistics and ID the collection of the cess will naturally be less than the original and hence the payments are better. What is the role played by the WUA in the process? Whether the WUAs involved or not? If involved what are the results?

Table 4: Joint Azamoish and Cess Collection

WUA	CCA in ha	Joint Aza	%	Demand	collection	%
163	2010	1566	78%	6.07	4.59	76%
164	2316	1873	81%	7.83	4.03	51%
165	1506	1026	68%	3.78	2.00	53%
166	1754	1036	59%	4.67	3.67	79%
167	2976	1437	48%	6.00	5.08	85%
168	1845	997	54%	4.42	3.23	73%
169	2214	1963	89%	9.35	4.37	47%
170	1497	858	57%	4.11	2.78	68%
171	1631	422	26%	1.88	1.2	64%
172A	1491	1330	89%	6.02	2.51	42%
172B	1199	1307	109%	5.91	2.29	39%
173	1803	1784	99%	8.54	3.46	41%
174	2549	2434	95%	11.69	5.39	46%
175	2447	1670	68%	7.70	3.67	48%
176	2309	1922	83%	8.37	2.72	32%
177	2106	917	44%	3.96	1.52	38%
178	2942	910	31%	2.92	1.40	48%
179	1546	168	11%	0.42	0.08	19%
180	2019	1940	96%	3.93	1.95	50%
181	1985	1830	92%	0.58	0.24	41%
182	2040	1906	93%	6.18	1.19	19%
183	2810	480	17%	1.68	0.78	46%
184	2535	320	13%	0.79	0.34	43%
185	2459	170	7%	0.42	0.12	29%
186	3422	2689	79%	6.27	4.28	68%
187	2684	2458	92%	1.80	0.51	28%
188	1929	1853	96%	1.00	0.96	96%
189	998	978	98%	0.60	0.36	60%
190	3120	2843	91%	5.23	0.43	8%

Source: kalluru Division records as on 20.3.2002

As an observation in the WUAs where the Joint Azamoish reported less than the WUA localized those WUAs have shown higher percentages in cess collection.

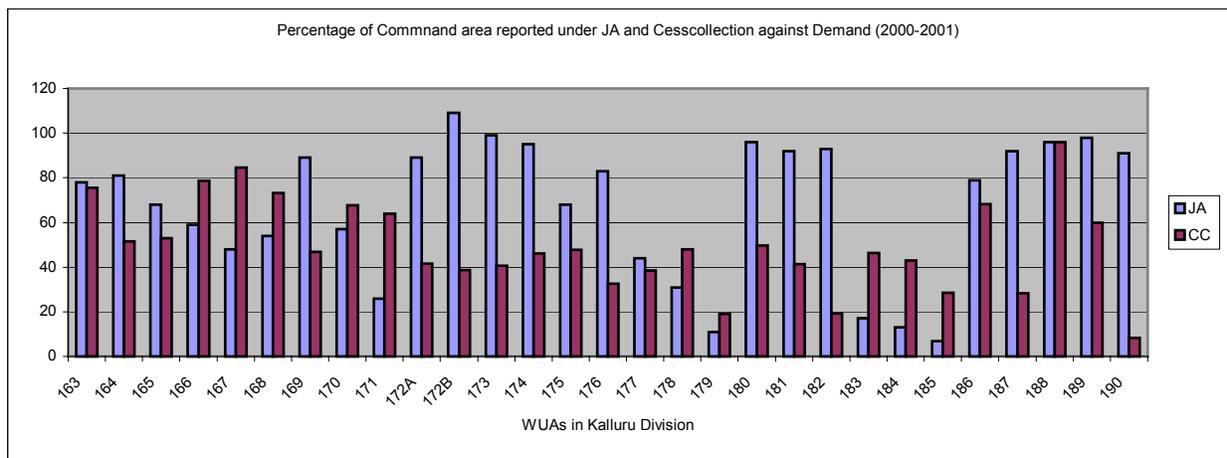
In DC 13, WUAs 166,167 and 168 in Tallada Sub division reported 59, 48 and 54 percent respectively when compared to their CCA. However the reported cess collection against actual demand shown as 79, 85 and 73 percent respectively.

In DC 14 kalluru WUA 171, the tail end of Punyapuram major had shown the least joint azamoish with 26 percent to the total irrigated. In the same Distributory committee for WUA no. 173, elections were not held for the WUA due to the court order. There is no WUA functioning

and it was under the DC president supervision . The WUA reports 99 percent in the joint azamoish when compared to the ayacut irrigated shown by the Irrigation Department.

In DC 15 Madhira, WUAs 177,178,179 on Utukuru major registered low percent of joint azamoish compared to the actual irrigated. They had registered 44, 31 and 11 percent respectively and forms the head, middle and tail reach WUAs on the Utukuru major. The actual cess collections also reported less as 38, 48 and 19 percent respectively. Where as WUA 180,181 on Madhira major and WUA 182 on the first reach of the Nidanapuram major have shown 96, 92 and 93 percent after the joint azamoish conducted. Interestingly these three WUAs fall under one section of the Madhira sub division. Where as under the second reach of Nidanapuram major, the tail end reach also reported the huge gap existing between the irrigated and the joint azamoish statistics. In WUA 183 it was 17 percent followed by WUA 184 with 13 percent and 185 WUA the lowest of 7 percent was reported.

In DC 16, out of five WUAs existing for two vacancies are existing. For WUA 189 the president had passed away and for WUA 188 the president has resigned. Where as WUA no 188 ,Tituvuru had registered the highest percentage both in the JA and cess collection against actual demand. The lowest record was also reported in the same Distributory committee, WUA no 190, Khambampadu though the percentage of joint azamoish was reported as 91 percent and the cess collections was only 8 percent.



The emerging pattern and the associated results show that in the tail reach WUAs there is a huge gap between the joint azamoish reports and the Actual irrigated because of the practices involved in the JZ. Hence the evidence suggest the involvement of the WUAs in the tail reaches is minimal because there is no supply of water. Where as can be applied to the involvement of the respective department representatives. Where ever the joint azamoish has reported high it is due to the concerned irrigation staff is attentive and have proper records to show to the revenue department and negotiate for a higher figure. Where ever good results of cess collections are achieved it is due to the revenue staff involved and in general the local culture of the farmers in paying the cess. It was also observed that the regional factors do have influence in the payments made as cess charges.

1.2.10 Offences and penalties: Applying Ostrom's Design Principle

Chapter five of the APFMIS Act deals with the Offences and Penalties. An irrigation offence can be defined as 'any Act, relating to an irrigation system, which is specially prohibited under law and which is done voluntarily and with out proper authority is an irrigation offence'. These offences and penalties for irregular irrigation have been dealt in the earlier irrigation Acts viz., A.P IU & CAD Act 15 of 1984 and A.P. (Telangana) irrigation Act, 1948. All types of offences under IU & CAD Act, 1984 were listed as cognizable (i.e. the police officer can arrest the offender with out an order from a magistrate and with out a warrant) but can obtain a bail.

The WUA as a local organization was empowered to use the provisions of the Act in order to regulate the behavior of the members who violate the rules and sanctioned norms. Where as the emerging field evidence suggests that the WUAs have been failing to impose the regulations and to regulate the behavior. The cause was attributed to the nature of the WUA representative who elected through an election process to the WUA office. Hence the elected representatives in view of getting reelected, do not want to use the power that the Act provides even in the case of violation of rules. The net result was that the increase in the illegal fetching of water and growing evidence of tampering the irrigation structures. When there was no WUA, the Irrigation Department used to use its powers to punish the violators. There are some lapses in the management of the department was also evident. However the irrigations staffs belong to state they don't have the same oblige to the violators that the WUA representatives today have. The power to punish have changed the institutional form but the end result was violation still exist. In the absence of sanctions and graduated punishments by an institution the exploitation of resource shall continue.

1.2.11 Incentives and rewards

The various Government orders issued by the Government in irrigation sector reveals the commitment of the state in providing the incentives and rewards for the farmer organizations for their better functioning. These local level organizations can improve their performance and play an active role in the system improvement and management. Through the recent government order (GOMS no?), the government is committed to allocate 100 percent utilization of the money that will be collected after 1.2.2001 in the form of water cess, through the local farmers organizations only. In the past half of the cess collected used to be remitted to the state treasury to meet the staff salaries and other administrative expenditure. But to facilitate the financial sustainability to the newly formed farmers organizations the state decided to allocate more resources than in the past. For every 200 rupees collected as cess per one acre of wet crop, 100 rupees (50%) will be deducted to the WUA account and 40 rupees each (20%) to the Distributary committee and Project committee and 20 rupees (10%) to the account of Gram Panchayat. These incentives were created to promote WUA's involvement in the cess collection because the rate of the collection is directly proportional to the revenue that a WUA can earn. In practice the revenue department still holds the power to collect the cess. The recent Government policy regarding the appointment of village secretaries in the place of village assistants indicates the government intention to decentralize the administration at all levels. The results will only be clear when there is a co-operation between the WUA and the new village secretaries. The system

of Joint Azamoish can be implemented effectively in the new institutional set up. Complete identification of the type of the crop and the extent can be recorded which would result in better water cess collections at a village level. The more the cess collected the more the resources for the WUA to spend on maintenance and repair works on the canals in its jurisdiction.

In the present system of cess payment the Revenue Department start collecting the cess through their staff from December 15 of a crop calendar and continues till the end of the April because the Rabi harvests will end by the April. Then the money be deposited to the government treasury. The money from the treasury come back to the Mandal Revenue offices. The Mandal Revenue office then prepares the statements of cess returns to the each WUA according to the government orders. The drafts drawn in the name of the associations will be sent to the concerned Irrigation Department and the competent authority will then handover the draft to the president of the WUA. Then these drafts will be accounted in the WUA register and then sent to the bank for realization. Once the drafts are encashed the money will be available for the WUA spend on the approved works by the general body and the managing committee. The process involves time and recording at different levels. According to the WUA presidents who had received their first such share in the month of September 2001 for the crop year of 2000-01 and hence they could not carry out any works in the summer 2001. Some of them had shared that since they need to receive money from more than one Mandal Revenue office the WUA president had to spend more time, energy and often money to complete the long process.

1.2.12 Crop choice

The APFMIS Act provides the individual farmer with a freedom to choose the crop of his/ her own unlike in the earlier acts which specify the crop to be grown on a particular plot in the localized area. Under the section on Rights of members rule no 4 and 5 of the Act states that ‘to have the freedom of growing any crop, other than those prohibited by law, adjusting the areas within the water allocated’ and to sell or transfer the water share to any other water user within the operational area of water users association. However the implementation and the results in the field are not that evident and encouraging. For example the tail reach areas of the canals were designated as the wet areas in most of the canals under Nagarjunasagar and they are localized. Where as in reality these tail reach fields have become suitable to grow irrigated dry crop since they do not receive enough water. If a farmer wants to grow a wet crop as a choice and request the department or the WUA they are not in a position to supply the water to the farmer who had requested. In my discussions with the Kesavapuram farmers who are the tail reach farmers on the Punyapuram major willing to grow paddy crop, since the cash crops like chilly and cotton are no more viable for them. They claim that even after the WUA existence for five years there was not much change in the water use practices through out the canal from the head to tail and hence they could never have an equal access to water share when compared to the head and middle farmers. If these farmers are right then the well intention of the Act with freedom to choose the crop will remain as a mere provision.

Added to these supply dimension the ‘choice of the crop’ to the farmer, the available options have already been limited and be determined by the design factors and the availability of water in the canal. Providing freedom of crop choice will only make sense if the WUA and the

department able to supply water to a particular plot, when there is request made by a farmer irrespective of his or her location of the plot in the command.

1.2.13 Three Tire Organization

Though in the APFMIS Act it was pronounced that in the large canal systems there will be three levels of organization with an apex body made responsible for the operation and management of the irrigation systems. But in practice elections were held for the WUA level and Distributory committee level. Where as the Project Committee level i.e. the third level organization the elections have not been created. According to the Act even there is a formation of apex committee, which will be headed by the Irrigation Minister as the chairperson of the committee. Apex committee will be overarching body which will have powers to arbitrate the decision of the apex body shall be the final in case of any party to a dispute or difference aggrieved by any decision made or order passed by the managing committee of project committee. The reasons for not conducting elections for the project committees and the formation of an apex committee have not been announced by the government.

The discussion with WUA representatives, irrigation staff and other interest public groups suggests many reasons for not conducting the elections at the project level organization. The main reasons stated are 1) if there is a project committee and the Chairman got elected he or she will become the most powerful in the political sphere because the decision taken at the level do have an effect on the decisions of the farmers and their votes.2) the other reason stated that the positions of the WUA and the DC are captured by the Congress and other political representatives than the ruling Telugudesam party representatives and hence the Project Committees Chairman positions will also be captured by non Telugudesam party representatives and hence no political mileage for the ruling Telugudesam party. 3) The third quoted reason was that the bureaucracy and the higher officials in the Irrigation Department do not wanted the farmer representatives at that level of decision making for two reasons, one that they had to share the power and the second to avoid the political interferences in the management and supply of water at system level. These are some of the reasons stated but the fact is that the absence of the third level organization, the objective of the APFMIS Act that is forging linkages between the levels of farmer organizations and through this promoting formal representation of the farmers in the system or project level management has not been achieved.

1.2.14 Provider to facilitator

It is the collective role of the farmers makes the Irrigation Department more sensitive to the “service” role it should be playing than the “provider” role. The strength of the APFMIS Act lies in facilitating the collective action by the farmer-users so that they concert the pressure that would make the department service oriented. However in reality it was different in the field than the expected. The Department still plays an important role in water distribution and supply. The department still controls the water since the structures on the canal, which regulate the water flow is in the hands of the department. Hence there are evidences of tampering of the irrigation structures even after the WUAs formation and their existence for more than four years.

1.2.15 Localization as policy and in practice

The 'localization' has not been formally defined although it is widely used and commonly understood in the South Indian irrigation systems. The term was coined during British India and was implemented strictly in a systematic manner in the Grand Anicut Canal area of the Cauvery Delta. Localisation can be termed as an administrative process, a design idea implemented to demarcate the commands under an outlet by an official notification by the state. Then a localized land will be known as authorized ayacut. However in practice the localization as a principle had failed and the pattern had been reversed compared to the original design. In the original design traditionally the tail reach of the canal was designed as wet crops and the head reaches and irrigated dry crops on the same canal. The idea was water will flow to the tail reaches first and then irrigate the plots from the tail to head. But the field evidence show that all the wet tail reach areas had become dry and more water is being used in the head reaches only. Hence the localization has lost its relevance. Hence through the APFMIS Act it should have been rectified but no mention about the process was made. The policy of localization adopted so far has not been successful even after the implementation of the APFMIS Act is being implemented. Non-localized or unauthorized ayacut lands are found irrigated with the canal water in the head reaches where as the localized ayacut in the tail reaches have failed to receive canal water in time and sufficient quantities.

1.2.16 Perceptions of the stakeholders about the APFMIS Act

In the discussions and the interviews made with the farmers, WUA representatives, Department staff, NGO leaders, Researchers, political party representatives and others had revealed interesting perceptions and responses about the Act, the implementation and the results. The common response was that Act is good and there is political will. The perceptions have changed especially across the Irrigation Department one of the main stakeholder. The higher level staff had shared that by bringing the Act the government showed its seriousness and there was a general acceptance by the department. Where as the lower level staff had perceived the formation of the WUAs made their job responsibilities difficult because they felt that the WUA representatives are pressurizing them especially for more water to their designated commands of the WUAs. Since the Competent authority for the WUA level is the Assistant Engineer he had to facilitate the functioning of the WUA especially in terms of the reporting and carryout the works and submission of the audits. Not many of the WUA representatives can maintain their records and the office.

The lowest tier of the department staff luskars who are the actual link between the farmers and the department had felt that these WUAs are a threat to their jobs. There was a move that the government wanted to bring the job of the luskar under the supervision of the WUA and on the basis of the clearance from the WUA president the luskar will receive his or her salary from the department. The move was opposed by the unions of the luskars and the case was in the court. There are expectations that if not today some other day these jobs for sure will be brought under the WUAs and then the luskars had to deliver their services under the supervision of the WUA president who was elected. Hence many of the luskars had seen these associations as a threat to their job security. They also felt that if they had to work under the supervision of the WUA

presidents then they will lose their identity as the government servants and hence do not receive respect and the protection from the society, which they are receiving at present.

The WUA representatives especially the Presidents had responded very positively about the Act. They said that they were aware of their powers and duties because these things had been discussed in the trainings conducted by department in the first year after their election to the WUA office. But later the government has not showed much interest and the last two years there was no encouragement from the government claims the presidents irrespective of their political affiliations. Many of the presidents had also shared that they were given with the Telugu (local language) version of the Act book but they could not read all of it. Some presidents had shared that they read most of the Act and had realized that the powers that Act provides to their organization were immense but for the political and social reasons they are not able to implement all the rules. Very few of the presidents had claimed that the Act was not even understood by the department staff and hence there was no recognition to the powers of the WUA representatives by the department.

However the discussions with the TC members revealed that many of them only aware that there is an Act but do not know the powers and responsibilities of their own. Because there was not much encouragement for them to participate. They were not invited to the meetings and discussions organized by the Department. They also claimed that even the WUA president of their own association have not called for meetings. The awareness level about the Act among the farmer members (whose names appear in the WUA election voters list) was even minimal. The interviews conducted with the community leaders in a village had revealed that some of them knew about the Act but never read the book for reasons that they do not have it and never felt that they should know about the Act. To put it in their own words some of them who also got elected as *Gram Panchayat* President or Co-operative society members not even aware that there is an Act that guides their actions and empowers them to act.

SECTION 2

Alternative Institutional Models

2.1 Assurances

There is evidence that in the canal irrigation the access to water is better to the head reach farmers than the farmers from the tail reach. Though the Localization Policy had tried to address the issue by providing water to the tail reach plots and then upward. In reality this had been proved a failure because the farmers in the head reach never let the water to flow downstream without irrigating their plots in first place. The practice has become a norm and probably accepted as a natural process. There is also evidence that since the tail reach farmers denied of their share they need to invest more energy and used lobby with the political people and with the staff in the department to obtain water to their plots. These farmers had to invest more time and energy when compared to the head reach farmers. Here, I explain the factors for users participation with the help of concepts of Assurances. Vertical Assurances can be defined as the future returns from the present investments. If I do not intend to use my share of water in the present season, then shall I be able to get more water for the next season? The horizontal

assurances i.e one's own behavior against others. If I do not have more water will others also do the same? These assurances will have a bearing on the evolution of the WUA as a resource management organization. The present WUAs are not able to provide these assurances to the members and hence there is wastage, over usage of water, conflicts and unequal distribution.

2.2 Risk Adjustment Strategies

The study of the WUAs formed in the tail reach of the majors and the branch canal show that there is slight increase in the water availability to the fields but the frequency and the quantity is still a problem. The department shows more commitment than in the past in supplying the water to the tail reach areas. Where as co-ordination between the tail and upstream WUAs is not visible in sharing the water. Each WUA president wants more share to his or her WUA because more water is associated with more successful leader and increased opportunity to win in the next elections to these organizations.

Building sustainable organizations need strategies to cope up with the risk, which is involved in the canal water supply. To explain, the tail enders access to the water is less assured and hence the risk of loosing crop is more. If the WUA can address the risk factor and try to reduce the effect the users will show interest in participating the WUA activities. With the available financial resources the WUA can decide to create farm ponds to store the water whenever available or the WUA can initiate a lobby for their due share of the water with the upstream WUAs. These strategies of the WUA enhance the confidence of the users on the WUA and increase their participation.

2.3 Policy Corrections

There is an urgent need to establish a strong linkages and formation of the project committees as the apex body, which will make WUAs independent of Irrigation Department and true partnership, can be established between the WUAs and the department. The Irrigation Department need to asses it's new roles as technical and consultancy body and there is need for attitudinal changes not only at the higher circles but to the last link in the irrigation hierarchy.

Success of the PIM program depends upon the participation of the small and marginal farmers. The strength of the Water Users Associations also depends upon the involvement of these members in the WUA activities. Both PIM and WUAs might have to face problems while organizing small and marginal farmers because they need to spend most of their time and earning a livelihood from different sources. Hence PIM and WUAs focus on facilitating economic activities suitable to the small and marginal farmers. For example the WUA can provide labour opportunities to these groups during the repairs and maintenance works of the canals. To meet the needs of the marginal and small farmers broad-based multi-sectoral institutional reform is required. Access to credit and agricultural implements to substantiate their agricultural income land tenure, and extension services will lead to better livelihoods of these communities. Then only all types of farmers will participate and cooperate with reforms in irrigation management as visualized by the State.

The agricultural production is directly linked with the capacity and willingness to pay the fees by the users. And, production is linked to the reliable supply of water at particular intervals. Where as supply factors are dependent on many other elements of the system management. Hence to study the viability of these institutions one has to look into these aspects. More information need to be collected the rate of cess collection in a normal year and in a drought year, pre and post IMT years. The financial sustainability of these institutions are directly linked to the process of joint azamoish taking place and the role of WUAs in using the joint azamoish as a strategy to increase their source of income. Successful IMT model should meet full-time farming needs of the users in order to help them to earn a substantial proportion of their livelihoods from irrigated farming.

3 Conclusions

The WUA had emerged as an alternative organization to the earlier institution like Neerukanti in the state. The newly crafted organizations have not grown enough to bring about any substantive improvement in user's control over canal water resource.

Control over the distribution and supply of canal water still rest with the Irrigation Department and the role of the WUAs is limited to demand their due share of the water only.

The access to information about the frequency, quantity, closing and opening of the canals had been improved slightly but is limited to the WUA President level. It did not reached till the members level though the Act provides the right to know information to all the member.

WUA as a local institution is not involved in regulating the behavior of the user, which can be corrected by using the sanctions and incentives, provided in the APFMIS Act.

The WUA as an organization will only be strengthened by raising the awareness regarding the rights and duties of an user provided by the Act, which is lacking in the present.

The reform process can be further strengthened by inducting lessons that are learned through the WUAs while working with Users. Continuous feedback and monitoring evaluation tools should be in place

Achieving equity and Social justice among the users in a command would only be possible by updating the present cropping pattern right from the head to tail reach of the canal and re-localization process should be carried out and the practice of changing localization (according to the water availability and cropping pattern) can be adapted and implemented. This can be done by interchanging the water delivery patterns to wet and irrigated dry blocks in alternate years so that in long run each farmer would thus have an equal access to water instead determined by the location of his or her plot on the canal.

The institutional response to the present legal back up can be abstracted from the study of these institutions. The findings should be revised and cross checked and can be used after validating them to bring midcourse corrections to the policy and state proposals in irrigation sector development.

The social practices and reasons for the collective action failures or success can be studied in three different regions of the state and documented. The acquired insights and knowledge about functioning of institutions and their strategies can be utilized while correcting the existing institutions and in designing the new institutions in future.

End Notes

The history of irrigation laws in India the useful reference was the Act made in the British India named Northern India Canal and Drainage Act of 1873, and in the post British period, the reference to the Model irrigation Bill Circulated by the Government of India in 1974 are important. In the State of Andhra Pradesh there were different Acts namely the Irrigation Cess Act in Andhra Region, The Telangana Irrigation Act, The Irrigation Utilization and CAD Act of 1984 were in operation with specific functions and powers. There is no single comprehensive Act for irrigation systems management was not existing in the state before the APFMIS Act was passed in the year 1997 by the Andhra Pradesh State Assembly unanimously. The main strength of the APFMIS Act of 1997 is derives from it's comprehensive nature and the scale that it is applicable. It applies to the entire state of Andhra Pradesh, except some schedule areas.

The irrigation commission in their report in 1972 stated that 'there were several statues, rules and orders in different parts of the country covering different aspects of irrigation management'. It recommended a unification of laws and their simplification. On request from the Ministry of Irrigation and Power, GOI, the Indian Law Institute studied the various laws and rules and camp up with model legislation for the guidance of the states. Consequently the Government of India finalized the draft Bill by providing alternate models based on application- sanction system and on block system with uniform crop pattern within the block. The bill called " The Model Irrigation Bill 1976" was then circulated to the states for consideration and application with modification needed.

The Andhra Pradesh (Andhra Area) Irrigation Cess Act, 1865

The Act is only applicable to the districts of Rayalaseema and the Coastal area based on the Old Madras Presidency Act.

The Andhra Pradesh (Telangana Area) Irrigation Act, 1357 Fasli (1948)

The Act is applicable to the projects in Telangana region except Srisramsagar Project (because the Srisramsagar Project is being covered under CADA Act).This Act was more comprehensive than the Irrigation cess Act. Under the present Act it was lawful for the government to levy at pleasure, a separate fee for water supplied for irrigation from any river, stream channel or tank constructed by or on behalf of the government. The important section of the Act dealt with

a)The construction and maintenance of irrigation works(storage, conveyance, and delivery systems controlled or maintained) by government b) the supply or stoppage of water and regulation of water deliveries, c) Water Tax and d)Irrigation Offences (interfering with or damaging the irrigation system) and penalties.

The Andhra Pradesh Irrigation Utilization and Command Area Development

(A.P IU & CAD) Act, 1984 and Rules (1985):

The present Act was made applicable to the specified major irrigation projects in the state based on the model circulated by Government of India in 1976. The projects covered under the Act were Sriramsagar Project on river Godavari, Nagarjunasagar project on river Krishna, Tungabhadra Project and delta systems of Krishna and Godavari. The Act provided the opportunity to form the pipe committees. For the first time an opportunity was created through the Act to transfer the management of the canal below the pipe outlet not commanding more than 100 acres or 40 ha of ayacut. Formal elections were conducted and Pipe committees were formed in the command of SRSP on experimental basis. The Act clearly prescribes the responsibilities of the landholders for the maintenance of the watercourse and field channels. The Act also contains the penal Actions and punishments for the violations. The several issues that the Act aimed to address were evident from the preamble and was stated as:“ To provide for an accelerated increase in agriculture and allied production in the state of Andhra Pradesh through a program of comprehensive and systematic development on scientific and modern lines of command areas, comprising measures for optimum use of lands and water, prevention of land erosion and water logging, improvement of soil fertility and regulation of cropping pattern and for proper maintenance and upkeep of irrigation systems in the state for ensuring maximum benefits for the cultivators under the command areas and for the matters connected therewith”.

Evolution of APFMIS Act of 1997:

In most developing countries, governments have chosen to centralize management of local level natural resources with the help of the bureaucratic organizations which are essentially state organs and protect the state's interest. Where as the Government of Andhra Pradesh had decided to hand over the management of irrigation water resource to it's users for the better management of the resource. Andhra Pradesh, a southern state in India, has been in the fore front in implementing irrigation sector reforms in the Country. Reforms in irrigation sector in the irrigation sector is seen as vital to both the welfare and economic development of the State. The Participatory Irrigation Management Program(PIM), widely known as the 'AP Model of Irrigation Reforms' was initiated with the enactment of the Andhra Pradesh Farmed Managed Irrigation System Act (APFMIS Act) in 1997. The Act enables the transfer of rights over the canal water and its assets to the newly constituted 'Water Users Associations' (WUA's). 10,292 WUAs have been 'declared' as constituted covering the major, medium and minor systems in the state. The reforms aims to achieve higher production, efficiency and equity. It is widely perceived that program receives stronger political will and bureaucratic support. The State aims to build the capacity of the newly formed local level Institutions in land and water management and transferring the management to these institutions for better. This program is based on the assumption that the transfer of 'rights' from the Irrigation Department to the WUAs would result in better management of water distribution and management of the system. This inherently assumes that the transfer of 'rights' to the newly crafted institutions by the State would lead to better management through collective Action. In the Andhra Pradesh Gazette it was publishes as

“AN ACT TO PROVIDE FOR FARMERS' PARTICIPATION IN THE MANAGEMENT OF IRRIGATION SYSTEMS AND FOR MATTERS CONNECTED THERE WITH OR INCIDENTAL THERETO.”

The Act recognizes the ‘ scientific and systematic development and maintenance of irrigation infrastructure is considered best possible through farmers’ organizations’ and it suggests that ‘such farmer organizations have to be given an effective role in the management and maintenance of the irrigation system for effective and reliable supply and distribution of water’.

Objectives of the APFMIS Act :

The opening lines of the Chapter III of the APFMIS Act clearly spelled out the objects of a farmers organization. The rule 16 of the Act states,

‘The objects of the farmers’ organization shall be to promote and secure distribution of water among it’s users, adequate maintenance of the irrigation system, efficient and economical utilization of water to optimize agricultural production, to protect the environment, and to ensure ecological balance by involving the farmers, inculcating a sense of ownership of the irrigation system in accordance with the water budget and the operational plan’.The three main stated objectives of the reform policy stated by the government is to achieve Production, Efficiency & Equity in irrigation systems management in the state.

References:

Bromley Daniel. W (1989a), *Economic Interests & Institutions: The Conceptual Foundations of Public Policy*, Basil Blackwell, New York.

Buchanan, James B and Gordon Tullock (1965)*The Calculus of Consent*, Ann Arbor, University of Michigan Press

de Janvry Alain (1993), “State, Market and Civil Organisations: New Theories, New Practices and their Implications for Rural Development,” *World Development*, Vol. 21, No. 4, April.

Eggertsson T (1994), “The Economics of Institutions in Transition Economies,” in Salvatore Schiavo-Campo (ed.) *Institutional Change and the Public Sector in Transitional Economies*, World Bank Discussion Papers, 241.

Gupta Anil K (?) “ Sustainable Institutions for Natural Resource Management : How do we participate in people’s Plans” in People’s Initiatives For Sustainable Development : Lessons of Experience ed. By Samad etal, Asian and Pacific Development Centre.

Gupta Anil K, (1985a)” Sociology of Stress: Why do Common Property Resource Management Projects Fail?” Proceedings of The Conference On Common property Resource Management, April BOSTID & National Council, Washington, D.C Pp305-322.

Gupta Anil K (2000). “ Institutional pathways to Sustainability: Conservation, Creativity and Continuity or Why does it matter, Who cooks and How? Recipe versus Process and Actor based Models of Institution” paper circulated in the sixth International Summer school on Management of Common Property Resources, IIMA, June 10-19,2000.

Hardin Garrett (1968), “The Tragedy of Commons,” *Science*, Vol. 162, December.

Lupanga, IJ (1988), “ promise and Pitfalls : Enlisting Cooperation in Developing Countries” KIDMA, *Israel Journal of Rural Development*,10(3): 21-25.

McClusky, Howard Y (1970), “ A Dynamic Approach to Participation in Community Development” *Journal of Community Development*,Vol1.

North Douglass C (1990), *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge.

Olson Jr. Mancur (1965), *The Logic of Collective Action: Public goods and the Theory of Groups*, Harvard University Press, Cambridge.

Ostrom Elinor (1990), *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press, Cambridge, New York.

Ostrom Elinor (1992), *Crafting Institutions for Self-Governing Irrigation Systems*, ICS press, Sanfrancisco, California.

PMU(1992) *Irrigation laws, Policies and Procedures (Andhra Pradesh , Indo –Dutch Training Production Management Unit, Code G-05(E),National Water Management Project, GOI and Government of Netherlands.*

Reddy V. Ratna (1995a), *Quenching the Thirst: Means and Costs in Fragile Environments*, Working Paper, Institute of Development Studies, Jaipur.

Uphoff Norman (1986), *Local Institutional Development: An Analytical Source Book with Cases*, Kumarian Press, Connecticut.

Uphoff Norman (1995), “Grassroots Organizations and NGOs in Rural Development: Opportunities with Diminishing States and Expanding Markets,” in De Janvry, et.al (ed.).

Wade Robert (1988), *Village Republics: Economic Conditions of Collective Action in South India*, Cambridge University Press, and Cambridge.