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**WATER RIGHTS IN  
INDIA AND WATER  
SECTOR REFORMS IN  
ANDHRA PRADESH**

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# **WATER RIGHTS IN INDIA AND WATER SECTOR REFORMS IN ANDHRA PRADESH<sup>1</sup>**

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## ***Abstract***

*Water rights in India in a formal, legal manner are still under formulation. Rights based on centuries old customs and conventions currently prevail. In recent years, reforms have sought to introduce water rights through user organizations, and provide for better allocation across competing sectors. Andhra Pradesh has led in introducing water sector reforms. This paper discusses the water rights and water allocation situation in India and some implications of reforms in Andhra Pradesh for water rights.*

## **Introduction**

Water rights and water allocation are gaining relevance due to increased competition among domestic, industrial, and agricultural water users. In many regions of India, inter-state water disputes have become alarming, such as along the Cauvery, Krishna, and Yamuna Rivers. Formal laws and rules are increasingly being used to govern increasingly scarce water supplies, manage inequity in access (by individuals, communities, and riparian states), and distribute vital water resources. Nevertheless, questions of relative priorities among different uses remain: irrigation versus drinking water, rural versus urban demands, agricultural versus industrial demand, irrigation and power-generation versus flood-moderation, and abstractions for use versus maintenance of minimum flows. These are questions of socio-political-economic choices. However, when conflicts arise and the courts make decisions, this translates those choices into the language of rights. Traditionally, the basic elements of space, air, water, and energy, were perceived as non-legal objects and as such were incapable of becoming property. Roman law never classified running water as capable of becoming someone's property. No ancient Indian text mentions the property rights of anyone, including the king, with respect to rivers.

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In 1980s, India faced several river water disputes, which has led to legal disputes between states and it had affected law and order problem in several places. Commenting on this situation, Chattrapati Singh (1991) argues that the original natural rights over rivers and other natural waters belong to the people of India and not to the government or the state. He asserts that people have a natural or fundamental right over what is essential for their life and which inherently belongs to them. Governments can have only a legal usufruct right, with the consent of the people. When the government acquires any usufruct right for specific public use it should compensate the original users or beneficiaries and define the 'public' in terms of all bearers of rights. He concludes that to make the state accountable and to make water use equitable for all in India, a number of amendments are required in the Easement Act, the Irrigation laws, Panchayat and Municipal Corporation laws, Water Supply Acts, and other laws related to water.

One source of difficulty is that India has taken over the colonial legal legacy in its entirety. The Constitution itself is largely based on the Government of India Act 1935. In recent decades, attempts have been made to introduce elements, some traditional and some modern, that do not easily fit in with it or with one another. Water as a basic right<sup>2</sup> is a useful idea, but it has the potential of being asserted not only against the state but also against the community or civil society. Iyer (2003) argues that one has to reconcile the individual fundamental right of all people to water as life-support with the community's right of managing common pool resources. Both of these must be reconciled with the responsibilities (and therefore the rights) of the state to control, regulate, and legislate. Indeed, many interstate issues including the intra-basin apportionment and inter-basin transfers of water arise from different interpretations of the ownership rights in regard to water. Questions of rights relating to water or in the context of water resources arise in diverse ways and from different perspectives (Iyer 2003). Table 1 summarizes some of these perspectives.

**Table 1 : Questions of Rights Relating to Water in India**

Type of perspective	What it means	Applicability and remarks	Examples
Riparian	Rights to waters of a flowing river inherited-in, or claimed by, different users located alongside (or in the vicinity of) that river.	At the level of households, farms, communities, villages, or towns, but occurs in a more marked form at the level of political or administrative units within a country, or at that of 'co-riparian' countries.	Inter-state Cauvery dispute, Indus Treaty 1960 (India-Pakistan), the Mahakali Treaty 1996 (India-Nepal) and the Ganges Treaty 1996 (India-Bangladesh).
Federalist	Distribution of rights and powers in relation to water between different levels in the federal structure.	Three lists - Union, State, and Concurrent. A distribution of legislative power of the Union Parliament and State Legislatures. 73 <sup>rd</sup> and 74 <sup>th</sup> amendments to the constitution provide a three-tier structure.	Villages, cities, and states.  Water is listed as state subject in the Constitution.
Formal Law	Includes judicial determinations. But, quite complex and confused.	The right to drinking water is a fundamental right. Unclear whether legislative (and corresponding executive) powers conferred by the Irrigation Acts, imply <i>ownership</i> of rivers and other surface waters by the state. Governments tend to assume so.	In the Inter State Water Disputes Act 1956, 'inter-State' means 'inter-governmental'. International treaties or agreements over rivers (e.g., the Indus Treaty, the Mahakali Treaty, the Ganga Treaty). Groundwater rights go with land ownership rights.
Customary Law	Communities allocate water according to land ownership or often investments made, caste, or community membership	Farmer-managed irrigation systems, domestic water supply systems not built by government	Small tanks in south India, Kuhls in Himalays, wells.
Civil Society	Arises in three different but inter-connected contexts where local communities are involved.	(a) efforts to protect people's rights, particularly poor, disadvantaged communities and tribal groups, from state and its agencies, and large projects. (b) move to revive traditional community-managed systems of water management. (c) new initiatives in social mobilization and transformation.	Anna Hazare's in Ralegan Siddhi in Maharashtra or Tarun Bharat Sangh's in Alwar District in Rajasthan.
Participatory	Varies from full involvement of users from the early stages of planning to mere	Participation is invited in projects planned and implemented in a wholly non-participatory manner. Often the inability of the state to	Large irrigation projects and tanks across the country. Some exceptions are WUAs in A.P and recently some tanks

<p>formality of asking for comments on a plan, program, or project prepared entirely within government.</p>	<p>manage a project and provide the planned services. The state is usually unwilling to enter into a contractual relationship with users and accept binding obligations with penalties for non-performance.</p>	<p>in Karnataka.</p>
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The next section of this chapter presents background on water resources in India and their management. The following section discusses Andhra Pradesh and its reforms in water management. Subsequent sections look specifically at water rights in Andhra Pradesh and water conflicts in South India. The final section offers recommendations regarding water rights.

### **Country Background**

India has 2.45 percent of the world's land resources and roughly 4 percent of the world's fresh water resources, while 16 percent of the world's population resides in the country. Nearly 12 percent of the country receives an average rainfall of less than 610 millimeters and only 8 per cent receive more than 2,500 millimeters. Even low rainfall areas, especially in some parts of Gujarat and Rajasthan, are prone to occasional high intensity storms. Average annual precipitation in India (including snowfall) has been estimated to be 4,000 km<sup>3</sup>. The estimated total annual water resources (including both surface and ground water) are 1,953 km<sup>3</sup>. Some of this originates beyond the country's border and, in turn, some rivers flow downstream across other borders.

More than 90 percent of the annual rainfall for all peninsular rivers and more than 80 percent of the annual runoff in Himalayan rivers occurs between June and September. The Ganga-Brahmaputra-Meghana system is a major contributor to India's water resources representing more than 60 percent of the total. Many small rivers stop flowing during the summer. The depletion of forests has further aggravated the problem. Reduced infiltration results in smaller dry weather flows. Heavy silt concentration has resulted in deposition of silt in flood plains since the shrinking river channels cannot transport excessive silt loads. This again reduces the valley storage, which used to absorb high floods, resulting in higher flood peaks. About 40 million hectares are prone to floods though not all of the vulnerable areas are affected each year. On the other hand, recurring droughts afflict about one third of the country. Drought has also aggravated regional imbalances in economic development.

India's total ground water potential is assessed as 432 km<sup>3</sup>(CGWB, 1995). There are extensive groundwater resources, especially in the Ganga and Brahmaputra basins, which have not fully exploited their recharge potential. However, the economic feasibility of full utilization of ground water in these regions requires further study, including the environmental impact of lowering ground water levels. There are very large tracts in the peninsular regions, which are covered with hard rock at shallow depths. These areas have limited potential for ground water and the availability is subject to rainfall during the year.

In 1999, the National Commission for Integrated Water Resources Development Plan (hereafter the Commission) estimated that, as against total annual availability of 1,953 km<sup>3</sup> (inclusive of 432 km<sup>3</sup> of ground water), approximately 1,086 km<sup>3</sup> of water (including 690 km<sup>3</sup> of surface water and 396 km<sup>3</sup> of ground water) could be put to use. So far, a quantum of only about 600 km<sup>3</sup> out of this available water has been used. While this may be true in aggregate, many areas of peninsular India and the Indo-Gangetic plain are locally overexploited, resulting in falling water tables.

Pollution problems have been growing, posing a serious threat to water use availability. Municipal sewage (often untreated), urban and rural wastes, industrial effluents, chemical fertilizers, and pesticides have polluted both surface and ground waters. At the same time, the demand for water grows with the booming population (1.2 billion in 2001) and the process of economic development. The Commission estimated that demand will match if not exceed the available supplies of certain areas by the year 2050. The Commission has also indicated that many parts of the country will experience water stress conditions unless they take remedial measures in time. In practice, people are already in stress, at least seasonally.

India faces several critical issues in water resources development and management. The Commission (1999) underlined several physical and fiscal issues, and stressed that major attitudinal and organizational changes are necessary to deal adequately with all the issues and concerns. A whole range of structures from large to small is needed to meet the people's requirements. The National Water Policy, as issued in 1987 and again revised version in 2002, took some steps towards evolving national consensus. Several states are following this trend and articulating their state water policies, with importance placed on water rights and water allocation.

## **Andhra Pradesh : A Trend Setter**

Andhra Pradesh is endowed with numerous rivers such as the Godavari, Krishna, Pennar, and Vamsadhara, as well as other minor river basins. The complexity of irrigation systems varies from minor irrigation tanks to major irrigated commands. Farmers in Andhra Pradesh have small land holdings ranging from 1 to 1.5 hectares. The State has a total irrigation potential of 4.8 million hectares.

Government Plan allocations have always accorded priority to irrigation and drainage. Despite massive investments in the irrigation sector, the irrigated area has shown a declining trend in several major commands. Due to insufficient allocations for the maintenance of irrigation schemes, poor cost recovery of water charges, limited user involvement, and low quality of agriculture. This resulted in a gap of 0.47 million ha between the officially registered command area and actually irrigated. Further, the indiscriminate use of water by the head-enders deprives the tail-enders, with water logging and salinity being an almost common phenomenon in most of the irrigation projects.

To remedy these problems, the Government of Andhra Pradesh made the historic decision in January 1996 to transfer management of all irrigation systems to farmer's organizations. In 1996 and 1997, the Government held several consultations with farmers of the major project areas, district magistrates, media, universities, legislators, and parliamentarians, to evolve a strategy for the constitution of farmers' organizations in the irrigation sector. This series of consultations led to the enactment of the Andhra Pradesh Farmer's Management of Irrigation Systems Act, 1997 (APFMIS Act).

### **APFMIS Act**

The APFMIS Act provides for the establishment of water users associations in the irrigation sector. Projects have been classified as minor (less than 2,000 hectares), medium (2,000 to 10,000 hectares), and major (more than 10,000 hectares). Elections in June 1997 constituted 10,292 WUAs in the State, covering 4.8 million hectares. Minor irrigation schemes serve 8,163 WUAs covering 1.2 million hectares. Medium sector schemes serve 424 WUAs covering 0.33 million hectares. The major irrigation sector serves 1,705 WUAs covering an area of 3.27 million hectares. In November 1997, 172 Distributory Committees were constituted in the major irrigation sector. As of February 2003, project committees have yet to be established. During 1997-98, the Government initially released Rupees (Rs.) 404 million

- at the rate of Rs. 50,000 per WUA for unanimously elected associations and Rs. 30,000 for WUAs formed through contest.

The new Act provides for recall of leaders on grounds of nonperformance or any other violations. The tenure of water user associations and their leaders is five years. The Act provides for linkage between Irrigation department and WUAs through appointment of officers as competent authorities. The competent authorities are responsible for implementation and execution of all decisions taken by the WUA. At the WUA level, an Assistant Engineer/Assistant Executive Engineer is the competent authority while Deputy Executive Engineer is the competent authority at Distributory Committee level. At Project Committee level, the Superintending Engineer/Chief Engineer is the competent authority.

**Table 2 : Structure of Water Users Associations**

Farmers Organization	Irrigation Systems	Composition & functions.
Water User Associations (WUA)  (at the primary level).	Minor, Medium and Major Irrigation Systems	Formed on a hydraulic basis. Area of a WUA to be divided into 6 Territorial Constituencies (TC) in Minor and 12 TCs in Medium & Major sectors to give adequate representation to all farmers in head, middle, and tail reaches.  All land holders and tenants within the notified area are members with voting rights.  All other water users are members without voting rights.  President and Managing Committee members are elected through simple election procedure.
Distributory Committee (DC)  (at the Distributory Level)	Major Irrigation Systems Only	Five or more WUAs constitute a Distributory committee.  All WUAs in its jurisdiction are its members. Look after medium drains and Distributories.  Resolve disputes of WUAs.
Project Committee (PC)  (at the project Level).	Major & Medium Irrigation Systems	A part or whole of the project to have a project committee. All the presidents of the DC and WUA are its members in respect of Major and Medium projects.  Ensure that WUA and DC accounts are audited and O & M is carried out.  Resolve disputes of DC's & WUAs.

*Source:* Based on Government of Andhra Pradesh, 2004 and APFMIS Act, 1997.



Four Sub committees have to function in each tier of farmer's organisations. They are a) Finance b) Water management c) Works d) Training, monitoring and evaluation. Each sub committee in a farmer's organisation will have one of the managing committee member as coordinator and four other members. Each sub committee is entrusted with specific functions. Rules pertaining to the water rights of members and farmers organisations are mentioned in Table 3.

**Table 3 : Rights of WUA Members and WUAs**

Particulars	Rights of WUA Members	Rights of WUAs
Quantity of water	As per specified quota	Receive in bulk from WRD
Tradable water rights	Can transfer to any user within the WUA operational area	-
Water deliveries	Suggest improvements	
Information on	Water availability, allocations, canal operation timings and duration	Water availability, opening / closing of main canal, periods of supply and quantity
Crop choice	Full freedom but within water allocated	-
Allocation of water	-	To both members and non-members
Distribution of water	-	Among water users on agreed terms of equity and social justice
Layout of field channels and drains	-	Suggest improvements / modifications to enable all farmers to have access to water
Groundwater	-	Plan and promote groundwater use

*Source:* Based on APFMIS Act 1997 and Rules, as issued by the Government of Andhra Pradesh.

### **Main System Modernization**

To rehabilitate and modernize the existing irrigation systems, the state government has obtained financial assistance (Rs.9,622 million) from the World Bank. The irrigation component of the Andhra Pradesh Economic Reforms Project (APERP) aims to place the irrigation sector on a sustainable basis through 1) involving farmers in irrigation management, 2) recovering operational (and partly capital) costs, 3) improving irrigated agriculture productivity, 4) strengthening cost recovery for operation and maintenance (O&M), and 5) expanding effectively irrigated areas in existing systems.

The irrigation component of the APERP is designed as a WUA

financial audits, and organizing general body and managing committee meetings.

2.3 The present tenure of five years for the WUA president is too long, resulting in complacency shown by the individuals.

To overcome these inadequacies, the government has decided to introduce certain changes in the present arrangement of the WUAs, to move towards broad based and transparent WUAs. This is also to prepare for the next round of WUA elections. It is also necessary to simplify the election process and change the orientation of WUAs from civil works to water management.

### **WUA Elections during 2002 and Reforms**

Farmers Organizations' terms have completed their 5-year tenure. After reviewing the performance of the Farmers Organizations during last five years, it was decided to change the WUA organization and to add certain amendments to the Act. The chief minister of Andhra Pradesh examined various alternatives to the existing WUA arrangements in review meetings held in March 2002. Public debate was initiated on the changes in the WUA set-up to carry out necessary revisions to the APFMIS Act.

As a part of this process, all the WUA presidents attended district level conferences in all 22 districts during April 2002. They provided feedback through questionnaires and group discussions. About 1000 WUA presidents took part in a state level conference in May 2002 and offered suggestions regarding the changes to WUA. State cabinet meetings in July-August 2002 examined various alternatives based on the feedback on WUA organization.

The amendments required to the Act were brought through the Act 7 of 2003 during April, 2003. The District Collectors were requested to complete the delineation or redelineation of the WUAs and to update the landholders list. Water Users Associations have been delineated and elections to the Water Users Associations in 13 districts of the State have been completed during October, 2003 and for the remaining 9 districts elections will be conducted later.

## **Water Conflicts and Water Rights**

### **Water Rights in Andhra Pradesh**

The Andhra Pradesh Farmers Management of Irrigation Systems Act of 1997 and subsequent amendments have brought water rights and water

- increased general awareness among farmers to take up maintenance works and prioritization of works to ensure proper regulation of water.

### **Awareness Creation and Public Consultation**

In order to disseminate technical know-how on agriculture and irrigation, the WUA presidents have been trained on the provisions of the APFMIS Act, execution of maintenance works, water regulation, and so forth, at various times. Through the end of 2002, 9,156 WUA presidents and 35,563 Territorial Constituency (TC) members have been covered in the training programs. To create awareness among WUAs about their role in participatory irrigation management and to inform them about Government policies, conferences have been regularly held at the district, region, and state levels. These conferences have helped the WUAs to air their problems and get on the spot solutions for some problems.

### **Water Charges**

One of the most important decisions is that water fees collected by the revenue department are now linked to the distribution of funds for O&M works. The state government has apportioned the water tax collected among the WUAs for the operation and maintenance of the irrigation systems as indicated in Table 5. The state approximately tripled the water fee levels in 1997. However, there was no resistance from the farmers, mainly owing to improvement in service delivery. There is also an independent committee to review water fee levels, on a periodic basis.

**Table 5 : Water Charges**

Sector	Water charges per acre	Allocation (%)				
		WUAs	DCs	PCs	GP	Irrigation Dept.
Major	Rs. 200	50	20	20	10	100
Medium	Rs. 200	60	—	30	10	100
Minor	Rs. 100	90	—	—	10	—

*Source:* Government of Andhra Pradesh, 2004.

### **Effects of Reforms**

The implementation of Participatory Irrigation Management (PIM) in Andhra Pradesh through WUAs during the last few years has resulted in:

- Inculcating a sense of ownership and belonging among the farmers in the irrigation systems.
- Reducing irrigation disputes among the farmers.
- Reducing irrigation offences by preventing damaging and tampering with the irrigation structures by the farmers, particularly in the tail end areas.
- Enabling farmers to take up minimum rehabilitation and O&M works according to their needs and choices.
- Improving water supplies to undeserved areas, particularly at the tail ends.
- Capacity building and empowerment of these organizations in decision making and execution of works.

However, feedback and field observations have revealed some inadequacies:

1.1 Some of the WUA presidents are behaving like contractors (e.g, undertaking the physical work in their own name, execution with low quality, making money in the process, considering the whole command area and its structures as his own, and accordingly operating it to show favours to his own persons).

1.2 Some of the WUAs are not concentrating on water management, which is their primary duty; instead they are now interested only in contracts.

1.3 Some WUA presidents acting like a sole monarch results in lack of transparency about WUA activities and the farmers not actively participating in water management and execution of civil works

1.4 Some of the WUAs are too large: command areas of more than 8,000 acres result in administrative difficulties with an unwieldy number of farmers for convening general body meetings and making decisions.

1.5 Some WUA presidents have been misusing the funds released by the government and indulging in financial irregularities.

2.1 Many of the WUAs have been performing only limited duties such as execution of works.

2.2 Most of the WUAs are not complying with their statutory responsibilities such as maintenance of records and accounts, conducting

support program. The farmers' organizations themselves undertook the minimum rehabilitation works in irrigation schemes. This enabled them to acquire experience in undertaking maintenance works and to understand the complexity of maintenance and operation of the irrigation systems. They executed maintenance according to the prioritization of the works decided after a walk-through survey. Table 4 shows details of minimum rehabilitation and O&M works (e.g. repair of canal, extending it to tail end, repair and strengthening of regulators and its structures) taken up during the period 1998 to 2004.

**Table 4 : Minimum Rehabilitation and O&M Works**

Year	No. of Works Completed	Value of work done (Rs. in million)
1998-99	21,406	1,175.60
1999-00	17,186	1,367.00
2000-01	6,768 + 147 tanks	989.40
2001-02	6,100 + 1,144 tanks	1,128.10
2002-03	820 + 1,703 tanks	1,195.30
2003-04	17,086	1,540.60
Total	69,366 + 2,994 tanks	7,396.00

*Source:* Government of Andhra Pradesh, 2004.

The total expenditure until January 2004 incurred under APERP is Rs. 7,396 million (US\$ 160 million). The minimum rehabilitation program of minor irrigation tanks has taken up 4,948 tanks at a cost of Rs. 2,258 million to bridge a gap command area of 157,000 hectares spread over in the total area of 579,000 hectares. The execution of these works has led to benefits such as:

- improved irrigation in all areas of the irrigation commands across the state,
- bridging a gap of one million acres between registered command area and what is actually irrigated, especially in tail end areas,
- increase the crop area (within the designed command area) by about 100,000 hectares in about three weeks (following first cleaning), and

allocation responsibilities into the domain of user organizations, a clear shift from the government. The APFMIS Act and Rules for implementing it clearly assigned water rights. Table 5.3 shows the water rights and other rights of members and WUAs. Indeed, all land holders and tenants within the notified area are members with voting rights.

According to the Act and Rules, the objectives of the farmers' organizations shall be to promote and secure distribution of water among its users, to adequately maintain the irrigation system, utilize water in an efficient and economical manner to encourage the modernization of agriculture to optimize agricultural production, to protect the environment, and to ensure ecological balance by involving the farmers, instilling a sense of ownership of the irrigation system in accordance with the water budget and the operational plan.

Owing to APFMIS Act of 1997 and several rules issued by the state government in recent years have led to establish different kind of rights. These are broadly riparian rights and traditional or customary rights. The clearest water rights are water use rights. These may not be absolute rights in terms of quantities but a general right to draw water within the Warabandi schedule or turn schedule applicable to the command of a WUA. Warabandi means a system of distribution of water allocation to water users by turn, according to an approved schedule indicating the day, duration and the time of supply. This stems from the fact that right to water basically depends on the availability of water in the source and this is subject to vagaries of nature.

Tail enders are often unable to operationalize their water rights owing to poor system performance and weak infrastructure and management. The government of Andhra Pradesh introduced following remedial measures:

- Prescribing a walk-through survey and prioritizing the works required to be taken up by the Managing Committee of farmers organisation themselves and then only spend the amount released by the government for minimum rehabilitation of the systems as per this priority. This is in contrast to the irrigation engineers thrusting their own priorities. This obviously has given lot of scope for the farmers to concentrate on taking up repairs at the tail end reaches and improve the system performance at the tail end also. Owing to this stipulation some of the tail end reaches got water after 20 years.

- On the management side also, during the WUA elections held in 2003, Government ensured that one of the posts of President or Vice-President goes to tail end farmer by prescribing that if the elected President is from upper reach, the Vice-President must be from lower reach.

Such measures can help to strengthen the use rights, especially to tail enders. Historically, tank users had management rights, but in canal irrigation system, farmers organisation function at different tiers i.e., at Distributory level and Project level which paved the way for more scope in decision making by the farmers.

There is a provision in AP Panchayat Raj Act vesting fishery rights in minor irrigation tanks with gram panchayats (village council). There is a conflict of legal rights between WUAs and gram panchayats. The government sought to solve this conflict by entrusting auctioning of fishery rights to the fishery department and distributing the proceeds to WUAs and gram panchayats as a per the ratio prescribed.

## Water Rights Changes and Conflicts

**Table 6 : Ground Water Rights in Andhra Pradesh and Karnataka**

Ground Water Rights	Legal Frame Introduced	What it provides	Relevant States
Ground water use	Water, land and trees Act of 2001  (Government of Andhra Pradesh)	Registration of existing wells and permission for new wells.  State can close down existing wells, if they are found to be causing damage to environment	Andhra Pradesh
	Groundwater Bill 2002 (Government of Karnataka)	State can permanently close down tubewells used for agriculture purposes, if they are affecting drinking water wells in rural areas	Karnataka

*Source :* a) Government of Andhra Pradesh, 2004 and b) Kolavalli and Raju, 2003

At present, WUAs primarily manage water for irrigation purposes. They have no control over inter-sectoral allocations. Conflicts over water rights are growing, as shown by a range of examples from these states. The Vijaiwada rural area and the municipal area of Vishakapatnam have conflicts over water. The Yeleru reservoir is used for sugarcane cultivation versus steel plant operation in Vishakapatnam. In the Nagarjunasagar

project, farmers are stealing water when crucial supplies are provided to fill tanks for drinking water. In the Godavari delta, farmers did not allow water supplies to aquaculture when it deprived them of their crop water requirements. In the Godavari and Krishna delta areas during water scarce periods, rice cultivators obstructed water supplies to expansion areas of irrigated dry crops.

In the Sri Sailam multi-purpose project, the conflict was between peak demand of power generation, and peak demand for irrigation. Some WUAs are demanding implementation of their water entitlements through judicial intervention. Under the Nagarjunasagar project, WUAs have filed a writ petition to stop power generation and give water for their crop water requirements.

The marginal utility of water is important in the determination of supplies during water-scarce periods. Sectors, activities, and crops with higher returns are trading their profits for water from those with lower returns. Thus, for example, sugarcane growers compensate rice cultivators for trading in their water share. Similarly, steel plant owners compensate crop growers for trading in their share. This seems to represent an emerging "custom".

Some WUAs are asking for a shift in canal operation schedules to enable the raising of seedbeds rather than depleting reservoir storage to grow a second season crop. When water is stored in tanks for livestock requirements, farmers are trying to steal that water for irrigation purposes, while cattle owners are claiming that they have historical rights on tank water for their cattle.

In some cases, a hierarchy of needs during scarce periods was prioritized, based on absolute necessity (e.g, in parts of Telangana region in northern Andhra Pradesh). Meager reservoir storage was reserved exclusively for drinking water in most drought prone areas. The issue was discussed with the WUAs and they ensured that there would be no unauthorized lifting from the reservoir or unauthorized irrigation along the canals.

Many WUAs are demanding the authorization of the hitherto unauthorized area in the canal commands, which but they have been irrigating for many years. Many of the WUA members also have lands in the authorized area. This has implications in terms of reducing supplies to future expansion of the authorized lands in the planned command areas.



The state government has taken a serious view of declining groundwater resources and has created enabling legislation to regulate it. The government has banned any drilling of groundwater wells in areas declared as dark blocks (areas where groundwater extraction is more than 85% of its potential). In canal areas, the canal flows recharge groundwater, but groundwater users in canal areas resist paying a canal water fee, since they are paying for groundwater pumping (e.g. for power tariff, pipelines, and capital costs on tubewell).

### **Tank Resources**

Another example of conflict about rights to water resources and their management occurs in the case of tanks. The revenue sources from the tank include e.g. irrigation fee, leasing out fee for fishing, fee for sand mining, leasing out fee for tank bed cultivation. The revenue generated from use of tanks goes to different agencies. The legal framework and state policies in all three southern states (Andhra Pradesh, Karnataka, and Tamil Nadu) are not clear. Owing to this, both users and the agencies get into conflicts. Table 7 shows some of the legal conflicts for the case of Karnataka. Similar issues also apply in Tamil Nadu and Andhra Pradesh. Due to these conflicts, tank users associations (both formal and informal) are facing constraints on mobilizing resources, threatening the survival of tank users associations (TUAs).

The conflict between irrigation and fish culture needs is increasing. Inflows into the tank have decreased due to overexploitation of groundwater and expansion of agriculture in catchment areas as well as construction of new water harvesting structures in catchment areas. Owing to conflicting rights to the resources, tank users associations are in a dilemma in several places. This occurs even after the states have come up with a clear policy to support tank users associations and transfer management of tanks to the user groups. These states did not focus adequately on the legal implications. For example, in Andhra Pradesh some TUAs have been drawn into court cases by local Village Councils based on claims made on fishing rights. This is also true in the emerging TUAs in Karnataka. While Andhra Pradesh has issued a Government Order making provision for TUA rights over fishing, in practice, it could not happen. Karnataka is now drafting a comprehensive Act exclusively for tank rehabilitation. This would be the first comprehensive Act on tanks in south India.

**Table 7 : Conflicting Legal Frameworks over Tank Resources**

Use and source of income	Agency responsible and focus of the conflict
1. Water fee	Imposed by irrigation department and collected by revenue department
2. Fishing	Fisheries department auctions fishing rights. Generally, a trader sub-leases it at a much higher amount to a fishing group. No preference to TUA.
3. Silt (soil rich with nutrients are taken by local farmers)	Mines and Geology department has control and ownership
4. Tree nurseries and plantations in the tank bed and catchment area	Forest department claims rights
5. Ownership and management of all water bodies in the Constitution, Gram Panchayats	According to the 73 <sup>rd</sup> amendment of the village revenue boundary Indian have rights.

*Source :* Based on APFMIS Act, 1997 and various Rules issued by the Government of Andhra Pradesh

### **Some Suggestions**

Based on the experiences and issues discussed above, some policy recommendations can be made. Policy changes should be in the direction of establishing clear-cut water rights, with or without land rights. Policy should promote equitable distribution of water rights. Proper water pricing and resource regulation mechanisms for sustainability should be in place. The user rights are more or less permanent (as long as the resource exists) and are treated as total ownership, especially in the case of ground water. Rights and allocation mechanisms should not ignore traditional water users like fisherman, cattle, washerman, and local rituals. Implementation of the Participatory Irrigation Management (PIM) in Andhra Pradesh State had impact inculcating a sense of ownership/belongingness among the farmers on the irrigation systems. It reduced the irrigation disputes among the farmers and the irrigation offences by preventing damaging of /tampering with the irrigation structures by the farmers, particularly at the tail end areas. It enabled the farmers to take up minimum rehabilitation and O&M works as per their necessity and choice. It also bridged gap command, particularly at the tail ends and capacity building and empowerment of these organisations in decision making and execution of works.

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**Annex-1****Bridging of Gap Ayacut**

S.No.	Name of the Project	Gap ayacut bridged in 1998-99 (in acres)	Gap ayacut bridged in 1999-2000 (in acres)	Total (in acres)
<b>I.</b>	<b>MAJOR IRRIGATION</b>			
1.	Vamsadhara Project	17000	874	17874
2.	N.S. Left Canal	50000	40000	90000
3.	N.S. Right Canal	53000	30000	83000
4.	Tungabhadra Project HLC	10000	13000	23000
5.	Tungabhadra Project LLC	11000	5000	16000
6.	Rajolibanda Diversion Scheme	2000	2500	4500
7.	Nizamsagar Project	74000	17000	91000
8.	Kadam Project	23000	12000	35000
9.	Sriramsagar Project	251000	75000	326000
10.	K.C. Canal	21000	10000	31000
	<b>SUB-TOTAL I</b>	<b>512000</b>	<b>205374</b>	<b>717374</b>
<b>II.</b>	<b>MEDIUM IRRIGATION</b>			
a.	Coastal Andhra Region		30640	30640
b.	Rayalaseema Region		8649	8649
c.	Telangana Region		27428	27428
	<b>Sub-Total-II</b>		<b>66717</b>	<b>66717</b>
<b>III.</b>	<b>MINOR IRRIGATION</b>			
a.	Coastal Andhra Region		13370	13370
b.	Rayalaseema Region		42200	42200
c.	Telangana Region		168100	168100
	<b>SUB-TOTAL III</b>		<b>223670</b>	<b>223670</b>
	<b>GRAND TOTAL</b>	<b>512000</b>	<b>495761</b>	<b>1007761</b>

## **Annex-2**

Certain amendments to the APFMIS Act have been brought through the Act 70 of 2003. The salient features are as follows:

- (1) The tenure of the T.C. members will be six years with 1/3 members retiring once in two years.
- (2) The tenure of the President and Vice President is 2 years.
- (3) Voters of the respective TCs will directly elect their TC members while the TC members will elect the president and vice president of the WUA.
- (4) WUAs of Major & Medium Irrigation Projects will have 12 TCs, while those of Minor Irrigation systems will have six TCs.
- (5) In order to have a standby arrangement to carry on the activities of the association, in the event of a casual vacancy arising in the post of President due to death, recall, resignation or any other reason and to act as a joint Account holder in the Bank Account, it is decided to induct the post of a Vice-President into the set-up of the Farmers Organizations.

<sup>1</sup> Earlier version of this paper was presented in the International Working Conference on Water Rights: Institutional Options for Improving Water Allocation, held in Hanoi Vietnam, during Feb 12-15, 2003. Authors are thankful to Dr. Ruth Meinzen-Dick and Dr. Bryan Randolph Bruns for useful comments on the earlier version of this paper.

<sup>2</sup> In practice, the government agencies have to ensure supply of drinking water in all places, if necessary, by reduction in supplies to irrigation and industry. In no-source or severe scarce parts, the government make efforts to supply drinking water by train-tankers or truck-tankers. The National Water Policy (both 1987 and 2002) prioritise drinking water supplies compare to irrigation and industrial supplies. Both the central and state governments follow this priority in ensuring supplies for drinking water, if necessary, by reducing supplies to irrigation and industries.