

# Participatory Irrigation Management Through Moral Suasion: A Case Study Comparing the Formal and Informal Organisational Structures

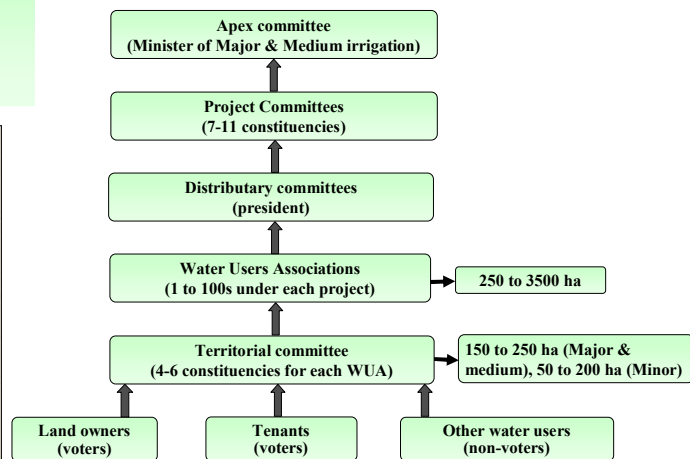
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Introduction

Indian water resource potential and the country's agricultural economy mainly depends on the monsoon rains and its spatial and temporal variations. Indian irrigation system is classified into major, medium and minor irrigations depending on the area irrigated by the source. India's irrigation potential has been increased over the years. This increment is mainly due to the major, medium irrigation projects and development of technology in groundwater extraction, on the other hand there is a decline in the irrigated area by traditional water harvesting structures (tanks) and reduction in the groundwater levels due to over extraction and decreased managerial efforts on surface water.

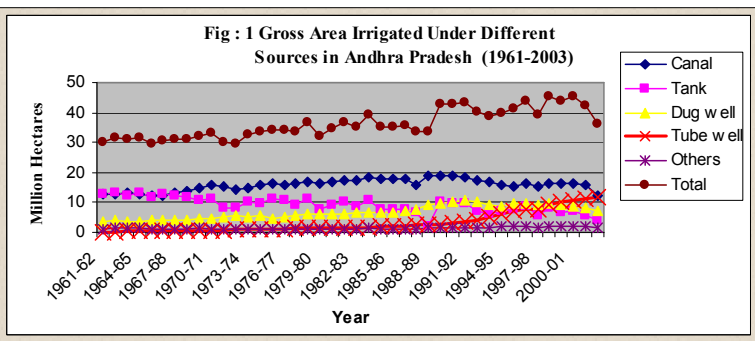


Fig: 2 Structure of Participatory Irrigation Management in Andhra Pradesh



Problem Statement

- Decreasing trend of area irrigated by tanks (Fig: 1)
- State interference in Operation and Maintenance (O&M) of traditional irrigation structures
- Political structured Water Users Association (WUA) (Fig: 2)
- O&M were not decentralised to the local communities
- Biased provision of share from the state irrigation budget
- Subsidised electricity policy for groundwater extraction (2004) decreases the stabilisation value (Tsur, 1993)



Methodology

**Main objective:** To assess the impact of community participation in the management of irrigation tanks by moral suasion and to modify the structure of WUA for minor irrigation.  
**Data Collection:** In India 53 percent of the total geographical area is under semi-arid zone and majority of the tanks fall under it. So a semi-arid region (Nalgonda District) has been selected from Andhra Pradesh state. Primary data has been collected from 143 farmers from a Formal WUA, which is under the state control and 45 samples from Informal groups, where NGO (DHAN foundation) is creating awareness regarding management of traditional water harvesting structures, training in water management, educating, encouraging voluntary participation and scheduling of water supply (moral suasion).  
**Models:** Analysis of Covariance (ANCOVA) and Scoring Techniques were employed for comparing the modus operandi of Formal and Informal WUA's, which is a part of Participatory Irrigation Management.

Table: 1 Factors influencing co-operation in tank management by Informal WUA's:

Particulars	Ranks					Total scores	Rank of scores
	I (5)	II (4)	III (3)	IV (2)	V (1)		
Tank is under village panchayat	7 (14.9)	5 (10.6)	25 (53.2)	10 (21.3)	0	130	III
Creating Awareness and educating by NGO	21 (44.7)	17 (36.2)	7 (14.9)	2 (4.3)	0	194	II
Involving all farmers under the tank command	1 (2.1)	5 (10.6)	7 (14.9)	31 (66.0)	3 (6.4)	111	IV
75% of funds from NGOs	18 (38.3)	21 (44.7)	7 (14.9)	1 (2.1)	0	197	I
Given positions to farmers	0	0	0	3 (6.4)	44 (93.6)	50	V

Table: 2 Factors influencing Non co-operation by Formal WUA's:

Particulars	Ranks						Total scores	Rank of scores
	I (6)	II (5)	III (4)	IV (3)	V (2)	VI (1)		
Tank is Under Irrigation Department	34 (22.8)	46 (30.9)	39 (26.2)	27 (7.1)	3 (2.0)	0	677	II
Lack of Funds	23 (15.4)	39 (26.2)	50 (33.6)	31 (20.8)	6 (4.0)	0	650	III
Lack of Sufficient Monsoon Rainfall	62 (41.6)	30 (20.1)	41 (27.5)	15 (10.1)	1 (0.7)	0	733	I
Uncertainty in Tank Water Supply	19 (12.8)	19 (12.8)	12 (8.1)	40 (26.8)	46 (30.9)	13 (8.7)	482	IV
Non Participation by Bore Owners	12 (8.1)	12 (8.1)	4 (2.7)	28 (18.8)	46 (30.9)	47 (31.5)	371	V
Conflicts between Stakeholders	0	3 (2.0)	3 (2.0)	7 (4.7)	48 (32.2)	88 (59.1)	232	VI

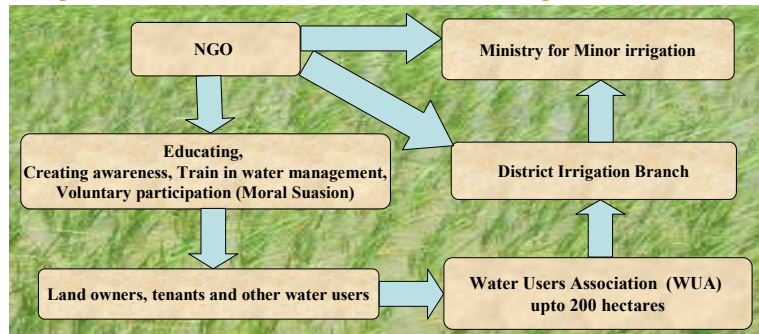
Results

Table:3 Results of the Impact of Informal and Formal WUA's:

Variables	Unstandardized Coefficients		Standardized Coefficients		t
	B	Std. Error	Beta		
Constant	18.379	1.415			12.986*
Dummy for Informal and Formal WUA (D2)	4.223	0.754	0.406		5.598*
Dummy for distance to the Tank (tail end, D3)	1.992	0.894	0.192		2.229**
Dummy for distance to the Tank (middle region, D4)	0.504	0.828	0.053		0.609
Dummy for the problem in the soil (Alkaline soils, D5)	-0.680	0.778	-0.075		-0.874
Age of the samples (X1)	0.006	0.026	0.016		0.225
Education (X2)	0.059	0.251	0.017		0.233

Dependent Variable: Water productivity of paddy (kg/ha-cm) R<sup>2</sup> = 0.160, N = 188 F = 5.729

Fig: 3 Modified structure of Water Users Association for Minor Irrigation



Conclusion

In case of Informal group, creating awareness through moral suasion and providing 75% funds for rehabilitation by Non Governmental organisations through District rural development agency (DRDA) lead to the collective action. Where as in case of Formal group tank property rights were under the control of Irrigation department and lack of funds for management lead to non collective action. NGO is bridging the gap in collective action in minor irrigation and improving the water productivity. By Considering the modified structure of WUA we can improve the managerial efforts for minor irrigation system.

- References: 1. Benno Torgler (2004): Moral Suasion: An alternative Tax Policy Strategy? Evidence from a controlled field experiment in Switzerland. Centre for Research in Economics, Management and the Arts, Working paper No. 2004 – 01  
 2. Alfons Weersink (2002): Policy options to account for the environmental costs and benefits of agriculture. Canadian Journal of Plant pathology, 24: 265-273.  
 3. Yacov Tsur (1993) The Economics of conjunctive Ground and Surface Water Irrigation System. Basic Principles and Evidence from Southern California. Staff paper P93-15, University of Minnesota.