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STATUS OF MINOR IRRIGATION IN ANDHRA PRADESH

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ABSTRACT :

The water resources available in India are not only from the major and medium irrigation sources but also from minor irrigation sources. In India, the share of minor and ground water irrigation dominates the other sources. The minor irrigation schemes play a vital role in the agricultural development and also in providing livelihoods for people in drought prone areas in Andhra Pradesh. They also help the areas outside command of major and medium projects. Minor Irrigation Systems meet the irrigation requirements of agriculture in Andhra Pradesh. The schemes are very beneficial to lakhs of farmers. Over a period of time, there have been dramatic changes in the minor water irrigation in Andhra Pradesh. Hence, this paper mainly focuses on the trends in minor irrigation during the pre and post bifurcation period in Andhra Pradesh.



KEYWORDS : *Minor Irrigation, Tube Wells, Ground Water Irrigation, Surface Irrigation.*

INTRODUCTION

India has a total of 143 million hectares of arable land, or around 108 million hectares of rain-fed area, or roughly 75% of the total. There is an unequal distribution of rainfall across the nation, with certain locations receiving between 400 and 1000 mm. Farming in these rains fed areas is called rain fed farming. These areas contribute more than of the food grain production in India. In some places, the yearly rainfall is less than 500 mm. These regions are referred to as dry lands, and farming there is referred to as dry land farming. Only 47 m.h. of the 108 m.h. total area supplied by rain is dry land. 42% of the nation's total food grain production is produced on these grounds. Only four regions were responsible for 75% of the world's pulse output.

Interventions that address the non-agricultural livelihood needs of the poor, such as food security, clean drinking water, savings and credit, transportation, communications, non-land based income generation, and access to health and educational services, are necessary for the development of rainfed areas.

It is often argued that the rain fed agriculture is handicapped on the natural resource front. But, one can diagonally argue that the cropping systems and cultivation practices in rain fed regions are not tailored to the suit natural constraints. Historically, farming began in the river basins and slowly shifted to the other regions due to population pressure. Hence, the practices followed in the assured rainfall

regions cannot be the same for the less endowed regions. They need a different approach. That is why watershed approach is adopted.

Watershed is a geographical unit/area in which water from the ridges or valleys flows towards the surface area or into a common point.

The watershed approach is in fact not new. In ancient times also tanks and reservoirs were developed to provide irrigation facility to lands dependent on rain, to increase production and meet the needs of growing population. The need to conserve soil and preserve water was realized by the rulers of those times and it was done by utilizing the services of Gram Panchayats. Such an approach is now followed in the name of watershed approach.

The minor irrigation approach has resulted in watershed development programme. Watershed programme is taken up for conservation of water and soil. The main aim of watershed programme is to develop all villages in a specified area called watershed by properly utilizing the natural resources that are locally available. Several watersheds are demarcated in a district/region. Under each Watershed Development Project, 500 hectares of land is taken up for development. However, the actual project area may differ from one watershed to another depending on the watershed's geographic position, the size of the settlement, etc. For the purpose of choosing a watershed region, several topics, including land use, land cover, soil fertility, etc., may be employed.

The traditional goal of the watershed programme has been to restore degraded lands using low-cost, readily available technology, such as in-situ soil and moisture conservation techniques, afforestation, etc. This strategy ensures close user community interaction and is participatory. Its overarching goals are to encourage global economic growth and to better the socioeconomic circumstances of those who lack resources.

Most of the studies on Watershed Management (WSM) either laid stress on environmental, conservational and technical aspects or on physical linkages between land and water or on the evolution of participation in such programme or the problems involved in sectoral implementation of watershed management programmes. There are studies, which emphasized on the need of participation and consequences of non-participation in such programmes, but studies with regard to the implication of *socio-cultural* factors, which can lead to the understanding of failure or success and sustainable participation in the watershed programmes, are scanty. Though there are studies, which focussed on the environment and ecological impact of such programmes, there are very less number that dealt in detail with regard to the impacts of such participation on the socio-cultural and economic life of people. Hence, this study will try to deal with such issues in detail.

The improvement of the watershed, however, is intended to benefit farmers in general and dry land farmers in particular over the long run. However, just a few research have been conducted thus far to support this assertion. The continuous adoption of better conservation and dry land agricultural production methods is crucial for the flow of benefits after withdrawal. The predicted economic returns over investment may not be achieved and need to be re-estimated if such a stream of benefits is not guaranteed.

IRRIGATION IN ANDHRA PRADESH

Irrigation is one of the prominent factors in agricultural production. In the year 2020-21 major portion of gross cropped area extending to 1856932 hectares is under canal irrigation and irrigation through tube wells stands at second place with 1652552 hectares (table-3.5a). Tanks have their proportionate share respectively providing to 3985197 hectares in facilitating the crops with irrigation. Other sources of irrigation do have their part in irrigation which is being provided to 140197 lakh hectares. In respect of canal irrigation, it has had increasing trend from 60's to 90's and from then onwards there has been observed decreasing trend. After that there occurs again an increasing trend. As the irrigation from wells and tanks provide inadequate facility it has been replaced by tube well irrigation and so there is gradual increasing trend. Variations regarding gross cropped area and net sown area as well as gross irrigated area and net irrigated area are analysed. However, more than 50.39 per cent of the gross cropped area is being facilitated with irrigation. Out of the gross area irrigated in

the state, 9.20 % was under tanks, 47.74 % was under canals, 39.62 % was under wells and 3.42 % under other sources. The net irrigated area is reported as 3013700 lakh hectares during 2020-21.

The total net area irrigated was increased by 7.59% during 2016-17 over 2020-21. Out of the total 27.18 lakh hectares of net area irrigated, 8.68 per cent was under tanks, 45.05 per cent was under canals, 42.75 per cent was under wells and 3.51 per cent under other sources. Out of the gross area irrigated in the state, West Godavari has the largest extent with 15.70 per cent followed by 13.94 per cent in Guntur, whereas the same is low in Vishakhapatnam with extent 3.69 per cent followed by Anantapuram district 3.94 per cent. Total food grains occupied by 69.58 per cent and total food crops occupied by 88.15 per cent of the gross area irrigated in the state during 2020-21. The irrigation intensity is 126 at state level and found to be high in Guntur (164.19), East and west Godavari districts with 137 and 153 respectively. And irrigation intensity is very low in Vizayanagaram (89.44) and Visakhapatnam District with 98 during 2020-21.

MINOR IRRIGATION IN ANDHRA PRADESH

Minor Irrigation systems include all ground water and surface water schemes with a cultivable command area of less than 2,000 hectares. Dug wells, Shallow and medium tube wells, and deep tube wells are the three types of wells underground water. Surface flow schemes and surface lift schemes come under surface water schemes. These are the five major categories of the minor irrigation schemes. Dug wells are nothing but the ordinary open wells of various dimensions dug from the ground surface into the water bearing stratum to retrieve water for irrigation. Masonary wells, kuchcha wells, and dug-cum-bore wells are the most common types. The majority of these plans are of a personal nature, belonging to individual cultivators. A shallow tube well is a bore hole drilled into the ground that is used to extract ground water from permeable zones. The depth of shallow tube wells in sedimentary strata is not more than 25 metres. The concept of medium tube wells with a depth of 35-70 metres was presented in the 5th Minor Irrigation Census (MIC). Deep tube wells can reach depths of 70 metres or more, with a discharge rate of 100-200 cubic metres per hour. Surface flow schemes often include tanks, check dams, and structures, and they can be used for both water conservation and ground water recharge. These constructions are commonly seen in hilly areas. Surface lift schemes are typically constructed in areas where the topography prevents direct flow irrigation from rivers and streams, necessitating the lifting of water into irrigation channels. These works are comparable to diversion projects, but they additionally include the installation of pumps and the construction of pump houses.

Status of Minor Irrigation Sources under various MICs in Andhra Pradesh

Irrigation has been critical to the state's agricultural development. Because minor irrigation schemes account for a significant share of irrigation in the state, there was a need for a solid and trustworthy data base on the sector, which would serve as a solid platform for planning and policy formulation. In order to achieve this goal, five minor irrigation censuses have been conducted so far.

The Government of Andhra Pradesh has undertaken several Minor Irrigation Censuses, which provide data on these types of minor irrigation. The data on tanks and other surface flow kinds of irrigation are grouped together in a single category termed surface flow irrigation. The census gives information on the number of farmers (holdings) that have access to each type of irrigation as well as the actual area watered by each.

The status of minor irrigation sources under various Minor Irrigation Census (MIC) in Andhra Pradesh is presented in Table 3.6. It is observed from the table that the total minor irrigation schemes during the 1st MI Census (1986-87) were 13,92,931 in number which considerably increased to 20,35,696 during the 3rd MI Census (2000-01) but drastically decreased to 9,72,496 in the year 2006-07 during 4th MI Census. However, they increased slightly during 5th MI Census (2013-14) to 10,54,356. Out of the total minor irrigation schemes during 1st MIC, there were 12,98,837 total ground water sources and 94,094 total surface irrigation schemes. These further increased to 19,29,060 and 1,06,636 of ground water and surface water sources respectively in the 3rd MIC. But, during the 4th MIC, the ground water sources fell down to 9,16,621 and surface irrigation schemes decreased to 55,875. The

ground water irrigation and surface water irrigation schemes rose to 9,88,185 and 66,171 respectively. The number of tube wells increased down to 7,76,155 in 5th MIC against 1,23,492 during 1st MIC. Over a period of time, the usage of ground water resources has increased drastically. The real estate businesses have become the reason behind the conversion of tanks into housing plots decreasing the tank water availability. Also, many tanks were leveled out in and near the areas of several projects. Government has also taken away some tanks for its own purposes. The total minor irrigation sources increased from 1054356 in 2013-14 to 1190964 by 2017-18. During this period, ground water sources increased from 988185 to 1132769. But surface irrigation schemes declined to 58195 from 66171 .

Table: 1
Minor Irrigation Sources in Andhra Pradesh (Number)

Source Type	1986-87 1 st MI Census	2000-01 3 rd MI Census	*2006-07 4 th MI Census	*2013-14 5 th MI Census	*2017-18 6 th MI Census
Dug Wells	1175345	1185219	376617	212030	171301
Shallow Tube Wells	110071	656359	321203	398205	435875
Deep Tube Wells	13421	87482	218801	377950	525593
All Tube Wells	123492	743841	540004	776155	961468
Total Ground Water	1298837	1929060	916621	988185	1132769
Surface Flow Irrigation Schemes	79023	82443	45204	51363	47590
Surface Lift Irrigation Schemes	15071	24193	10671	14803	10605
Total Surface Irrigation Schemes	94094	106636	55875	66171	58195
Total Minor Irrigation Schemes	1392931	2035696	972496	1054356	1190964

Source:1. AP Minor Irrigation Census, 1986-87, 2000-01, 2013-14 and 2017-18.

Note: * Data indicates Residuary state of Andhra Pradesh (13 districts).

Status of Irrigation Potential Created and Area Irrigated under Minor Irrigation in Andhra Pradesh

The Table 3.7 shows the IPC and Actual area irrigated along with the %age of utilization of various minor irrigation sources during 4th MIC and 5th MIC. The data indicates that during the 4th MIC (2006-07), 29,12,370 hectares of Irrigation Potential was created under minor irrigation. But the actual area irrigated was 17,71,436 hectares. It can be said that the utilization of IPC is 60.8% only. Under the total IPC, 10,87,147 (37.2%) hectares was irrigated by surface irrigation schemes while the rest 18,25,223 (62.8%) hectares was irrigated by ground water irrigation schemes. From the total IPC by ground water 11,89,383 hectares was the actual area irrigated that is only 65.2% was the utilization. On the other hand, 5,82,053 hectares was the actual area irrigated of the total IPC of 10,87,147 hectares resulting in a 53.5% utilization. However, by 5th MIC, the IPC had increased to 30,70,471 hectares and so has the area irrigated to 20,23,998 hectares showing a 65.9% utilization, an increase from the previous MIC's. Under Ground Water Irrigation, out of 19,19,998 hectares of IPC 13,98,996 hectares was irrigated showing 72.9% utilization, a significant rise from the 4th MIC. 6,25,002 hectares of area was actually irrigated of the total 11,50,472 hectares of IPC leading to a 54.3% utilization. Ground water has been a major source of irrigation in both 4th MIC and 5th MIC. According to 6th MIC in 2017-18, total IPC created 2776242 and actual area irrigated is 1991499. It indicates that irrigation potential utilized is 71.7 percent. Out of the total irrigation potential created, the ground water share is 60.9 percent and the remaining part is surface lift irrigation schemes.

CONCLUSION

Minor irrigation is vital for the growth of agriculture, livelihoods, and food security, especially in drought-prone areas and those outside the command of Major and Medium projects. In 1986-87, the total number of minor irrigation sources in Andhra Pradesh was 13.9 lakhs. After state bifurcation in 2014, the residuary state of Andhra Pradesh has around 11.9 lakh minor irrigation sources in the 13 districts, according to the 6th Minor Irrigation (MI) Census. Farmers began to shift to minor irrigation, notably ground water irrigation, due to shortcomings in the canal irrigation system, particularly in terms of its timely availability. The irrigation potential of ground water use has been steadily increasing. It has become the state's primary source of irrigation in recent decades. Despite its enormous relevance and value, minor irrigation particularly ground water irrigation in Andhra Pradesh is on the verge of becoming a crisis that requires immediate attention and understanding. Modern irrigation techniques like drip and sprinkler irrigation technology should be utilized to relieve stress on the ground water system and increase resource availability.

Table-3.7
IPC and Area Irrigated across various Minor Irrigation Sources in
Residuary Andhra Pradesh :4th MI Census ,5th MI Census and 6th MI Census (Hectares)

Source Type	2006-07 (4 th MIC)			2013-14 (5 th MIC)			2017-18 (6 th MIC)		
	Irrigation Potential created	Actual Area Irrigated	% of Utilisation	Irrigation Potential created	Actual Area Irrigated	% of Utilisation	Irrigation Potential created	Actual Area Irrigated	% of Utilisation
Dug Wells	543912	253263	46.6	267634	130275	48.7	189863	123579	65.0
Shallow Tube Wells	686266	502578	73.2	784386	591409	75.3	656430	566679	86.3
Deep Tube Wells	595045	433542	72.8	867978	677312	78.4	845177	664528	79.0
Total Ground Water	1825223 (62.8)	1189383 (67.1)	65.2	1919998 (62.5)	1398996 (69.1)	72.9	1691470 (60.9)	1354786 (68.0)	80.1
Surface Flow Irrigation Schemes	961557	511277	53.2	992376	530179	53.4	925048	542040	58.6
Surface Lift Irrigation Schemes	125590	70776	56.4	158096	94823	59.9	159724	94673	59.3
Total Surface Irrigation Schemes	1087147 (37.2)	582053 (32.9)	53.5	1150472 (37.5)	625002 (30.9)	54.3	1084772(39.1)	636713 (32.0)	58.7
Total Minor Irrigation Schemes	2912370 (100)	1771436 (100)	60.8	3070471 (100)	2023998 (100)	65.9	2776242(100)	1991499(100)	71.7

Source: AP 4th, 5th and 6th Minor Irrigation Census Reports, Government of AP.