

# **COMPREHENSIVE WATER USE APPROACH - A PARTICIPATORY IRRIGATION DEVELOPMENT AND MANAGEMENT IN KARNATAKA UNDER SMALL HOLDING CONDITION**

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## **Abstract**

The euphoria of “**Green revolution**” in India during 1970s and 80s mainly due to irrigation has given way to a rather concerning phase of productivity stagnation during the 90s. It is estimated that, country should maintain a growth rate of 7.5 % in agricultural production to meet the needs of growing population by 2015 AD. The concerns of equity and social justice raised by activists have compelled the governments to give equal priority for development of rainfed areas too.

The detailed analysis of land holding between 1995 and 2005 shows that the shift from large (> 10 ha) to medium (1-2 ha) and to marginal (> 1 ha) is mainly due to social justice of equity by division of the inherited land. The novel approach by establishing 2600 water user co-operative societies under each tank commands for irrigation water management through participatory model by themselves helped smaller holders. These organization liason between irrigation authorities and farmers which was significant milestone in the irrigation history. Above all, the efforts by the government in providing water to rainfed areas by filing the minor irrigation tanks shows the concern of developing rainfed areas and equity between rainfed and irrigated areas in sharing irrigation water.

The University of Agricultural Sciences, Bangalore had an operational research project for land development, crop management, alternative land use had pronounced effect on crop yield and productivity. The comprehensive approach of providing irrigation water to rainfed areas shows social concern in water use approach for smaller holdings in Karnataka.

## INTRODUCTION

The euphoria of “Green revolution” in India during 1970s and ‘80s mainly due to irrigation and new technology has given a way to a rather concerning phase of productivity stagnation in during the ‘90s, when it is estimated that the country should maintain the growth rate of 7.5per cent in agricultural production in order to meet the needs of its growing population by 2015 AD. Augmenting and improving irrigation facilities and ensure irrigation facilities for small and marginal farmers – a major contributor to green revolution was possible by heavy investment. The realization has shifted during late 90s to the efforts of augmenting country’s agricultural production from even to the rainfed areas through watershed approach. The concerns of equity and social justice raised by several activists have compelled the government s to give priority for the development of rainfed areas too.

Karnataka state agricultural scenario as it represents a wide range of agro-climatic and ecological situation accommodating a number of land based enterprise and called as miniature India. About 70 per cent of the state’s population depends on agriculture that contributes around 30 per cent of GDP. Out of 19.2 million hectare of the total geographical area in the state 10.5 million hectare are under cultivation with more than 75 per cent being rainfed. The detailed analysis of land holdings between 1995 and 2005 that there has been increased in number of smaller holdings. The conversion from large (>10 ha) to medium (1-2 ha) and to marginal (>1 ha) is mainly due to social justice of equity by division of inherited land. The situation of more number of smaller holdings directly or indirectly encouraged and ensured the sharing of irrigation water than fewer larger holdings.

Off late the states initiative through establishing Karnataka irrigation corporation (KIC) for investing and improving in minimizing the seepage and conveyance losses by lining the canal

has led to better supply of irrigation water equal to all farmers in the command area. The most important and novel approach by establishing 2600 water user co-operative societies for management of irrigation was significant milestone in the irrigation history. Above all, the efforts of KIC in providing water to rainfed areas by filling the minor irrigation tanks (command area > 40 ha) shows that the concern of developing rainfed area and equity between rainfed and irrigated areas in sharing water for irrigation.

University of Agricultural Sciences, Bangalore (UASB) had close association with state water development departments, more closely through its operational research projects (ORP) for on farm research. The experience gained are scientific land development, crop, management, alternative land use, water harvesting and recycling had direct pronounced effect on crop yield and productivity. The results of the study indicated that two protective irrigation from the farm pond water had increased the yield of chili by more than 300 per cent under rainfed situation (Anon. 1984).

Further, impact of *Achalu* Micro Watershed (52 ha) with only small and marginal farmers showed that the increase in man-day (72-125) and net returns in a period of four years from the start. The combined approach of providing irrigation water to the minor irrigation tanks and watershed development showed comprehensive water use experiment of Karnataka holds good elsewhere to the benefit of smaller holdings. Keeping the advantages of protective and life saving irrigation strategies encouraged filling up of tanks in the command areas.

## **METHODOLOGY**

The present paper deals with the study carried out in irrigated area (command area) and rainfed areas (watershed) in using the stored water effectively which accelerated the social justice to all the category of farmers. In both the studies 100 farmers have been selected by

adopting forced choice technique for collecting data and observations. The observation refers to before the formation of water user associations (WUA) and after the formation are presented in table 1.

The data pertaining to rainfed area of *Achalu* watershed on cropping intensity, economics and mandays of before and after the watershed development association are presented in table 2.

Table 1 Changes in crop management strategies as influenced by establishment of Water users association

Observation	Before water users association	After water users association
1. Irrigation water use	Outside command areas was also used (Unauthorized)	Limited to command areas
2. Management of Irrigation water	Not scientific, No lining of canals- causing more conveyance losses	Scientific due to Lining of canals very less conveyance losses
3. Crops	No uniform crops & Management Throughout the season and command area	Uniformity up to 75% of the crops and its management in the season and command area
4. Water use efficiency	Low water use efficiency (WUE) i.e. excess water use/unit of economic parts produced	Better use of controlled application
5. Conveyance loss	Up to 30 per cent	Reduced to 5-10 per cent
6. Canal water control	Irrigation engineers of the department	Water users association
7. Impact i) Total Volume of water used/crop/season	More water use	Optimum water use
ii) Effect of excess water use in command area	Almost all low lying areas were water logged	Only 20% of the low laying areas were water logged

Table 2 Net and Gross cropped area, cropping intensity, total production, and economics of *Achalu* micro watershed before and after the watershed development programme

	Net cropped area ( ha )	Gross cropped area( ha )	Cropping Intensity (%)	Total production (tonnes)	Net returns (000's)	Man days
Before	28.45	30.45	107.3	15.75	-1.40	2041
After water shed development						
I year	28.45	31.50	111.25	41.19	79.47	2993

II year	28.45	32.95	115.81	35.23	71.11	3396
III year	28.45	33.45	117.51	48.41	86.13	3358

## **Results and discussion**

The irrigation water saved due to modern and scientific management of irrigation water (minimizing conveyance losses) has provided the opportunity to extend the area under irrigation. The technological approaches adopted were scientific crop management and improved irrigation system and participatory approaches were the key elements.

While the rainfed area also scientific and technological adoption insured the soil moisture for longer periods thus, the resulted clearly showed a higher net profit and more man power use. Further, under rainfed situation providing two protective irrigation with the water harvested and recycled by providing has resulted in 300 per cent increased in crop yield.

## **Summary and Conclusion**

From the above study almost 6000 minor irrigation tanks in Karnataka have been filled with water from different reservoirs to irrigate the crop and to minimize crop failure and drinking water scarcity. Also the water provided for irrigation through lift irrigation has added more area and number of farmers in the state. At present 26,000 water user associations are in operation under participatory irrigation development and management.

The highlights of studies under comprehensive water use are

- Small and marginal farmers have benefited more with irrigation.
- Participatory model favored better understanding and improved the water use.
- Drought mitigation even under rainfed areas were covered.
- Better environmental protection under public-private partnership.

Reference:

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