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PROMOTION OF MICRO IRRIGATION PROGRAMME IN ANDHRA PRADESH

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ABSTRACT

Sustainable development and efficient management of water is an increasingly complex challenge in India. Increasing population, growing urbanization, and rapid industrialization combined with the need for raising agricultural production generates competing claims for water. The main objectives of this paper is to analyze the Production and productivity of the crop, Quality of the agriculture produce in the study area with the help of micro irrigation programme. There is a growing perception of a sense of an impending water crisis in the country. India with 24% of the world's total area has 16% of the world's population; but has only 4% of the total available fresh water. This clearly indicates the need for water resource development, conservation, and optimum use. Fortunately, at a macro level India is not short of water. The agriculture sector is the predominant consumer of water. Almost 70% of all available freshwater is used for agriculture across the world. In India more than 80 % of the renewable water resources are spent for agriculture alone. Many of the world's most important grain lands are consuming groundwater at unsustainable rates. Government of Andhra Pradesh has launched the Andhra Pradesh Micro Irrigation Project in 2003 to promote micro irrigation in large scale for sustainable development of agriculture. The project has so far covered more than 0.654 m ha area under micro irrigation systems in 6 years period with capital investment of Rs 1962 crore, benefiting 04 million farmers. The Micro irrigation has helped in improving the crop productivity, saving in water and energy and creating employment opportunities.

KEY WORDS: Micro Irrigation, Agriculture Development, Crop Productivity,

INTRODUCTION

Sustainable development and efficient management of water is an increasingly complex challenge in India. Increasing population, growing urbanization, and rapid industrialization combined with the need for raising agricultural production generates competing claims for water. There is a growing perception of a sense of an impending water crisis in the country. India with 2.4% of the world's total area has 16% of the world's population; but has only 4% of the total available fresh water. This clearly indicates the need for water resource development, conservation, and optimum use. Fortunately, at a macro level India is not short of water.

The agriculture sector is the predominant consumer of water. Almost 70% of all available freshwater is used for agriculture across the world. In India more than 80 % of the renewable water resources are spent for agriculture alone. Many of the world's most important grain lands are consuming groundwater at unsustainable rates. As we have stepped into the twenty first century, the new frontier is boosting water productivity, getting more from every liter of water devoted to crop production.

Government of Andhra Pradesh has launched the Andhra Pradesh Micro Irrigation Project (APMIP) in 2003 to promote micro irrigation in large scale for sustainable development of agriculture. The major thrust was on to put the 3 million electrified pump sets in the state of Andhra Pradesh into micro irrigation. The project has so far covered more than 0.654 m ha area under micro irrigation systems in 6 years period with capital investment of Rs 1962 crore, benefiting 0.4 million farmers. The Micro irrigation has helped in improving the crop productivity, saving in water and energy and creating employment opportunities. The project is contributing to an additional productivity of worth Rs 980 crores per annum. On annual basis the project is helping in saving of 120.12 TMC of water (1 TMC = 2700 ha m), 324 million kwh of energy. On annual basis every rupee invested in micro irrigation pays Rs 2.4 through additional productivity. The attractive pay back period of less than 2 years has influenced the bankers to provide loans to farmers to procure micro irrigation systems. The success of APMIP has lead to the extension of micro irrigation into canal commands under major lift irrigation projects in Andhra Pradesh.

A study has been conducted to develop a micro Irrigation system suitable to small land holdings in sandy tracts of coastal Andhra Pradesh powered by SPV pumping unit. SPV array having 24 panels with 900W rated capacity, a mono block centrifugal pump of 1.1 hp, laterals with inline emitters, online emitters and micro sprinklers. The hydraulic performance of 4 models of micro sprinklers was studied with the operating pressure varying from 0.51 to 0.61 kg/cm. The diameter of spread was found in the range of 3.7 to 5.0 m and the uniformity coefficient in the range of 40 % to 64%. At an operating pressure of 0.42 kg/cm the droplet size of micro sprinkler was in the range of 0.56 to 0.78 mm. Trickle irrigation design layout is made to suit to SPV pumping system to irrigate banana crop in an area of 7200 sq m.

What is Micro Irrigation?

Micro Irrigation is an irrigation method deployed to save water and fertilizer by allowing water to drip slowly to the roots of plants, either onto the soil surface or directly onto the root zone, by using a network of valves, pipes, tubing, and emitters. It is done through narrow tubes that deliver water directly to the base of the plant.

Why Switch to Micro Irrigation:-

Irrigation is an artificial application of water to the soil. It is used to assist in the growing of agricultural crops, maintenance of landscapes, and re-vegetation of disturbed soils in dry areas and during periods of inadequate rainfall. Additionally, drip and sprinkler irrigation also has a few other uses in crop production, which include protecting plants against frost, suppressing weed growing in grain fields, and helping in preventing soil consolidation.

Micro irrigation is the method in which long pipes of water are spread on the field where the seeds are sown there is a tap from which drop by drop of water come and fall on the appropriate place at which the plant is placed. Drip irrigation, also known as trickle irrigation, functions as its name suggests. Water is delivered near the root zone of plants, drop by drop. This method can be the most water-efficient method of irrigation, since evaporation and overflow are minimized.

OBJECTIVES OF THE MICRO IRRIGATION

- Increased crop productivity
- Improved quality of agriculture produce
- Conservation of water and sustainable use of water
- Higher energy efficiency in agriculture sector
- Saving in labor expenses

SCOPE OF THE MICRO IRRIGATION

Although the Micro Irrigation provides for 50 percent of the investment cost

THE ADVANTAGES OF MICRO IRRIGATION

- Save 90% more water.
- Minimizes labor cost.
- Whatever the type of Soil, with drip, irrigation is possible.
- High water application efficiency.
- Highly uniform distribution of water.
- Not necessary of Leveling of the field.
- Ability to irrigate irregular shaped fields.
- Allows safe use of recycled water.
- Variation in supply can be regulated by regulating the valves and drippers.
- Usages of fertilizer are very less.

ANDHRA PRADESH MICRO IRRIGATION PROJECT

Almost 70% of all available freshwater is used for agriculture Table 1. Over pumping of groundwater by the world's farmers exceeds natural replenishment by at least 160 billion cubic meters a year. It takes an enormous amount of water to produce crops: three cubic meters to yield just one kilo of rice, and 1,000 tons of water to produce just one ton of grain. Land in agricultural use has increased by 12% since the 1960s to about 1.5 billion hectares. Current global water withdrawals for irrigation are estimated at about 2,000 to 2,555 km per year.

Table-2 the irrigation resource potential of the country has been assessed from time to time by different agencies. The different estimates are shown in table-2. It may be seen that since 1954, the estimates have stabilized and are within the proximity of the currently accepted estimate of 1869 billion cubic metres which includes replenishable groundwater which gets charged on annual basis.

Table-3 the two states also differ in other pre-conditions, particularly their respective levels of MI development prior to these SPVs. Andhra Pradesh was on the early adopters of MI, and in 2002 had about 12 percent of the 5 lakh ha under drip irrigation in India. Since this period, this state has seen

an increase in factors that are likely to be positively associated with MI adoption. For instance, area irrigated by groundwater has gone up, particularly in Andhra Pradesh. This State has also seen an expansion in area under crops suitable for drip irrigation such as horticulture and cotton.

Agriculture is responsible for most of the depletion of groundwater, along with up to 70% of the pollution. For the last half-century, agriculture's principal challenge has been raising land productivity- getting more crops out of each hectare of land. As we have stepped into the twenty first century, the new frontier is boosting water productivity getting more from every liter of water devoted to crop production. There is long and growing list of measures that can increase agricultural water productivity.

Krishna District:-

The prestigious Andhra Pradesh Micro Irrigation Project **(APMIP)** has come as sign of relief to the farmers of Krishna District, and they are utilizing this opportunity to minimize the Water and, Electricity consumption and increase yields with less cost of cultivation.

Drip Irrigation ranks near the top of measures with substantial untapped potential. In contrast to a flooded field, this allows a large share of water to evaporate without benefiting a crop, drip irrigation results in negligible evaporation losses. When combined with soil moisture monitoring or other ways of assessing crop's water needs accurately, drip irrigation can achieve efficiencies as high as 95 percent, compared with 50-70 percent.

SUMMARY AND CONCLUSIONS

The world and more importantly the developing countries are heading towards water stress and scarcity. They are left with no alternative but to adopt modern irrigation technologies, which save water, double the area under irrigation, improve yields and quality as well as save on labour, energy and crop production costs. In India more than 82% of the total water is used for agriculture with very low irrigation efficiencies. It is expected that in the next 7-8 years, there will be cut of about 10% irrigation water for meeting ever-increasing demand from domestic, industrial and other sectors. Hence, there is necessity to undertake large-scale micro irrigation projects like Andhra Pradesh Micro Irrigation Project to bring more areas under drip irrigation system improving water use efficiencies to as high as 95%.

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APPENDIX

Table -1 Comparison of water usage in different sectors

Usage in (%)	World	Europe	Africa	India
Agriculture	69	33	88	82
Industry	23	54	5	12
Domestic use	8	13	7	6

Tabel-2 Water Requirement for Various Sectors

Sector	Water Demand in KM					
	Standing Subcommittee of MoWR			NCIWRD		
	2010	2025	2050	2010	2025	2050
Irrigation	688	910	1072	557	611	807
Drinking Water	56	73	102	43	62	111
Industry	12	23	63	37	67	81
Energy	5	15	130	19	33	70
Others	52	72	80	54	70	111
Total	813	1093	1447	710	843	1180

Table-3 Trends in factors promoting micro-irrigation in Andhra Pradesh in 2000-11

Factor	Andhra Pradesh	
	(Year) Value	(Year) Value
Net irrigated area-groundwater	(TE.2001-02) 1927	(TE.2009-10) 2298
Net irrigated area- surface water	(TE.2001-02) 2264	(TE.2009-10) 2096
Area under fruits and vegetables	(2001-02) 798.3	(2010-11) 1297.3
Area under cotton	(2001-02) 1108	(2010-11) 1740

Sources: India statistical 2012, National Horticulture Board 2011

Table -4 Coverage of MI systems since inception of APMIP

Year	Area covered under micro irrigation, hectors		
	Sprinkler	Drip	Total
2003-04	20,770	3,780	24,550
2004-05	40,020	24,905	64,925
2005-06	25,000	51,811	76,811
2006-07	23,750	66,258	90,008
2007-08	30,000	90,000	1,20,000
2008-09	37,000	94,000	1,31,000
2009-10	37,500	1,09,341	1,46,841
Total	2,14,040	4,40,095	6,54,135