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EXECUTIVE SUMMARY

Water is a renewable resource. However over exploitation by various human activities has resulted in depletion of ground water table. The ever increasing demand for water from various sectors has rendered water a scarce commodity. Availability of water in appropriate quantity for both industrial and irrigation purposes is under severe stress.

Agriculture is an inevitable activity for survival of human race. Agriculture sector consumes 80% of the country's exploitable water resources. The overall development of the agriculture sector is largely dependent on judicious use of the available water resources.

The inefficient conventional methods of conveyance water adopted in irrigation has led not only in wastage of water but also to several ecological problems like water logging, salinization and soil degradation rendering agriculture lands unproductive.

Efforts were on in various countries to find suitable solution to minimize wastage of water in irrigation. It has been recognised that use of modern irrigation methods are the only alternative for efficient use of surface as well as ground water resources. Therefore, Micro irrigation has been prioritized as the singular factor contributing to the overall development of agriculture sector.

Government of India Initiative:

Government of India is aware of the fact that in spite of having the largest irrigated area in the world, the coverage of irrigation is only 40 percent of the gross cropped area. Considering the water availability for future use and the increasing demand from various sectors, Government of India has introduced a number of demand management strategies and programmes to increase water use efficiency; However the net impact of these strategies in increasing the water use efficiency is not very impressive till date.

One of the strategies introduced recently to control water consumption in Indian agriculture is "**Micro-irrigation**" (MI) which includes mainly drip and sprinkler irrigation method.

Micro-irrigation refers to low-pressure irrigation systems that spray, mist, sprinkle or drip. The term “Micro-irrigation” describes a family of irrigation systems that apply water through small devices delivering water very near to the plant or below the soil into the plant root zone.

Conveying water in an efficient manner has influenced growers, producers and landscapers to adapt micro irrigation systems to suit their needs for precision water application.

Micro-irrigation in Agriculture is used extensively for row crops, mulched crops, orchards, gardens, greenhouses and nurseries

Micro irrigation systems are immensely popular both in arid regions & humid and sub humid zones where water supplies are limited or water is expensive.

Micro irrigation facilitates Water savings, Energy savings, Weed and disease reduction, Automation, Improved production on marginal land etc.

Micro-irrigation systems normally have greater maintenance requirements. Animals, rodents and insects may cause damage to some components. Even though the investment cost would be high Micro-irrigation systems are ideal for high value crops such as orchards, vineyards, greenhouses and nurseries where traditional irrigation methods may not be practical.

Micro irrigation is introduced primarily to save water and to increase water use efficiency in agriculture. It delivers many other economic and social benefits to the society. The reduction in water consumption due to drip irrigation ranges from 30 to 70 percent for different crops. The productivity gain is estimated to be in the range of 20 to 90 percent for different crops. Since Drip irrigation is a new technology and capital-intensive venture, both Central and State government operates schemes with subsidy for promoting drip method of irrigation.

Trends and Achievements so far:

Central scheme was started during 1982-83 (during the Sixth plan). Through this scheme Government of India provided a subsidy of 50 percent to the farmers with matching contribution from the State governments for installation of micro-irrigation devices. During the seventh plan the subsidy was limited to only small and marginal farmers.

However, due to capital paucity, this group could not afford the drip systems even at the subsidised rate and hence the progress during seventh plan was very negligible.

All though remarkable growth has been achieved over the last two decades in adopting micro irrigation, its share to the gross irrigated area of the country is only negligible percent as of today.

Capital-intensive nature of Micro irrigation system is the main reason for the slow progress in adoption of this new technology. Further, there were many restrictions such as the limits in area that a beneficiary could cover under the scheme, cost structure etc that acted as deterrents for wider coverage.

However the Micro-Irrigation Scheme has undergone lot of changes over the years. This is visible in the policy initiative taken by Government of India on Micro-irrigation scheme for the 10th five year plan.

To bring more area under irrigation new techniques viz. Micro and Sprinkler Irrigation for economizing the use of water and increase productivity per unit of water is the best available option. This technology also arrests water logging and secondary salinization problems of the canal command areas and check the receding water table and deteriorating water quality in the well command areas. The estimated potential for the new Technology in the country is 27 & 42.5 Million hectares respectively. It is proposed to implement a Centrally Sponsored Scheme, on Micro Irrigation during the Tenth Five Year Plan covering an area of 1.5 million hectares under drip irrigation and 0.5 million hectares under sprinkler irrigation.

The objective of the scheme is to increase the coverage of area under micro irrigation in the country for improving crop productivity with efficient use of water resources. Micro irrigation is to be viewed with a different perspective as a total plant support system starting with planting material to post harvest management and marketing.

The scheme will be available to all the farming community in the country and the focus will be for the efficient utilization of various inputs as water, fertilizer etc. & increase in productivity & quality of produce.

It is proposed to provide financial assistance @50% of the unit cost for various spaced crops. The financial assistance of 50% would be jointly shared by the centre and state governments in the ratio of 80:20.

The outlay proposed for covering 2 Million hectares under micro/sprinkler irrigation during the Tenth Plan Period will be Rs.7600 Crores

Central government sanctioned the Central Sector Scheme for Micro irrigation during the fag end of financial year 2006-07 and therefore actual implementation of scheme has started from the financial year 2007-08.

Key features of the Micro irrigation (MI) Scheme:

It will be a Centrally Sponsored Scheme under which out of the total cost of MI system, 40% will be borne by the Central Government, 10% by the State Government and the remaining 50% will be borne by the beneficiary either through his/her own resources or soft loan from financial institutions.

Assistance to farmers will be for covering a maximum area of five ha per beneficiary family.

The Panchayati Raj Institutions (PRIs) will be involved in selecting the beneficiaries. All categories of farmers are covered under the Scheme. However, at least 25% of the beneficiaries are to be small & Marginal farmers.

The focus will be on horticultural crops being covered under National Horticulture Mission. A cluster approach will be adopted.

There will be a strong HRD input for the farmers, field functionaries and other stake holder at different levels.

The Scheme will be implemented by an Implementing Agency (IA) appointed by the State Government; Registration of System Manufacturers will be done by the SMIC for use of the Districts

Payment will be made through crossed cheque. If the cheque is in the name of the system supplier, the same will be delivered through the farmer/beneficiary.

Supply of good quality system having BIS marking, proper after sales services to the satisfaction of the farmer is paramount.

The main objectives of Micro-irrigation Scheme:

1. To increase the area under irrigation.
2. To increase the coverage of area under micro irrigation.
3. To promote efficient use of water resources.
4. To increase the yield/productivity of the crop.
5. To improve the economic status of farmers in the region.

Farmers, Drip/Sprinkler companies approved by concerned SMIC and State Department of Horticulture/Agriculture are the main stakeholders in the scheme

Initially, the focus will be on horticulture crops; with emphasis on potential belts/regions in the States suiting to the agro-climatic conditions.

KARNATAKA SCENARIO:

Karnataka State Department of Horticulture has been promoting Drip system of irrigation from the year 1991-92. Since to the end of the year 2004-05, an area of 2.27 lakh hectares belonging to 1.30 lakh farmers have been brought under Drip system of Irrigation. An amount of 450 crores has been spent for providing subsidy.

Centrally Sponsored Scheme for Micro-irrigation:

The scheme was sanctioned during the fag end of the year 2005-06. Therefore, actual implementation of the scheme was started in the year 2006-07

The State Government has constituted State and Districts level Monitoring committee.

Suitable guidelines on 36 important points have been issued to all the implementing officers. The Micro irrigation scheme is being implemented since 2006-07.

As a policy matter, it has been made mandatory to subject all Centrally Sponsored Schemes for third party evaluation to assess its social and economical impact on the targeted group in particular and the society at large. Accordingly, the Micro Irrigation Scheme which has completed first four years of its implementation since 2006-07, is now subjected to third party Evaluation.

The state Department of Horticulture, has entrusted the task of evaluation of the scheme, to the IN-RIMT, Bangalore

OBJECTIVES, TERMS OF REFERENCE AND METHODOLOGY

Objectives:

The State Department of Horticulture through comprehensive evaluation desires to know the level of awareness about Micro irrigation Scheme among the farmers.

Whether the assistance extended by the Government is being put to proper use.

Suggest Policy changes that need to be adopted to make the scheme successful. .

Terms of Reference:

The State Department of Horticulture has set the Terms of Reference

- Economic analysis of MIS with annual, perennial crops
- Evaluation of water use efficiency with Horticulture crops.
- Farmers' response in the adoption of the scheme.
- Involvement of DMIC and drip / sprinkler companies in planning, implementation, monitoring and reporting.
- Impact of technological supports towards productivity enhancement.
- Assessing the nature of inter-relationship and co-ordination between departmental personnel, implementing companies and farmers.
- Nature and efficiency of processing claims and disbursement of subsidy assessment. Whether subsidy has reached the eligible farmer?.
- Study the opportunities & limitations in the implementation of MIS scheme with the farming system.
- Whether subsidy covers all categories of farmers.
- Problems in identifying the farmer beneficiaries.
- Whether there is any change in cropping pattern.:

The Department of Horticulture has suggested the methodology for evaluation.

1. Field based survey to assess the impact of various scheme components.
2. Farmer beneficiary survey and farmer's group survey to assess the process and impact of scheme implementation.

3. Data collection from different project stake holders, Govt. Departmental staff and farmer beneficiaries.
4. Analysis of the available data and reports.

Expectations of evaluation:

It is expected to analyze the impact of the Micro Irrigation Scheme towards increasing productivity by bringing in more area under drip irrigation.

APPROACH:

Immediate action was initiated to gather all primary and secondary information from Directorate of Horticulture.

Field schedules were prepared based on the terms of reference for collecting information from various stake holders in the scheme.

Five Evaluation teams were formed to take up field visits / verification/ interactions with concerned stake holders in the randomly selected 20 districts of the State.

METHODOLOGY.

1. In order to get required data format was designed and sent to concerned DDH (ZP) of 20 districts along with dates of visits to districts and field visits by the evaluators in the specified taluks vide our letter dated 09/02/2011
2. The evaluation teams visited the districts on scheduled dates. They had interaction with DDH, SADH /ADH & MIS dealers. The team elicited required information as per schedules from them.
3. Later, the teams visited randomly selected beneficiary fields located in villages of selected taluks in each of 20 districts. The visit to beneficiary field was followed by interaction with the concerned beneficiary and other farmers in the neighbourhood.
4. The core group review discussions were held regularly to monitor the progress of evaluation.
5. The evaluation teams gathered all required information from the concerned stake holders.

6. The information so gathered was subjected to analysis.

Evaluation:

The financial achievement during the period subjected for evaluation is in the range of,

Sl.No.	Financial Year	% Achievement
1.	2007-08	74.02
2.	2008-09	78.73
3.	2009-10	99.99

The financial achievement has been steady and reached its peak of 100% in the third year itself. The performances in the first two years under review are also very good indicating the zeal of the implementing agencies and eagerness of farmers for adopting the Micro irrigation System.

Economic analysis of MIS with annual, perennial crops:

All the officers working in 20 selected districts have expressed in unison that, adoption of Micro irrigation system has ushered in an economic change in the beneficiary families. They have stated that the change is for the good:

The evaluation teams during the course of their visit to 413 villages have met a total of 1618 beneficiaries falling under various categories and had interaction to ascertain from them on the benefits of MIS.

Irrespective of the category, all the beneficiaries have expressed that, the higher income generation after installation of micro irrigation is attributed to its positive influence on various factors such as growth plants/ bearing/ yield / quality of produce/ and expenditure on weeding & irrigation.

The responses of sample beneficiaries indicate that the water usage in horticulture crops after adopting micro irrigation has helped them increasing period of irrigation, spread of intervals.

All the 1618 beneficiaries have expressed that MIS serves the purpose.

98.57% beneficiary farmers have said that they received subsidy.

67.40% beneficiaries have changed the cropping pattern.

Virtually the DMIC has been a non starter in all the districts.

The IAs have trained all of them on management of system, like cleaning filters, using control valves, fertigation unit and the care to be taken..

Further 75% of the beneficiaries have stated that they have attended training on plant protection, plant nutrition, post harvest management and also water management.

All 44 departmental officials have expressed that the IAs and farmers have extended full co-operation during the course of implementation.

The 1618 sample Farmers who were interviewed by the evaluators had no reservations in expressing their satisfaction about the coordination between them, the IAs and departmental staff.

Performance of Micro irrigation system suppliers:

The State Department of Horticulture has approved 36 companies for supply of Micro irrigation systems in the State. All the 36 approved companies are active in their respective allotted districts. These companies have put in their efforts to achieve the target in spite of financial constraints and the risks involved. As a result of efforts of these companies /dealers the department could achieve 100% expenditure during the year 2009-10.

Opportunities:

Some beneficiaries felt that there is ample opportunity for water management and soil moisture regime while majority of beneficiaries have said that there is scope for fertigation.

Limitations:

Some beneficiaries stated that rat damage is a major concern and few more beneficiaries say that clogging of filter & tubes requiring acid frequent treatment are also a major limitation in MIS.

The response of beneficiaries amply proves that while there are some manageable limitations, opportunities for MIS are umpteen.

Subsidy coverage:

Sufficient care has been taken to cover all the categories of farmers under MIS. Of the 1617 sampled beneficiary farmers, majority of them have either entirely changed the cropping pattern or added new crop/crops with the existing ones. According to their responses to the questionnaire, 1090 (67.40%) beneficiaries have changed the cropping pattern and the rest have perennial crops and hence not changed.

CONCLUSION:

All the objectives enunciated in the scheme have been achieved in general with minimum deviations of the guidelines. However, some of the gaps such as functioning of DMICs in some districts, delay in processing and release of subsidies are noticed, lesser utilisation of funds for SC/ST categories due to their poor economic status, probability of misuse of subsidy provided by the misrepresentation of the area of utility in subsequent claim by the farmers / companies are noticed.