

Modern Water Management Practices in Gujarat and the Development Thereof



Management

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ABSTRACT

In the State of Gujarat the modern water management practices like Sprinkler water management, Drip water management, High Discharge Drip water management, Micro Sprinkler and Surge Flow water management practices are very popular techniques of water management.

Gujarat government under development of water resources has prepared master plan for maximum utilisation and development of water resources.

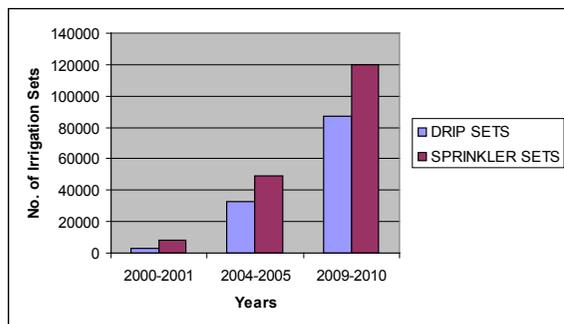
Government of Gujarat State has the mission to work with agricultural policy of Gujarat – Vision 2010 and to bring more green revolution because of which water and electricity can be saved and increase the agricultural productivity which ultimately resulting in to well being of the farmers of the Gujarat state.

In Gujarat considering all types of water resources i.e., surface water resources and ground water resources, the ultimate irrigation potential is 67.10 lakh hectare. Gujarat has also adopted and developed modern water management practices like drip, drop, sprinkler, etc. like other developed countries in the world. It is planned to provide modern practices of water management to 21 lakh hectare land area, which is around 30 percent of total area, due to which 30 percent water can be saved and additional 5.4 lakh hectare land will have irrigation facilities. Recently, per hectare Rs.40000/- expenditure cost is estimated to cover land under drip and sprinkler water management techniques.

TABLE .1
DISTRIBUTIONS OF IRRIGATION SETS BY CENTRAL GOVERNMENT TO THE STATE OF GUJARAT – 2000-2010

YEARS	DRIP SETS	SPRINKLER SETS
2000-2001	3000	8000
2004-2005	33016	48800
2009-2010	86920	120033

CHART. 1
DISTRIBUTION OF IRRIGATION SETS BY GOVERNMENT OF INDIA TO GUJARAT STATE – 2000-2010



In the State of Gujarat the modern water management practices like Sprinkler Irrigation, Drip Irrigation, High Discharge Drip irrigation, Micro Sprinkler and Surge Flow Irrigation are popular techniques of water management which are mentioned below:

1. SPRINKLER WATER MANAGEMENT PRACTICE:

With the help of sprinkler water management practice, the use of water can be minimise and pour the water to the crop like rain water. Sprinkler water management can save 30 to 50 percent water so as in limited supply of water can produce much crop. Upland soil can be pour with sprinkler water management and can reduce risk of decreasing fertility when making it flat-

ter which is irrigated by basin or furrow irrigation. The same practice can apply for sloppy and uneven soil.

Moreover with the help of sprinkler, flow of water can be controlled and can increase the efficiency in such a way that water can be pour according to type and age of plant. Even with the water, the use of chemical fertilizer, fungicides, and weedicides can be done according to its necessity. Because of this practice not only plant can be saved from too cold, but also the use of that land which is covered under flood or canal irrigation is possible. The structure of land can be maintained and the labour cost also reduces due to sprinkler method of irrigation.

2. DRIP WATER MANAGEMENT PRACTICE:

The drip irrigation can pour water in double area of land and can increase total production compare to some of the other traditional water management practices. The root area of plants gets constant moisture, results in to double the growth in productivity in per hectare production of land.

In drip irrigation for producing crop, the root are kept wet by giving drops of water which results into wet soil but because of not pouring more water, the plant gets necessary air. Flood and canal irrigation generally give adverse effect of collecting more water in root area of plant within earlier four days, which gives lessen the required air. While in case of drip irrigation the proportion of the water kept equal and constant, and that nurture regular nutrition to the soil.

The waste of water due to evaporation can minimise with the help of drip irrigation and due to save of 70 to 80 per cent of water, additional land get benefited from the saved water. Soil amortisation of rockslide land and sloppy land can reduce with both sprinkler and drip irrigation. Chemical fertilizer and pesticides remain around root area of plant by adding them in to drops of water pouring in to plants results in to quality and quantity production.

3. HIGH DISCHARGE DRIP WATER MANAGEMENT PRACTICE:

High discharge drip irrigation technique is adopted for the crop like onion, wheat, jeera and garlic which requires to be planted seed very near to each other. As in this type of water management there is high capacity of flow of dippers, bio or other impurities can not block the system. And moreover energy can also be saved as it requires less pressure for pouring the water to the land.

4. MICRO SPRINKLER WATER MANAGEMENT PRACTICE:

In drip water management practice soil pour with water by drop of water from the whole in pipes, due to that there is possibility of blockage, which can be eliminate in this micro sprinkler method of water management. The crops which are not having

much height to the land are poured by micro sprinkler techniques. Moreover, there is no need of more pressure and lateral in micro sprinkler techniques than other water management techniques.

The expenditure in drip irrigation is high due to the dripper in drip irrigation are kept in near distance on pipe which resulting less spread of water, such limitation can be avoided in sprinkler irrigation and can reduce the expenditure.

5. SURGE FLOW WATER MANAGEMENT PRACTICE:

Surge flow can be defined "Water pouring can be on off in the flood of canal from end point or start point of canal on regular bases with proper proportion". The time duration for pouring water by surge flow is dependent on many factors that are types of soil, structure of soil, height and depth of soil, and the crop. Therefore considering such factors local testing of land is needed for the use of surge flow.

The depth of irrigation can be controlled with the help of surge flow. As soil capacity for flow of water, length and depth of canal should be kept in mind, and thus depth of surge flow is decided.

Surge flow can reduce the vaporisation of bore water because of the surge upper level of land become sealed and strong.

Lastly one may conclude that the level of land can be maintained as the water are poured by the way of canal end or start. So that water can pour deeply in the land. The difference between time and place can be reduced as surge flow is helpful in deciding depth and length of irrigation.

MICRO WATER MANAGEMENT TECHNIQUES:

For implementing Micro Water Management techniques on equal level, one nodal officer is working from Gujarat Green Revolution Company Limited.

This agency is working for the awareness and inspiration for the micro irrigation on behalf of Government of Gujarat State and Government of India, which is having mission to work with Agricultural Policy of Gujarat - Vision 2010 and to bring more Green Revolution because of which water and electricity can be saved and increase the agricultural productivity, which resulting in to well being of the farmers of Gujarat.

Under Micro Water Management Scheme the farmers who are interested to take advantage of the scheme can have 50 per cent of subsidy or Rs.60000 cash, whichever is less. There is no restriction about the method of irrigation and area under irrigation.

ACHIEVEMENTS OF MICRO WATER MANAGEMENT PRACTICE:

The grants of Rs. 476.01 crore from Central Government and Rs. 647.09 crore from the State Government have been utilised during the period from May 2005 to December 2011, which has been utilised by 252495 farmers and benefited 408114 hectare land under Micro Water Management Scheme.

Moreover, if we examine in detail one may find that in the Banaskantha District 62599 hectare land had covered under Micro Water Management Scheme, then in Junagadh District and Sabarkantha District 47401 hectare and 44332 hectare respectively land covered under Micro Water Management Scheme.

**TABLE .2
CROP WISE AREA UNDER MICRO WATER MANAGEMENT SYSTEM - 2011-12**

SR. NO.	CROPS	AREA COVERED UNDER MICRO IRRIGATION SCHEME (In Hectares)
1.	GROUNDNUT	172000
2.	COTTON	115352
3.	SUGAR CANE	11801

SR. NO.	CROPS	AREA COVERED UNDER MICRO IRRIGATION SCHEME (In Hectares)
4.	AGRICULTURAL CROPS	332708
5.	HORTICULTURAL CROPS	75406
	A. POTATO	21568
	B. BANANA	12326
	C. MANGO	9673
	D. VEGETABLES	1469

Source: Socio Economic Review, Government of Gujarat Publications, 2012

The funds are allocated to Tribal farmers from tribal areas to get 25 per cent more benefit with compare to the farmers from open category eligible for 50 per cent subsidy. Under this scheme the total amount of Rs.74.45 crore has been utilised by the Tribal farmers till December 2011.

For the field crops micro water management system is the most beneficial method of water management. The summery of different crop wise area covered under the distribution of micro water management system are mentioned below.

KALPSAR PROJECT IN GUJARAT STATE:

Gujarat Government under development of water resources has prepared master plan for maximum utilisation and development of water resources.

During the monsoon most of the rivers are filled with water within 20 to 30 days and then after if water is not saved then it flow out to sea. In Gujarat the water of Mahisagar, Narmada and Sabaramati, stored in to gulf of Khambhat. For the reason to store water the dam has built up named Kadana on the river Mahi, Naramada dam on the river Naramada and Dharoi dam. But in monsoon these dams does not store water beyond their capacity and therefore the excess water flow away to sea. Therefore the water becomes scarce for industrial needs, irrigation and for drinking purposes. Thus, to protect this excess water from flow in to sea, Kalpsar Project having much importance.

SOME OF THE IMPORTANT ASPECTS AND OBJECTIVES OF KALPSAR PROJECT ARE MENTIONED BELOW:

1. The dam is to be built up between Hansot of Bharuch district and Ghogha of Bhavnagar district in the Gulf of Khambhat.
2. The length of Kalpsar Project dam will be 64.16 km.
3. The storage area of the dam will be 2070 Sq. km. and the water storage capacity will be 12,250 cubic meters.
4. For tidal electricity generation the area of tidal lake will be 872 Sq. km.
5. In the area covered under tidal lake the obstacle window is to be built up for specific (Chalti) Dam, Shipping, and for Power Station.
6. The water will be provided to the 10.54 lakh hectare sea shore area of South Saurashtra Region which is not covered under Sardar Sarovar Yojana.
7. The unfertile and saline 1.19 laks hectares land will be renewed.
8. Distance of 225 km. between Ghogha and Dahej Region will be minimised.
9. For this scheme Rs 10 crores has been sanctioned in year 2004-2005 from which Rs. 1.63 crore has been spent.

For the efficient use of modern water management practices Government of Gujarat suggested for the follow up process in two steps. In first step the committee is to be developed including Officer of Agriculture Department and Irrigation Department in association with Gujarat Agricultural University, which works for the monitoring whether the material used for the modern techniques and material to be purchased are having proper quality. In second step they have to motivate farmers to

use modern water management techniques apart of traditional water management techniques and planning to be done for providing subsidy for the development of modern techniques of water management.

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