

Title: Speed breaker on Salt March

Background and Objectives:

Gujarat is a coastal state, and as many as 14 out of 26 districts are affected by saline sea water. The natural boundaries of western and southern districts are very vulnerable to the flow of sea waters into arable land, particularly during high tide. As a result of this salinity of soil and ground water increases in the cultivable land making it unfit for growing crops.

Typically, salinity ingress in coastal areas is characterized by the mixing of sweet rain-fed underground water with horizontal saline water aquifers. In other words, it is the penetration of saline sea 2

water into underground water sources like wells, which makes the underground water saline. The primary reason for this phenomenon is the excessive extraction of groundwater, encouraged primarily by agricultural growth that causes intrusion of sea water into the water table.

The increase in salinity has led to reduction in arable area, agricultural yields and paucity of drinking water and is threatening the livelihood of people, putting the region at risk of economic marginalization and forced migration.

Checking salinity ingress has been one of the focused interventions taken up by Government of Gujarat. The agencies involved in this activity include Department of Agri, Horticulture & Forest and Department of Irrigation, Gujarat Agriculture University, University of Junagadh, Anand, Navsari, Central Soil Salinity Research Institute, Bharuch, Central Salt Marine Chemical Research Institute, Bhavanagar, Narmada & Water Resource Dept.

The project was initiated in 2007-08 and is being implemented by the Gujarat Land Development Corporation under RKVY from 2007-08 onwards with an overall outlay of Rs. 136.01 crores and a physical target treating 70795 ha.

Intervention:

Experiences in salinity mitigation show that combating salinity requires a multi-dimensional approach that includes building ingress prevention structures, increasing rain water recharge potential of the area by constructing recharge structures water harvesting and run-off diversion systems, rehabilitation of the highly saline waste land by re-vegetation through afforestation and non-conventional crops, capacity building of farming communities on efficient water management practices and adoption of low water-intensive crop farming, among other interventions.

All these measures would fulfill the ultimate objective of improving the socio-economic status of the people by checking migration and increasing their income. 3

The RKVY project entails three pronged corrective measures which are as follows-

- Erection of reclamation bund along the arable land to prevent saline sea water entering into arable land

- Promotion of recharging of ground water through various measures such as loose boulder structure, farm ponds, *nala* plugging for conservation of rainwater, earthen water harvesting systems, masonry check dams, percolation tanks, recharging of village tanks, wells and *sim talavs* etc

- Adoption of soil conservation measures such as field bunding with drainage, land leveling, soil texture amendments, green manuring, deep ploughing, afforestation, silvi pastures & over seeding of grass etc.

The action plan was prepared in consultation with villagers, Central Soil Salinity Research Institute and scientists of state universities.

In each district affected by salinity, micro plans were prepared to check salinity ingress, and to deal with recharge of water and soil salinity management at the village level. Village Sarpanchs and Panchayats played a key role in all such activities. Once all the plans were executed, further maintenance of ponds, recharge structures, check dams etc was the responsibility of village Panchayats.

The entire expenditure of Rs. 135.43 crore involved in the project in the state was met from RKVY. The period of implementation was 2007-8 to 2011-12.

The approved project was implemented at the coastal sites through the field staff of GLDC in accordance with the micro-plans and action plans of the sites selected. User groups were also formulated to check and supervise the activities and also to make the policy for distribution of stored rain water in ponds, tanks etc. and to maintain the water bodies created under the project. User groups also ensured transparency in all activities. 4 Execution of various activities like reclamation bunds, farm ponds, land leveling, percolation tanks, *sim talavs* and desilting of village ponds was carried out by both manual labourers and by machinery.

Outcome:

Due to construction of long reclamation bunds along the sea, the entry of saline water into agricultural land has stopped. The quality of saline sub-soil water has improved and its PH and EC

has become normal due to percolation and recharge of sweet water from farm ponds, percolation tanks, and other storage structures.

Large areas of fallow land have become cultivable in Kharif season due to soil and water conservation measures like field bunding, land leveling and land shaping. Kharif crop failure due to long dry spells in the monsoon season has been controlled, soil fertility and productivity have improved, and the effects of flood and drought hazard mitigated.

Additional area of 8580 ha has come under cultivation in the Rabi season, due to creation of supplementary irrigation facilities through WHS, percolation tanks, farm ponds etc. In addition, drinking water facilities for the human population and cattle have also been created. Cropping intensity has increased by approximately 1.5 times. Yield under various crops has also shown increase after treatment, e.g. cotton production has increased from 8 qtl/ha to 12 qtl/ha, paddy from 38.20 to 58 qtl/ha, wheat from 8 qtl/ha to 10 qtl/ha, castor from 15 to 20 qtl/ha and fennel from 8 to 12 qtl/ha 5

Land reclamation, soil fertility conservation, ground water quality improvement and rain water conservation for enhancement of crop production are the parameters for success of the project. In Gujarat, 69771 ha of land has been reclaimed making it cultivable through the project till November 2011. Total number of farmers who have benefitted from this intervention is 20479.

In south Gujarat, the problem of salinity ingress is more severe than in other parts of state. The project work was verified in two districts, viz, Navsari and Valsad where the project was allotted in 2009-10. The areas covered in the two districts were 3478.00 ha and 5311.52 ha, respectively, making a total of 8789.52 ha. In these 2 districts 23.22 kms of reclamation bunds were constructed leading to 782 ha of fallow land becoming cultivable in the kharif season and 163 ha in the rabi season.

The number of beneficiaries of villages Malvan, Untadi, Chharvada and Khatalvada in Valsad and Dandi & Sultanpur in Navsari districts are 5642 and 405 (total 6047) and their land reclaimed is 4580.71 ha and 529.95 ha (total 5110.16 Ha) respectively.

As a result of implementation of the project, quality of soil in the project areas also improved as revealed from following data pertaining to specific farmers in the mentioned areas- 6

Survey: Area and Before Project Period	After Project				
Sampling Month	Name of Farmer	Village	PH	EC	PH&EC
Jan-10	Mulijibhai Mangal Kapil	Khatalvada	8.33	19.30	Normal
Jan-10	Dhanji Gopibhai	Khatalvada	8.16	18.73	Normal
Jan-10	Yogesh Mahdev Desai	Sultanpur	8.21	14.21	Normal
July-09	Rabiben Dayabhai	Dandi	7.86	13.03	Normal
July-09	Jeevanbhai Somahbhai	Dandi	7.74	11.82	Normal
July-09	Ramji bhama	Dandi	7.76	---	Normal

Photo:



