

WATER AND NUTRIENT MANAGEMENT IN COCONUT

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WATER HARVESTING CUM GRAVITY-BASED DRIP IRRIGATION AND NUTRIENT MANAGEMENT INTERVENTIONS TO IMPROVE COCONUT PRODUCTION AND INCOME OF TRIBAL FARMERS OF GOA

Authors: Dr. Sujeet Desai, Scientist (LWME)
Dr. Gopal Ramdas Mahajan, Scientist (Soil Science)

PROBLEMS/CONSTRAINTS

The state of Goa receives an average annual rainfall up to 3000 mm, but the utility of the rain water is very limited. About 80% of the soils in Goa are lateritic with gravelly texture and poor water holding capacity. The soils of the regions are acidic in soil reaction & possess multi-nutrient deficiency and farmers are accustomed to apply suboptimal fertilizer nutrient. The limitations of undulating terrain, multi-nutrient deficiency and poor soil water holding capacity poses a serious challenge to the crop production especially during post-monsoon months. As such, practically after the monsoon season there is no moisture available in the soil. These factors have led to the poor productivity of coconut in the state of Goa.

INTERVENTIONS

Interventions on the water harvesting cum drip irrigation and nutrient management were implemented through farmers participatory approach to a group of 30 farmers at Bhupar village in South Goa practicing coconut farming (500 plants) over a 2.45 ha area. A water harvesting pond was established wherein rain water during monsoon and the water of the perennial springs during post-monsoon season was harvested. The harvested water was regularly utilized to irrigate the 500 number of coconut plants through gravity-based drip irrigation and fertigation system. The pond could harvest 4 lakh litres rain water. The natural slope of the land was utilized by connecting the gravity-based drip irrigation system with the pond for irrigating the coconut trees which saved 100% energy on the electricity consumption and reduced the cost of production. The irrigation application efficiency was 85% which caused water saving which would otherwise be wasted by flood irrigation. At the same time, nutrient management interventions included soil-test based application of organic and inorganic fertilizers through drip fertigation and soil application.



Farmers participatory water harvesting



Fertilizer application in Coconut

IMPACT

The coconut yield and net income of farmers was 7143 nuts/ha and Rs. 1.21 lakh/ha, respectively before the interventions, which increased to 17755 nuts/ha and Rs. 3.49 lakh/ha with a benefit to cost ratio of 4.48. These interventions have resulted in increase in the coconut yield by 149% and net income by 184% over the farmers practice i.e., before interventions. The interventions have increased the yield and income of the group of farmers from 17500 nuts/year to 43500 nuts/year (2.5 times higher) and Rs. 2.97 lakhs to 8.45 lakhs (2.8 times higher). Round the year availability of the water harvested would be sufficient to irrigate 4000 coconut trees (19.6 ha area) through the gravity-based drip irrigation. This is further helping for crop diversification and enhancing the income and livelihood of tribal farmers.



Rain water harvesting pond



Coconut harvest after intervention



Gravity based drip irrigation system