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Sources and methods of irrigation among NAIP farmers in Udaipur District of Rajasthan

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Abstract

The present study was conducted in tribal dominated district of southern Rajasthan. Total 28 villages were selected from 10 clusters of Udaipur, Dungarpur, Banswara and Sirohi districts of the state. For the selection of respondents total 288 beneficiary farmers were selected randomly. The results of the study revealed that the flood irrigation method is required to be discouraged among the farmers and three scientific methods viz; drip irrigation, sprinkler irrigation system and PVC pipeline must be popularized as far as possible in the study area.

Keywords: irrigation, NAIP farmers, sprinkler irrigation system

Introduction

The Indian council of Agricultural Research launched a new initiative named as “National Agricultural Innovation Project (NAIP)” with financial assistance from the World Bank. The overall objective of NAIP is to facilitate an accelerated and sustainable transformation of Indian agriculture, so that it can support poverty alleviation and income generation through collaboration, development and application of agricultural innovations by the public organizations, in partnership with the farmers, the private sectors and other stakeholders.

Attaining livelihood and nutritional security, improved quality of life and sustainability of agriculture is an important goal for the governments. The productivity and profitability of the tribal regions in the country has not improved. It was worth mentioning that four districts of Rajasthan *viz.* Udaipur, Banswara, Dungarpur and Sirohi figure prominently as the disadvantaged districts identified by the planning commission based on income, tribal population, their resources and state of agriculture, etc. Food self sufficiency still eludes the major segment of the population in this region. This has led to growing disparity in the standard of living and social inequity. The agriculture in this region is the main stay of the people, yet it is at a subsistence level because of low productivity and income.

In the consortia project of NAIP under MPUAT, Udaipur, has implemented two models. (i) Horticulture based IFS and (ii) livestock based IFS model with judicious mix of proven need assessed technologies, appropriate for small and marginal farmers encompassing end to end approach were planned for development of appropriate replicable models. The public private partnership in a consortia mode was expected to accelerate the pace of sustainable development and increasing productivity. Cluster approach in a specific sites differing in natural resource base in four identified district was chosen. Appropriate, sound and effective baskets of technologies aimed at propelling agricultural transformation leading to increase in farm employment, increased productivity and profitability. Better management of natural resources, processing and value addition and federating farmers for marketing of their produce were the another strategies for research. The strategies developed drawn heavily on the past proven technologies, testing them in integrated and holistic manner and having multiple technology options for increased income leading to better quality of life to families in the clusters identified for creating sustainability fund through farmers’ contribution, which will take care of post project sustainability.

Looking to the importance of models implemented under NAIP, the present study was undertaken to find out the impact of technologies adopted by the farmers in the study area.

Resources and Methods

The present study was undertaken the project implemented by MPUAT, in Udaipur, Dungarpur, Banswara and Sirohi district of Rajasthan. District and clusters were selected purposely due to working area in the state. From the selected clusters, 10 clusters, where NAIP was implemented. From the selected villages, there were 78 villages, in which the NAIP was executed, out of these, 28 were the sampled villages for conducting the Mid-term evaluation.

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Therefore, purposively, these 28 villages were considered as selected for the present study. A sample 130200 Beneficiaries were covered under NAIP in 78 villages of 10 clusters. But sampled respondents for mid-term evolution of consortia NAIP were as many as 66 each from 10 clusters (total 660). The sampled respondents did vary from village to village so selected for evolution of the consortia project. Out of these 660 total sampled respondents of consortia project, total 288 beneficiaries were sampled for the present investigation. Thereafter, collected data were analyzed, tabulated and interpreted in the light of above objective. The SPSS 13.0 version software was used for statistical analysis of data.

Groupism of farmers based on their sources of irrigation

The results about sources of irrigation given in Table-1, reveal that Tube-wells were the prime source as said by 107 (47.14 per cent), 49 (47.14 per cent), 63(48.46 per cent) and 37 (44.05 per cent) farmers of Udaipur, Sirohi, Dungarpur and Banswara respectively.

Table 1: Groupism of farmers based on their sources of irrigation

District	Dug well f	Tube well f	Canal f	Jal kund f	Total f
Udaipur	12(5.29) 50.00*	107(47.14) 41.80*	102(44.93) 41.30*	6(2.64) 33.33*	227(100.00) 41.65*
Sirohi	5(4.81) 20.83*	49(47.12) 19.14*	45(43.27) 18.22*	5(4.81) 27.78*	104(100.00) 19.08*
Dungarpur	4(3.08) 16.67*	63(48.46) 24.61*	60(46.15) 24.29*	3(2.31) 16.67*	130(100.00) 23.85*
Banswara	3(3.57) 12.50*	37(44.05) 14.45*	40(47.62) 16.19*	4(4.76) 22.22*	84(100.00) 15.41*
Total	24(4.40) 100.00*	256(46.97) 100.00*	247(45.32) 100.00*	18(3.30) 100.00*	545(100.00) 100.00*

f= frequency, % = Percentage, n= Total number of respondents, *= Percentage to columns, Figures in the parentheses show percentage of rows

Along with the tube-wells, canals were also important source of irrigation in all the four districts similar to tube-wells. It is noteworthy that majority of Dungarpur farmers exploited tube-wells followed by canals as sources of irrigation. Dug wells and Jalkunds were least used by the beneficiaries for irrigation purposes.

The findings are in contradiction with the findings of those of Shish Ram (1996) [2]. On the bases of findings, it is concluded that during the execution of NAIP, the concept of water budgeting and water harvesting had not been addressed. No attention was paid on the disadvantaged beneficiaries of NAIP. The underground water is heavily being exploited by the farmers and this richest source is being depleted. Again, canals as source of irrigation in the area is also serious problems clubbed with unnecessary wastage of precious water.

Recommendations on the basis of findings are made that traditional sources of irrigation viz. dug well and jalkunds along with other such methods must be popularized and farmers are to be persuaded for using them.

Categorization of NAIP farmers on the basis of irrigation methods

Methods of irrigation used in farming were one of them important parameters under personal profile of NAIP beneficiaries. Respondents were categorized in accordance

with four methods of irrigation and data are presented in terms frequency and per cent in Table 2.

Table 2: Categorization of NAIP farmers on the basis of irrigation methods

Districts	Drip f	Sprinkler f	Flood f	PVC f	Total f
Udaipur	56(21.71) 45.16*	12(4.65) 27.91*	90(34.88) 39.30*	100(38.76) 40.65*	258(100.00) 40.19*
Sirohi	25(19.38) 20.16*	9(6.98) 20.93*	45(34.88) 19.65*	50(38.76) 20.33*	129(100.00) 20.09*
Dungarpur	27(17.76) 21.77*	12(7.89) 27.91*	53(34.87) 23.14*	60(39.47) 24.39*	152(100.00) 23.68*
Banswara	16(15.53) 12.90*	10(9.71) 23.26*	41(39.81) 17.90*	36(34.95) 14.63*	103(100.00) 16.04*
Total	124(19.31) 100.00*	43(6.70) 100.00*	229(35.67) 100.00*	246(38.32) 100.00*	642(100.00) 100.00*

f= frequency, % = Percentage, n= Total number of respondents, *= Percentage to columns, Figures in the parentheses show percentage of rows

It is obvious from the table that as many as 246 (38.32 per cent) farmers used PVC pipeline as a method of irrigation. It was most popular among 100(38.76 per cent) beneficiaries followed by few farmers 36(34.95 per cent). Flood irrigation was equally popular in four districts as it was observed in the field with 229 (35.67 per cent) of farmers. Drip irrigation and sprinkler irrigation methods were used by total 19.31 per cent and 6.70 per cent of the farmers respectively.

The findings are in conformity with the results of Khjuaria (2000) and contradictory with the findings of Wichelns *et al.* (1996) [5]. Conclusion is drawn that the irrigation through PVC pipelines is becoming popular especially due to NAIP. Flood irrigation method is most prevalent in the study area. Drip and sprinkler methods of irrigation could not do well during the execution of NAIP.

In line with the findings, it is hence inferred that NAIP during its execution could not exert very encouraging impact towards empowerment of irrigation methods in the tribal area. It is recommended that the flood irrigation method is required to be discouraged among the farmers and three scientific methods viz; drip irrigation, sprinkler irrigation system and PVC pipeline must be popularized as far as possible.

Categorization of NAIP farmers according to area (ha) covered under irrigation up to 2011 through PVC pipeline

One of the interventions for saving water by the farmers was irrigation through pipeline. The data about area covered under irrigation up to 2011 through PVC pipelines by the farmers was recorded and the beneficiaries of NAIP were categorized into 3 groups.

It is observed from Table 3 that as many as 86 (74.78 per cent), 45 (66.18 per cent), 40 (80.00 per cent) and 38 (69.09 per cent) farmers of Udaipur, Dungarpur, Banswara and Sirohi respectively fell under marginal land holdings, and they utilized pipelines to irrigate their crops. Table also revealed that there were almost similar number of farmers observed under small farmers category (1-2 ha) who utilized pipelines for irrigation purpose up to 2011 which was the period up to which NAIP was executed in the study area. Farmers under big farming were very few and those who were there in this category in all the four districts, they too preferred pipelines for irrigation.

Table 3: Categorization of NAIP farmers according to area (ha) covered under irrigation up to 2011 through PVC pipeline
n=288

District	Area (ha)			Total f
	<1 f	1-2 f	>2 f	
Udaipur	86(74.78) 41.15*	24(20.87) 36.36*	5(4.35) 38.46*	115(100.00) 39.93*
Sirohi	38(69.09) 18.18*	14(25.45) 21.21*	3(5.45) 23.08*	55(100.00) 19.10*
Dungarpur	45(66.18) 21.53*	21(30.88) 31.82*	2(2.94) 15.38*	68(100.00) 23.61*
Banswara	40(80.00) 19.14*	7(14.00) 10.61*	3(6.00) 23.08*	50(100.00) 17.36*
Total	209(72.57) 100.00*	66(22.92) 100.00*	13(4.51) 100.00*	288(100.00) 100.00*

f= frequency, % = Percentage, n= Total number of respondents, *= Percentage to columns, Figures in the parentheses show percentage of rows

The results depicted encouraging results with regards to use of pipelines for irrigation purpose to save the most precious resource (water) for irrigation. The findings are in line with Khajuria (2000) [6], Deshmukh and Sen (2000) [7] and Wichelns *et al.* (1996) [5] respectively in favour of use of sprinkler, drip and latest improved irrigation methods.

Concluded that PVC pipelines got momentum during the execution of NAIP in the study area Therefore, recommended that the PVC pipelines must be given priority for irrigating the crops and all types of farmers should be encouraged and persuaded for adoption of pipelines. It is also recommended that under prestigious projects like NAIP, the interventions of use of pipelines for irrigation must be kept as one of the important interventions.

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