

Technology integration for doubling farm income

through participatory research and extension approaches
in Jodhpur district of Rajasthan

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Location and selection of area

Three villages, viz. Balarwa, Binjwaria and Manai from two tehsil of Tinwari and Mandor, Jodhpur district, were selected under the FFP, ICAR-AU. Major cropping system included Pearl millet based, Green gram based, vegetables based, seed spices based and cotton wheat based.

Number of farm families: A total of 1,000 farm families including marginal (260), small (320), large (220), and landless labours farmers (200) have participated in the project.

INTERVENTIONS

Horticulture based module

Introduction of Pusa Rudhira variety of carrot

Rationale of the intervention

Pusa Rudhira is a carrot variety released from IARI, New Delhi. Results of the trials conducted at ARS Mandor Jodhpur indicated that it was found highly suitable for Jodhpur region and therefore, it was recommended for the area by the researcher of AU, Jodhpur.

Outcome/Economic impact: Pusa Rudhira carrot variety was introduced at 37 farmers' fields during 2 seasons (2017-18 and 2018-19) revealed additional returns of ₹ 39,720/ha over local carrot (Table 1). Due to bright red colour and good finish, it was appreciated by the farmers. Farmers have started seed production of this variety at



Dr V.P. Chahal ADG (Agril. Extn.) and Dr Rajbir Singh Director ATARI, Ludhiana Visiting the commercial production of carrot at the field of Sh. Sawai Singh during Rabi 2018-19.

their fields.

Social Impact: Sh. Sawai Singh of Village Manai is producing carrot seeds at his own field by adopting rouging and maintaining required isolation distance. He is doing this activity under the guidance of the Horticulturist of AU, Jodhpur. As a result of this practice, this carrot variety Pusa Rudhira has a horizontal spread and more than 500 farmers are growing this locally available

cultivar at present in area.

NRM based module

Grafted khejri (Prosopis cineraria) Thar Shobha plantation at borders of farmer's field

Rationale of the intervention:

This tree is native to the arid areas and it is grafted and thorn less. The fruit yield from Thar shobha is quit high over local plants and the fruit/

Table 1. Yield and benefits from horticultural crop varieties introduced in the FFP villages during 2017–18 and 2018–19

Crop	No	Yield (q/ha)		Benefits (₹/ha)	
		Before FFP	After FFP	Before FFP	After FFP
Carrot (<i>Pusa Rudhira</i>)	37	160	200	75,500	1,15,250

pod is one of the five ingredients used for making curry locally known as Panchcuta. Dry leaves of the plant are also used as a fodder for goats and sheep. The plants were procured from CIAH, Bikaner. Ten plants per farmer were given to 25 farmers for raising them at their fields during 2018–19.

Outcome/Economic impact: Additional benefit of ₹ 2,500 per 10 plants was achieved by farmers through extra pod and dry leaves yield over local plants.

Social impact: Thar Shobha grafted khejri is thorn less and dwarf in nature and therefore harvesting of leaves and pods is easy. Plant grows very well under dry condition and therefore Thar Shobha is very popular amongst farmer as a part of integrated farming system. Farmers are planting these trees at their own level as these trees are available in the nursery of CAZRI and Agriculture University, Jodhpur.

Livestock based module

Introduction of poultry system for landless agricultural labourer and marginal farmers.

Rationale of the intervention: Pratapdhan is a dual purpose breed of poultry released from MPUAT, Udaipur, well known for backyard poultry production in rural and tribal areas. This breed produces average 160 eggs per year, having higher growth rate, coloured feathers and

Table 2. Benefits of pratapdhan breed over local poultry birds

Poultry breed Pratapdhan for back yard poultry (50 Units)	Performance (Av. eggs/year/bird)		Benefits (₹/bird /year)		B:C Ratio	
	Deshi	Pratapdhan	Deshi	Pratapdhan	Deshi	Pratapdhan
	63	125	280	850	1.80	3.13

Table 3. Yield and economics of Napier hybrid Co-4 and Fodder Sorghum

Yield (q/ha)		Benefits (₹/ha)	
Fodder Sorghum	Napier grass	Fodder Sorghum	Napier grass
415 q/year/ha	650 q/year/ha	59,000	1,12,000

brown shelled eggs which are highly preferred in rural areas over white colour birds and eggs. It was introduced at 50 landless agricultural labourer and marginal farmer's families residing in the three adopted Villages during 2018–19 and 2019–20. This intervention was demanded by landless labourer and others for establishing small poultry units (locally called as darba: one darba means 18–20 birds) as they have open land in their vicinity and there is good scope of front yard poultry.

Outcome/Economic impact: The Pratapdhan breed gave 125 eggs per year whereas deshi provided average 63 eggs only. Therefore, Pratapdhan provided benefit of ₹ 850 per bird per year as against ₹ 280 per bird per year from deshi hen (Table 2). The Pratapdhan breed was found highly adaptive in the prevailing Agro-climating condition of FFP villages.

Social impact: Due to fast growth and high adaptability of the bird, there is high demand of these birds in FFP villages and in nearby vicinity.

Farmers have reported that they have sold the cocks at ₹ 750–800 per cock during winter. People have started brooding and selling chicks of Pratapdhan breed in the area. More than 60 poultry units exist in the villages as there rearing cost is low and adaptability is high.

Introduction of Napier grass as green fodder

Rationale of the intervention: Co-4 Napier grass is a hybrid grass introduced for fodder purpose in adopted villages. This has crude protein content ranging from 8–11%. It is a perennial grass which increases milk yield in cattles. It was planted at 20 farmer's field in 0.1 ha area during 2018–19 and 2019–20 (10 sites/year).

Outcome/Economic impact: Napier produced green fodder of 650 q/year/ha and provided benefit of ₹ 1,12,000/ha (Table 3).

Social impact: Napier grass was introduced at 20 farmers' field. Now it is spreading in all the three FFP

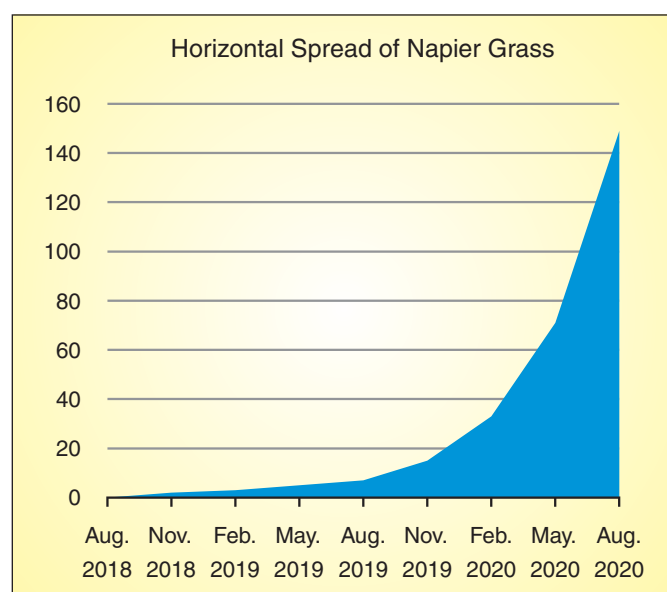


Table 4. Overall income of farmer (₹/year/family)

Category of Farmer	Before FFP	After FFP
Landless Labours	1,20,000-1,30,000	1,50,000-1,60,000
Marginal Farmers	1,80,000-2,00,000	2,40,000-2,70,000
Small Farmers	2,50,000-2,75,000	3,10,000-3,50,000
Large Farmers	5,00,000-6,00,000	6,50,000-8,00,000

Villages and surroundings. At present about 150 farmers have setup napier grass at their farm houses by taking suckers from their neighbors. It has been proven a successful intervention of FFP.

TRAINING

Under FFP project a total no of 56 trainings and demonstrations were conducted during 2017-18 (21, 1482); 2018-19 (18, 1246); and 2019-20 (17; 550) respectively.

IMPACT

- Overall income enhancement of farmers of different categories and overall in the village bench mark is presented in Table 4.
- New varieties of crop recommended by the Agriculture Research Station, Mandor were introduced at FFP sites. MPMH-17 of pearl millets, GaM-5 of green gram, Girnar of mustard, Pusa Rudhira of carrot, ACr-1 of coriander, RAJ-4083 of wheat were introduced. This intervention

resulted in increase in seed/product yield by 18-23%.

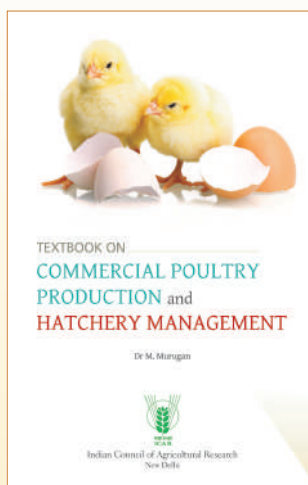
- High Walk in Tunnel for drying of mint, rose petals and chilli was found successful as this intervention provided quality drying and protection from aberrant weather.
- Growing vegetables through low pressure drip irrigation system was also found very effective in saving water and clean cultivation of vegetables crop.
- Rearing chilli, cabbage and other vegetables saplings in 40 mesh plastic net provided virus free seedling resulting better establishment of crop, high yield and more income.
- Demonstration of potash application in onion, phosphorus application in carrot resulted in high yield by 15-22% resulting in more profit.
- Twenty five improved bucks of Sirohi breed were introduced for breed improvement. Similarly, 50 units of Poultry: Pratapdhan were also introduced for earning

additional income. Both these interventions became popular amongst the farmers.

- Tree saplings of Lasoda (*Cordia myxa*), Drum stick, Aliganj Ber and grafted khejri: Thar Shobha were planted at borders of field at FFP sites for getting additional income from the existing system. The produce is sold to market/ pharmaceutical companies.
- Increase in area under chilli based farming system- Due to adoption in IPM in chilli
- Inclusion of Napier in fodder based farming system in place of fodder sorghum.
- Cucumber cultivation in protected/ shade net farming (6 polyhouse have been established in FFP Villages).
- Many units of backyard poultry in FFP Villages and dominance of Sirohi breed goat in the local herds can be seen.
- Due to improvement in the knowledge and behavioural attitude through scientific interaction, farmers have started IPM in different crops, utilization of farm waste by making organic manure and adopted IFS modules for better farm income.

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TECHNICAL SPECIFICATIONS

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