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Public-Private Partnership Model to Strengthen IARI Technologies Assessment and Transfer in NWHR: Reaching the Unreached

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Agriculture, being mainstay of Indian economy and support system of rural development should be strengthened, if we forecast paradigm shift in the approach and its development. With the advent technological backstopping, Indian agriculture has seen a paradigm shift in technology development and dissemination. There is now basket of technologies available to combat malnutrition, poverty issues and for upliftment of farmers with higher productivity, profitability and income enhancement. The major challenge faced by Hill agriculture is constantly reducing land size thus pushing farmers towards impoverishment with lesser income from the farming. Farmers of hills face the constraints of difficult accessibility, small and fragmented land holdings, poor and shallow soils, erratic rainfall, damage caused by the wild animals, inadequate market infrastructure, meager input availability and poor dissemination of the knowledge, that's why agriculture in hills has been a challengeable task (Joshi P. *et al.,* 2014). Improved agricultural practices are the products of modern science and technology. Development of new technology is generally not the major problem now days as India is capable of providing techniques suitable for the local condition. The main problem that exists today is dissemination of these techniques among the farmers. Adoption of location specific modern technology could increase the productivity of wheat. Several on-farm trials/demonstrations had been conducted under VOs programme to popularize the modern paddy and wheat technologies in the farmer's fields in different locations. These on farm trials/demonstrations showed that the yield performance of paddy and wheat is quite high as compared to the farmer's yield. In general, yield of local variety was less mainly due to their non-practice of the full-recommended technological packages. Farmers usually adopted modern wheat technology at varying degree based on their infra structural facilities and socio-economic conditions that ultimately resulted variations in yields.

It has been realized that there is an urgent need to increase the income from farming in order to attract and retain the farmers in agriculture. The contribution of public extension in attaining self reliance in food production is very well recognized. But in this changing time, public extension alone is not sufficient to address multi-faceted problems faced by farmers (Chandra Shekara P., 2001). The function of agricultural extension system is to disseminate technology, knowledge and advice to farmers. But certain obstacles like ever-growing population, low manpower, inadequate budget for extension activities, administrative rigidity and old policies have rendered the agricultural extension system stagnant (Anirban Mukherjee and Aniruddha Maity, 2015). In wake of these challenges, IARI implemented collaborative extension programme for assessing and out scaling potential agricultural technologies among the large farming community across the country in partnership with ICAR Institutes, SAUs and VOs. The present study was undertaken with the collaborative approach of Centre for agricultural technology assessment and transfer, IARI collaborating with Himalayan Environmental Studies and Conservation Organization (HESCO), Dehradun, Uttarakhand since 2010-11. This partnership project has been implemented with the objective to upscale of IARI technologies and reach out to the thousands of the farmers. An effort has been made through the present study to assess the efficacy of this model in terms of increasing farm productivity and profitability of the farmers. IARI technologies were assessed and disseminated with this convergence model and data from 2014 to 2018 were analyzed.

METHODOLOGY

Rabi and Kharif crop technologies were assessed every year from 2014. From rabi 2014-15 to 2017-18,and Kharif 15 to Kharif crop demonstrations were laid on improved varieties of different crops on the selected farmers' fields of adopted villages of HESCO Dehradoon (Taluk/ Tehsil Johnpur, Sahaspur and Raipur) in the districts of Dehradun and Tehri Garhwal of Uttarakhand. The local unit of land measurement in hills of Uttatakhand is Nali (1 Nali =200 meter square; 50 Nali= 1 hectare). IARI provided the seeds at the far flung areas of hill economy through VOs networking and technical help to the farmers was

provided through scientific monitoring by IARI and HESCO . Need based training and Packages and practices were also provided along with crop technologies.

RESULTS AND DISCUSSION

The indicators for technology adoption were examined in many seasons by tracing the reaction of farmers who are participating in the on-farm trials to the improved technology. The participant's farmers include farmers that hosted on demonstrations of the technology under consideration. The impact of the collaborative programme with reference to yield performance and economic impact of technology demonstrated with Voluntary Organisation HESCO is given in table.1

Table 1: Crop performance in Kharif and Rabi Season from year 2014 to 2018

Crop	Variety	Area (ha.)	No. of Demo.	Ave. Yield of the crop in q/ha.		Increase in yield %	Av. Net Return (Rs./ha)	BC Ratio
				Demo.	local			
Year Kharif 2015								
Paddy	PB-1	0.38	7	43.44	36.28	19.73	49364	2.59
	P-1509	0.51	12	46.84		29.10	45444	2.54
Year Kharif 2016								
Paddy	P-1121	3.84	11	41.85	42.16	-0.73	63600	2.21
	P-1509	3.84	16	50.25		19.18	64200	2.22
Year Kharif 2017								
Paddy	P-1460	0.60	8	42.42	36.15	17.34	52340	2.6
Arhar	P-991	0.10	8	14.35	10.35	38.64	43900	3.37
	P-992	0.10	10	14.35	10.35	38.64	43900	3.37
Bhindi	A 4	0.01	2	100.27	80.30	24.86	144540	3.58
Year Kharif 18								
Paddy	PB-1	0.30	8	51.00	40.0	27.5	108800	3.2
	PB-1121	1.20	8	44.50	40.0	11.25	114600	3.53
	PB-1637	0.40	10	52.6	40.0	31.5	129800	4.56
	PB-1609	0.10	2	48.76	40.0	21.9	94520	3.15
Total		11.38ha or 569 nali	102	-	-	-	-	-
Year Rabi 14-15								
Wheat	HD 2967	1.50	9	48.30	30.2	59.93	66170	3.59
	HD 3059	0.16	2	45.10	29.5	52.88	60090	3.35
Year Rabi 15-16								
Wheat	HD 2967	2.17	12	50.6	36.2	39.77	83000	5.56
	HD 3059	3.62	20	51.6	36.2	42.54	85000	5.67
	HD 3086	4.59	15	47.6	36.2	31.49	77000	5.23
Year Rabi 16-17								
Wheat	HD-3059	1.83	10	46.5	35.2	32.10	47626	2.56
	HD-3086	2.38	16	53.08	35.2	50.79	55525	2.82
	HD 2967	2.38	25	42.23	35.2	19.97	67698	3.21
Year Rabi 17-18								
	HD 2967	8.0	32	57.86	45.0	28.57	81064	2.96
	HD-3086	4.0	18	56.00	45.0	24.44	78600	2.94
	HD-3059	2.0	10	47.30	45.0	5.11	64653	2.64
Total		29.01 ha or 1450.5 nali	169	-	-	-	-	-

It can be envisaged from table 1 that during kharif 15, a total of 19 demonstrations of Paddy variety PB-1 and P-1509 were laid in 0.89 ha (44.5 nali) area. Paddy variety P1509 yielded 29.10 percent higher than local check with economic gain of Rs. 45444/- in the year 2015. During Kharif 2016, 2017, and 2018 a total of 83 demonstrations on Paddy varieties P-1121, P-1609, PB-1, P-1509, P-1460 and Pigeon pea varieties P-991 and P-992, and Okra A4 were laid in 10.49 ha (524.5 nali) area. All the paddy varieties preferred by farmers over local check due to good economic return, good grain quality in terms of maturity, cooking quality, good aroma and weight.

During Rabi 14-15, 15-16, 16-17 and 17-18 total of 169 wheat demonstrations (HD 2967, HD 3086 and HD 3059) were laid in 29.01 ha area. The yield performance of HD 2967 was good in respect of growth, profuse tillering, and good grain quality. Farmers preferred HD 3086 for high yield, good market price and good chapatti making quality. Although, HD 3059 is suitable

under late sown conditions. This variety also performed well under timely sown conditions and farmers prefer the variety due to high yield and resistant to yellow rust disease. In one study, technological package was proved to be superior to the traditional farmer's practices as reflected in high productivity and high marginal rate of return as argued by Elsir, (2004).

Spread and impact assessment of Paddy variety P 1121 was analyzed from Kharif 2016. Pusa Basmati 1121 (PB 1121) is a landmark Basmati rice variety having Basmati quality traits introgressed from traditional Basmati varieties. It was released for commercial cultivation in 2003.

Table 2: Spread of Pusa Basmati -1121 in collaboration with HESCO

	Kharif 16	**Kharif 17 (area)**	**Kharif 18**	**Kharif 19**
	0.38 ha (43.44 q/ha)	@10 % 11.00 ha	@2 % 63.75 ha	-
			1.2 ha (42.00 q/ha)	@10 % 33.6 ha
Total (area, ha)	0.38	11.00	64.95	33.6
Cumulative Growth (area)	-	11.38	76.33	109.93
Total area covered 109.93 ha Area diffusion effect = 4.63 times				

PB 1121 is a semi-dwarf rice variety with a plant height ranging from 110 to 120 cm. PB 1121 has a yield potential of up to 5.5 tons per hectare. It can produce 18–20 tillers per plant at a spacing of 20 cm × 15 cm and around 350–400 panicles per m^2 (Vijaipal Singh *et al*, 2018). In collaboration with HESCO, Dehradun seed for paddy variety 1121 were supplied for 0.38 ha area in the year Kharif 2016. Afterwards, in Kharif 18, demonstrations of paddy P-1121 were laid in 1.2 ha area (table 2). Some amount of seed (@10 percent in first year and @2 percent) were retained from total produce for farmer to farmer diffusion spreading the cumulative growth of 109.93 ha area from 0.38 ha. The area diffusion effect for variety P-1121 was 4.63 times with the collaborative programme in HESCO location.

Table 3: Spread of PB-1509 in collaboration with HESCO

	Kharif 15	**Kharif 16 (area)**	**Kharif 17**	**Kharif 18**
	0.51 ha (46.84 q/ha)	@8 % 12.74 ha	@2 % 79.56 ha	
		3.84 ha	@4% 51.45 ha	@2 % 344.75 ha
Total (area, ha)	0.51	16.58	131.01	344.75
Cumulative Growth (area)		17.09	148.1	492.85
Total area covered 492.85 ha Area diffusion effect = 7.55 times				

For the analysis of spread of P-1509 in Kharif 15 and 16, total 65.25 quintal seed was supplied which was spread in 492.85 ha area with area diffusion effect of 7.55 times (table 3).The intensity of adoption represents the quantity of the modern inputs that applied by farmers in specific locality (Shideed, 2004).

An important factor in restricting the horizontal expansion of agricultural technology, especially of field crops is the non-availability of seed. Therefore, under a IARI-VOs systematic programme, HESCO, Dehradun have conducted the farm trials on farmers field of improved wheat technologies developed by ICAR-IARI viz. HD 2967, HD-3086 and HD 3059. Along with Paddy varieties, demonstrations of wheat varieties HD-2967, HD-3086 and HD-3059 were also conducted over a period of time with Voluntary Organization HESCO in and it was found from data that wheat variety HD 2967 were spread in 350.95 ha area (cumulative growth of four consecutive years from Rabi 15-16), However variety HD 3086 and HD 3059 were spread over 150.86 and 92.54 ha area, respectively.

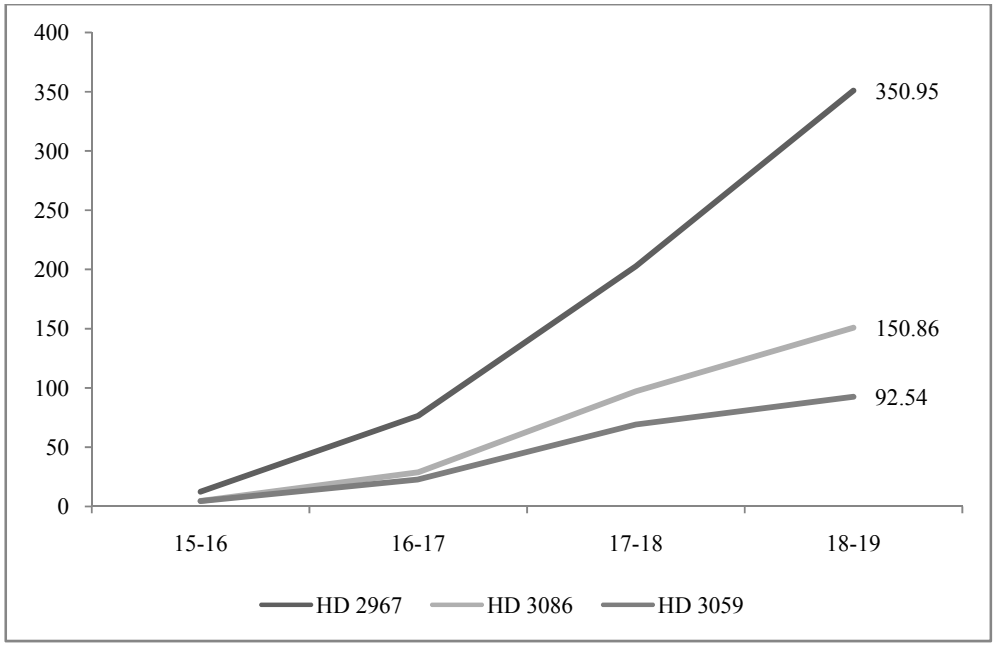

Fig. 1: Spread of Wheat Varieties from Rabi 15-16 to 18-19 in collaboration with HESCO, Dehradun

Adoption dramatically increased over the four years since the IARI-VOs program had commenced. The preferred improved wheat varieties were HD 2967, HD 3086 and HD 3059.

Conclusion

Considering diversity in paddy and wheat cultivation, the shift in area under improved technology was observed with collaborative programme with HESCO to popularize the modern paddy and wheat technologies in the farmer's fields in Uttarakhand. These on farm trials/demonstrations showed that the yield performance of paddy and wheat is quite high as compared to the farmer's yield with area diffusion effect ranges from 4-8 times in case of Paddy variety P 1121 and P 1509. However, in case of wheat demonstrations the area diffusion effect was 24.97 times for HD 2967, 13.75 times for HD 3086 and 12.16 times for HD 3059.

Reference

[1] Anirban Mukherjee and Aniruddha Maity (2015). Public–private partnership for convergence of extension services in Indian agriculture. CURRENT SCIENCE, VOL. 109, NO. 9, 10 NOVEMBER 2015

[2] Chandra Shekara P. (2001), Public–Private Partnership in Agricultural Extension Management : Hoshangabad shows the Way, MANAGE bulletin, Vol. 7 Issue : 5/6 November/December 2001

[3] Joshi P, Chandra N, Jethi R (2014) Conditions and Consequences of Involvement of Farm-women in Agriculture and Off-farm Activities in Mountain Region of Uttarakhand. J Ergonomics 4: 127. doi:10.4172/2165-7556.1000127

[4] Vijaipal Singh, Ashok Kumar Singh,Trilochan Mohapatra, Gopala Krishnan S and Ranjith Kumar Ellur (2018) Pusa Basmati 1121 – a rice variety with exceptional kernel elongation and volume expansion after cooking. Rice, ISSN: 1939-8425 (Print) 1939-8433 (Online)