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PROMOTING A NEW CROP AMONG FARMERS IN KHORDHA DISTRICT

As the main mandate of KVK is geared towards technology assessment, refinement and demonstration, it is not always easy to get new technologies adopted at a scale in a short period of time. However, there are certain technologies that get easily adopted at a scale if different extension approaches are carefully deployed. P N Ananth, A K Dash and J K Sundaray illustrate one such experience here.

CONTEXT

Khordha is one of the 33 districts of Odisha (India) which has a favourable climate for cultivating cereals, pulses, oilseeds and different vegetable crops. Many varieties of vegetables are grown during the winter (Rabi) season. Krishi Vigyan Kendra (KVK)-Khordha, under the administrative control of ICAR-Central Institute of Freshwater Aquaculture, is mandated to work in Khordha district. KVK has been responsible in the district for diversifying crops, introducing new varieties, and breeding of animal and fish species with scientific package of practices for improving production and farm income.

In Odisha, capsicum (*Capsicum annuum* L. var. grossum Sendt) is grown on limited scale in different districts; predominantly, the supply to the state is from outside. The farmers in Khordha district used to grow chilli after paddy was harvested and were not aware of capsicum cultivation. In fact, they had the perception that it would not grow in their soil and also would not sell in the local market. KVK tried to change this preconceived idea of the farmers and introduced high-value and low-volume capsicum as part of crop diversification in the district.

Capsicum is also called bell pepper and is one of the high-valued vegetables with a high content of antioxidants. Nutritionists indicate that a small bell pepper could provide up to three times the recommended daily amount of vitamin C, compared to any citrus food. The vegetable also possesses a very high content of vitamins A, C and E (all antioxidants) that help to effectively neutralise free radicals. India contributes one-fourth of the world production of capsicum with an average annual production of 0.9 million tons from an area of 0.885 million hectare with a productivity of 1266 kg per hectare (Sreedhara et al., 2013).

GOOD PRACTICES IN PROMOTING NEW CROP ESTABLISHMENT

Awareness Building

Like any other crop introduction in the district, KVK too started organising awareness programmes for farmers to cultivate capsicum by replacing chillies to an extent with a view to increasing farmers' income. With this initiative, KVK regularly reminded farmers that capsicum could indeed be grown in Khordha district and the market could be developed over time. A great opportunity to introduce the crop came to KVK during 2011 after floods hit the district.

Provision of seedlings

KVK worked on the flood assistance programme and farmers were provided with seedlings of vegetables. Along with other vegetable seedlings, capsicum seedlings were also provided. As the need of the hour, farmers accepted the seedlings of capsicum and were astonished to see capsicum growing and thriving in their fields. Today the crop has spread to 550 farmers in the district due to the initiation by KVK and through introduction of capsicum by state schemes.

The pathway to new crop development: It took five years to influence the farmers to adopt this crop. The timeline of the introduction is presented below:

Table 1: Timeline of capsicum as a newly introduced crop in Khordha district

Year	2011-12	2012-13	2013-14	2014-16
Pathways	• Seeds procured from other districts • No supplier of capsicum seeds in Khordha district • Supply of capsicum seeds as flood assistance • Seeing is believing • Farmers gain confidence that capsicum can be grown on their soil	• KVK advised input dealers to procure and supply seeds at district level • Location-specific testing and confirmation by KVK	• Seed availability becomes common in the district • Capacity building of farmers through training and demonstration • Government provides seeds to farmers in subsidised rate (post cyclone Phailin period)	• Inclusion in demonstration programmes under ATMA in different blocks of the district • Supply of capsicum seedlings free of cost through horticulture department • Various extension methods employed for horizontal spread • Spread to 550 farmers to adopt in the district • Local farmers have contributed to partial replacement of capsicum supply from Bangalore

Influencing input dealers to stock capsicum seeds

In 2011-12, capsicum seeds were procured from other districts as there were no local input dealers who were interested to market. It was after floods (Cyclone Phailin) that flood assistance made 150 farmers accept and try the crop from KVK. With a strong presence and contact with the input dealers, KVK influenced them to procure capsicum seeds. Today, it is invariably available in all input shops, which has paved the way for farmers to adopt this crop.

Varietal Assessment and Demonstrations

Varietal assessment and frontline demonstrations were carried out in farmers' fields selecting a hybrid variety 'Indra' to assess its suitability to open-field condition as well as the profitability of capsicum crop over green chilli. Today, the district has more than 550 farmers who are cultivating both open-pollinated and hybrid varieties of capsicum while adopting scientific management practices.

From the trial results, it was observed that the net income was 142.7–163.2% higher with an increase in yield of 170.8–215.1% by adopting capsicum in open-field condition compared to farmers' practice of cultivating green chillies. Farmers adopted a closer spacing of 60X45 cm for the hybrid var. Indra instead of 75X60 cm as the plant growth is not vigorous in open-field condition. The results of the assessment trials are presented below in Table 2.

Table 2: Results of Varietal Trials on Capsicum

Year	No of Trials	Yield (q/ha)		Net returns (in Rs/ha)		% of increase over control
		Farmers' Practice	Recommended Practice	Farmers' practice	Recommended Practice	
2012-13	10	112.0	353.0	130057	3,42,399	215.1
2013-14	20	123.6	334.7	238251	5,78,348	170.8

It was further observed that though fruiting continues in the plant with increase in temperature, there is a reduction in fruit size. Upon successful trial of capsicum, KVK took another initiative of introducing maize as an intercrop in capsicum as capsicum is a shade-loving crop.

Use of different extension methods

For any crop to be established in the district there is a requirement of employing different extension methods for larger adoption. In this case, different extension methods, viz. individual, group and mass media were used for faster reach of this crop. On-farm trials, frontline demonstrations, technology week, farmer-scientist interactions, field days, exhibitions and trainings were the specific extension methods. During the period, all possible ways for larger adoption of capsicum was undertaken by KVK. Special attempts were also made towards using the mass media, especially Doordarshan, in documenting success stories. Farmers from all blocks have benefitted. KVK also worked on popularising the adoption of capsicum through the progressive farmers of the district as farmer to farmer extension will be faster. Above all, the convergence with ATMA yielded better results to scale up the cultivation and reach a target of 550 farmers. The employed extension methods and beneficiaries are presented below (Table 3).

Table 3: Extension Methods and Activities towards promotion of Capsicum in the district

Year	Activity	Beneficiary	No. of blocks covered
2011-12	Technology Week on Integrated Agriculture	Farmers, Extension Personnel of Line Departments	10
	State Level Exhibition of KVKs of Odisha	Farmers, Extension Personnel of Line Departments	7
2012-13	Orientation Training Programme	Progressive Farmers, Block-level ATMA Officials, Village Agriculture Worker	1
	Field Day	Farmers, Extension Personnel of Line Departments	1
2013-14	Vocational Training	Practicing Farmers	1
	Field Day	Farmers, Extension Personnel of Line Departments	1
2014-15	Training of Extension Functionaries	Block-level ATMA Officials	4
	Doordarshan Coverage	Farmers	2
	Exhibition at Regional and State Level Krushi Mahostav	Farmers, Extension Personnel of Line Departments, NGOs	10
	Demonstration under ATMA	Farmers	1
	Farmer-Scientist Interaction	Farmers, Extension Personnel of Line Departments	4
2015-16	Pre-Rabi Sammelan	Farmers, Extension Personnel of Line Departments	10
	Exhibition at District Level Krushi Mahostav	Farmers, Extension Personnel of Line Departments	10
	Distribution of extensión literature	Farmers, Extension Personnel of Line Departments	10
	Training	Progressive Farmers	7

IMPACT

One of the major impacts of the interventions by KVK have been on the availability of seeds with all input dealers in the district. As the seeds are available and farmers have started cultivating capsicum, its presence is widely seen in the local markets. Local production has, to a large extent, replaced the supply from Bangalore markets.

Also, farmers are in an advantageous position as the crop fetches a good price in the market compared to chillies.

It is also observed that capsicum fetches a market price of Rs. 1600–Rs.4500/quintal during the months of January–April, which is a boon to the farmers. The demand for capsicum is increasing at the household level and at the burgeoning chain of fast food restaurants in rural and urban areas of the district. The capital city of Odisha, Bhubaneshwar, falls in Khordha district; hence, there is an assured market for capsicum. Udyan Fresh and Veggies Kart, the state government initiatives for horticulture crop marketing, are procuring capsicum from KVK-adopted farmers. Over a period of time, KVK expects that the district will be self-sufficient on availability of capsicum.

CONCLUSIONS

Upscaling new technologies at a scale through technology assessment and refinement process by KVK is often difficult as this would require large funds and support from the state extension system (Figure 1).

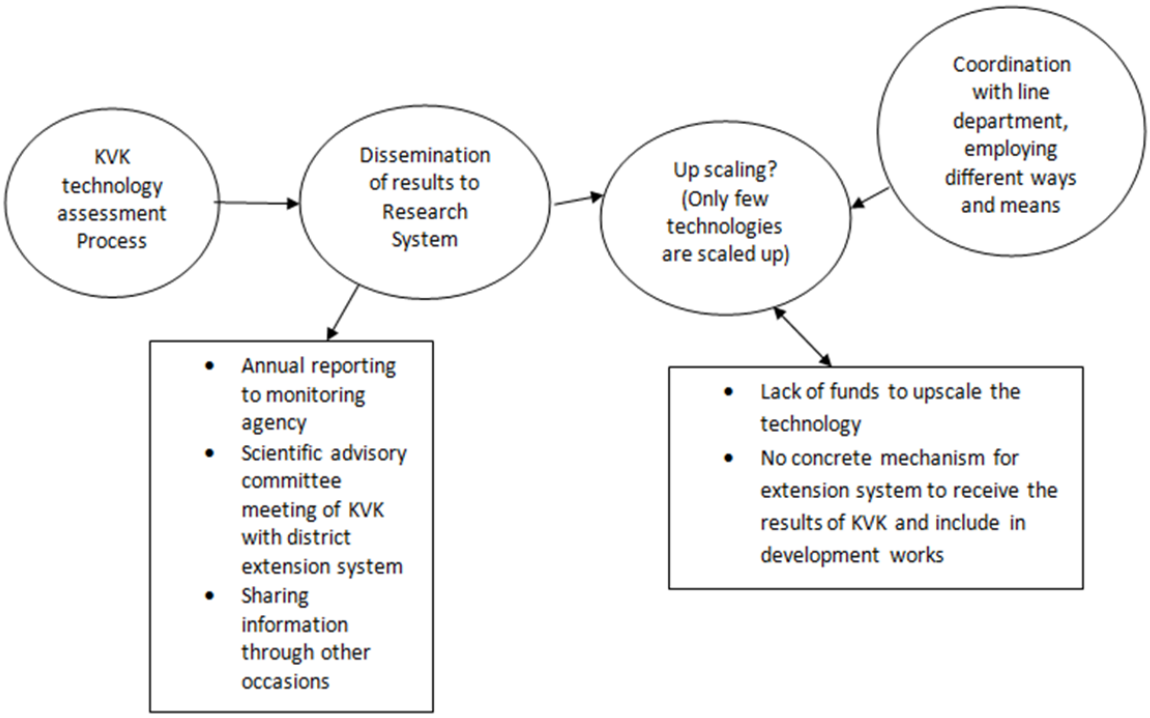

Fig 1: Process of Technology Assessment and Up-scaling

However, judicious selection of technologies and deployment of varied extension strategies can make a huge difference. To be successful, three aspects are important:

Firstly, the economics or the relative advantage of the technology one is promoting. In our case, the net income was 142.7–163.2% higher with an increase in yield of 170.8–215.1% by adopting capsicum in open-field condition compared to farmers' practice of cultivating green chillies.

Secondly, employing a combination of extension methods can enhance awareness and adoption on a large scale.

Thirdly, for successful scaling of new technologies, one should partner with other organisations that have funds and better reach. The KVK has always been trying to link the technology assessment results to the state extension to scale up. In this case, the state department of horticulture and ATMA at the district level supported the KVK initiative with funds for additional demonstrations and promoting capsicum in their own demonstrations.

References

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