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A CASE STUDY

Success of marigold farming: an intervention by NAIP–value chain on flowers for domestic and export markets

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ABSTRACT

Marigold gained popularity amongst farmer and flower dealers on account of its easy culture, wide adaptability, attractive colour, shape, size and good keeping quality. Lack of technical know-how of scientific flower cultivation among the growers and high level of post-harvest losses, lack of awareness on market opportunities, lack of timely and precise price information were the major missing links in the marigold value chain in India. To address all those missing links in the marigold value chain Tamil Nadu Agricultural University (TNAU), proposed a project entitled 'Value chain on flowers for domestic and export markets' to the NAIP, with the aim of contributing to the promotion of the nation's floriculture industry. The project period is September 2008 to June 2012 and it is operated in the Department of Floriculture and Landscaping. R. Rangasamy one of the farmer in the project area, marigold is the major source of income for his family and his livelihood depends mainly on the marigold farming. Since, he is having ten years of experience in marigold farming he says that over the year the yield marigold was reduced to 4-5 tonnes per acre due to indiscriminate use of pesticide, fungicides and fertilizer. Before NAIP intervention he received very low price (Rs. 2-3 per kg.) due to exploiting nature of market channel. After NAIP intervention the farmer undergone different training programs related to production, post-harvest and marketing aspects and adopted most of the technologies recommended by the NAIP scientist. Because of the adoption of advanced technologies he got the yield of 10-13 tonnes per acre. The farmer received daily price information through the cell phone that was disseminated by the NAIP scientists based on which he is able to get correct price from the buyer in the market. The farmer was entered into the contract farming with AVT natural Pvt. Ltd. who buys the marigold for xanthophylls extraction. Under this arrangement the farmer gets assured price of Rs. 6 per kg. of marigold, timely inputs and consultancy services from the company. Now the farmer was reaping the benefit of Rs. 2-3 per kg. as net profit from the Marigold farming due to intervention of NAIP.

KEY WORDS : NAIP, Value chain, Technology adoption, Contract farming

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In the era of globalization, liberalization and privatization and despite several market interventions undertaken by the central and state Government, problems of the farmers especially with respect to production and marketing of their farm products are yet to continue. This topic would describe the success story of marigold farming in Tamil Nadu with the intervention of NAIP - Value chain on flowers for domestic and export market scheme operated under the Department of Floriculture and Landscaping, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu.

Marigold gained popularity amongst farmer and flower dealers on account of its easy culture, wide adaptability, attractive colour, shape, size and good keeping quality. Marigold is valued as loose flower for making garlands and also it is used to extract the oleoresins and xanthophylls for

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export purpose. Besides, it is used as trap crop in the borders to attract insects attacking the main crop.

Tamil Nadu scenario :

Tamil Nadu has immense potential to produce world class cut flowers and loose flowers with high export potential, which is attributable to the advantages the state has for floriculture, including diverse agro climatic conditions.The state produces 2,01,905 tonnes of loose flowers such as jasmine, chrysanthemum, marigold, rose, crossandra and nerium in an area of 24,750 hectares. The area and production of the major loose flowers grown in the state are furnished in Table 1.

Table 1 : Area and production of major loose flowers in Tamil Nadu (2005 -2006)

Crop	Area (ha)	Production (tons)
Malligai (*Jasminum sambac*)	9,893	76,671
Mullai (*J. auriculatum*)	3,195	27,158
Jathi malli (*J. grandiflorum*)	849	7,641
Rose	1,681	1,681
Marigold	826	12,390
Other flowers	8,306	76,364
Total	24,750	2,01,905

(Source: IndiaStat.com)

Apart from the conventional uses, traditional flower crops such as marigold are associated with novel uses in the world trade. Marigold carotenoids have immense potential as natural colourants as well as anti-carcinogenic compounds. Carotenoids from marigold are being exported to Mexico. China, India and Peru are the leading countries producing and exporting marigold flowers. The value of the global xanthophyll trade is around Rs.300 crores of which China's contribution is 50 per cent and India's is 25 per cent. In South India, M/s. AVT Natural Products Ltd. is involved in contract farming of marigold for xanthophyll production in an area of 7000 hectares.

Challenges in the floriculture sector :

In spite of the fast growth of India's floriculture sector, its share in the global floriculture trade is only 0.61 per cent which is likely to reach 0.89 per cent by 2015 (ASSOCHAM, 2012). This is attributable only when the challenges such as need of infrastructure, availability of basic inputs, higher volume of production, quality parameters and product diversification to meet the export requirements are to be addressed properly (EXIM, 2006). Lack of technical know-how and do-how of scientific flower cultivation among the growers and high level of post-harvest losses (35-40%), lack of awareness on market opportunities (both domestic and export), lack of timely and precise price information and negotiating skill and high air freight costs are the major missing links in the value chain on flowers in India.

Intervening with the floriculture value chain :

Tamil Nadu Agricultural University, with a strong base in floricultural research and development, proposed a project entitled 'Value chain on flowers for domestic and export markets' to the NAIP, with the aim of contributing to the promotion of the nation's floriculture industry. The project period is September, 2008 to June, 2012 and it is operated in the Department of Floriculture and Landscaping, Tamil Nadu Agricultural University, Coimbatore.

Mode of implementation :

The project planned for a timeframe of four years with a budget outlay of Rs. 353.29 lakhs attempts at possibly addressing all the missing links in the various levels of the value chain of the potential flower crops of Tamil Nadu namely, jasmine, marigold, carnation and dry flowers. The project is being implemented on a 'Consortia approach' with Tamil Nadu Agricultural University as the lead centre of the consortium, the key private partners based in the state, namely, M/s. AVT Natural Products Pvt. Ltd., Erode district, M/s. Salem Spices Pvt. Ltd., Salem, M/s. Vanguard Exports Pvt. Ltd., Coimbatore and M/s. Elkhill Agrotech Pvt. Ltd., Ooty as the Consortium Partners and Krishi Vigyan Kendra, UPASI, Coonoor and Deepam Self Help Group functioning in the Nilgiris as the Associate Partners.

Situation before NAIP intervention :

Marigold is one of the important flower crop in Sathyamangalam, Thalavadi and surrounding areas in Erode district of Tamil Nadu and almost every farmer in that area are cultivating minimum of 0.5 ac to 3 ac of marigold in their farm. Most of the farmer's livelihood solely depends on the income from marigold cultivation. The farmers in this area are having more than ten years of experience in marigold cultivation and in early days they were practiced only the conventional way of cultivation and also they don't have enough knowledge on the new advanced method of cultivation. Because of their lack of knowledge and awareness about modern management practices and inefficient and indiscriminant use of inputs they have faced the problem of reduction in productivity of marigold.

Apart from this yield reduction the cost of production of marigold has increased many folds due to excess use of agro inputs for farming and increased labour wage because of the shortage of the farm labour in that area. Table 2 shows the major problem in the marigold cultivation among the farmers of Sathyamangalam and Thalavadi.

Apart from the above listed problems farmers were exploited by the middleman such as local traders, commission agents, brokers etc, in the marketing channel. The farmers were availing some financial assistance from

Table 2 : Problems in marigold cultivation

Sr. No.	
1.	Stagnation in yield
2.	High cost of cultivation
3.	Labour shortage and high labour cost
4.	Lack of assured market price
5.	Non-availability of new marigold varieties
6.	Incidence of diseases and pests
7.	Indiscriminate use of fungicides, pesticides and fertilizers
8.	Very low use of organic inputs

local traders and commission agents for crop cultivation so they have to sell their produce to the particular trader who financed the farmer even if the trades offer low price to the farmer compared to prevailing market price. So the farmers could get only the minimum price for their produce and it affects the income level of the farmer intern it prohibits the adoption of advanced production methods in marigold farming. Because of lack of assured price for marigold and exploiting behaviour of the middleman in the market channel forced the farmers to switch to other crops from marigold.

NAIP intervention in marigold farming :

National Agricultural Innovation Project - Value chain on flowers for domestic and export markets was launched in 2008 with the objective of to optimize cost effective production technologies and standardize technologies for post-harvest management and value addition and to impart training to growers and entrepreneurs on production and post-production technologies and create floriculture database and to facilitate market linkage and supply chain management in flowers for domestic and export trade.

Technologies given under the NAIP scheme :

Under the NAIP- Value chain on flowers for domestic and export markets scheme number of trainings were given to the marigold farmers in different aspects of marigold cultivation such as production technologies, post-harvest technologies and marketing linkages to improve the profitability and income level of growers. Following technologies were explained and demonstrated to the growers in the field level to improve the adoption of advanced technologies among the marigold farmers (Fig. 1).

Technology adoption among marigold farmers :

A study was conducted among the 60 randomly selected marigold farmers (Sharma, 2002) to analyze the adoption level of advanced technologies with respect to production, post-harvest and marketing aspects that has been given under the NAIP scheme through different training programs and on farm demonstration (Table 3). The study reveals that overall adoption of advanced technologies among the marigold farmers was good and it enables the farmer to get higher yield and better price in turn it improves the income level of the marigold farmers.

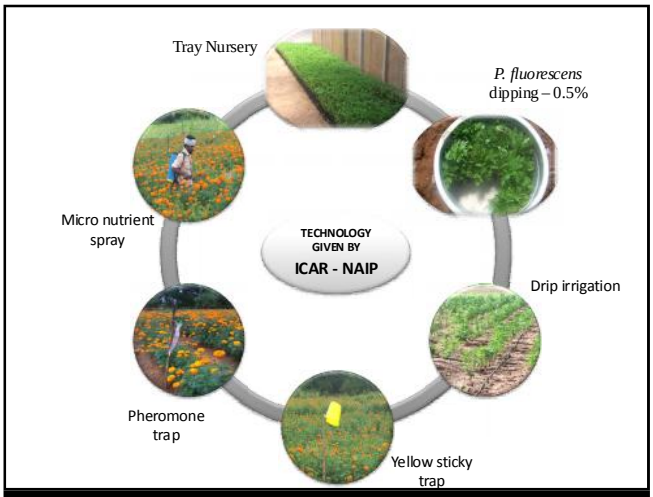

Fig. 1: Technologies given under the NAIP scheme

Table 3 : Technology adoption by the marigold farmers

Production	Post-harvest	Marketing
Soil and water analysis	Pre cooling	Market linkage programmes
Land preparation	Grading techniques	Market intelligence
Nursery preparation	Packaging techniques	Contract farming
Bio control agents		
Bio pesticides		
Bio fertilizer		
Planting and spacing methods		
Pinching		
Fertigation schedule		
Plant protection technologies		
Harvesting technologies		

From Table 3 we could conclude that most of the farmers in the study are have followed recommended land preparation and spacing methods and majority of them used bio fertilizers like *Azospirillum* and phosphobacteria in marigold cultivation. In case of plant protection aspects most of the farmers were able to identify the pest and diseases in the field level and this enables adoption of right type plant protection measures at right time and right quantity. It reduces the indiscriminate use of farm inputs through which it reduces the cost of production and improves the profitability of marigold farming.

Success story of a farmer :

A marigold farmer R. Rangasamy, S/o. Rajappa gounder, Bannari post, Sathyamangalam taluka, Erode district of Tamil Nadu has adopted improved technologies in marigold farming with the help of Department of floriculture and Landscaping, Tamil Nadu Agricultural University under the NAIP - Value chain on flowers for domestic and export markets scheme being operated in Tamil Nadu. This project has become a blessing to all the marigold farmers in the implementation area because all the important advanced technologies have been disseminated to the farmers through the training and on farm demonstration in the field level.

R. Rangasamy one of the farmers in the project area have the farming experience of more than thirty years and ten year experience in marigold farming. He is totally having five acres of farm land, in this he is cultivating two acres of marigold and remaining area is used to cultivate vegetables. Marigold is the major source of income for his family and his livelihood depends mainly on the marigold farming. Since, he is having ten years of experience in marigold farming he says that over the year the yield marigold was reduced to 4-5 tonnes per acre due to indiscriminate use of pesticide, fungicides and fertilizer. Before NAIP intervention he received very low price (2-3 rupees per kg. of marigold) due to exploiting nature of the market channel. After NAIP intervention the farmer undergone different training programs related to production, post-harvest and marketing aspects and adopted most of the technologies recommended by the NAIP scientist. Because of the adoption of advanced technologies in marigold farming he got the yield of 10-13 tonnes per acre.

In marketing aspects the farmer received daily price information through the cell phone that was disseminated by the NAIP scientists based on which he is able to get correct price from the buyer in the market. Even after all these interventions the farmer has been adversely affected by the

Table 4 : Level of technology adoption **(n=60)**

Sr. No	Technologies of marigold	Adoption level	
		Adopted	Per cent (%)
1 .	Soil and water test	24	40
2.	Land preparation		
	Ploughing- 4 times	46	77
	FYM 25 t/ha	60	100
	Azospirillum and phosphobacteria	38	63
	Raised beds	36	60
3.	Nursery		
	Tray nursery	0	0
	Seed treatment @ *Azospirillum* @ 20 g/kg	46	77
	TP- 20 days after sowing	48	80
4.	Spacing - 90 × 22.5 cm	42	70
5.	Fertilizer application		
	Fertigation	24	40
	Application of $FeSO_4$ @ 0.5% and $ZnSO_4$ @0.5% at 30 and 45 DAT	28	47
	Application of Humic acid 0.2% at 30 and 45 DAT	12	20
6 .	Drip irrigation	24	40
7 .	Plant protection		
	Identification	36	60
	Pheromone trap	0	0
	YST	4	7
	Bio pesticide	46	77

price fluctuation in the market for that the NAIP scientist introduced the concept of contract farming in marigold. The farmer was entered into the contract farming with AVT Natural Pvt. Ltd. with the help of NAIP scientists who buy the marigold for xanthophylls extraction. Under this arrangement the farmer gets assured price of Rs. 6 per kg. of marigold. Apart from this he also gets all the required inputs in time from the AVT naturals, for that the farmer need not pay immediately to the company and it will detected from their weekly payment when he receives money from the company. Now the farmer was reaping the benefit of Rs. 2-3 per kg. as net profit from the marigold farming due to intervention of NAIP. Related work was also done by Jagtap *et al.* (2009); Gawle *et al.* (2012), Karuppusamy *et al.* (2014), Kaushik *et al.* (2013), Verma *et al.* (2013).

Conclusion :

From the above success story of Marigold farmer R. Rangasamy in Tamil Nadu we could conclude that because of the intervention of the NAIP- Value chain on flowers for domestic and export markets in marigold farming the farmers income level and their livelihood has improved over the year since from the implementation of the project. Now the farmers in the project area were reaping very good profit from the marigold farming and most of them were aware of different improved technologies in marigold production and they are receiving every day price information through their cell phones and they have also liked with buyers in contract farming mechanism for price assurance. In this way the NAIP- Value chain on flowers for domestic and export markets have created tremendous improvement in Marigold farming and promoted the sustainable income improvement to the farmers in the project area.

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