

SUCCESS STORIES DOCUMENTED

1. Improve the socio economic status of okra growers of Navsari district

Particularly this extension activity is aimed to disseminate the technology of off season vegetable cultivation in Navsari district and to increase the productivity to improve income and ultimately socio economic status of okra growers.

The aim of the project was to spread the off season okra cultivation and increase the income of tribal farmers.

In Navsari district two blocks were selected and in each block six villages were covered for the purpose. In selected villages, farmers of tribal categories are covered and village wise list of farmers was prepared in advance. Groups were formed and leaders were identified for successful implementation of the project.



500 tribal farmers are the beneficiaries of the project. First KVK conducted on/off campus training to selected farmers and supply inputs like, seeds, bio fertilizer, organic manure, krats, yellow sticky traps & bio pesticides etc. KVK scientists continuous follow up and diagnostic visit at farmer's fields.

Gaps identified:

Growing of off season okra is profitable practice. It not only increases the daily income of the farm family but also provides employment opportunity for villagers, so that the migration from villages to city was reduced. During harvesting period okra require 7 labour/ha alternate days for picking of fruits. Total 280 labour require for picking of fruits. Through training application of chemical and use of bio pesticides for control of pest and diseases which reduce chemical load of the crop and save health hazards.

Actual output: Farmers are aware about scientific okra cultivation and they have got 12 to 15 ton/ha yield and reduce the pesticides spray (8 to 12) with use of yellow sticky trap. Farmers get more income by reducing the cost of pesticide application (32 to 44 thousand/vigha) from off season okra cultivation then other crops growing during winter season.



Growth impact: Results of this project is to increase the production of okra. **Overall 51% yield was increase over traditional method of planting.** Famers built self confidence about okra cultivation during off season. They become aware about okra cultivation like, time of sowing, nutrient management, pest control, post harvest management etc. After harvesting of okra fruit, they adopted grading of okra fruits on the basis of market demand and transportation of fruits in crates instead of gunny bag. So farmers got additional income of Rs. 1 to 2 per kg. Farmers know about scientific okra cultivation and they have got 12 to 15 t/ha yield and reduced the pesticides spray (6 to 12) with use of yellow sticky trap. Famers got more income (32 to 44 thousand/Vigha) from off season okra cultivation as compared to other crops grown during winter season. Off season okra cultivation during winter season farmers got higher net return because they got more market price in month of December to February month. **During demonstration of our technology farmers got net profit Rs. 1,98,246 /ha where in farmers practices was only Rs. 93,359/ha area.**

2. Improve the nutritional status through kitchen gardening

In Navsari district majority of farmers have their own spare space in and around the house. Due to lack of knowledge and interest none of them are properly utilizing the available space. Keeping in this mind KVK, Navsari implemented a project with objective to popularize and adoption of kitchen garden and through this activity farmer can earn extra income by selling surplus quantity as well as get fresh vegetable and increase nutritional status in their daily diet.



Krishi vigyan Kendra, Navsari conducted 150 demonstration for kitchen garden to popularize kitchen garden. Farmers grown sixteen different type of vegetables in their back yard and farm families used those fresh vegetables for daily diet and after consumption surplus vegetables were sold out in the market

Actual output: Farmers are aware about scientific kitchen garden cultivation and they have got daily fresh, organic and nutritional food. Farmers grown sixteen different type of vegetables in

their back yard and farm families used those fresh vegetables for daily diet and after consumption surplus vegetable were sold out in the market and earned average Rs. 2185. Adopting kitchen garden model farmers got Rs.4885/season/guntha. Kitchen garden activity was done year round and they got 12-14 thousand rupees from one guntha.

Actual outcome: Popularizing kitchen garden activity we have conducted 150 demonstration but the impact was reached out to more than 3000 farmers and now they are practicing this kitchen garden for expecting the higher income. Farm families easily available fresh, organic and nutritious food from their back yard. Better utilization of spare time and space. Improve the health of farm families. Through training, Application of chemical and bio pesticides for control of pest and diseases which reduce chemical load of the crop and save human health.

Growth impact: To popularize kitchen garden in rural area through KVK extension activity. Farmers grown sixteen different type of vegetables in their back yard and farm families used those fresh vegetables for daily diet and after consumption surplus vegetables were sold out in the market and **earned average Rs. 2185/1 gunta. Net profit form one kitchen garden was Rs. 4885 season/family. Demonstrations were conducted by 150 farmers** but the impact was reached out to more than 3000 farmers and now they are practicing this kitchen garden for expecting the higher income.

3. Socio- economic status of chikku growers a steps forward

Chiku is the one of the most important horticulture crop in Gandevi, Jalalpure & Navsari taliuka of Navsari District. Navsari district cover more than 4000 ha area under chikku in that more than 60% farmers comprise small & marginal. Since 4-5 years farmers are in difficulty to cultivate the crop. Indiscriminate use of pesticide, fertilizer and chemical spray push them in debt. There is lot of scope for increasing the productivity by judicious use of chemical and pesticides and also by proper management of chikku orchard.



RKVY project is implemented during the year 2012-13. Out of three taluks 58 villages of Navsari district were selected and technologies have been successfully demonstrated in **548 ha of sapota** orchard. The selected area comprises of **2740 beneficiaries**. In this project inputs were supplied, azadectin, bio pesticides beaureria bassiana and bio fertilizer mycorrhiza to the farmers.



Gaps identified:

Scope of increasing the yield of sapota by practicing improved method of orchard management techniques. Nutrient management and use of bio- pesticides will reduce the yield loss due to biotic and abiotic stress.

Actual output: Productivity of sapota in Navsari district is 12.00 ton/ha. Using these technologies farmers got yield 159 kg/plant. Earlier they were harvesting up to 135 kg/plant yield. **17 per cent yield was increased per hectare.**

Growth impact: Using these technologies, the luxurious growth of sapota, leaf color is archived from light green to dark green color, increased flowering (3 to 4 per cent) and increased the yield up to 14 per cent. This is due to application of mycorrhiza increased the availability of nutrient & finally increased the size of fruit. Spraying of bio pesticides reduced the incidence of pest up to 13 to 15 percent. Overall productivity of sapota in Navsari district is 12.00 ton/ha. Using these technologies farmers got yield 159 kg/plant. Earlier they were getting up to 135 kg/plant yield. So 17% yield was increased per hectare. While computing economics this method of cultivation has got 2,74,500 Rs/ha income which was 2,40,000 Rs/ha in un treated orchards. Rs.34,500 increased income un treated control. Thus an implementation of this project in over 548 hectares of sapota could have benefited to the tune of about 189.06 lakhs.

4. Popularizing high yielding turmeric variety

Turmeric is the one of the most important and chief spice in daily diet. South Gujarat comprises an area of 321.0 ha with annual production of 5339 MT. Most of small & marginal farmers are preferred grow turmeric crop in this region. The productivity of turmeric is only 16.63 MT/ha. Farmers are losing their productivity & quality of turmeric crop due to use of low yielding variety, indiscriminate use of chemical fertilizer & poor soil as well as crop management. Hence there is good scope to increase the productivity by means of various inputs like good quality seed material, INM, control of pest & diseases & Value addition. Considering the scope of turmeric cultivation in the area KVK has implanted this project.



The RKVY project has implemented during the year 2012-13 in eleven villages of five taluka of Navsari district and strategies have been successfully demonstrated on 75 beneficiaries field, using high yielding variety along with IPM, INM and IDM.

Gaps identified: Cultivation of improved turmeric variety with scientific method of cultivation and also to increase the yield of turmeric by replacing the existing variety to new variety. Through training emphasis was given on soil management and use of bio fertilizer which improve the soil health. Some farmers are not selling fresh turmeric in market but make powder from it and sell in the market. Farmers of the targeted area are well educated by scientist of NAU and other qualified technical personnel regarding turmeric cultivation.



Actual output: Farmers are aware about new high yielding variety and scientific turmeric cultivation and they have got 22 to 26 ton/ha yield. Farmers get more income (32 to 44

thousand/Vigha) from turmeric cultivation. Farmers **increased yield up to 49 percent. Earlier farmers were getting yield only 16 ton/ha** but after conducting demonstration they got **yield 25.35 ton/ha.**

Growth impact: The RKVY project was implemented during the year 2012-13 in eleven villages of five taluka of Navsari district and strategies had been successfully demonstrated on 75 beneficiary fields, using high yielding variety along with integrated crop management. Farmers improved **yield up to 49 percent. Earlier farmers were obtaining yield of 16 ton/ha** but after conducting demonstration they obtained **yield 25.35 ton/ha.** While computing economics, as estimated benefited of **Rs. 2,68,425/ha** is accrued by **spending merely Rs. 74,500/ha.** They get net profit of Rs 1,93,925/ha thus an implementation of this project farmers are become aware about new high yielding turmeric variety production technology and increased income. Now farmers are adopting this variety and technology in a larger area.

5. Large scale management of fruit fly in fruits and vegetable crops.

Rashtriya Krishi Vikas Yojana is the key to support state and district action plans funded by Ministry of Agriculture, GOI. A project on large scale management of fruit fly in fruit vegetable crops was implemented under the aegis of Navsari Agricultural University in Navsari district. The project is aimed to create awareness among the farming community about organic production of fruits & vegetables by implementing eco – friendly IPM technology for fruit fly management in wider area. A mass adoption of technology can be useful for recognizing the production of pest free area.



The RKVY project was implemented during 2012-13 in 74 villages of 5 taluka in Navsari district and strategies had been successfully demonstrated in 4000 ha fruit crops 250 ha, in cucurbitaceous crops and 450 ha in okra & brinjals crops by installing 70,500 different fruit fly traps. **The selected area comprising of 8500 beneficiaries, among them 32.8 per cent**

includes Scheduled Tribe, 37.2 per cent OBC and 30 percent of other category availed the benefit of RKVY project.

In this project KVK have conducted demonstration of pheromone trap for the control of fruit and shoot borer in brinjal. Total **400 farmers** were benefited to this project covering **200 hectare area** demonstration plot showed significant reduction in the per cent infestation of the brinjal fruit and shoot borer. **Total 9400 farmers are benefited through this project.**

Actual output: The fruit fly damage in mango and sapota orchards minimized to 1 to 5 percent which was 25 to 30 percent in untreated orchards. Thus, more than 85 percent damage due to fruit fly is reduced which resulted in increase of about 25 percent in yield. While in case of cucurbitaceous vegetables, the fruit fly damage was minimized to 2- 4 percent by using the technology which ranged



22 to 32 per cent in untreated fields. Average yield in treated plots was 10.19 ton/ha. It is about 22 per cent increase in yield over control (8.31 ton/ha). In brinjal crop fruit and shoot borer demonstrations plots were observed 22.29 per cent infestation in untreated plot, while 9.35 per cent infestation was observed in pheromone trap demonstration plot. **17.26 percent yield was (2780 kg/ha.) was increase over untreated plot.** Yellow sticky trap as a component of IPM worked very effectively in controlling white fly in okra, brinjal, tomato and chilli. This trap is also helpful in reducing the number of insecticidal sprays. After using this technology it reduced the eight insecticidal spray and saved about 4000 Rs/ha.

Growth impact: Damage of fruit fly in unprotected mango and sapota ranged from 21 to 32 per cent while it was 22 to 32 per cent in unprotected cucurbits. By installing the fruit fly traps that too in wider area could successfully bring down the damage level up to 1 to 5 percent, which tune to the 85-87 per cent control of the pest. While in case of brinjal fruit and shoot borer infestation installation of pheromone trap reduce the 4 to 5



number of insecticidal spray. Use of yellow sticky trap for control of sucking pest and also reduce the pesticidal spray. In addition, this is an ecofriendly approach which can be useful in qualifying the produce as organic product. Thus, the quality of large quantity of fruits and vegetables was improved and that will be helpful in export of produce. The area wide adoption of fruit fly traps could effectively kill the male flies and thereby check further multiplication without disturbing the ecosystem. If such technology will be adopted for long time would definitely helpful in recognizing the area as PFA (Pest Free Area) and ultimately increase the export trade.

6. Popularizing newly released high yielding paddy variety.

The aim of the project was to popularize the high yielding paddy varieties and spread the information regarding the scientific cultivation practices of paddy among the farming community. **Total 1103 farmers** are the beneficiaries of the project. They are grouped *viz.*, SC/ST/OBC/GEN. Among the beneficiaries an average **49.95** per cent were SC/ST and **50.05** per cent of OBC category



Farmers of Navsari district are purchase the seeds generally from private company/ local market because of unawareness of high yielding improved seeds produced by university.

Gaps identified: Newly released high yielding paddy variety *viz.*, NAUR-1, GNR-2 and GNR-3, which performs average 10-20 per cent higher yield of local and hybrid varieties. Thus productivity of paddy of Navsari may increase in near future. Farmers also realized about scientific cultivation practices of paddy include use of bio-fertilizers, rate time and methods of fertilizers application, identification of insect and disease infestation and its symptoms and its control measures etc.

Actual output: The productivity of paddy crop of Navsari district is 2674. By implementing this projects in targeted areas of different villages of Navsari district, farmers produce averages paddy grain yield of 5204, 4814 and 4062 kg/ha of NAUR-1, GNR-2 and GNR-3, which was

32.25, 26.87 and 8.93 per cent higher as compared to other local, old and hybrids varieties of irrespective areas, respectively.

Growth impact: By implementing this project, farmers become aware about the importance and benefits of integrated nutrient managements on production and productivity and also cost of cultivation are decreased in demonstration plots up to the tune of 5-10 per cent. Average income of paddy **demonstrations plots** is 61671/- Rs/ha and cost **benefit ratio is 2.15**, whereas, average income of paddy **control plot** is 50090 and cost **benefit ratio 1.64**.



KVK collaborating with Navsari Kishan Sang, Navsari and produced 1 lakh kg seeds and it sold to the farmers. Around 5050 farmers are cultivated this crops.

7. Crop diversification through high value sweet corn crop in tribal area.

This project was implemented with the aim of popularizing high value sweet corn crop in tribal area and increases the income per unit area of small and marginal farmers. Sweet corn is the one of the high value crop having rich source of sugar. It is also very good source of fodder for animal to increase milk production. In south gujarat, most of farmers small and marginal farmers and area under this crop very less. Hence, there is good scope for increase the income of tribal people by means of adopting such high value seasonal crops.



KVK selected **500 farmers** from 14 different villages of tribal taluka Chikhali & Vandsa and **covered 100 ha area** under sweet corn crop. First we have conducted training programme on scientific cultivation of sweet corn then we have distributed all critical input to the farmers. For

easy marketing of their produce, we have made a **MOU between farmers committee and Saraf Food Ltd. Vadaodra**. So farmers get assured price of rupees six per kg of their produce.

Gaps identified: There is scope to cultivate sweet corn in this area, soil and other factors are congenial for cultivation of this crop. Farmers are aware about new short duration high value crop and scientific sweet corn cultivation and they got 12 to 15 ton/ha yield. Farmers gain more income (23 to 27 thousand/20 gunta) from sweet corn cultivation.



Actual outcome: Results of this project, Farmers got on an average corn yield of 15 t/ha and fodder yield of 12 t/ha. Farmers get higher value during short time. Day by day cultivation of sweet corn area is increasing tremendously and they also growing sweet corn round the year.

Growth impact: The RKVY project was implemented during the year 2012-13 in twenty one villages of two taluka's of Navsari district and strategies have been successfully demonstrated on 500 beneficiaries field, using high yielding variety along with integrated crop management. Total production of sweet corn cob and fodder yields were 1500 and 1200 tones and total revenue generated from this crop 90.00 lakhs and 12 lakhs, respectively. Which is apparently more as compared to other cultivated crops during *rabi* season. Farmers also produced sufficient quantity of fodder to supply the demand of animal. Therefore, farmer realized about the importance and scientific cultivation practices of short duration high value sweet corn crop.

8. Integrated nutrient management approach, to get higher production of vegetables in Navsari district.

Introduction:

Total area under vegetable crop cultivation of Gujarat is about 4.66 lakh ha with productivity of 18.61 t/ha. South Gujarat comprise 80421 ha area under vegetable with



productivity 15.44 t/ha. In tribal belt, increasing population, fragmented land holding, limited irrigation facility and lack of knowledge regarding scientific cultivation of agriculture make it difficult to sustain agriculture. Among the production factors, fertilizer is the expensive input but continuous disproportion and excess use of fertilizers deteriorates the soil health, discourage soil arthropods, declining organic matter and degrades the quality of produce. Farmers are sprawling their productivity and quality of the vegetable crops due to indiscriminate use of chemical fertilizers and less use of organic matter. An organic matter serves as mechanical spring in soil and improves resilience once stress is removed. The integrated nutrient management (INM) maintains soil fertility for sustaining increase in crop productivity through optimizing all possible sources, such as organic and inorganic nutrients of plant. The plant require all nutrients for complete its life cycle. Farmers of this region struggle for livelihood and divert from traditional agriculture to high output vegetables cropping viz., Brinjal, Chilli, Onion and Okra. Therefore, to harvest optimum yield of vegetable crops in eco-friendly manner it is very essential to go towards integrated nutrient management which has capability to improve the soil health. The demonstration was conducted on the integrated nutrient management in vegetable crops at farmer's field, which will create awareness about the improved technology to increase the productivity of vegetable crops and to improve the soil health.

Implementation of INM in vegetable

KVK had organized scientific cultivation on vegetable in farmer's field during 2007 to 2010 and details of the implementation are given in Table.

Table: Year wise extension activities

Activities	2007-08		2008-09		2009-10	
	No./ha	Beneficiary	No./ha	Beneficiary	No./ha	Beneficiary
Training	2	48	15	396	4	73
Field Days	4	109	21	504	4	169
Field Visits	8	87	15	314	12	239
Literature Published	3	1000 no.	11	5000 no.	4	5000 no.
Scientist farmers interaction	1	56	6	211	2	347

Result of Demonstration:

Organic manure in the form of enriched bio-compost, recommended dose of fertilizers and bio-fertilizers (*Azotobacter* + PSB) were used in all demonstration units with respect to crops demand. Seeds/seedlings were treated with bio-fertilizers viz., *Azotobacter* + PSB each at 2kg/ha before sowing or transplanting. Organic fertilizer (jai kishan) @ 5 t/ha was applied at the time of



land preparation in all four crops i.e. brinjal, okra, chilli, and onion. The recommended doses of fertilizers for brinjal (100-50-50 NPK kg/ha), okra (150-50-50 NPK kg/ha), chilli (125-50-50 NPK kg/ha) and onion (75-60-50 NPK kg/ha) was followed under all demonstration plot selected at farmers field. In brinjal, chilli, and okra whole P and K fertilizers were applied before the time of planting while nitrogen was applied in four equal splits. The first split of nitrogen was applied at 25 DATP and remaining 3 splits at 25-30 days interval in brinjal and chilli, while in okra, 1st split at 21 DAS and remaining 3 splits at 25 days interval. Similarly, 50 per cent N and 100 % P and K was applied as basal dose in Onion and remain 50 per cent N was applied at one month after sowing. Total 174 demonstrations on Brinjal, 151 demonstrations on chilli, 81 demonstrations on onion, and 38 demonstrations on Okra were conducted during three years at seven different villages of Navsari districts during year 2007-08, 2008-09 and 2009-10.

Results and Discussion

Table : Effect of INM on yield of different vegetable crops (Average of three year)

Crops	Yield kg/ha		Per cent increase over conventional
	INM (demon.)	Conventional method	
Brinjal	22.40	16.80	33.3
Chilli	32.19	27.44	17.3
Onion	45.2	38.50	17.4
Okra	19.32	14.12	36.82

Yield was recorded higher in all vegetable crops fertilized with integrated nutrient management approach than without the INM practice. Integrated nutrient management plot observed 17 to 37 per cent increase in yield than farmers practices. The higher yield in INM plots might be due to



adequate supply of nutrients in balanced form. As organic matter improves soil health and creates sympathetic root environment for better augmentation and thereby better absorption of nutrients. Integrated nutrient management demonstration plots indicated that improvement in soil properties and nutrient content of soil after harvest of crops with compare to initial soil nutrient status. The organic carbon content was marginally improved while P and K status was improved considerably. It might be due to solubilizing effect of organic matter on native fixed nutrient by improving physico-chemical and biological properties of soil.

Table: Economics of vegetable crops

Sr. no	Crops	Yield (t/ha)		Cost of cultivation (Rs/ha.)		Gross return (Rs/ha)		CBR	
		Demo.	Control	Demo.	Control	Demo.	Control	Demo.	Control
1	Brinjal	22.40	16.80	46252	42540	1,12,000	84,000	2.42	1.97
2	Chilli	32.19	27.44	47235	41985	241425	205800	5.11	4.9
3	Onion	45.2	38.50	53890	49765	180800	146300	3.35	2.93
4	Okra	19.32	14.12	56940	51690	1,93,200	1,41,200	3.39	2.73

For economic point of view, cultivation of chilli during *rabi* get higher CBR (5.1) than other vegetables. In vegetable treated with INM get higher gross return than conventional practices.

Conclusion:

It can be concluded that organic manuring play an important role for better crop production, soil health and nutrient use efficiency. The INM not only increase the production but also improves quality of fruits and keeping quality. The INM practice is very essential for eco-friendly vegetable cultivation. To preserve soil, environment and water for their future use the INM technology is a current need of the time. It is proved that INM may be the sole responsible factor to produce better quality as well as well as higher profitable vegetable cultivation in this area.

9. Low energy drip system for vegetable production in backyards

Farmers of rural Navsari (Gujarat) with small backyard spaces were used for the dumping waste material and other unproductive work. These issues have been noticed by many of them but are un aware of efficient utilization of the space.

Krishi Vigyan Kendra, Navsari, Navsari Agriculture University has changed the lifestyle of rural people though backyard kitchen gardening training programme to the selected beneficiaries.



The farmers were encouraged to go for cultivation of diverse vegetable primarily for house consumption. They were provide with initial capital inputs and pack of assorted seeds containing seasonal vegetable in combination of leguminous & leafy vegetables and low energy drip system. This practice has been success in several adopted villages resulting increased participation of farm women and women get encouraged. They get benefited by earnings from selling the excess produce from kitchen garden in local markets. Mrs Rekhaben Vinodbhai Patel is successful backyard Kitchen gardener from Sultanpur Village, Dist : Navsari. She did not have any prior knowledge of kitchen gardening. Through Krishi vigyan Kendra she received vegetable kit and other technical support from the scientists. She adopted the technology given by KVK experts & she got 500 Kg of vegetables. Now she is happy to enhance the nutritional affordability for her family and earn an addition income from sale of surplus produce.

10 .Economic- Nutritional backyard kitchen gardening

Ashaben Sanjaybhai Patel from Village Dandi, Dist : Navsari , Gujarat. She has a little education knowledge and enthusiastic to do new things. Now she became a motivator for many womens in the village. She has an obvious habit of purchasing fresh vegetable from the market keeping their nutritional value in the mind. It was happened to visit her krishi vigyan Kendra Navsari. Then she learnt many things and motivated towards the cultivation of kitchen garden the backyards. She was choosen as one of the beneficiary and provided with low energy dripset and vegetable seed kits & fruit tree grafs. She sincerely attended the horticulture training proframme & attended the all the technical guidelines given by KVK scientists. She adopted the technology and she got 600 kg vegetable produce. Out of which 450 Kg was sold in local markets to earn gross income to the tune of approximately 10,000 in a year. Now she is happy and indebted to wards KVK. Ashaben Sanjaybhai Patel not only enhanced nutritional status of her family but also earned additional income from scale of surplus produce.