Inspiring Stories from Innovative Farmers










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Compiled and Edited by

Dr. Muttanna
Senior Research Fellow (SRF)
Centre for Agricultural Extension Policy, Public Private Partnership in Extension and International Centre of Excellence in Agricultural Extension
National Institute of Agricultural Extension Management (MANAGE)
Rajendranagar, Hyderabad- 500030, Telangana State, India
E-mail: muttanna.bk@gmail.com

Dr. Lakshmi Murthy
Deputy Director (Documentation)
National Institute of Agricultural Extension Management (MANAGE)
Rajendranagar, Hyderabad- 500030, Telangana State, India
E-mail: lakshmi@manage.gov.in

Dr. Saravanan Raj
Director (Agricultural Extension)
National Institute of Agricultural Extension Management (MANAGE)
Rajendranagar, Hyderabad- 500030, Telangana State, India
E-mail: saravanan.raj@manage.gov.in

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Department of Agriculture, Cooperation
& Farmers Welfare

Dr. S.K. Pattanayak
Secretary (AC & FW)

Message

India has made tremendous advancement in food production moving from a food deficit to a food surplus country, as a result of scientific research, innovations, technological advancements and developed extension services. Studies indicate that of late, many farmers are quitting agriculture due to various reasons and moving to cities in search of better livelihood. Often this is attributed to distress but there are many farmers who have been highly successful and flourishing despite the challenges and constraints. Through innovations and efforts, these farmers have not only transformed their own lives but that of others too. Documenting and disseminating success stories of farmers can inspire millions of farmers across India.

MANAGE has compiled the stories of different farmers with a view to inspire farmers to strengthen their belief in themselves and their own abilities.

I compliment and congratulate MANAGE for documenting and skillfully depicting the challenges of individual farmers who have tasted the fruits of success in the end.

(S.K. Pattanayak)

Acknowledgement

MANAGE would like to acknowledge everyone who contributed to the compilation of success stories of farmers. MANAGE extends sincere gratitude to all the farmers from different states of India for providing valuable information that helped us to strengthen the book considerably. Last, but most important, we also thank all faculty members and technical staff for their contribution during the preparation of this book.

Contents

The Millet Man of Telangana

Mr. Veer Shetty Biradar (44) is from Gangapur village, Jharasangam mandal, in Sangareddy district of Telangana State, India. He is a graduate and owns 13 acres of dryland and 5 acres of irrigated land. He grows sugarcane, chickpea, red gram, jowar, bajra, foxtail millet and finger millet.

Once, while travelling to Maharashtra, Mr. Biradar could not get any food to eat and suffered from starvation as a result. He started thinking of producing food for the future generations after coming back from Maharashtra.

He started growing millets and entered the field of value-added millet products under the technical guidance of Dr. C.L. Gowda, Deputy Director General, ICRISAT, and Dr. C.H. Ravindra Reddy, Director, MSSRF (M.S. Swaminathan Research Foundation), Jeypore, Odisha.

One of the reasons for focusing on value added millet products is the emergence of lifestyle diseases among the urban population and prevalence of junk food consumption among the youth. Keeping all these factors in mind, in 2009, Mr. Biradar started a value-added centre for millets in Huda Colony, Chandanagar, Hyderabad, Telangana, India, in the name of SS Bhavani Foods Pvt. Ltd. Within a span of seven years, his company developed 60 value-added millet products from sorghum, bajra, foxtail millet and finger millet.

He takes up millets in June-July with the onset of the south-west monsoon. He manages to get a good yield from millets (foxtail millet 3-3.5 quintals/acre, bajra 4-5 quintals/acre, sorghum 4-5 quintals/acre and finger millet 4-5 quintals/acre) with proper management practices at the right time even though his village receives meagre rainfall.

According to Mr. Biradar, millets are super foods for the future generation because the risk of pest and disease attack is comparatively low, except for bird damage. He believes a farmer and a jawan are the two eyes of our country. Keeping the farmer in mind, he started a Non-Governmental Organization (NGO) called Swayam Shakthi in Huda Colony, Chandanagar, Hyderabad. The NGO covers 1000 farmers from 8 villages from Sangareddy district. The main purpose of the NGO is to disseminate timely information to farmers and take new technologies to the doorstep of the farming community.

Mr. Biradar received technical guidance about millet processing, types of machinery etc. from Indian Institute of Millets Research (IIMR), Hyderabad, Telangana. He also started working with an Indian Council of Agricultural Research (ICAR) project called FARMER FIRST in collaboration with IIMR. He started another value-added centre (shop) on February 27, 2017, to expand the coverage of millet-based value-added products. He also delivered a seminar on "Underutilized crops for nutritional security" at MSSRF, Jeypore, Odisha, followed by a field visit to educate farmers in Odisha.

He believes all millet-based value-added products should be made available all the year round for everyone irrespective of the place. Mr. Biradar faced many challenges in his journey of developing millet-based value-added products and quotes the proverb "stones and sticks are thrown only at fruit-bearing trees" when remembering his journey. He earns Rs. 1 lakh per month from SS Bhavani Foods Pvt. Ltd.

Mr. Biradar's work has been acknowledged through several awards for his remarkable achievements in millets-based value-added products, including 'Best Farmer Award', from MS Swaminathan Research Foundation (MSSRF), Jeypore, Odisha in 2017, 'Dr. M.V. Rao Memorial Award' from Professor Jayashankar Telangana State Agricultural University (PJTSAU) in 2017 and 'Best Millet Misharayya Award' from Indian Institute of Millet Research (IIMR) Hyderabad in 2017. He earns Rs. 3-4 lakh annually from agriculture, apart from millet-based value-added products. In future, he wants to start ready-to-eat millet foods and wishes to cover maximum regions across the country.

Mr. Veer Shetty Biradar
Gangapur Village, Jharasangam Mandal,
Sangareddy District, Telangana State, India.
Mobile Number: +91 7702860613

Authors: Dr. Muttanna, Senior Research Fellow (SRF), Dr. Ravi Nandi, Program Manager FTF-ITT, Ms.Shakera Parveen, Program Executive, FTF-ITT, National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad- 500030, Telangana State, India.

Award – Winning Piggery Enterprise of Bijapur

Mr. Somanna Siddappa Bhasagi (39) is from Alamel village, Sindagi taluk, Bijapur district, of Karnataka, India. He started farming in 2009, before which he was a scrap merchant. In 2009, he purchased 2.5 acres of land, which yielded 40 to 45 tonnes of sugarcane per acre. In 2010-11, he leased 6 acres of land and continued the earlier subsistence farming system.

He was not satisfied with the market price of field crops and sugarcane and started thinking of trying innovative methods of farming instead of growing regular crops. That's when he got the idea of starting a piggery that could function with low rearing cost and high returns.

To start the piggery, he received training and guidance of Dr. L.K. Jayaramayya at Piggery Breeding Centre, Hesaraghatta, Bengaluru. After the completion of his training program, Mr. Bhasagi put his rich knowledge about pig rearing to practice and purchased 20 piglets from the same breeding centre on June 16, 2014.

He started a piggery at Alamel, equipped with the necessary facilities and with a shed size of 60"x100" for 20 piglets. To tackle the issue of frequent electricity cuts, he got a generator installed. He has placed particular emphasis on cleanliness, washing the shed twice a day to avoid diseases. All the waste from the pig shed is collected in a tank with a capacity of 8 to 10 litres and is diverted to the field and horticulture crops; in this way, he has reduced the usage of chemical fertilizers by 50 to 60 per cent.

To reduce the feed cost, he formulated a homemade concentrate feed for piglets using available grains such as corn, rice, wheat, groundnut, mineral mixture and salts in an appropriate proportion. In the morning, he gives concentrate feed to the pigs, and in the evening, he feeds

them semi-solid waste generated from nearby city restaurants. The litter size is 16-18 piglets per year.

He sells piglets at the rate of Rs. 3,500 per piglet to interested farmers. He also has a good market link for selling pork to Goa and in Hassan district of Karnataka. In the span of three years, he has increased the number of piglets from 20 to 200, with an annual turnover of Rs. 4 to 5 lakh.

Apart from pig rearing, Mr. Bhasagi purchased 4.50 acres of land in 2015 and started practising mixed cropping and inter-cropping. In order to make use of the space between two crops, he grew pumpkin and earned Rs. 2 lakh in a single season. He also cultivates commercial crops such as sugarcane and cotton. To regulate his income throughout the year without spending much on inputs, he started growing horticultural crops such as mango, guava and lemon. He also planted 110 coconut trees around the farm, which yield an average of 80-100 nuts per tree.

He gets Rs. 4.5 to 5 lakh net profit from farming, which is inclusive of piggery. In future, he wants to purchase land and is willing to expand piglets and horticulture crops, particularly vegetables. He wants to be independent and aims to be a role model for his fellow farmers. For his work, he was awarded the Progressive Farmer Award by the University of Agricultural Sciences (UAS), Dharwad.

He encourages the youth to take up agriculture and allied activities such as poultry, piggery, goat and sheep rearing, apiculture, horticulture, fishery and value addition in millets for increasing production and productivity at the farm gate instead of waiting for government jobs, subsidy, insurance and crop loans. Mr. Bhasagi sums it up perfectly when he says “farming is close to nature; the happiness and peace that we get from farming cannot be comparable to any other business in the world”.

Mr. Somanna Siddappa Bhasagi
Alamel (Village), Sindagi (Taluk), Bijapur (District)
Karnataka, India.
Mobile Number: +91 9845075311

Author: Dr. Muttanna, Senior Research Fellow (SRF), National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad- 500030, Telangana State, India.

Trendsetter of Cattle–Based Organic Farming in Andhra Pradesh

Mr. Gadde Satish (47), is a post-graduate in commerce and is from Seethampeta village, Denduluru mandal, Eluru, in West Godavari district of Andhra Pradesh, India. He continues farming even in the present scenario where many farmers feel that farming is not profitable any more, due to pests and diseases, stagnation of crop yields, shortage of labor and high cost of cultivation. He owns 16 acres of coconut plantation, cultivates paddy in 19 acres and corn in 20 acres. He also owns 37 buffaloes, including calves, heifers and adults.

He learned about cattle-based organic farming from his father and went ahead with it because he believes this is the best farming system and is environment friendly as well. He continued with the cattle-based organic farming system in the contemporary era in spite of the risk and uncertainty associated with it because he had observed the success of this farming system in his family since the 1990s.

According to Mr. Satish, dairy animals are part of organic farming systems because of the complementary and supplementary relationship between both enterprises. One of the many advantages of cattle-based organic farming is that there is no dependence on expensive chemical fertilizers, which leads to reduction in the production cost, which in turn saves energy and protects the environment in the long run.

He follows open grazing in the daytime, and during night-time, animals are tied in rows across the farm using a long rope; on alternate days, the rope is shifted a few meters ahead in order to change the resting place/position of the animals. This way, dung and urine of the animals is allowed for absorption by the land insitu. The farmyard manure, enriches soil fertility and reduces weeds. Mr. Satish says the availability of labour is a major problem, and to minimize this problem, he uses the basin method of irrigation for coconut orchards. Along with open grazing, he feeds paddy straw to the animals during lean periods of fodder. Flood irrigation through field canal allows for deep rooting of coconut trees and plant becomes stress tolerant.

Mr. Satish says that due to natural grazing, animals are not affected by fertility and reproductive problems. Since the whole milk is left for calves it is helping the calves to grow healthy. As per his experience, proper management practices lead to animals attaining maturity and conceiving at the age of 24 months, whereas in other cases, it may take a longer period. He grows 19 acres of paddy organically, without using any fertilizer and pesticides. He adds paddy residues in the soil to enhance the organic matter content, which helps build up soil microorganisms and increases soil fertility.

Paddy grown organically, once harvested is left in the field or insitu drying for a week, then heaped in one place and left for three months for curing. After threshing and winnowing, the paddy is stored for about a year, milled and sold as organic rice at a premium price. He believes the organic method of rice cultivation has additional nutritional value and taste compared to the inorganic method. He has good linkages with extension officers in agriculture and animal husbandry departments. He has also participated in several seminars and meetings related to farming and was awarded the Best Cattle-Based Organic Farming Practice award by Indian Council of Agricultural Research (ICAR)-Indian Institute of Rice Research (IIRR), Hyderabad.

He has been recognised as a progressive farmer and he is well known for his rich knowledge of organic farming. He does not hesitate in sharing his experience with farmers and other senior officers in agriculture and allied departments.

He believes that cattle-based farming is a way of life because of the credibility of the organic method of cultivation, reduced dependence on external inputs, minimum usage of labour and high market demand for organic products due to the emergence of lifestyle diseases. He has not encountered major pest attacks or diseases across his cropping pattern. He gets a premium price for organic rice, which starts from Rs. 80/- to Rs. 100/- per kg. He considers organic farming a culture and a tradition. In future, he wants to increase the number of buffaloes he owns from 37 to 60 for better income and sustainability.

Mr. Satish plans to work in collaboration with the tourism department to start agro-tourism and dairy tourism to educate and disseminate better farming practices. He has given valuable advice to farmers to not consider farming in terms of economic terms and monetary benefits alone but accept it as a sustainable way for the future generation. He believes every farmer should follow the integrated way of farming as this results in complementary and supplementary methods that enhance the productivity of crops.

Mr. Gadde Satish
Seethampeta (Village), Denduluru (Mandal), Eluru,
West Godavari (District), Andhra Pradesh, India.
Mobile: +91 9912511244

Author: Dr. K. Uma Rani, Director (Retd.), National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad-500030, Telangana State, India.

The Spice Rich Farmer of Karnataka

Mr. D.M. Ramesh (59), is from Daradahalli village, Mudigere taluk, Chikkamagaluru district, Karnataka, India. He has studied up to the pre-university level. He currently owns 15 acres of land and grows plantation crops such as coffee, pepper and areca nut.

According to Mr. Ramesh, the manner in which we grow in a society depends on the environmental condition of a particular area. He has a deep interest in farming because his ancestors used to practise cultivation. He wanted to cultivate plantation crops but he did not possess his own land due to absolute poverty and hence could not achieve his dream. He shifted from Coorg to Mudigere in search of a job. He started Seetha Bangles Store in the year 1987 in Mudigere to earn his livelihood.

After a couple of years, he got married and entered the timber business to increase the family income. Though he earned sufficient money from the timber business, he was not satisfied and discontinued working in it. Later, he purchased 15 acres of land in Daradahalli and started cultivating coffee, pepper, banana and areca nut in the year 1995. For five years, he got a good yield, which brought him immense happiness.

However, between the years 2002 and 2008, coffee rates decreased drastically from Rs. 3,500/- to Rs. 700/-. Even though he faced multiple hardships in this time, he did not quit farming. He continued because he strongly believed that farming would never fail him if he worked hard and with devotion. He left the city and started living at the farm from 2004 onwards to fully focus his efforts on farming; by this time, his bank loan increased to around Rs. 40 lakh.

He continued farming while facing the ups and downs of life during the bad period. From 2008 onwards, he started getting a good price for coffee, pepper and areca nut. He started repaying the bank loan in instalments with some assistance from the government. According to Mr. Ramesh, an average of 60-80 inches rainfall is needed for the cultivation of pepper, and special care should be taken for pepper leaves from June to October in order to avoid exposing them to heavy rainfall, and

from March to May, adequate irrigation should be provided through sprinklers.

He used Farm Yard Manure (FYM) for the effective growth and development of plantation crops. He used Bordeaux paste 2.5 feet above the ground level and applied neem cake and Trichoderma to protect the crops from pathogens. He also applied chemical fertilisers in the months of June and September, which ranged from 400 to 500 grams of NPK per pepper plant. Pepper plants are known to get the leaf spot disease during heavy rainfall; to tackle this, he took preventive measures by using a spray of Bavistin (Carbendazin 50% WP). He also took up the advisable application of Thimet to avoid root diseases.

Mr. Ramesh believes that an experienced farmer is a real agriculture scientist. He mentions that the pepper plant is very sensitive, and special care should be taken at almost each stage of its growth. He

gets 8 1/2 tonnes of pepper, 450 bags of coffee and areca nut per year and is earning around Rs. 40 lakh as his annual income. He attributes his success to hard work, taking right decisions at the right time and applying scientific practices for cultivating crops.

He was awarded the Progressive Farmer award by the University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka, and he also received the Best Farmer award from Black Gold League (BGL), a Pepper Growers Training Institute in Mudigere, Chikkamagaluru. Mr. Ramesh believes that farmers do not need more than 50 acres of land for successful farming; they need dedication and continuous efforts. He also suggested that the youth "take up agriculture and allied activities and preserve our ancestral occupation for future generations".

Mr. D.M. Ramesh
Daradahalli (Village), Mudigere (Taluk),
Chikkamagaluru (District), Karnataka State, India.
Mobile: +91 9242144019/ +91 9480738978

Author: Dr. Muttanna, Senior Research Fellow (SRF), National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad - 500030, Telangana State, India.

The Way Forward for Sustainable Agriculture

Mr. S. Sukhdev Singh (60), is from Bhullar Bet village in Kapurthala district of Punjab, India. He studied up to matriculation and has been practising agriculture since his childhood. The land he inherited was barren, saline with no irrigation facilities and yielded very little. Under the land reclamation programme, he witnessed a tremendous improvement in soil fertility with gypsum application.

Earlier, he followed the traditional paddy-wheat cropping system. With improvement in soil fertility, he switched to other crops, such as sugarcane, potato, mustard, berseem and maize etc. Gradually, through sheer hard work, his income from agriculture started increasing. Now, he cultivates 74 acres of land, growing diversified crops. He has become a perfect example of a rags-to-riches story.

He was trained under extension centres of Punjab Agricultural University, Ludhiana, and Farm Advisory Service Centre (FASC), Kapurthala. With his rich knowledge of agriculture and allied sectors, he got inspired to cultivate improved varieties of crops. His production of wheat, maize, rice and sugarcane increased manifold with the cultivation of improved varieties of PAU, Ludhiana. Now he regularly participates in extension programmes such as kisan melas, field days and crop seminars organised by extension centres of PAU.

He irrigates crops through the underground pipeline system to cut down on losses through evaporation. To prevent distress sale in the market, he stores his agriculture produce, such as basmati and maize, in storage structures to sell in future at a higher rate. As a tech-savvy farmer, he utilises his smartphone and the Internet for getting latest rates from agri-markets, weather information and advanced agri-tech on different websites and shares the information with his fellow farmers for mutual benefit.

Mr. Singh experiments at his farm and shares the results with scientists. He has observed the effect of alternate wetting and

drying of wheat and concluded that it enhances germination, tillering and productivity. In compliance with the orders of the district administration, he sows wheat on 15 acres and oats fodder on 5 acres with Happy Seeder every year. Therefore, he does not burn the paddy straw but rather ploughs it back into the soil to improve the environment and soil fertility and attain sustainable productivity.

He has an uncanny flair for growing diverse crops such as wheat, rice, basmati, oats, turmeric and marigold. This cropping pattern fetches him a gross annual income per acre of Rs. 30,000/- from wheat, Rs. 40,000/- from rice, Rs. 27,000/- from basmati, Rs. 40,000/- from maize, Rs. 20, 000/- from oats, Rs. 2,40,000/- from turmeric and Rs. 30,000/- from marigold cultivation.

He also maintains a dairy enterprise comprising 9 milch animals. Four buffaloes and five H.F. Cows produce about 126 quintals of milk per annum. After sparing milk for domestic consumption, the surplus milk is sold to dairy units, which fetches him an annual income Rs. 3,78,000/-. Mr. Singh has been bestowed with Dalip Singh Dhaliwal Memorial Award for crop diversification by PAU Ludhiana in 2017. He is a successful amalgamation of modern farming using agro-technologies, economic prosperity and human values combined with simplicity, thriftiness and knowledge.

Mr. S Sukhdev Singh Bhullar
Bhullar Bet (Village), P O Nurpur Lubana
Kapurthala (District), Punjab, India.
Mobile: +91 9814565706

Author: Dr. Pardeep Kumar, District Extension Specialist (Agronomy), Farm Advisory Service Center, PAU, Ludhiana, Punjab, India.

Rural Entrepreneurship through Amla Farming

Mr. Amar Singh, aged 60 years, is an inspiration to all cereal and pulses farmers in Rajasthan who want to venture into horticulture and improve their income. His hard work and dedication has led to his success story being shared all across Rajasthan.

Mr. Singh once came across a leaflet about Amla farming at an agriculture exhibition in the state. After reading about the health benefits of amla, he was so inspired that he decided to plant amla trees in the year 1997. Prior to that, he had plum trees in his field. He bought 60 plants at a cost of Rs. 1,200 from the Horticulture department in the Bharatpur district and planted them in his 2.2 acres of fertile land. After one year, he purchased another 70 plants and included them in his nursery. He maintained the fertile land with good irrigation facilities, and within a span of 4-5 years, the trees were ready and started bearing fruits. Some trees bore 5 kg fruits, while some bore up to 10 kg. Within a year, he started receiving an income of Rs. 7 lakh. Between the horticulture plants, he also took up the cultivation of green peas, tomatoes, brinjal and green vegetables to supplement his income.

Mr. Singh's enterprising nature has not only generated employment in the village, but it is also an example of women empowerment. He has employed village women in his Murabba preparation unit. The turnover of his business is around 26 lakh in one season from August to February. He is keen to learn new things and never misses an opportunity to interact with experts in the agriculture and animal husbandry fields whenever he meets them in the village or at the panchayat, where he makes frequent business visits.

The Amla fruits from his field used to be sold at Rs. 2-3 per kg even though they were of the best quality. At the same time Mr. Singh observed that amla murabba was being sold for a much higher price compared to the fruits. Assured market and remunerative prices led

him to start processing amla fruits for the preparation of murabba. He started visiting murabba factories near Bharatpur district and observing the procedure of murabba preparation. He gathered a wealth of information through keen observation and his interactions with murabba factory owners, workers and traders.

Initially, he employed 25 workers from the Hathras district in Uttar Pradesh to work in the processing plant. He had to travel from village to village to market his produce initially as he had no linkages. Gradually,

he developed contacts with big traders in Bharatpur district and started supplying murabba to them in bulk quantities.

Mr. Singh regularly invests 40 percent of the profits into farm mechanisation. He has set up a solar unit, a compost pit and a gobar gas unit on his farm. He also has six buffaloes, including two milking, two dry and two buffalo calves. The milk is used for home consumption and the cow dung is used for the gobar gas plant.

Mr. Amar Singh being felicitated by then Chief Minister of Rajasthan Shri. Ashok Gehlot

Marketing was another challenge for Mr. Singh as he observed that big amla would fetch Rs. 10 per kg, while small amla would fetch somewhere around Rs. 5 to Rs. 8. Initially he got good rates, but gradually the demand started to dwindle and he had no option but to sell his fruits to traders at wholesale prices. He received training in murabba preparation from a private foundation. In 2005, he started his own factory with an initial investment of Rs. 5 lakh. In the first year, he managed to prepare around 7,000 kg of murabba, for which he employed several village women. He sold the murabba under the brand name "Amruta" in Rajasthan in Kumher, Bharatpur, Tonk, Dig, Mandawar and Mahua.

Mr. Singh travelled to many places, such as Mathura in UP, Bhusawal in Maharashtra and Bharatpur in Rajasthan itself, in search of a market. Slowly and steadily, his business expanded, and in 2015, he produced 400 quintals of murabba. Meanwhile he also got the license from Food Safety and Standards Authority of India (FSSAI) to sell processed murabba. In 2012, he re-registered his unit and named it "Amar Mega Food Pvt. Ltd". Presently, his company is involved in growing, processing, packaging and transporting. He takes a keen interest in every step of the production process. Even after getting a turnover of around Rs. 26 lakh every year, he manages to stay simple and rooted.

After earning a big fortune from amla processing, Mr. Singh now wants to diversify and has decided to venture into goat farming. He has purchased 10 Berari goats. He says that Berari goats do not make much noise and can be stall fed. He was introduced to this idea when he accidentaly picked up his son's smart phone once and found a video about the income and growth in goat farming, and it struck a chord with him.

Mr. Amar Singh
Penghore (Village), Kumher (Panchayat)
Bharatpur (District), Rajasthan.
Mobile No.: 9982566104, 8003114663

Authors: Dr. M.A. Kareem, Deputy Director, Dr Shahaji S. Phand, Assistant Director and Dr. Madhusudan Borade, Senior Research Fellow (SRF), Centre for Extension in Agri-Allied Sectors(EAAS), National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad- 500030, Telangana State, India.

All is Well in Integrated Farming

Mr. Muttappa Pujari (45), from Hasanapur village, in Gulbarga district of Karnataka State, India, studied up to the 5th standard. He has a family that includes two sons and three daughters. He owns 8 acres of land, and he also owns two oxen and two goats. He grows red gram, cotton, ginger, flowers and leafy vegetables in the Kharif season. Immediately after harvest of the Kharif crops, he takes up wheat, chilli, chickpea and sorghum for the Rabi

Mr. Pujari has been farming since childhood, and he wants to continue with the integrated farming system in a contemporary situation, where loss in one crop can be substituted with the other enterprise. He has good contact with fellow farmers and Input Dealers, facilitating a healthy exchange of information. He has considerable mass media exposure as he listens to the radio, watches the television and reads Kannada newspapers regularly.

Mr. Pujari believes that the beauty of the mixed farming system is that he gets most of the ration from his own farm. According to him, the supplementary and complementary relationship between the enterprises generates more income for farmers. He is the only farmer in the village to take up 10 different crops on 8 acres of land. He has a house but he has stayed on his farm for 8 years in order to commit to improving the land for a higher yield.

He is of the opinion that farming can be successful when one takes the right decision at the right time and puts in considerable hard work. He grows tomatoes on 0.5 acres of land, and with effective management, he gets a yield of 10 tonnes. Mr. Pujari says that the availability of labour is the biggest challenge in a rural area, because of which he wants to purchase new machinery to substitute labour force for a better yield and help reduce the drudgery that farm women face. He gets Rs. 200 to 300/- on a daily basis by selling leafy vegetables in his own village.

To avoid losses due to middlemen, he travels from village to village to sell vegetables and chilli when the market price falls due to a glut. He says farming gives him self-confidence and a considerable income to run his family and maintain a comfortable living standard.

Mr. Pujari gets Rs. 4 to 5 lakh net profit from his 8 acres of land. He is confident that if he has access to proper electricity and irrigation during the summer season, he would be able to increase his income considerably. Apart from agriculture, he purchased two goats worth Rs. 3,500/-, and within two months, he sold them for Rs. 7,000/-, with a profit margin of Rs. 2,500/- after deducting the expenditure. He draws parallels between farming and catching fish through a net: you need to look over each and everything for effective implementation at a farm level in order to increase production and productivity.

According to him, having credit at hand while making decisions gives farmers confidence. He believes farming is remunerative and that it is correlated to socio-economic events of everyday life. Every year, the cattle festival is conducted near his village during the festival of Makar Sankranti. To make use of this opportunity, he purchased two oxen and sold them within four months for Rs. 58,000/-, making a profit margin of Rs. 21,000/- after deducting expenditure. In addition to that, he got two tractors of cow dung as organic manure.

In future, Mr. Pujari plans to start commercial goat, poultry and fish farming in partnership in order to increase his net income. He relates farming to interest and zeal rather than literacy and believes that one needs to take calculated risks in order to make profits by increasing production and productivity.

Mr. Muttappa Pujari
Hasanapur (Village), Kalaburagi (Taluk),
Gulbarga (District), Karnataka, India.
Mob: +91 9731680384

Author: Dr. Muttanna, Senior Research Fellow (SRF), National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad- 500030, Telangana State, India.

Integration in Farming leads to Prosperity

Mr. Manjanna T.K. is from Thimmalapura village, Tiptur taluk, in Tumkur district of Karnataka State, India. He owns 0.8 ha of land. He grows field crops such as ragi and red gram, horticultural crops such as banana, mango and coconut, and he also maintains a nursery and does bee-keeping, along with owning one milch cow. He is a hard worker who was self-motivated to take up a new initiative for profitable agriculture.

Mr. Manjanna lacked technical and scientific knowledge about agriculture and allied activities. With the intervention of the IFSD project through KVK (Krishi Vigyan Kendra), Konehalli, Tumkur, he could be initiated into Integrated Farming System (IFS) because of the complementary and supplementary nature of his agricultural produce.

Before taking up the integrated farming system, he used to cultivate crops in a traditional way. After the KVK intervention, he has been able to practise agriculture with modern plant protection methods such as the use of balanced fertiliser, weed and water management and integrated pest and disease management. Owing to these factors, now he gets a good yield and has witnessed increased production and productivity of crops.

Mr. Manjanna used to grow coconut as a sole crop earlier. To make use of the land in between trees, he started growing Jasmine and Chrysanthemum as an inter-crop in an area of 20 guntha, which gave him additional income. Keeping in mind the advantages of the integrated farming system, he started growing red gram (BGR-1) and chilli in between rows of mango. He wanted to use every inch of his land in a proper way. So, he started growing banana (G-9) in 20 guntha as an inter-crop in a coconut orchard. Looking at the adequate availability of flora and fauna in his garden, he started

keeping beehives, which helped in the pollination of plants as well. He used pheromone traps in the coconut orchard to control the damage from rhinoceros beetle. For better growth of the plants, he used compost and Trichoderma.

Crop/Activity	Area (ha)	Yield (qt)	Total income (Rs.)	Expenditure (Rs.)	Net icome (Rs.)
Banana	0.5	2.5	80,000	30,000	50,000
Chrysanthemum		22	1,21,000	30,000	91,000
Coconut	--	2.5	20,000	6,000	14,000
Jasmine	--	6	99,000	25,000	74,000
Mango	0.3	3	15,000	4,500	10,500
Dairy	-	2,550 litres	51,000	9,000	42,000
Total	0.8		3,86,000	1,04,500	2,81,500

Economics of farm activities

Due to non-availability of labour in his area, Mr. Manjanna purchased machines such as weeder and coconut climber for the smooth running of inter cultural operations and for plucking nuts from coconut trees.

After establishing the integrated farming system, his net income increased to Rs. 2, 81,500/- annually in his 0.8 ha land. He has become a role model for fellow farmers in the Tumkur district of Karnataka. His plan for the future is to expand IFS by purchasing land and inculcating the value of agriculture among youth who are quitting agriculture.

Mr. Manjanna T. K.
Thimmalapura (village) Tiptur (Taluk) Tumkur (District),
Karnataka, India.
Mobile number: +91 9741365466

Authors: Mr. Shankara M. H., Scientist (Agricultural Extension), Dr. Mamatha B, Scientist (Soil Science), Dr. Sukanya T. S., Senior Scientist & Head, ICAR- KVK, Konehalli, Tiptur, Tumkur. University of Agricultural Sciences, Bangalore, Karnataka, India.

The Sweet Taste of Success with Bee-Keeping

Mr. Bhoopalaksha (49), is from Kenchanahalli Pura village, Alur taluk, in Hassan district of Karnataka, India. He owns 7 acres of land and follows a mixed farming system of cultivation (Agri+Horti+Pasture). In the monsoon season, he used to grow paddy, maize and horticulture crops such as chilli, ginger, coconut, mango, sapota, guava and banana and earmarked a considerable portion of farming area to cultivate vegetables for household consumption.

In his childhood, he started developing a passion for bee-keeping. His interest increased when his saw his family members get involved in collecting honey from different parts of Hassan district. After completing matriculation, his passion for bee-keeping turned into his profession, along with agriculture.

To start bee-keeping professionally, in 2006, he received training and guidance from Punyabhoomi, an NGO in Alur. During the training program, he was given a bee box to maintain. His acquaintance with Mr. Shanthiveer, a resource person from the programme, augmented his interest in bee-keeping. Subsequently, in the year 2008, he consulted Krishi Vigyan Kendra (KVK), Hassan, to gather additional information on scientific bee-keeping as well as valuable management practices. Over a period of time, he attended various training programmes on scientific bee-keeping. With this technical knowledge and expertise, he ventured into the profession and earned additional income along with agriculture and allied activities.

2014-15 onwards, Mr. Bhoopalaksha started participating in a vocational training programme on bee keeping, organised at KVK, Hassan, both as a participant as well as a resource person. During the training programme, he acquired the skill of multiplication of bee colonies. He successfully adopted the technique, and now he

is capable of multiplying a single bee colony into 5-6 bee colonies during the season and supply them to bee-keepers. He also assists 100 bee-keepers in Channarayapatna, Arsikere, Gubbi, Tumkur, Chikkamagaluru, Madikeri and Mangalore. Annually nearly 2,000 farmers and students visit his farm to gain technical knowledge on bee-keeping. From this subsidiary enterprise, he gets 50 kg of honey annually and sells it at the rate of Rs. 600/kg and 50 bee boxes along with bee colonies at the rate of Rs. 4,000/box. Hence, this enterprise fetches him an annual income of more than Rs. 1,40,000/-.

For successful integration of his farm enterprises, the members of his enterprise were awarded the "best farm women" award at the Taluk level during 2014-15 Krishimela at the University of Agricultural Sciences (UAS), Bengaluru. In 2015-16, he was also honoured as Karnataka Rajyothsava Prashasthi by the Department of Horticulture, Karnataka, and they also provided him with 25 bee boxes under Madhuvana Yojane.

Mr. Bhoopalaksha has started motivating his fellow farmers to take up bee-keeping. He is not only a successful farmer in apiculture, he is also a resource person in the field whose services are utilised by various agencies, such as KVK-Hiriyur, KVK-Hassan, All India Radio (AIR)-Hassan, Samaya-Television, NGO-Punyabhoomi etc. for offering training and guidance on bee-keeping. His plans for the future include expanding his bee-keeping business with more number of bee boxes. He also wants to train the youth and encourage them to work in agriculture and allied sectors.

Mr. Bhoopalaksha
S/o Rudraiah
Kenchanahallipura (Village), Alur (Taluk),
Hassan (District), Karnataka, India.
Mob: 9591256671

Authors: Dr. H. K. Pankaja, Assistant Professor (Agril. Extension) and Dr. Preethi, Senior Research Fellow (SRF), Distance Education Unit, Directorate of Extension, University of Agricultural Sciences (UAS), GKVK, Bangalore, Karnataka, India.

Farmer Converts Adversity into Opportunity

Mr. Hari Babu is a farmer who enjoys agriculture and who chose to be a farmer even though he has talents in other fields, such as journalism, cinema etc. Farming is very close to his heart. Mr. Hari Babu owns 10 acres of land near Hyderabad. The land is well connected to the Thimmapur village, Rangareddy district and is on the main road, but it faces some disadvantages in that the soil is poor and water availability is inadequate. Owing to his passion for agriculture, he converted these 10 acres into a heaven on earth. He planted as many as 9,000 trees belonging to 90 different species. These include rare and valuable forest plants such as red sanderwood, sandalwood, rosewood and horticulture plants such as seetaphal, rose apple, star fruit, mango, guava. The farm also has medicinal plants such as Ashwagandha, Sarpa Sarika etc.

No Chemical Farming

The success model adopted by Mr. Hari Babu is the Integrated Farming System. He has six cows, whose dung and urine is converted into Jeeevamrutham, which is used as a fertiliser for the plants. He never uses chemical fertilisers or pesticides; he follows only natural methods of agriculture.

There are more than 300 hens freely moving in his garden, and according to Mr. Hari Babu, these hens are great in controlling pests as they eat most of them, including termites.

Key to success for his farming

He has achieved success with his farm due to several factors, including personal involvement and close supervision, high density plantation,

regular pruning and training of all horticulture plants, reduced input cost by integrating cows and backyard poultry, growing unconventional plants and varieties to get better prices, for example, dragon fruit, rose apple and star fruit, which are not common in Hyderabad. He plans long-term gains through plants such as sandalwood and red sanderwood as well as short-term profits though guava, medicinal plants etc.

Mr. Hari Babu ensures he has sources of income apart from agriculture, such as selling grafts, cuttings etc. He multiplies plant material for his own use to ensure quality and reduce cost. He plans for continuous income throughout the year and undertakes direct marketing of fruits and other produce.

While his neighbours do not make profits from agriculture, Mr. Hari Babu gets profits because of proper crop planning based on limitations of soil and water resources, personal involvement in all field operations and following modern practices clubbed with traditional intelligence.

He is an example of a successful farmer and has proved that wonders can be done in agriculture if investments are made in the right direction and farmers are equipped with the latest knowledge. Mr. Hari Babu's net income for each acre is approximately Rs. 1,00,000 per annum.

Mr. S. Hari Babu
Plot No. 372B, III Phase, Road No.81, Jubilee Hills
Hyderabad - 500 033.
Mobile: 9441280042

Authors: Ms. K. Naga Rani, (Consultant) and Ms. T. Baby Rani, (Former Consultant), National Institute of Agricultural Extension Management (MANAGE), Rajendranagar, Hyderabad-500030, Telangana State, India.

Success in Agriculture Leads to Success of Ecosystem

Mr. Narinder Singh (54), S/o Mr. Ram Chander, is from Uchana Village, Karnal District, Haryana, India. He graduated as Master of Social Work (MSW) in Labour Law and Human Behaviour. Even though he is educated, he did not want to pursue his career in the service sector. Since his childhood, he has been passionate about agriculture and allied sectors. During his school days, he used to maintain a small bee hive using his pocket money, which was indicative of his interest and passion towards farming. Mr. Singh started his career with Sanjeevini Drug De-Addiction Centre. After working for a few years, he realised he was not satisfied with his job, and he decided to take up agriculture and allied activities.

He started meeting people to understand different agriculture practices and improve his knowledge; his passion and interest widened when he met Mr. Dharmpal, a horticulture officer, during a training programme on horticulture crops in Pune, Maharashtra. Soon after the training program, Mr. Singh purchased pomegranate seedlings and planted them in his field. He is not only interested in making a profit for himself, he has also disseminated the pomegranate variety across Haryana.

He wanted to diversify his farm from the routine rice-wheat farming system. With this intention, he started a horticulture nursery from 1990 onwards. In the nursery, he took up horticulture crops such as apple, jamun, pear, peach, sapota, guava, mango, litchi and so on. He was the first person to introduce apple in Haryana, and he named it "Rana Gold Apple" and started selling apple seedlings. He is also known as the "Apple Man of Haryana". Along with the nursery, he took up other allied enterprises, such as bee-keeping, crop production, vermi-compost and so on. He maintains 15 cows that yield 180 litres of milk per day. He also maintains 350 beehive boxes that provide 27-30 kg of honey. He believes the complementary and supplementary relationship of enterprises generates higher income for farmers.

Due to his rich knowledge and expertise in bee-keeping and breeding, he started educating fellow farmers. In 1992-93, he also supplied bee boxes to the Government of Gujarat as part of the Narmada Project. His advice of keeping bee boxes in orchards led to a 15-20 percent increase in the yield. Seeing his remarkable achievements in agriculture and allied sectors, ICAR-NDRI (National Dairy Research Institute), Karnal, awarded him the Best Bee-keeper in Haryana State award.

He has also been awarded 'Progressive Farmer' by All India Radio (AIR), Rohtak. He has been part of several television shows about bee-keeping and apple production practices, and he has motivated the farming community to attract and retain youth in the agricultural sector. His future plan is to increase his area under orchards. According to Mr. Singh, "a diversified farming system is like flower plants of different colours in a beautiful garden".

Mr. Narinder Singh
S/o. Mr. Ram Chander
Uchana, Near Karan Lake (Village),
Karnal (District), Haryana, India.
Mobile: 9416112157

Authors: Dr. Rakesh Kumar, Principal Scientist (Agronomy) and Mr. Prasanna S. Pyati, Ph. D. Scholar, ICAR- National Dairy Research Institute (NDRI), Karnal, Haryana, Inida.

Every drop counts

Mr. Sigicherla Chenna Reddy (48), is from Lakkasamudram village, Talupula mandal, Anantpur district, Andhra Pradesh, India. He owns 15 acres of ancestral land and has been passionate about agriculture since his childhood, which is when he started observing frequent drought and adverse climatic conditions in Anantpur district of Andhra Pradesh.

He always wanted to try innovative methods of water application to save crops during the drought. Mr. Reddy says "just like little drops of water and tiny grains of sand make the mighty ocean, drop by drop, water makes its way into soil down to the roots and makes an ocean of difference".

Mr. Reddy says drip irrigation is an efficient way of irrigation for crops when there is limited availability of water. Earlier, he was using the flood method of irrigation. During that time, the bore well would dry up in one season, and he would not able to irrigate in the next season. He realised that the sprinkler and drip irrigation method saved crops in a drought situation. He was the first person in his village to drill a bore well in early 1998 for irrigating crops, and then he started saving water by adopting three sets of sprinklers in 2004 and two sets of drips in 2011. He used sprinkler and drip irrigation for crops such as groundnut, Bengal gram and black gram.

Ever since he has adopted the drip irrigation method, he has been able to manage a whole year without any scarcity of water. He not only cultivates agricultural crops such as groundnut, Bengal gram and black gram, but he also grows vegetables such as dolichos bean and fruit crops such as watermelon. He also maintains floriculture in one acre of land by cultivating Crossandra with the help of drip irrigation. Due to all this, he has been able to generate a regular income for his family.

From 2014 onwards, he started applying fertilisers through drip systems (fertigation). He applied micro-nutrients such as Boron and calcium ammonium nitrate for the effective growth of plants, and subsequently, he started cleaning drip pipes using acid. He followed crop rotation every year to restore soil fertility, and he also planted

Sesbania around and in between Crossandra, which acts like a shelter belt. With this, he started getting additional income ranging from Rs. 120-200/ per kg of seeds.

The main factors that have contributed to his success are his interest in and passion towards advanced technologies. Due to proper management practices in the process of taking care of the crop, he has never seen the popping of nuts in groundnut. He grows ground nuts in mango and black plum orchards for effective land utilisation. Due to unavailability of labour during the lean season, he started using a tractor for inter-cultivation operations, and he also uses a seed-cum-drill fertiliser. His plan for the future is to cover his entire land under drip irrigation and increase floriculture cultivation. To meet the demand for flowers in cities he has also been quick to adopt new drip irrigation technologies. He believes agriculture is remunerative when we take intelligent decisions. He adds that the young generation should give agriculture a try and aim for sustainable development.

Mr. Sigicherla Chenna Reddy
Lakkasamudram (Village), Talupula (Mandal),
Anantpur (District), Andhra Pradesh, India.
Mobile: 9676468687

Authors: Ms. Madhulatha C. Research Scholar and Dr K.S. Kadian, Principal Scientist & Head, Division of Dairy Extension, ICAR-National Dairy Research Institute (NDRI), Karnal, Haryana, India.

More Crop per Drop

Mr. Manjeet Singh Saluja (51), is a well-known progressive farmer from Rajnandgaon district, Chhattisgarh State, India. He has been involved in farming along with his father since the age of 20. From the beginning itself, he was keen to learn and adopt new production techniques. This passion led to him adopting drip irrigation when it was introduced in agriculture.

He got a field automated drip irrigation system, Netajet, installed for vegetable cultivation in his farm. Presently, he is cultivating exotic varieties of vegetables and fruits on 25 acres of land on an experimental basis.

He has dabbled with this technology for both vegetables and cereal crops. His specialisation and experimentation extended to fruit cultivation, and he adopted crop rotation and Farm Yard Manure (FYM) use and kept the field fallow from March to June every year in order to maintain soil fertility. He also adopted integrated pest and disease management.

He has carried forward the legacy of his father by maintaining records of income, expenditure, production and sales management of each and every crop.

Over a period of time, he started facing labour problems at his farm due to high wages of agricultural labourers. In order to overcome this problem, he motivated those working on his farm to become working partners in his business. Though the response was not very encouraging initially, with time, it got significantly better and he was able to solve the problem of shortage of agriculture labourers.

In addition to commercial farming, he maintains a kitchen garden. He started growing organic vegetables at his farmhouse in Rajnandgaon. In the initial years, he shared the produce with his friends and relatives, and based on their feedback regarding quality and taste, he expanded it on a commercial scale.

As the consumer base increased for fresh farm produce, he opened a retail outlet on the field itself and started selling produce to consumers at a reasonable price. Eventually, he started spreading awareness about the importance of agriculture and convinced people that agriculture too can be remunerative.

His hard work and continuous efforts were awarded and appreciated by the Agriculture Department, Rajnandgaon, at "Krishak Samman Samaroh" and "Progressive Cultivation Practice in Chilli" by Spices Board of India, Cochin, in 2003.

In 2013, he was awarded the "Krishi Samrat Samman" for West Zone, organised by Mahindra Agri Tech. In 2013, he was honoured for being an "Innovative Farmer" by the Department of Agriculture at Krishi Vasant, an agriculture fair organised by the Ministry of Agriculture, GOI, and Government of Maharashtra at CICR, Nagpur. He is a member of the National Horticulture Mission, Rajnandgaon (CG), and Agriculture Technology Management Agency (ATMA), Rajnandgaon, which has enabled him to share his knowledge and experience with other farmers and agriculture officers in programmes arranged by these organisations. His plan for the future is to expand the area of cultivation for crops that witness good yields.

Mr. Manjeet Singh Saluja
Rajnandgoan (District), Chhattisgarh, India.
Mobile: +91 9425295224

Author: Dr. P. Kanaka Durga, Assistant Professor, National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad- 500030, Telangana State, India.

Crop Diversification is the Way Forward in Punjab

Mr. Sarwan Singh Chandi is from Boolpur village, Kapurthala district, Punjab, India, and has studied up to graduation, after which he started agriculture as a career. He wanted to do something novel in the field of agriculture. He received 14 acres of land from his ancestors and purchased 16 acres of land on lease. He observed the declining water table every year due to the monoculture of the rice-wheat farming system in Punjab. From his frequent contact with Punjab Agriculture University (PAU) scientists, he found out about diversified farming system. He started diversified farming on 30 acres of his land comprising various combinations of field crops such as cereals, pulses, fodder crops, floriculture, oilseeds, bee-keeping, fruit cultivation. He also got a drip irrigation system installed for vegetable crops to aid judicious use of irrigation facilities.

In the kharif season, he grows paddy, basmati, fodder, pulses and onion, which give him a gross income of Rs. 9,50,250/-. The diversified cropping pattern helps him generate an income of Rs. 3,29,000/- from wheat, Rs. 3,15,000/- from potato, Rs. 40,000/- from pulses, Rs. 2,50,000/- from bell pepper, Rs. 18,000/- from sunflower, Rs. 60,000/- from Barseem and Rs. 25,000/- from Marigold. His total income is Rs. 10,37,000/- during the rabi season. Had he grown wheat on 30 acres, he would have generated a total income of Rs. 8,98,909/-. The diversified cropping system fetches him an additional income of Rs. 1,38,091/-. His pooled gross income from both seasons is Rs. 19,87,250/- per annum.

Mr. Chandi has maintained a nutritious kitchen garden keeping in mind the health of his family members. He rears seven milch animals to meet domestic consumption and generate an additional income (Rs. 3,000/- per day) through the sale of surplus milk.

He underwent training in bee-keeping and purchased 50 boxes of bee hives. In the very first year, he produced 350 kg of honey, which motivated him to work with more zeal. Later, he got his honey certified (Agmark) from the Government of Punjab and Government

of India. He got trained in modern packing techniques from Punjab Agricultural University, Ludhiana, and started selling his honey under the name "Lion brand honey". He maintained regular contact with the University and agricultural experts and started his own honey processing unit in 2011.

He was awarded by the Agriculture Minister, Mr. Chaudhari Ajit Singh, on behalf of the co-operative department at a state level function in Sangrur in the year 2002. He received the Chief Minister's Award in March 2008 at the Kisan Mela held at PAU, Ludhiana. He has received many state and national awards as well. He won 52 prizes in crop competitions at various Kisan Melas organised in Punjab. He received the first prize for a record 14 times for producing good quality honey. He inspires other farmers to participate in Kisan Melas and Kisan goshtis etc.

He has provided self-employment opportunities to many farmers by training them in bee-keeping. Mr. Chandi's success has inspired other farmers through various multimedia channels. He has collaborated with many government and non-government organisations at the village level as well as the national level. His novel approach of progressive farming has pushed him on the path of economic progress. He has become a role model and a beacon of knowledge for the farming community to adopt diversification in agriculture for higher income and sustainability.

Mr. Sarwan Singh Chandi
Boolpur (Village), Nawan Thatta, Tehsil Sultanpur Lodhi
Kapurthala (District), Punjab, India.
Mobile: +91 9815293765

Author: Dr. Pardeep Kumar, District Extension Specialist (Agronomy), Farm Advisory Service Center, Punjab Agricultural University (PAU), Ludhiana, Punjab, India.

Dairy Farming Flourishes with Fodder Crops

Mr. G. Srinivasulu is from Narayanapuram village, Kalyandurg mandal, Anantapur district, Andhra Pradesh, India. A majority of the farms (90%) in Anantapur district are under dryland agriculture. Mr. Srinivasulu has been practising the dairy enterprise for 10 years in spite of the risk associated with it: 60-70% of the expenditure goes towards feed and fodder. The shortage of feed and fodder leads to decline in livestock population in Anantapur and thus it becomes non-remunerative for dairy farmers.

Mr. Srinivasulu was experiencing losses and incurring high costs in producing a litre of milk. He wanted to quit dairying because of huge losses and it was non-remunerative. Before quitting dairy farming, he approached the Smt. Lakshmi Devi Krishi Vigyan Kendra (KVK), Kalyandurg, to seek a scientific solution to these problems. After analysing his problems, KVK scientists inferred that he was incurring huge losses because his total expenditure was on fodder procured from outside.

The KVK scientists suggested that he grow a new and improved high yielding and drought-tolerant Hybrid Napier variety called Phule Jayawant (RBN-13). Initially, he took a few samples of Hybrid Napier and planted them in a 500 Sq.m area. Later, he multiplied and extended it in a 1 hectare area. With KVK intervention, Mr. Srinivasulu overcame green fodder deficiency and stopped buying feed and fodder from the market.

Now, he can manage around 95-120 tonnes of green fodder per year, which is sufficient for maintaining 8 dairy milch animals with minimum expenditure. Appropriate fodder cultivation enabled him to save up to 80% expenditure, besides getting a higher milk yield.

Mr. Srinivasulu started guiding his fellow farmers on fodder cultivation by sharing his experience. He also initiated sale of fodder to nearby

villages, which provided him additional income. He has become a role model in surrounding villages. So far, he has supplied fodder to nearly 25 farmers free of cost, covering an area of 20 hectares, which has contributed to improvement in milk yields and net returns for the farmers.

He is in regular touch with KVK, extension agents and Department of Agriculture for timely information regarding agriculture and allied activities. He is called an innovative farmer in his village because he is always quick to implement new technologies suggested by research institutes.

Earlier, he was spending Rs. 25,000/- for feed concentrate. With the intervention of a new and hardy variety, his expenditure reduced to Rs. 13,000/-, marking a difference of Rs. 12,000/-. With KVK's support and cooperation, he gets an additional income of Rs. 20,000/- per month. He utilises this additional income for his children's education and his family's healthcare. His plan for the future is to buy more animals and to set up a commercial dairy farm.

Mr. G. Srinivasulu
Narayanapuram (Village), Kalyandurg (Mandal)
Anantapur (District), Andhra Pradesh, India.
Mobile: +91 9494542720

Contributor: Acharya N.G. Ranga Agricultural University, Smt. Lakshmi Devi Krishi Vigyana Kendra (KVK), Kalyandurga), Andhra Pradesh, India.

Prosperous Dairy Farming through Crossbreeds in Karnal

The Arvind Dairy Farm in Nalvi Khurd village, Karnal, Haryana was initiated as an integrated livestock within a traditional agriculture farming system through the efforts of Mr. Pramod Khokhar. Later, his younger brother, Mr. Ravi Khokhar, joined him and is currently taking care of farm activities.

Mr. Ravi Khokhar wanted to change the family-based subsistence farming system to rearing crossbred dairy cows in order to diversify the farming. He underwent training at National Dairy Research Institute (NDRI) before starting Arvind Dairy Farm. He owns well-fed healthy crossbred cows and an automated milk collection system, a well-maintained cattle shed and a feeding area.

Currently, Arvind Dairy also has 30 crossbred cattle, and the milk is marketed to the nearby areas. The farm has also sold around 50-60 animals and currently has 80 percent dairy animals in the lactating phase. The peak yield of cattle ranges from 35-53 litres. Animals are fed a mixture of green and dry fodder consisting of berseem or oats and wheat straw thrice a day, along with some homemade concentrate (maize/wheat/barley + de-oiled cake + neembola) and a mineral mixture (200 gm per day per animal) for good health and quality milk.

Proper and timely vaccination is followed in order to maintain the sound health of the animals. Mr. Ravi follows NDRI's guidelines as per which there should be a 13-14 months calving interval among cattle. He credits the success of Arvind Dairy Farm to hard work and passion. As a result of this dedication, the farm has expanded from 30 to 80 crossbreeds with proper modern facilities for dairy animals.

Mr. Ravi was awarded 'Milk Champion' in 2015 at the Dairy Mela organised by National Dairy Research Institute (NDRI), Karnal. He has established good linkage and a proper market for selling milk to Nestle as well as the adjoining villages, sweet shops and also at various community functions as and when required.

In the future, he envisions rearing crossbreed animals on the farm that could produce milk yield of around 50 litres per animal per day. He believes that the most crucial thing required for a dairy farm is the supply of semen that is of good quality.

Mr. Ravi is constantly in touch with other farmers in the area and advises them on dairy farming. He is also informally associated with the Dairy Farmers Association, which is a network of dairy farmers in Haryana. In future, he wants to expand the farm with more pure Holstein Friesian, breeds on priority. His message to fellow farmers is "working with passion, focussing on purity of breeds and breeding with good quality semen will lead to a successful dairy venture".

Mr. Ravi Khokhar
Nalvi Khurd (Village), Karnal (District), Haryana, India.
Mobile Number: +91 9050660070

Author: Dr. B. S. Meena, Principal Scientist, Dairy Extension Division, ICAR - National Dairy Research Institute (NDRI), Karnal, Haryana, India.

Zero Budget Farming

Mr. Malleshappa Gulappa Biserotti is from Hiregunjal village, Kundgol taluk, Dharwad district, Karnataka, India. The Dharwad region of Karnataka is recognised as a transitional belt. Since 1990, the onset of monsoon rains in the area has reduced considerably and farmers have to fetch drinking water from nearby villages and face scarcity of water for agriculture operations. Under these difficult circumstances, Mr. Biserotti took up organic farming practices as an alternative method for crop production.

He has been continuously practising organic farming since the last one decade. He started organic agriculture practice by using Farm Yard Manure (FYM), compost and vermi-compost. Over four years of usage, he noticed his crops getting better and developed an interest in vermi-compost development and its continuous application. He started using liquid Jeevamrutha organic technique, a zero investment method in agriculture crop production, but the catch was that sufficient water was required to prepare liquid Jeevamrutha. With the water shortage situation in mind, he started experimenting with the use of solid Jeevamrutha and succeeded in raising crops over the last six years.

Solid Jeevamrutha is prepared from 10 kg cow dung from a local cow or ox, 250 gram pulse flour (any), 250 gram jaggery, 500 gram soil and 1.5 to 2.0 litres cattle urine. These products are mixed well and a heap is made under the shade and covered with a gunny bag for 24 hours. The next day, the gunny bag is removed and the products are dried under the shade for 25-30 days, which results in the pebble form of solid Jeevamrutha. Then, pebbles are sieved to separate fine and coarse particles and used directly along with the seeds during sowing and also as top-dressing. With this method, Mr. Biserotti noticed the development of an enormous number of earthworms, which provided a new ray of hope to organic farming. For three days, 2.5 litres of water was added to 20 kg solid Jeevamrutha. He found around 1,000 earthworms in the tray after 45 days under incubation.

After 71 days of vermi-compost preparation, he found a high number of earthworm colonies, pupa and small worms and noticed 1,500 well grown and developed earthworms in the tray.

He gets 20 kg of vermi-compost from each tray, which is mixed with compost and solid Jeevamrutha and used for crops. With the help of this new method of preparing solid Jeevamrutha and vermi-compost, Mr. Biserotti produces 10 MT of vermi-compost and 5 MT of solid Jeevamrutha every year. With these organic products, he has been able to produce sustainable crops that are naturally better than those produced through inorganic farming practices.

Every day, he prepares a minimum of 15 kg of solid Jeevamrutha per tray, which amounts to more or less 5,475 kg of solid Jeevamrutha a year. He also prepares 200 kg of neem cake with the seeds collected from 17 neem trees and uses neem leaves for vermi-compost production. He explored sustainable agriculture using locally available natural resources with compost, vermi-compost and local seed material. By adopting this method of organic farming, he has been able to achieve better crop productivity per acre of land under scanty rainfall conditions. Also, the culinary value and shelf life of the end produce is good and retains its original nutrient contents on storage.

Mr. Biserotti believes that if other farmers follow the organic farming method he has practised all these years, it will greatly benefit them in maintaining sustainable agriculture and getting remunerative income from agriculture operations under uncertain and unpredictable rain fed conditions.

Mr. Malleshappa Gulappa Biserotti
Hiregunjala (Village), Kundgola (Taluk),
Dharwad (District), Karnataka, India.
Mobile: +91 99450 11754

Authors: Shri K. V. Patil, Ph. D. Scholar and Dr. I. S. Rao, Professor and University Head, Extension Education Institute (EEI), PJTSAU, Hyderabad, Telangana, India.

Integration is the New Success Mantra for Sustainable Agriculture

Mr. Praveen, s/o Mr. Shivegowda, hailing from Vagarahalli village, of Channarayapatna taluk, Hassan district, Karnataka is a role model for impoverished farmers of his village. His total land holding is 1.69 ha. Traditionally, he grew crops such as ragi, maize, potato and coconut with a small dairy and poultry unit. Technical support from the Krishi Vigyan Kendra (KVK), Hassan, helped him shore up and integrate his farming through the use of improved varieties/hybrids of agriculture crops, horticulture crops and silkworm rearing; upgrade his dairy unit, poultry, piggery; stall feeding of sheep; use of Azolla as cattle feed; vermicomposting; Co-3 fodder and reducing drudgery through farm mechanisation.

Earlier, his only source of income was from crops such as ragi, maize, potato and coconut, which would fetch him an annual net income of Rs. 47,740. With the introduction of high value crop ginger and sericulture, his annual income increased to Rs. 2,37,558. He has started growing drumstick and papaya between coconuts, which fetches him additional income. Mr. Praveen has developed his farm with a combination of Horti-Silvi-Pasture cultivation. He has planted silver oak all along the borders, utilising the land efficiently, and has started backyard poultry rearing with Swarnadhara (15), Giriraja (15) and local (20) poultry breeds. From these birds, he gets around 4,230 eggs and earns Rs. 49,780. Moreover, he has a sheep and piggery unit that helps him fetch an additional income of Rs. 23,950 and Rs. 73,630, respectively. This has motivated many farmers in his village to start integrated farming with livestock.

To feed his dairy (three Holstein Friesian cows, two nondescript cows and one Buffalo) and sheep unit, he has established a fodder block comprising Co-3 and Azolla with the help of KVK, Hassan. The combination of Azolla with mineral mixture has helped him save on feed cost by Rs. 150 per day.

As a water conservation practice, he adopted a micro sprinkler irrigation system in the coconut garden, which increased water use efficiency compared to flood irrigation. He uses farm machinery such as coconut climber, coconut dehusker and cycle weeder to reduce

farm drudgery. He also underwent vocational training on coconut climbing and plant protection in 2012-13 and saves Rs. 20,000 annually by engaging himself in the harvesting process. He acts as a master trainer during palm climbing training programmes organised by KVK, Hassan, and also assists neighbouring farmers.

Mr. Praveen recycles farm waste into healthy manure through the vermi-compost unit and gets over 50% nutrients by recycling the bio-mass available within the farm itself. He cultivated Sun Hemp in the coconut garden and incorporated the bio-mass (green manure). The average production from his farm per year is 5,400 coconuts, 10 tonnes of vermi-compost, 5 tonnes of cow dung, 40 tonnes of fodder grass and vegetables worth Rs. 1 lakh.

Within a short span of time, Mr. Praveen transformed into a successful farmer with an improved livelihood. UAS, Bengaluru, awarded him the Best Taluk-level Youth Farmer. Furthermore, he delivers lectures and shares his experience with trainees and neighbouring farmers. His success is reflected in the fact that he earns a net annual income of Rs. 7.28 lakh from his 1.69 ha land. He is a great example of how adopting integrated farming practices could be the way forward for farmers.

Mr. Praveen
S/o Mr. Shivegowda
Vagarahalli (Village), Channarayapatna (Taluk), Hassan (District), Karnataka, India.
Mobile: +91 9972117190/ 9113697264

Authors: Dr. H. K. Pankaja Assistant Professor (Agril. Extension), Dr. S. Channakeshava, Assistant Professor (Soil Science) and Dr. G.S. Krishnareddy, Assistant Professor (Agril. Engg.) University of Agricultural Sciences (UAS), GKVK, Bangalore, Karnataka, India.

Award-winning Horticulture Farmer from Karnataka

Mr. H. Muralidhara (42) hails from Hosahudya village, Devanahalli taluk, Bengaluru Rural district, Karnataka. He has a total of 10 acres of land, out of which 8 acres is under irrigation and the remaining 2 acres under rainfed cultivation. He is from an agrarian family. As an agriculturist, earlier, he used to grow field crops, vegetables and old varieties of Anab-e-shahi grapes to earn his livelihood, but he was not satisfied with his income. Later, he shifted to cultivation of advanced horticultural crops, such as exotic grapes and pomegranate varieties, after consulting scientists from agriculture and horticulture universities.

In 2012-13, Mr. Muralidhara replaced the new grape rootstock, Dogridge, with exotic varieties of grapes, such as Sharad Seedless (70 guntas), Red Globe (20 guntas) and Sonaka (10 guntas) on 2.5 acres land and Bangalore Blue grapes on 1 acre using the Pendal system. He also adopted scientific spacing for different varieties. From the second year onwards, he started producing good quality bunches of grapes, but he failed to realise their remunerative income as market prices were low due to adverse weather conditions.

Even in the subsequent years, he produced good quality grapes after adopting advanced production practices but failed due to low market prices. After his bitter experiences, he contacted Dr. Jayaram, Professor and Head, Department of Agriculture, Marketing and Cooperation, GKVK, UAS, Bengaluru, to seek help for marketing grapes at economical prices. Based on his suggestions, Mr. Muralidhara harvested quality fruits over the next few years and packed them under his brand name of "Nandi grapes", which was suggested by Dr. Jayaram as his farm is in close vicinity of Nandi Hills.

He initially marketed at the GKVK main campus under the banner of UAS, Bengaluru, entitled "Riyaheethi Daradalli Raitharinda Grahakarige Nera Marata" under this new marketing system. On the first day, his entire produce sold like hot cakes for Rs. 30 less than the price of the Bengaluru retail market. Despite the low price, he made a good profit after selling Sharad grapes for Rs. 70 per kg and Red Globe for Rs. 80 per kg. However, HOPCOMS and other marketing marts were selling these varieties for Rs. 120 and Rs. 200 per kg, respectively. Consequently, in the year 2017 he produced 40 tonnes and in 2018 he produced 45 tonnes of grapes, including Bangalore Blue grapes and other exotic varieties of grapes, from his total land of 3.5 acres. In the year 2017, in addition to marketing at the farm, he made Rs. 22 lakh from direct marketing, with an annual expenditure of Rs.6.5 to Rs.7 lakh for the entire grapes orchard. Similarly, in the year 2018, he earned up to Rs. 26 lakh after following direct marketing of grapes. Scientists advised him to market at important

hubs of Bengaluru, such as MS Building, Marketing Board, and IT companies.

In addition to grapes, he started cultivating a pomegranate variety called Bhagwa in an area of 2 acres with a plant population of more than 1,000 by adopting a high density planting system during the year 2016. In 2017, with the same crop, he took home a gross income of Rs. 6 lakh from a total production of 12 tonnes. In the current season, he is expecting 25 tonnes from 2 acres with a bumper yield of 25 kg from each plant. He has used the same marketing strategy for selling fruits at the rate of Rs. 80 per kg in different locations of Bengaluru by reducing Rs. 30-40 per kg from the retail price in Bengaluru. According to him, the selling price is still economical and it is unfortunate that some merchants offered to sell for Rs. 35 per kg at his farm, an offer he rejected due to low price. With this type of direct marketing, he expects to earn Rs. 16 to 18 lakh with a cost expenditure of Rs. 3 to 4 lakh.

Mr. Muralidhara reads books and articles related to agriculture sciences and has delivered several talks on the radio, Dooradarshan and ETV Annadata. Because of his constant progress in the scientific cultivation of grapes, pomegranate, drumstick and chow-chow, University of Horticultural Sciences, Bagalkot, honoured him as the Best Horticulture Farmer of the district in the year 2016-17 during Totagarika Mela.

He has also adopted mechanisation for ploughing, spraying and other operations using a power tiller. His entire farm has adopted drip irrigation and supplements all nutrients through fertigation. Sometimes, he supplements micro-nutrients through foliar application products procured from IIHR, Bengaluru. For pomegranate, he regularly applies and sprays Arka microbial consortium to manage soil-borne wilt and bacterial blight. He also incorporates Trichoderma, Arka Microbial Consortium and biofertilisers for his crops on a regular basis. At his farm, he maintains a vermi-compost unit, farm pond with water capacity of 6 lakh litres and rain water conservation techniques.

His entire land exemplifies the biodiversity of fruits, flowers and medicinal and tree species grown for home needs without depending on outside purchase. Mr. Muralidhara has made great progress with the concept of the integrated farming system, securing his livelihood and fuelling economic growth.

Mr. H. Muralidhara
Hosahudya village, Venkatagirikote Post, Vijayapura Hobli,
Devanahalli Taluk, Bangalore Rural District - 562 110,
Karnataka State
Phone No: 9632832557

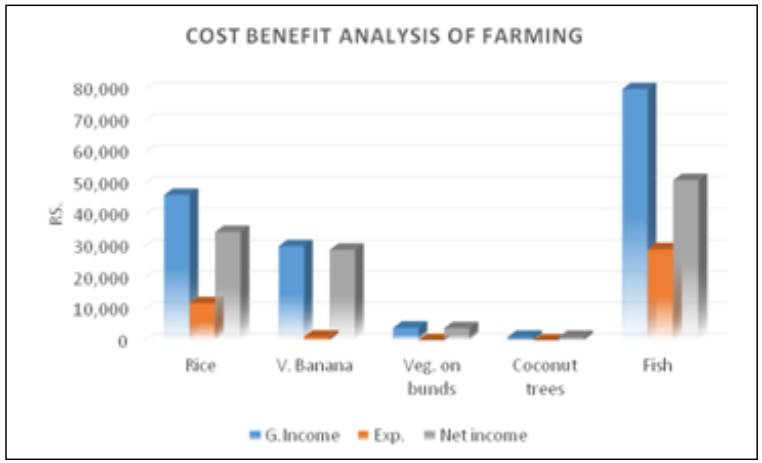
Authors: Dr. H. Amarananjundeswara, Assistant Professor (Vegetable Science) & Head, Ms.Sandhya G. C., Technical Assistant, Mr.Prasad P. S., Assistant Professor, Ms.Soumya Shetty, Technical Assistant and Ms. V. Lavanya, MSc Student, Horticulture Research and Extension Station, Hassan, University of Horticultural Sciences, Bagalkot, Karnataka, India.

Composite Farming

Mr. Angaraju Satyanarayanaraju (47), is from Kumudavalli village, Palakoderu mandal, West Godavari district, Andhra Pradesh, India. He owns 10 acres of land, and his main occupation is agriculture. He also owns a tractor and other farm machinery and is always on the lookout for innovative and profitable methods of cultivation for increasing productivity. It is known that paddy is cultivated in the field and fish in fish ponds. However, Mr. Satyanarayanaraju grows paddy and fish together along with vegetables on bunds in one acre of land.

He attended a demonstration conducted by the Department of Agriculture under the guidance of Mr. A. Sreenivasa Rao, Assistant Director of Agriculture (ADA), with technical support from Agricultural Technology Management Agency (ATMA) in West Godavari, before starting composite farming. The ADA promoted this concept based on the training program he had attended at Central Rice Research Institute (CRRI), Cuttack, Odisha, a few years ago. The demonstration on composite farming was successfully carried out under the technical guidance of Krishi Vigyan Kendra (KVK) and the financial support of ATMA under the category of innovative activities.

Mr. Satyanarayanaraju used two quintals of vermi-compost and minimum quantity of fertilisers, namely SSP (one quintal of Single



Super Phosphate), muriate of potash (10 kg) and urea (15 kg), at the time of puddling. He used MTU 1010, PLA 1100 paddy seed and 300 grams neem oil sprays three times. As advised by KVK scientists, among the fish varieties, he used Sheelavathi (800), Botcha (200) and Mosa (100) fingerlings, each weighing 50-100 grams. These were left in the trenches 20 days after the rice transplantation.

He used five kg rice bran every alternate day (1,000 kg in a year), 200 kg cattle manure and small quantities of Azolla as fish feed. Apart from serving as feed for the fish, Azolla also helps in absorbing and supplying atmospheric nitrogen to the paddy field. It was observed that freely moving fish in the paddy fields aided pest control naturally by eating the larvae and eggs. Mr. Satyanarayanaraju harvested 820 kg fish in one year on 20 guntha, and they were sold in the Bheemavaram market.

He also planted banana, papaya, chillies, tomatoes, gourds, coconut trees, drumstick, tree plants etc. on the bunds to supplement his income in the medium and long term. He introduced a vermi-culture unit to prepare manure at the farm level and a honey bee box to get supplemental income and help in pollination. He has also added a local variety of poultry birds to his farm by constructing a small nest for the birds above the fish trench using local material. In the first year itself, Mr. Satyanarayanaraju earned a net profit of Rs. 1.19 lakh from one acre plot. On an average, 16 quintals of paddy was harvested in each season, which is sufficient for a small family through the year. Fish cultivation alone has been a source of high net income for him.

Mr. Satyanarayanaraju's CB ratio worked out to 1:2.60. He is planning to introduce a few more varieties of animals to his farm and has built a three meter trench on one side of the farm to construct a permanent structure for poultry, ducks, goats and sheep. He is planning to cultivate turmeric and ginger under the tree shade. With his knowledge and experience, he is well equipped to train other farmers on composite farming.

Mr. Angaraju Satyanarayanaraju
Kumudavalli Village, Palakoderu Mandal,
West Godavari District, Andhra Pradesh, India.

Author: Dr. K. Uma Rani, Director (Retd.), National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad- 500030, Telangana State, India.

Where there is a will, there is a way

Many farmers are quitting agriculture nowadays and moving to cities in search of better livelihood. Under these challenging circumstances, Mr. Yusuf Khan, a farmer from Nangal Salangri village, Una district, Himachal Pradesh used his professional expertise to start mushroom cultivation. Since his childhood, he was passionate about agriculture and allied sectors. After joining the Agriculture College, his interest deepened and he established his own mushroom cultivation unit in the year 2000 in Nangal Salangri, Una. With success in this venture, he started a training centre, which has been promoting and popularising mushroom cultivation in Himachal Pradesh as well as all across the country. Along with this, he initiated protected vegetable cultivation, strawberry cultivation, and aeroponics (tomato, cucumber) etc. The centre also provides support for mushroom projects. Till now, he has trained more than 1,000 farmers across the country, apart from training some farmers from Bahrain as well. The turnover of his units is about Rs. 70-80 lakh/year.

The unit includes a well-equipped spawn lab, composting unit, growing unit and training centre. He cultivates milky and button mushrooms in the spawn lab, which covers an area of 1.36 ha. About 20,000 bags of compost per month are prepared for this purpose. Button mushroom is produced in large quantities.

Wheat straw, along with poultry manure and supplement (sunflower cake and cotton seed) as a source of nitrogen and gypsum, are used as raw materials. Making 1 kg wheat straw requires 5 litres water, and it needs to be sprayed for minimum 12 days for the outer phase of wheat straw at a required temperature of 75-800 Celsius. After 12 days, it is transferred to the composting temperature and then taken to a pasteurisation chamber. Pasteurisation is done at 58-600C for 8 to 10 hours; in this period, all the nitrogen is converted into ammonia, which acts as a nutrient medium for mushroom. Once the compost is ready for spawning, the temperature requirement becomes 220C. For 10 kg compost, the required quantity of spawn is 50-80 gram.

After that, 220C temperature is maintained in a closed room. Within 15 days, spawn is taken to the compost bag.

Mr. Khan also grows tomato, potato, capsicum, coriander, lettuce and strawberry on the farm under protected cultivation. There are two poly-houses on the farm, covering an area of 1,000 square metres in which vegetables such as cucumber and tomato are grown. He has developed a seedless cucumber nursery in media, and then it is shifted to a hydroponic system.

Mr. Khan received the "Progressive Farmer" award from Divya Himachal in the year 2006 and "Krishi Udayami Prize" (Agricultural Entrepreneur prize) from CSKHP Palampur University, Himachal Pradesh, in 2010. He also received the "Excellent Mushroom Grower" award from the All India Mushroom Association. According to him, "utilizing the resources at the doorstep is the key to success". He suggests that unemployed agriculture graduates take up agricultural enterprises as that will create employment opportunities for thousands of people in the rural area.

Himachal Scope

HIMACHAL EXCELLENCE AWARDS 2017

Ayurvedacharya of The Year : Dr. S.K. Sharma

Progressive Farmer of The Year : Yusuf Khan

Mr. Yusuf Khan
Mushroom Farm & Training Centre, VPO Nangal Salangri,
Tehsil & District Una Himachal Pradesh.
Mobile number: 9418178839
Website: http://www.khanmushroom.com

Authors: Ms. Arti, Mr. Chandan Kumar Rai, Mr. Sanjeev Kumar, Ms. Vinita Kanwal, Ph. D. Scholars and Dr. A.K. Chauhan, Principal Scientist, ICAR-National Dairy Research Institute (NDRI), Karnal, Haryana, India.

Empowered Women Run a Successful Dairy Venture

A group of women from humble family backgrounds have come together in a village called Amritpur Kalan near Karnal and formed "Anmol Mahila Dudh Samiti", which has empowered them and made them a role model for other women. The Arpana Trust, which has taken the initiative to mobilise women, motivated the women to take up some entrepreneurial activities. The members of the group realised that there is scope to start a milk-based enterprise for two reasons: (i) ample milk production in their village and (ii) milk producers not getting the proper price for milk.

They started with collecting 20 litres of milk from farmers and went up to 500 litres/ day. They started procuring milk at the rate of Rs. 20/ litre when the price in the local market was only Rs. 12/litre. They purchase cow milk for Rs. 20/litre and sell it for Rs. 28/litre- and procure buffalo milk for Rs. 35/- per litre and sell it for Rs. 45/- litre to the residents of Karnal.

The National Dairy Research Institute (NDRI), Karnal, came forward and initiated a three-months training on value-added dairy products for select women from the village. Realising the potential of the business, the women's group initially started a milk collection centre in the name of Anmol Mahila Dudh Samiti. The Harpana Trust provided them a loan of Rs. 1.5 lakh. The group purchased various items related to their enterprise, such as weighing machine, fat separator, fridge, cylinder, vessels and milk cans. Based on the training imparted by NDRI and the confidence they gained thereafter, Anmol Mahila Samiti has started preparing value-added products such as khoya, paneer, curd, butter, ghee etc. with technical support from NDRI.

The quantity of the value-added products to be prepared is decided based on the demand and orders received. The members approach

institutes such as the NDRI hostel, marriage parties, hotels/ dhabas and well-known sweet stalls for marketing their products. Festival seasons, such as Diwali, are effectively utilised for the sale of milk products manufactured by them. There is continuous demand for their products in the market due to the purity and quality of the products. Expressing satisfaction, Mrs. Savitha, Secretary of the Anmol Mahila Dudh Samithi, says each member earns a monthly income of Rs. 5,000-6,000/- from their work, which they do in addition to taking care of their family and domestic work. She further expressed that all the members work as one family and distribute the work, such as milk collection, taking orders, book maintenance, value addition etc, among themselves.

Three women work in the morning from 6 AM to 3 PM and the other three from 3 PM to 8 PM. The remaining member, group leader Ms. Kamalesh, handles all the marketing activities from receiving the milk to selling the value-added dairy products in the nearby city of Karnal. The members of the group reminisced that during the initial days, they lacked the support of family members and the village in starting the enterprise. However, due to their strong determination, they succeeded against all odds in the value-added dairy enterprise. The constraints they faced in the initial days gave them enough lessons for further progress. Now, they feel successful, profit-earning and empowered economically as well as socially.

The group felt that the NDRI training benefited them in making this enterprise a successful venture. It helped them get empowered, become role models for other women in the nearby villages and break societal stereotypes about women. The group members said that their savings have increased, their family status has improved and they are able to provide higher education for their children. The group also plans to start packaging of milk products soon in order to ensure higher returns.

Anmol Mahila Dugdh Samiti
Amritpur Kalan, Karnal (District), Haryana, India.
Contact Number: +91 9050794827 / +91 9728676626

Author: Dr. N. Balasubramani, Deputy Director, (OSP&M), National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad- 500030, Telangana State, India.

Success through Post–Harvest Technologies and Marketing of Fruits

Mr. Venkata Narsimha Raju hails from Kesavaram village in West Godavari district of Andhra Pradesh. He comes from an agriculture family holding 14 acres of fish pond and 9 acres of wetland. He ran an integrated farming system with crops, animal husbandry and fisheries and leaned more towards the fisheries enterprise. He felt a great pull from fish and fish ponds. This drove him to come up with innovative ideas and constant experimentation, which brought him recognition and several best farmer awards in fisheries. He is the first person in his district to undertake Indian catfish breeding and hatchery. He was involved in research activities of central institutes such as Centre for Cellular and Molecular Biology (CCMB), Hyderabad; Central Institute of Freshwater Aquaculture (CIFA), Bhubaneshwar; Central Institute of Fisheries Education (CIFE), Balabadrapuram, East Godavari, A.P.; College of Fishery Science (Muttukur, Nellore, A.P.) and KVK (Undi, West Godavari, A.P.). He became a major source for the supply of endangered species of fish to research centres.

However, Mr. Raju's dreams were crushed when the Government came out with Operation Kolleru, 2006. It not only destroyed the fish ponds owned by the family over the last 60 years, but also Mr. Raju's enterprising skills, which supported many individuals and organisations. Overnight, an employer who provided employment to many people became unemployed himself. Though he was distressed, he consoled himself and changed the direction of his work with renewed vigour to prove his calibre in other areas of development. He wanted to convert agriculture and allied sectors from an un-organised sector to an organised one. With this idea, he explored the modalities of operating a company and its implications in creating history for future development. This thought process strengthened his resolve of starting an agri-based industry.

Mr. Raju joined hands with three other likeminded entrepreneurs to start a firm called "Cold Space Agrotech India Private Limited" in April 2012. This venture focused on post-harvest management services for fruits and vegetables with pre-cooling and storage integrated Ethylene-based pressurised ripening chambers approved by the Telangana State Government. The main objectives of this venture are to help and educate farmers in "Good Agricultural Practices" (GAP); work with government organisations, research centres, agricultural universities, Farmer Producer Organisations (FPO's) and individual farmers and conduct and participate in "mango-melas" organised by the private sector or the Government.

Mr. Raju and his team members took the lead in standardising the ripening process through their professional agriculture background and by browsing the Internet for websites related to the field and through personal experiments. The team standardised the ripening

process in fruits such as mango, banana, sapota, mosambi, papaya as well as the preconditions for ripening, such as time, stage of harvesting and transportation, for better results. They maintained international standards for uniform ripening and fruit quality.

Mr. Raju and his team's initiatives have generated several employment opportunities in the village. Regular employment has been provided for 15 persons over the last 4 years, with remuneration ranging from Rs. 9,000-12,000/- per month. The employment generated through this unit has constantly increased from 190 to 353 days for the last four years. During peak mango season (March-June), extra labour is engaged for unloading and loading of crates, and Rs 2.25/- is paid for each crate and a labourer earns Rs. 600-700/- per day on average. This has attracted college-going students to take up this job in their summer holidays and earn the required fee from their village itself.

Today Cold Space is providing services to 170 farmers and fruit vendors bringing fruits from five states viz., Andhra Pradesh, Telangana, Tamil Nadu, Kerala and Maharashtra. The firm is networking with FPOs, university scientists, extension officers, supermarkets; educating farmers in Good Agricultural Practices for producing mangoes with minimum residue level; providing market information, on new technologies and machinery to member farmers.

Other activities Mr. Raju and his team are involved in are promotion of a kitchen garden on the same campus, capacity building of officers, buyer and seller arrangement and orientation of farmers and traders on Carbide-free mango production.

Mr. Raju, an active and knowledgeable farmer, has proved to be a role model in extending developmental activities in the agriculture sector and has received several awards. He has received an appreciation letter on the adoption of new fish technologies and leadership for the community, a certificate of merit in fisheries for successful fish farming and his contributions in increasing fishery productivity in A.P. and the first prize in a fisheries exhibition organised in Krishna district. He has also participated in training programs and the Indian Fisheries Forum.

"Cold Space Agro-tech India Pvt. Ltd" has just started export-oriented services and is considering expansion of the plant over the next two years by automating hot water treatment and auto-grading facilities. The team plans to conduct workshops to create awareness among farmers and vendors and venture into natural farming (free of chemical fertilisers and pesticides) to produce fruits such as mangoes, pomegranates, papaya etc.

Mr. Chintalapati Venkata Narsimha Raju
Kesavaram Village, West Godavari District,
Andhra Pradesh, India.
Mobile: +91 9676486789

Authors: Dr. P.L. Manohari, Assistant Director and Dr. M.A. Kareem, Deputy Director, National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad-500030, Telangana State, India.

Leading the Way in Fisheries: Kailash Fisheries and Aquatics

Mr. Akshaya Kumar Sahu is a 41-year-old progressive farmer/ entrepreneur from Astapura village, Baisinga mandal, Mayurbhanj district in Balasore, Odisha. His father, Mr. Manoranjan Sahu, started fish farming in 1.5 acre land, culturing Indian major carps (Catla, Rohu and Mirgal) in the traditional way, but the production was not much. Later on, he and his younger brother, Mr. Sanjay Sahu, started a technical way of culturing with the help of scientists from ICAR-Central Institute of Freshwater Aquaculture (CIFA).

Mr. Akshaya Kumar Sahu underwent several trainings to learn about the breeding and culture technologies of freshwater fish. He started breeding indigenous species of Indian major carps and other species in his own hatchery. He gradually increased his culture area to 100 acres in four different places in Balasore and started his own fish hatchery, breeding 25 varieties of freshwater fish, including freshwater prawn and scampi.

Kailash Fish Hatchery is the biggest in Odisha in terms of breeding, rearing and culturing. Mr. Akshaya also supplies fish yearlings and fingerlings to all parts of the country with oxygenated packing by train or air at a minimal price. His farm is considered an Aquaculture Field School for training farmers and entrepreneurs under ICAR-CIFA, Bhubaneswar, Odisha, supported by the Ministry of Skill Development, Government of India. It has facilities such as a training hall, an audio visual room, accommodation, a demonstration farm area and a hatchery. Several farmers have benefited from the training. Mr. Sahu supplies seeds based on farmer requirements.

He established his own Advanced Technology Formulated Kailash Floating Fish Feed mill plant on his farm site based on his and neighbouring districts' farmers' requirements to with the help of State Fisheries Department, Govt. of Odisha, and financial support from the subsidiary state scheme. National Fisheries Development Board (NFDB), Hyderabad; Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers Welfare also provided financial assistance for Recirculatory Aquaculture System (RAS) to grow commercial species high on demand, such as GIFT Tilapia, Asian sea bass and Pangasius. Mr. Sahu has developed an excellent

farm facility, hatchery, feed mill, rearing tanks, along with packing and transporting of fish seeds, feeds and training etc.

Noting the success of Mr. Sahu's enterprise, Department of Fisheries, Govt. of Odisha, recognised his farm as an Odisha Private Hatchery for successful induced breeding in 2011. He has won several awards as well. ICAR-CIFA, Bhubaneswar, recognised his enterprise, "Kailash Fisheries and Aquatics", as one of the Incubatees through their Aquaculture Field School. Society of Krishi Vigyan Kendra named him the "Best Farmer" in Odisha during the national workshop on "Improving Income of Farmers through Agriculture and Aquaculture Intervention" held from January 5-7, 2018, and awarded him the "Innovative Farmer Award" during the Innovative Farmers Meet on June 7, 2018, at ICAR-CIFA. National Fisheries Development Board (NFDB), Department of Animal Husbandry, Dairying and Fisheries, honoured him with the "Best Entrepreneur" award during the World Fisheries Day Celebration in 2016, 2017 and 2018.

The National Institute of Agricultural Extension Management (MANAGE) has recognised Kailash Fisheries and Aquatics as one of the Field Centres for hands-on training programmes at the field level as part of Incubation Centre activities for promoting entrepreneurship in the fisheries sector in future. Mr. Sahu has provided employment

opportunities to around 100 local people for regular activities. Kailash Fisheries produces 250 lakh spawns, 100 lakh fry and 60 tonnes fingerlings annually, with a turnover of Rs.10 crore. He maintains a close link with the Department of Fisheries, Government of Odisha, ICAR–CIFA, NFDB and Ministry of Skill Development and acts as a facilitator for learning and innovation.

Mr. Akshaya Kumar Sahu
Proprietor, Kailash Fisheries & Aquatics
Astapura, Baisinga, Mayurbhanj, Odisha
Mobile: 9437147897, Office Number: 9437191841,9583800959
E-Mail: akshyakumarsahu1977@gmail.com

Author: Mr. Vijayan R. Incubation Manager, National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad-500030, Telangana State, India.

Enriching Natural Resources for Sustainable Farming

Mr. Prasad (50), is from Sagipadu Post and Village, Rathnagirinagar, K. Kota mandal, Nellore district. Andhra Pradesh, India. He owns 25 acres of upland with bore wells and sufficient water for irrigation. His father was an agriculture officer, which led to his interest in agriculture and allied enterprises since childhood, though he is a mechanical engineer by profession and has worked as a Boiler Engineer with a private company for a few years.

His reason for leaving his job as an Engineer to start farming is that he wanted to live as a farmer without any dependence on anybody. He got drawn to the Sri. Palekar system of farming, underwent training and visited a few farms before starting his own farming system. He cultivates coconut along with banana (Karpuram variety) as an inter-crop in 12.5 acres with 8x8 meters spacing, palm with coco as an inter-crop in four acres, banana separately in two acres and fodder and vegetable in two acres.

He purchased a power tiller and small implements instead of big motors. His farm is adjacent to the village and abundant labour is available. Due to his achievements in a short period of time, his farm attracts many visitors. He is the president of the National Association of Palm Orchards and a member of Cow-Based Agri. Society, started during the year 2011 with 120 farmers as members. From 2007 onwards, he gradually started reducing external inputs and focusing on organic farming. In 2011, he introduced cow-based farming.

When he ventured into agriculture, he observed that water scarcity and poor soil conditions were the main reasons for unprofitable agriculture. He started farming based on Palekar principles. A few principles of Palekar system are zero budget farming – without spending on external inputs, natural inputs like jivamrita prepared from cow dung, urine etc, mulching and growing multiple crops. He dug trenches of two feet width and 2-6 feet length along pathways and bunds against the slope in the farm and used them as water

conservation structures, filling them with weeds and dung. He also dug shallow pits with about nine inches depth between plants on the entire farm and filled the pits with coconut shells as mulch to harvest rain water. He also made arrangements for insitu decomposition of

coco leaf fall in palm and coconut orchards to enrich soil. Through these measures, he was able to harvest surplus rainwater in his farm and improve soil fertility by incorporating decomposed farm waste.

He spent about Rs. 30,000 annually towards pitting. He opines that more people can adopt these measures if financial aid is provided by the government.

Mr. Prasad has adapted interventions such as micro-irrigation, trenches to harvest rain water, building soil health with organic carbon, installing a two HP motor to boost the existing pumping system and create pressure in the micro-irrigation system and shallow pits in between plants in the field covered with plant waste to act as mulch to reduce evaporation losses.

He is particular about using minimum water to irrigate crops and has set up micro-irrigation systems for all the crops he has been growing since 1995. He installed a jet instead of a drip in the orchard to sprinkle water on the leaf litter spread as mulch on the soil surface around the plants for faster decomposition, apart from providing irrigation to the plants. He has grown coco and banana as inter-crops in palm and coconut gardens to maximise the benefits from land, water and labour. This has helped him earn better even though palm oil prices have reduced since he gets income from inter-crop of coco. He has adapted multiple strategies, such as rearing cows to enrich soil health and manage pests and diseases using cow- and plant-based products. His practices have not only reduced cost of production but also realised quality production due to better soil health.

He manages to earn about Rs. 18 lakh annually through 25 acres of upland farm. He spends 30% of his income on labour wages, 15% on maintenance of machinery, 30% on household expenses and the remaining 25% on buying property and reinvesting on the farm. His future plans are to get his farm certified as organic, open a retail outlet to sell organic products at Vijayawada and organise farmer groups for organic production of vegetables.

Mr. Prasad
Sagipadu (Village), Rathnagirinagar (Post), K. Kota (Mandal),
Nellore (District), Andhra Pradesh, India.

Author: Dr. K. Uma Rani, Director (Retd.), National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad- 500030, Telangana State, India.

National Institute of Agricultural Extension Management (MANAGE)
(An organization of Ministry of Agriculture and Farmers Welfare, Govt. of India)
Rajendranagar, Hyderabad- 500030, Telangana State, India
www.manage.gov.in