

Special Issue December 2024, Volume 12 (SI)



ISSN 2319-6432 (Print)
ISSN 2349-4433 (Online)

NAAS RATING

4.95

w.e.f.
01.01.2024

Success Stories



JOURNAL OF KRISHI VIGYAN

A Quarterly Publication of Society of Krishi Vigyan

www.iskv.in

www.indianjournals.com

SOCIETY OF KRISHI VIGYAN

CENTRAL EXECUTIVE COMMITTEE (CEC) for 2024-26

President

Dr K.B. Singh

Director, Punjab Agricultural Management & Extension Training Institute, PAU Campus, Ludhiana

Vice President

Eastern Zone

Sanjoy Borthakur

Western Zone

B R Morwal

Northern Zone

Ranjay Kr Singh

Southern Zone

P Kumaravel

Secretary

N C Sahu

Treasurer

Manoj Sharma

Editor

Anil Kumar Singh

Joint Secretary

Gurlal Singh Gill

Editorial Board Members

1. Akhilesh Kumar, Scientist, Krishi Vigyan Kendra, Rewa, Madhya Pradesh
2. Anil Khippal, Principal Scientist, Agronomy, ICAR- Indian Institute of Wheat and Barley Research, Karnal, Haryana.
3. Anil Kumar, Assistant Professor (Soil Science), Guru Angad Dev Veterinary & Animal Sciences University, Krishi Vigyan Kendra, Booh, Tarn Taran, Punjab.
4. Arti Shukla, Senior Scientist (Plant Pathology) Horticulture Research & Training Station & KVK, Dr. Y.S. Parmar University of Horticulture & Forestry, Kandaghat, Solan, Himachal Pradesh.
5. Arvind Kumar Ishar, Senior Scientist & Head, Krishi Vigyan Kendra, Rajouri, SKUAST, Jammu, Jammu and Kashmir.
6. Ashish Kumar Tripathi, Senior Scientist and Head, Krishi Vigyan Kendra, Sagar -II, Madhya Pradesh
7. Bindu B, Assistant Professor (Horticulture), Farming Systems Research Station, Sadanandapuram, Kottarakkara, Kollam district, Kerala.
8. C Rajamanickam, Professor, Horticulture, Fruit Science, Horticulture College and Research Institute (TNAU), Periyakulam, Tamil Nadu.
9. Gulzar Singh Sanghera, Director, Regional Research Station (Sugarcane), Kapurthala, Punjab.
10. Gurmeet Singh, District Extension Specialist (Entomology), Farm Advisory Service Scheme, Amritsar, Punjab.
11. M. Pandiyan, Professor, Plant Breeding and Genetics and Former Dean, Dr. MSS Agriculture College and Research Institute, TNAU, Eachangkottai, Thanjavur, Tamil Nadu.
12. Moni Thomas, Director, Institute of Agri-Business Management, Jawaharlal Nehru Krishi Vishwa Vidyalaya Jabalpur India, Madhya Pradesh
13. N Venkateshwar Rao, Senior Scientist and Head, Krishi Vigyan Kendra, Jammikunta, Karimnagar, Telangana.
14. N Bommayasamy, Senior Scientist and Head, ICAR-Krishi Vigyan Kendra, Central Coastal Agricultural Research Institute, Ela, Old Goa.
15. Noorjehan A K A Hanif, Associate Professor, Agricultural Extension, Krishi Vigyan Kendra, Cuddalore, Tamil Nadu.
16. Pradeep Kumar Sharma, Former Vice Chancellor, SKUAST, Jammu.
17. P Kumaravel, Dean, Veterinary College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University, Udumalpet, Tirupur District, Tamil Nadu.
18. Rajesh K. Rana, Principal Scientist (Agricultural Economics), ICAR-Agricultural Technology Application Research Institute, Ludhiana, Punjab
19. Ranjan Kumar Mohanta, Scientist Animal Nutrition, ICAR-Krishi Vigyan Kendra, Cuttack, Odisha.
20. Sanjay Swami, Professor, School of Natural Resource Management, CPGS-AS, CAU, Umiam, Meghalaya.
21. Somendra Nath, Subject Matter Specialist, Agronomy, Krishi Vigyan Kendra, Balia, Uttar Pradesh.
22. Yana Venkanna, Subject Matter Specialist, Entomology, Krishi Vigyan Kendra, Ramagirikhilla, Peddapalli, Telangana.
23. Yogisharadhya R, Senior Scientist and Head, ICAR-Krishi Vigyan Kendra, Hialakandi, Assam.
24. Y. Prabhabati Devi, Scientist, Home Science, Krishi Vigyan Kendra, Chandel, Manipur.

Manuscripts: Offered for consideration should be uploaded on the society's website www.iskv.in in after remitting a non refundable processing fee of Rs. 500/-

Editorial Office:

Krishi Vigyan Kendra, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh.

Chief Editor: Dr. Manoj Sharma, Principal Extension Scientist, Animal Science, Directorate of Extension Education, Punjab Agricultural University, Ludhiana.

Subscription fee:

Fee for 1 year-Rs. 1500/- and Life Membership (10 Year) Rs. 7500/-

Edited and published by: Dr. Manoj Sharma on behalf of Society of Krishi Vigyan at M/S Dewa Enterprises, Jabalpur, M.P.

Editorial Board Members from Abroad

Dr. Dragan Sefer

Professor, Belgrade Faculty of Veterinary Medicine, Serbia (Chairman)

Prof. Dr. Radmila Markovic,

Faculty of Veterinary Medicine, Beograd, Serbia

Dr. Kusum Rana

Research Scientist, College of Agronomy and Biotechnology, Southwest University, Chongqing-400715, China

Dr. Vesna Djordjevic

Director, Institute of Hygiene and Meat Technology Street: Kacanskog 13 11000 Belgrade

Dr. N.R. Sarker

Director General (Ex), Bangladesh Livestock Research Institute, Savar, Dhaka-1341, Bangladesh.

TABLE OF CONTENTS

S.No.	Title	Page No.
1.	Adoption of Multi-Nutrient Block Technology under Field Conditions: Pathway of Success for Livestock Farmers in Kashmir Himalayas. Yasir Afzal Beigh, Abdul Majeed Ganai and Sayima Akhter	1-5
2.	An Example of Dedication and Hard Work: S. Sukhbir Singh Kanwarpal Singh Dhillon and Bikramjit Singh	6-8
3.	A Success story of Mr. Devaraj Lakshman Naik earning through grafting techniques Venkatesh L, Shabinabanu S Nadaf and Manju M J	9-10
4.	Beekeeping: A Sustainable Success Story of Mr. Bharat R. Venkatesh L, Manju M J and Shabinabanu S Nadaf	11-12
5.	Cattle farming: A Passion Converted into an Income Earning Means Chingtham Chanbisana	13-14
6.	Doubling income by production of fermented vinegar making Rajni Goel and Rachna Singla	15-17
7.	Empowerment through Scientific Backyard Poultry Farming Muthusamy N, Akila N and Velmurugan K	18-20
8.	Engineer Becomes Agri-Preneur through Livestock and Poultry Based Farming System B K D Borah*, U Barua, M S Bora and N Munglang	21-24
9.	Housewife sustained livelihood through Climate Resilient Technologies M. Sonowal Bora, Nancy Munglang, B. K. D. Borah, Utpal Braua and Lobsang Wangchu	25-29
10.	Improvement of Livelihood of Tribal Families through Scientific Backyard Piggery Farming Kangjam Sonamani Singh, Hb. Lungni Anal and A. Ameeta Devi	30-32
11.	Income Enhancement through Crop Diversification in Chandel District under NICRA Project Kangjam Sonamani Singh and Hb. Lungni Anal	33-35
12.	Integrating Flower and Inland Pisciculture An Innovative Method for Climate Resilience in Wetland Ecosystem Nazreen Hassan S, Kavitha K, Suresh S, A Selvarani and R Latha	36-39
13.	Mushroom Cultivation conferred recognition Rachna Singla and Rajni Goel	40-43

S.No.	Title	Page No.
14.	Mystical Stone of Gurdaspur (Punjab): S. Gurdial Singh Rajwinder Kaur, Ravinder Singh Chhina, Satwinderjit Kaur and Sarbjit Singh Aulakh	44-49
15.	Onattukara Sesame – Success Story from Declinal to Revival S Jyothilekshmi and V Mini	50-53
16.	Overcoming Low Farm Returns Limitations through Cultivation of Improved Rice Variety in the Aspirational District of Chandel Kangjam Sonamani Singh, Hb. Lungni Anal, Kl. Levish and A. Ameeta Devi	54-56
17.	Quality Fish Seed Production Led to Doubling Farmers Income M A Salam, Hemam Ramananda Singh, Nandini Chongtham and Gunajit Oinam	57-60
18.	<i>Sehar Ki Duniya</i> : A World of Resilience, Mobilization and Empowerment. Parveen Kumar* and Raj Kumar*	61-65
19.	Success of a Farmer through Enterprise Diversification Parveen Kumar* and Raj Kumar**	66-69



Adoption of Multi-Nutrient Block Technology under Field Conditions: Pathway of Success for Livestock Farmers in Kashmir Himalayas

Yasir Afzal Beigh, Abdul Majeed Ganai and Sayima Akhter

Division of Animal Nutrition,

Faculty of Veterinary Sciences & Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, Shuhama, Srinagar-190 006

ABSTRACT

Agriculture in Jammu and Kashmir is mainly rain fed and non-mechanized with limited scope for diversification due to typical land topography (mostly terrains) and restricted to a specific period (4-5 months of long harsh winter), thus animal husbandry is widely adopted in the region. However, the current low level of productivity of livestock remains an area of concern due to which the sector continues to be a non-vibrant economy even though having huge prospects. In order to address the problem of low productivity under field conditions, Scientists from Division of Animal Nutrition, FVSc and AH, Shuhama, SKUAST-Kashmir under DAHD-NLM, GoI sponsored project conducted awareness programmes and distributed value-added multi-nutrient blocks to the identified beneficiary dairy and sheep farmers in three district of Kashmir valley. As a result, the farmers got motivated and the impact of the technology adoption by the farmers led to significant improvement in the performance of animals in terms of enhancement of milk yield and composition, improvement in health and reproductive status, increased body weight gain and better economic returns to the farmers.

Situation Analysis

The Jammu and Kashmir is the northern most, hilly and 11th largest erstwhile state of India with the net area sown of only 7% of its total geographical area. The livestock sector alone contributes about 11% to total GDP of the Union Territory in contrast to 4.11% at the national level. However, the poor availability of feed and fodder resources both in terms of quantity and quality (especially during Winter and Spring seasons) result in non-fulfilment of nutritional needs of the livestock affecting their health and contributes to their low productivity. As such, there is a dire need to develop and disseminate technologies to pursue the goal of better health and higher productivity of animals that will not only bridge the demand and supply gap of animal food products but also make the sector a profitable venture to uplift the socio-economic condition of the farmers. Multi-nutrient block (MNB) technology is one of the methods developed in recent years to improve the

nutritional status of ruminant livestock. The MNB is an excellent blend of energy in the form of molasses, nitrogen in the form of urea and minerals as mineral mixture that provides these nutrients necessary for optimum productivity but normally deficit in routine diets provided to animals under field conditions. MNB supplementation is advantageous particularly for livestock reared on poor quality feed resources as is being practised under rural conditions pan India vis-a- vis J&K. They are convenient in terms of packaging, storage, transport and ease of feeding, thus are generally more in acceptable form by livestock farmers as majority of the farmers are marginal or small holders practicing unscientific feeding managerial ways of rearing livestock.

Plan, Implement and Support

The study was carried out in three districts of Kashmir valley viz. Bandipore in North, Budgam in Centre and Pulwama in South. 5 villages in the vicinity of Krishi Vigyan Kendras of



Survey in the study area before intervention



Collection of samples from livestock before intervention

concerned districts (Aloosa, Mangnipora, Potushai, Gamroo and Nadihal in district Bandipora; Galwanpora, Warapora, Qadipora, Haran, Soibugh in district Budgam; Banderpora, Goripora, Padgampora, Takuna and Malangpora in district Pulwama) were selected based on their involvement of animal husbandry activities. 10 beneficiary farmer families (6 dairy and 4 sheep farmers) from each of the selected village were identified for whom livestock rearing acted as the primary source of livelihood. In total, 150 beneficiary farmers were adopted under the study.

Survey was carried out in the selected areas for animal feed availability and feed practices followed by the identified farmers using pre-tested, structured schedule and personal observation. Samples of feeds/fodders offered to the livestock, milk and blood were collected and analysed to assess the nutritional status of livestock under field conditions before

intervention. Value-added multi-nutrient block (MNB) were prepared, the composition of which was validated by experimental pilot trials using region specific supplements. The MNB were prepared each of weight ~2.70 kg under the Government scheme of National Livestock Mission (NLM), Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry & Dairying, Govt. of India operational in the Division of Animal Nutrition, SKUAST-Kashmir. These value-added MNB were free distributed among the identified beneficiary farmers in two phases of three months each coinciding with the two seasons *viz.* Winter and Spring. In order to create awareness among the selected beneficiaries, six training programmes on importance and methods of feeding MNB to ruminant livestock for higher productivity were also conducted as detailed below:

Adoption of Multi-Nutrient Block Technology under Field Conditions

Table 1. Training programmes conducted on importance and methods of feeding MNB

Season	District	Number of trainings	Number of participants
Winter	Bandipore	1	50
	Budgam	1	50
	Pulwama	1	50
Spring	Bandipore	1	50
	Budgam	1	50
	Pulwama	1	50
Total		6	300

Table 2: Distribution pattern of value-added MNB among the identified beneficiary livestock farmers

Village	District Bandipora		District Budgam		District Pulwama	
	Winter season	Spring season	Winter season	Spring season	Winter season	Spring season
1	100	100	100	100	100	100
	(10 farmers each received 10 MNB of 2.70 kg weight each)					
2	100	100	100	100	100	100
3	100	100	100	100	100	100
4	100	100	100	100	100	100
5	100	100	100	100	100	100
Total MNB distributed	500	500	500	500	500	500

The details of the value-added MNB distributed among the beneficiary farmers during the study are given in the Table 2.

Thirty (6 cows $\times$ 5 villages) cows in their 2nd or 3rd lactation and hundred (5 ewes $\times$ 4 farmers $\times$ 5 villages) ewes in 2nd to 4th gestation were identified in each district. Animals under the study were offered 300 g to cows and 60 g to ewes of value-added MNB per animal daily above the normal course of feeding practices throughout the two seasons. The animals were reared under normal managerial conditions prevailing under field conditions with *ad libitum* lukewarm drinking water available. Effect of supplementing MNB to livestock on feed intake, production performance, metabolic profile and production economics were assessed.

Output

The study was conducted during Winter (November, 2023 to January, 2024) and Spring (February to April, 2024) when the livestock in Kashmir are under cold stress as the average ambient temperature fluctuates around -5 to 10 °C and 7 to 15 °C, respectively; moreover, most of the animals remain pregnant during the period. These conditions result in higher feed/nutrient requirements for livestock during the seasons. However, this is the time in Kashmir valley when greenery perishes from the scenario, and only locally available poor quality crop residues are left on which animals are completely stall fed. Also, non-availability of concentrate feeds due to blockade of National Highway by inclement weather during the period results in non-fulfilment



Value-added Multi-Nutrient Blocks (MNB) prepared for distribution



Trainings of farmers and distribution of prepared value-added MNBs among the selected beneficiaries

Table 3. Performance of livestock after adoption of value-added MNB supplement technology by farmers (n=90 dairy and n=60 sheep) of three districts of Kashmir

Specie	Parameter	Before intervention	After intervention (Winter)	After intervention (Spring)
Cattle	Dry fodder intake (kg/day)	7.98±0.14	9.23±0.13	8.97±0.13
	Average daily milk yield (Lt/animal))	9.03±0.34	10.64±0.35	10.91±0.34
	Milk fat content (%)	3.42±0.09	4.30±0.06	4.28±0.04
	Milk Solid not fat content (%)	7.65±0.08	8.53±0.04	8.40±0.04
	Body Condition Score	2.62±0.06	2.89±0.04	2.93±0.03
	Plasma urea N (mg/dL)	13.47±0.47	16.61±0.40	17.02±0.36
	Serum Calcium (mg/dL)	8.74±0.16	11.02±0.18	10.55±0.08
	Average Cost-benefit ratio	1:2.71	1:3.31	1:3.86
Sheep	Body weight change (kg)	44.07±0.59	47.67±0.51	51.42±0.46
	Body Condition Score	2.95±0.06	3.13±0.04	3.07±0.03
	Blood urea N (mg/dL)	8.82±0.19	12.36±0.31	12.97±0.24
	Serum Calcium (mg/dL)	10.93±0.20	12.81±0.17	12.84±0.16

Adoption of Multi-Nutrient Block Technology under Field Conditions

of nutrient requirements deteriorating their health and lowers productivity (drop in milk yield, loss of body condition score, unthriftiness, higher incidence of metabolic and reproductive disorders, etc.). Introduction of value-added MNB technology in 3 districts of Kashmir was well appreciated by the livestock farmers after continuous motivation through trainings and free distributions. The overall beneficial outcomes of the technology convinced the farmers to adopt the technology of feeding MNB to ruminant livestock for overcoming the nutrient deficiencies experienced by animals during these harsh seasons to augment the productivity and increase net farm income returns to the owners.

Outcome

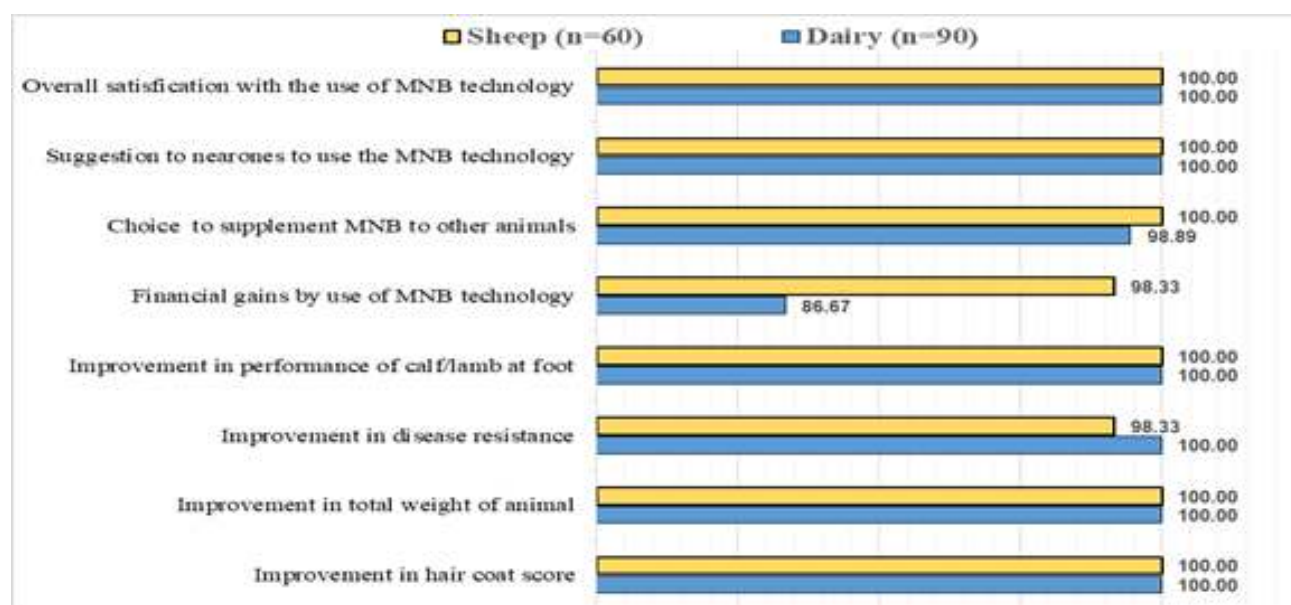
The outcome of the value-added MNB technology adoption by the beneficiary farmers in the selected village led to the overall improvement in health, production and composition of milk from dairy cattle, body weight gain in sheep, body condition score and lower incidence of reproductive disorders in animals. Evaluation of the different

parameters revealed a significant improvement in the performance of the animals provided with value-added MNB supplements (Table 3).

Impact

The positive effects of feeding value-added MNB on animal performance and net farm economic returns motivated the farmers to adopt the technology. The adoption pattern of the technology was evaluated among 150 beneficiaries in 15 selected villages of 3 districts of Kashmir, and the response of adoption of the technology is given in Figure 1. The farmers were ready to purchase MNB for animals not covered under the study and even non-beneficiary farmers got motivated towards adoption of the technology. Based on the adoption results and gaining popularity of the technology, approval was granted by the Competent Authority of the University in favour of the 1st author, Principal Investigator of the project for registering the company under SKUAST- Kashmir Innovation, Incubation and Entrepreneurship (SKIIE) Centre for up-scaling the production of MNB to commercial level.

Figure 1: Response pattern (in percentage) of the distributed value-added MNB among the beneficiary farmers (n=90 dairy and n=60 sheep)





An Example of Dedication and Hard Work: S. Sukhbir Singh

Kanwarpal Singh Dhillon* and Bikramjit Singh
Krishi Vigyan Kendra, Amritsar-143601 (Punjab)

ABSTRACT

Youth is considered a valuable asset for the society and the young people who are willing to take initiative and venture in a comparatively untouched territories are soon considered to be a role model by the society. S. Sukhbir Singh is one of such young, well-educated and dynamic farmer who is establishing new benchmarks in the poultry farming business. He belongs to the village Verka, district Amritsar and has only 2 acres of ancestral land in the village. He is very hardworking and innovative farmer but due to small land holding he was not earning much to meet daily needs of his family. To get better life he decided to start venture in some subsidiary occupation related with agricultural and he started his own poultry farm (broiler) in year 2022. Initially, he faced a lot of difficulties and though he consulted with various government departments, but he didn't get any success. During this period, he visited Punjab Agricultural University (PAU)'s Krishi Vigyan Kendra (KVK), Amritsar and acquired vocational training on poultry farming in the year 2023. An exposure visits at poultry farm of Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana was also made. According to the guidance provided by KVK experts, he modified and expanded his poultry farm capacity from 1000 to 3000 birds. Due to improvement in FCR (Feed Conversion Ratio), decreased mortality rate and disease incidence, now he sells more broiler birds with better marketable weight gain. After excluding all the expenses, he is earning a good profit of approximately Rs.50,000/- month. Now, he is invited as "Guest speaker" in the vocational training of poultry farming at KVK, Amritsar, where he shared his experience with the trainees about initial difficulties in poultry farming business. Many dignitaries and farmers from nearby areas visit his farm and various exposure visits and Farmer Field School has been organised at his farm. Now, he has become a role model for the other farmers who look up to him for guidance and advice on poultry farming.

Situation Analysis

In Punjab, fragmentation of land holdings and rise in input costs has made farming less profitable for small and marginal farmers. S. Sukhbir Singh, age 30 years, resident of village Verka, district Amritsar is an educated farmer having post-graduation in Master of Arts and Diploma in Computer Application. After graduation he also tried to get job at several places but could not succeed. All these constraints led him to adopt allied occupation to enhance his income.

Traditionally, he was involved in farming as he is very hardworking and innovative farmer,

but he was not satisfied with traditional system of farming and eager to do something promising in short time. But due to small land holding (2 acres) he was not able to earn much income to meet daily needs of his family. He explored enterprises like real estate and stock marketing but finally, after visiting poultry farms in nearby villages, he decided to enter in poultry farming business to get additional income. He started his own poultry farm (broiler) named as "D R Poultry Farm" of capacity 1000 birds in year 2022 and contacted with private company named Sampoorana which provided him chicks of age 0 day, feed and necessary medicines required for rearing the birds on contract basis. At

Kanwarpal Singh Dhillon and Bikramjit Singh

Before intervention (2022)										
Component	For one batch									No. of batches per year
	No. of birds	FCR	Mortality rate (%)	Farmer			Company			5
				Gross cost (Rs.)	Gross income (Rs.)	Net return (Rs.)	*Gross cost (Rs.)	Gross income (Rs.)	Net return (Rs.)	
				Poultry (Broilers)	1000	1.66	6.30	12,000	27,000	
After intervention by KVK Amritsar (2023)										
Component	For one batch									No. of batches per year
	No. of birds	FCR	Mortality rate (%)	Farmer			Company			6
				Gross cost (Rs.)	Gross income (Rs.)	Net return (Rs.)	*Gross cost (Rs.)	Gross income (Rs.)	Net return (Rs.)	
				Poultry (Broilers)	3000	1.47	3.44	30,000	89,000	

**Includes cost of labour, electricity, bedding material and other miscellaneous inputs.

**Includes cost of birds, feed, medicine and transportation as these are provided by the company in contract farming.

the start of business, he faced the major challenges of high mortality rate and disease incidence in the poultry birds due to less knowledge and experience in this field, but each sign of progress would give him encouragement to carry on with his work. He started consulting various government departments, but still, he didn't get any success in this enterprise due to lack of knowledge regarding breed, feed and disease management of poultry birds.

Plan, Implementation and Support

During his course of journey, he heard about training course on “Poultry farming” at Punjab Agricultural University (PAU)'s Krishi Vigyan Kendra (KVK), Amritsar. On his visit to KVK he gained knowledge about the various training programmes conducted by KVK for farmers, farm women and rural youth. On the advice of KVK expert, he got seven days of vocational training course on “Poultry farming” at KVK Amritsar in the year 2023. In this training, he got to know different breeds of poultry, housing system, care and management of poultry birds, deworming and vaccination schedule, feed management etc. including exposure visit at

successful and modern poultry farm at Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana. He also got method demonstration on “Egg candling” at KVK Amritsar and joined WhatsApp group of KVK named “KVK Poultry farming” to discuss queries. KVK scientists not only provided him with technical support and monitoring visits, but they also continually strengthened his morale by providing platforms for him to present his unique ideas at the state and national levels.

Output

After receiving the training and according to the guidance provided by KVK expert, he modified and expanded his poultry farm capacity from 1000 to 3000 poultry birds. Now, his birds (broiler) reach to the marketable weight earlier due to improvement in FCR (Feed Conversion Ratio) and he sells more broiler birds to the company than before. After a gap of 15 days, now he brings new batch of birds and again sells them after they reach the marketable weight and this cycle keeps on repeating. Now, he properly follows the deworming and vaccination schedule, and biosecurity measures without fail, due to which mortality rate decreases in his poultry farm.

An Example of Dedication and Hard Work

His family members also provide him helping hands in routine farm work, thus reducing labour cost at their farm. Due to carrying out the practices in a scientific manner, he is preparing and selling 6 batches in a year and earning good profit in this enterprise.

Outcome

Within few months, S. Sukhbir Singh became second best farmer of Amritsar district by Sampoorna company. After excluding all the expenses of electricity, labour and other miscellaneous things, the farmer is earning a good profit of approximately Rs. 50,000/- per month and has generated employment for a youth of his village. Now, he has become a source of inspiration for the farming community in his region. He is invited as “Guest speaker” in the vocational training of poultry farming at KVK Amritsar, where he shared his experience with the trainees about initial difficulties in poultry farming business. Many dignitaries and farmers from nearby areas visit his farm and various exposure visits and Farmer Field School has been organised at his farm. Now, he is developing and

strengthening linkage with small/traditional poultry farmers of the area for taking up poultry farming on a big platform. His future plans are to expand his unit upto 10,000 broiler birds and also start a new poultry farm of layer birds integrated with fish farming. He is also planning to enter in the field of value addition of poultry meat.

Impact

S. Sukhbir Singh is perfect example that hard work, dedication and technical guidance are key for any successful enterprise. He further got interested in other training courses at KVK Amritsar and regularly attended various meetings, programmes and *Kisan melas* organized by KVK Amritsar as a participant as well as a progressive farmer where he can share his experiences with his fellow farmers. He got full support from his family. Now, he has become a role model for the other farmers who look up to him for guidance and advice on poultry farming. Being very social he has encouraged about 25 of his friends and relatives to adopt poultry farming as a subsidiary occupation and many of them have shown interest to receive training and has started the enterprise.



S. Sukhbir Singh in his poultry farm of broiler birds



Awarded 2nd best farmer in Amritsar district by Sampoorna company



Setup of 3000 broiler birds in poultry farm after intervention by KVK Amritsar



Awarded with “Award of Honour” in the field of Poultry farming by Punjab Agricultural University

**A Success story of Mr. Devaraj Lakshman Naik earning through grafting techniques****Venkatesh L, Shabinabanu S Nadaf and Manju M J**

College of Forestry, Sirsi - 581 401, Uttara Kannada

In Indian scenario the integrated farming system is one of the most feasible farming systems. If one crop fails farmer may get income from other crop. In this a Success story of Mr. Devaraj Lakshman Naik, age 23 years, Thalan village, Bhatkala taluk, Uttara Kannada district, he is interested in growing agricultural and horticultural crops using scientific method. He started a small nursery in 2015 and chose nursery raising as a means of production by grafting various seedlings. While studying in class 10th, Mr. Devraj Laxman Naik started the nursery with 200 arecanut and coconut saplings. He is currently growing 12000 arecanuts after benefiting from I.C.A.R. Krishi Vigyan Kendra, Sirsi trainings related to precision agriculture in agriculture and horticulture crops under the Agroforestry Based Entrepreneurship

Development Scheme for Scheduled Caste Communities of Uttara Kannada District. Adopting the technology of grafting Mr. Devraj Lakshman Naik is growing 200 different varieties of mango saplings (Bennett, Alphonso, Appemidi, Mallika) 100 kokum, 150 cocoa, 250 nutmeg (seedlings and grafting method), 150 jackfruit and 150 rudraksha saplings in a year.

Apart from this he grows hibiscus (various colors), rose, amrut noni and tulsi plants by grafting method. Coconuts (native, mud, green and yellow) are the plants produced by their nursery. The annual income is approximately Rs. 4,00,000/- to Rs. 5,00,000/- earning. This will encourage other farmers to do this technique and gain skills in nursery production techniques. The economic cost of different saplings is given below.

Sl. No.	Particulars	Cost (Rs.)
1.	Areca nut	Rs.35/- per sapling
2.	Coconut	Rs.150/- to 200/- per sapling
3.	nutmeg	Rs.80/- to 100/- per seedling and per graft
4.	kokum	Rs.70/- per sapling
5.	Cocoa	Rs.25/-per sapling
6.	jackfruit	Rs.50/- 250/- per sapling (based on seasons)
7.	Mango	Rs.100/- per sapling (seedlings) Rs.150/-per sapling (Graft ed)
8.	Rudraksha	Rs.150/-per sapling (Graft ed)



Corresponding Author's Email: venkateshl@uasd.in





Beekeeping: A Sustainable Success Story of Mr. Bharat R.

Venkatesh L¹, Manju M J² and Shabinabanu S Nadaf³

College of Forestry, Sirsi - 581 401, Uttara Kannada

Mr. Bharat R., aged 23 is having 1.22 Acres of land in Irase, Siddapur, Uttara Kannada. Agriculture and Bee keeping have proved to be sustainable source of income for their family. Though they don't depend entirely on farming and bee-keeping for their main livelihood, their living standard has improved since they started practicing beekeeping as it gives a sustainable diversified income. Mr. Bharat R., is one among the trainees who attended the training programmes on Apiculture based Agroforestry systems organized by ICAR-KVK, Sirsi under DST project.

As a part of the training programme, he was given two bee colonies with comb. He managed the colonies very well as per scientific norms and was able to divide the colonies to 20 by the honey flow season. He owns around 0.50 acre of land where he cultivates Coconut and Arecanut and he also cultivates vegetable crops around. This training helped him acquire knowledge and skill required to identify the Queen in bee box, hiving of honey bee colonies, division and uniting of bee colonies, management of bee colonies in different seasons, extraction of honey and its processing and

the importance of bee-box. He is able to take proper care of queens whereas earlier he was not even able to locate the queen like many others. He is now not only able to split the colonies as a technique to avoid the swarming but also understand about the timing and concepts like colony strength. With the adoption of innovative practices, he generated a net income of Rs 22,000/- to 25,000/- per month.

As a result of his success, three people from their community also started bee-keeping. He has also encouraged and motivated fellow farmers to adopt scientific beekeeping practices and management. During the current year his total earnings was Rs.2,00,000/- as compared against previous year's Rs. 1,00,000/- (55 to 60 kg honey per season, 3 quintal of Arecanut, and 55000 cuttings of Black pepper). This bee keeping unit serves as a model for aspirant youth who like to integrate bee keeping along with farming and he extends all help to them. Around 15 rural youth from the area has approached the KVK for getting training on bee keeping which is an evidence for the spread of the technology. Many farmers visited his bee keeping unit and started their own unit.



Corresponding Author's Email: venkateshl@uasd.in

1Assistant Professor & PI, 2Professor & Co-PI and 3Project Associate

DST Project ICAR-Krishi Vigyan Kendra, Uttara Kannada, Sirsi – 581 401





Cattle farming: A Passion Converted into an Income Earning Means

Chingtham Chanbisana

Project Scientist II, Institute of Bioresources and Sustainable Development, Takyel
Centre of Bioresource Park, Haraorou, Imphal East.

ABSTRACT

Will to earn is the main triggering force for a person to do hard work. Eagerness to work hard led Mr. Sarangthem to start a venture from only one single cow. Now he is a proud owner of 23 cattle, producing not only milk, other value added products includes paneer and curd. Besides these, he also sells cowdung from his cattle farm giving him additional income. He currently gives employment to one person to look after the fodder and care for the cattle. He does the work of distributing the milk to household nearby his locality though he is a master degree student. He earns an income of 2 lakh per month by selling the milk and milk products he made in his residence. He sets an example for unemployed youths to start up any field for earning income without government assistance to become a successful entrepreneur.

INTRODUCTION

Mr. Sarangthem Biswanath Meitei, 30 years old, is a lonely son of Mr. Sarangthem Nabachandra Meitei and Sarangthem (O) Memi Devi from Wangkhei Thambalkhong, Imphal East, Manipur. He is a man of strong belief that only hardwork is the mantra of life. He already got master degree from Manipur University and he inherited a land property of area 0.4 acre. He has a strong passion for rearing cattle. He started a job as a technical assistant in the Institute of Bioresources and Sustainable Development, Takyel, Imphal West since November, 2017. Through his salary from the institute, he started monthly deposit system by depositing Rs. 5000/month for a year and got a sum of Rs.1.15 lakh in 2018 with which he started venturing his passion for rearing cattle by purchasing a 6 month old Holstein Friesian cattle costing Rs.1.12 lakh from a local farmer. Showing his dedication in rearing the cattle, his father gifted him two more cattle. During this time, he used to get 36 litres milk per day. With his skill in depositing money system, he started a deposit system where he deposited Rs.20,000 per month leading to an accumulated sum of Rs. 2.5 lakh at the end of the year with which he bought again two more cattles. So he has been adding up the number of cattle

slowly and currently he is rearing 23 cattles with 18 adult cattle and 5 calves. During lactation period, he obtained 150 litres milk per day while in dry season, he obtained 95-100 litres per day. Because of the excess milk production, he diverted some of the fresh milk into value added products like curd and paneer due to wide demand for such products in the market. He carried out the delivery of all products in nearby residential house while the remaining are sold in their own kiosk owned by his mother.

He sells all the product by delivering in household nearby. He distributes 30 litres/day himself while the remaining are sold in their own kiosk at their residence with the help of the family members. He currently employs a helper from 2023 to look after the cattle for fodder and cleaning shed since the number of cattle already increased giving him a salary of Rs. 9000/month. In return, he gets a monthly income from Rs.2 lakh per month from cattle rearing.

Problems faced

Since the cattle are of exotic breed, they require high nutrition. Due to lack of cultivation of high nutrient fodder like napier grass, alfalfa, Bermuda grass etc in the state, they depend largely on cattle feed so the expenditure is more on the cattle feed. He had a hard time handling all the cattles alone

Chingtham Chanbisana



Fig A: Feeding of cattles in the cow shed.

Price list of products

Name of the item	Price in rupees (Rs.)
1. Milk	60 per litre
2. Paneer	600 per kg
3. Curd	100 per litre
4. Cowdung	1500 per truck load
Total income earned per month	2,00,000 (Rupees two lakh)



Fig B. Various milk products made in own residence marketed by the farmer

along with the job in the institute, so he currently employs a helper to look after the cattles.

CONCLUSION

He did not stay idle after getting a job. He attends to rearing the cattle as his passion. He gets pleasure in serving the cattles. He successfully converted his passion into a means of earning. His success gives a message to the society that one can earn a living if one has a small land holding and a

willingness to work hard. If there are enough hard working people like him, then it is always better for the society and its development. Thus he sets an example that if one has a passion and works hard on it, the hard labour will be paid off. He starts his cattle farming with only one single cattle and he is now a prospering entrepreneur of various milk products in the locality.



Doubling income by production of fermented vinegar making

Rajni Goel and Rachna Singla

Krishi Vigyan Kendra, Patiala

ABSTRACT

The chemically synthesized vinegar is fraction of petrochemical industry containing traces of lead and has harmful impact on gastro-intestinal tract. The commercial synthetic vinegar is many a times is artificially flavoured and coloured with caramelized sugars and/or essences to give an impression of fermented product. Further, mineral acid contamination of commercial vinegar is given to provide a tangy sourness. Lack of awareness regarding ill effects of synthetic vinegar and its cheaper price, Indian markets are flooded with different brands of synthetic vinegar. Fermented vinegar being from natural raw materials viz. fruits, vegetables, cereals etc. is enriched with vitamins and minerals of fermenting microorganisms and the source fruit, hence, it is referred as a nutraceutical and used as a food, tonic and antiseptic. Krishi Vigyan Kendra, Patiala has employed various extension strategies to create awareness regarding harmful effects of synthetic vinegar and popularise the technology of PAU fermented vinegar among rural youth and farmers especially jaggery manufacturers. Fermented vinegar technology was initially adopted only for home use only. Krishi Vigyan Kendra, Patiala with its continuous efforts has succeeded in developing some entrepreneurship in the field of fermented vinegar technology.

INTRODUCTION

Situation analysis

S. Chamkaur Singh is 64 year old ex-serviceman from Nabha, Patiala. He somehow could complete his formal education up to 10 class and joined Indian Army with a great zeal to serve the nation. After taking voluntary retirement from the army service in 2008, he engaged himself in various jobs. He has two daughters and a son. He wanted to educate his daughters. His pension was not sufficient to meet the family expenditures. He is not satisfied with his job. He realized that the earnings he was getting were pretty much discouraging to continue the job. His army background has helped him to fight back and had lifted his spirit in the time of distress; and instead of giving up job, he started looking for different ways to increase his income. He visited KVK and attended many trainings and decided to try his hand on fermented vinegar production along with his job.

Plan, Implementation and support

Krishi Vigyan Kendra, Patiala with its continuous efforts has succeeded in developing

some entrepreneurship in the field of fruits and vegetable processing. He attended training on production of fermented vinegar and non-alcoholic carbonated beverages from fruit juices. Fermented vinegar making enterprise can be started with a small investment. So, he decided to venture in this enterprise. This enterprise does not require much time, space and money but it requires skill.

Indigenous practice is the natural fermentation of jaggery or sugarcane juice in earthen jars/tanks till it becomes sour. The method is crude, unhygienic, often takes 4-6 months and may lead to accumulation of slime. Punjab Agricultural University, Ludhiana has given the method of scientific fermentation of sugarcane, apple and grapes using optimized cultures. After training, he has prepared fermented vinegar from sugarcane, apple and grapes. On demand of his customers, he prepared Jamun vinegar with slight modification in the process. Innovative farmer has also prepared fermented vinegar from beetroot using this technology. KVK, Patiala guided him in preparation of inoculum, upscaling of technology,

Year wise detail Product

Sr. No.	Name of product	2017-18	2021-22	2022-23	2023-24
1.	Sugarcane vinegar (litres)	200	1200	1770	1960
2.	Apple vinegar (litres)	100	640	1390	1540
3.	Grape vinegar (litres)	100	180	170	1150
4.	Jamun vinegar (litres)	200	680	1210	1520

Income generation through Fermented vinegar making

Product	Income generation (Rs.)			
	2017-18	2021-22	2022-23	2023-24
Sugarcane vinegar	50050/-	78000/-	130980/-	152880/-
Apple vinegar	33150/-	64000/-	166800/-	223300/-
Grape vinegar	4900/-	12600/-	14450/-	115000/-
Jamun vinegar	18900/-	61200/-	118580/-	179360/-
Total	107000/-	215800/-	430810/-	670540/-

testing of alcohol and acidity, bottling, labelling, registration and marketing etc.

Output

Temperature requirement for vinegar making is less than 30°C. Jamun fruit comes in summer when temperature is more than 35°C. For preparing Jamun vinegar, maintenance of the room temperature below 30°C in July is the basic requirement. He sprinkled water and kept wet jute bags in room, used paddy straw at roof to maintain temperature. He prepared 250ml and 750ml capacity bottles of various vinegar. He has also prepared vinegar from other fruits like guava, strawberry and karonda etc. He is selling his products under the brand name of Kamal. He advertised and marketed his products through various social media platforms. Demand of his products increased exponentially. His unit has also been registered under FSSAI (Food Safety & Standards Act of India).

S. Chamkaur Singh is a regular participant in various exhibitions and competitions being organised by PAU, Ludhiana. He regularly attended various kisan melas and public gatherings organised by PAU, ATMA, Deptt. of Horticulture, NGO's and KVIC. He attended SARAS fairs at Patiala and CII fairs at Chandigarh with the support of NABARD.

Outcome

A sale outlet named “ATMA KISAN HUT” has also been provided to them by Department of Agriculture at Nabha town; district Patiala which has substantially improved the daily sale of his products. Recently KVK Patiala made a short documentary film on his success story to motivate other farm families and youth. He is able to increase his income from sale of fermented vinegar from 107000/- in 2017-18 to 670540/- in 2023-24.

Impact

Chamkaur Singh has established his name in fermented vinegar making. Fermented vinegar has immense and wide spread market potential due to its health benefits. He guided many people in preparing fermented vinegar as per PAU technology and helped them in taking up this as an enterprise. His personal rapport and good quality products ensured the marketing of products. He has also delivered many radio talks and is invited as resource person at several occasions. He is regularly invited as motivator and resource person in the training programmes organized by various development departments and agencies. There is improvement in the family economic and social status. He built a pucca house. He sent his two daughters abroad for higher education.

Doubling Income By Production Of Fermented Vinegar Making



Food adulteration is a curse to our society. He is providing adulteration free products and also at reasonable prices. It should be mentioned here that he carries all the activities with the help of his family members without engaging any outside labour.

Vinegar is being used in large quantity in restaurants, hotels and other eating places.

However, domestic market for fermented vinegar can be developed by making people aware about its benefits and encouraging them to use fermented vinegar instead of synthetic vinegar. The setting up of cottage scale units can help in generation of good quality fermented vinegar and its easy availability in the market.



Empowerment through Scientific Backyard Poultry Farming

Muthusamy N, Akila N and Velmurugan K

Krishi Vigyan Kendra, TANUVAS,
Veterinary College and Research Institute Campus,
Namakkal 637 002 (Tamil Nadu)

ABSTRACT

Backyard poultry farming is a viable enterprise with low initial investment along with higher income and improved the livelihood and socio economic status of the small and marginal farm woman. However, farm woman are getting low income due to conventional rearing of backyard poultry. KVK, Namakkal planned to improve their livelihood of the farm woman through various scientific interventions. KVK, Namakkal enhanced the skills and capacity building of farm woman through training programme on scientific backyard poultry farming and motivate the farm woman through distribution of improved germplasm of desi poultry, night shelters, on farm trials and front line demonstrations. Farm woman adopted scientific backyard poultry farming and getting additional income of Rs.17000 to Rs.19000 per annum, provided additional income to the family and increased their socio economic status.

Situation Analysis

Backyard poultry farming is the important activity of rural woman of Namakkal district in Tamil Nadu. Namakkal district was known for egg production. However, Backyard poultry farmers live in a low socio economic status due to adoption of traditional backyard poultry farming. The farm woman involved in backyard poultry farming reared non-descript birds which yielded low egg production (50-60 eggs), less body weight (1 to 1.1 kg at 5 months of age), low hatchability percentage from natural brooding and early chick mortality. Backyard poultry farmers reared birds without proper housing and find difficult to protect the desi birds from predator during night time. Backyard poultry was only sufficient to meet family needs.

Plan, Implementation and Support

The KVK, Namakkal adopted Naraikinaru and Mangalapuram villages of Namagiripettai block of Namakkal district. KVK scientists visited the village advised farmers to get a training of their interest and form a group by involving women of their village. In the year, 2019-2020 one woman group formed with 10 farm woman. After two years 5 more woman groups were formed with the participants of 55 farm woman. All 65 members of

the group enrolled themselves in Entrepreneurship Development Programme on backyard poultry farming conducted by KVK.

KVK Namakkal planned to enhanced livelihood and nutrition security of rural family through various scientific interventions. KVK improved the skills and capacity building on scientific backyard poultry rearing through on campus, off campus and skill development training programme. Farm woman trained on brooding management, least cost feed preparation, vaccination, deworming, ectoparasites management, candling and hatching of eggs using egg incubator etc. KVK motivated scientific backyard poultry farming by distribution of improved germplasm of desi bird (Vanaraja, Gramapriya, TANUVAS Aseel, TANUVAS Star chicken, and Aseel cross), Feed supplements probiotics EC as growth promoter, TANUVAS waterer with heater to control early chick mortality, semi automatic egg incubator with the capacity of 100 eggs to improve the hatchability percentage, night shelters for protection of desi birds from predators through ICAR OFT, FLD , TANUVAS FLD programmes, CPPM SCSP, and ICAR SCSP scheme.

		
Distribution of desi poultry night shelters to farmers by Vice chancellor of TANUVAS	Field visit to semi automatic incubator	Demonstration of Lasota vaccination to backyard farmers at adopted village

year	No of farm woman covered	Egg production (Eggs No/bird/year)	Body weight (kg)	Annual income per family (Rs)
2020-2021	20	145	1.75	17,500 - 18500
2021-2022	25	151	1.82	18000 - 19500
2022-2023	20	158	1.93	18500 - 19500

	
Field visit to backyard poultry unit	

Output:

Rural woman adopted scientific rearing backyard poultry as suggested by KVK. Now the backyard poultry lay eggs numbers up to 150 /bird /year and increased the body weight from 1.6 to 1.8 kg at the end of 5 months of age. The egg weight of improved variety of desi bird was higher (45-50 g) than the country chicken (35-40 g). Periodical

vaccination and deworming decreases the incidence of disease and increase the profitability in backyard farming. The main source of income for farm woman was from sale of surplus egg @ Rs 12-15/egg and sale of surplus cocks and hen @ Rs.350-450/kg. Backyard poultry manure used for nutritional kitchen garden.

Empowerment through Scientific Backyard Poultry Farming

Outcome

Initially, backyard poultry satisfy the family nutritional security and now farmers selling surplus eggs and cocks on regular basis in local market and earn Rs. 17000-19000 per annum. Backyard poultry farmers keep in touch with KVK, Namakkal and as a follow up, animal science scientist visits the village for conducting group meeting and interacted with backyard poultry farmers regularly. KVK Namakkal provided all the need based advisories and skill for further expansion of the backyard poultry for reducing the cost of production.

Impact

Adoption of scientific backyard poultry farming improved the family economic status, social status, nutritional status, awareness level leads to a better life of farm woman. Now these farm women have become self dependent and even contributing to the overall income of the family. The farm woman reared improved variety of desi birds successfully and getting more income by directly selling backyard birds to the consumer in the local market. The farm woman from neighboring villages of adopted village approach the KVK for scientific backyard poultry farming.



Engineer Becomes Agri-Preneur through Livestock and Poultry Based Farming System

B K D Borah*, U Barua, M S Bora and N Munglang

Krishi Vigyan Kendra, Namsai District,
Chongkham, Arunachal Pradesh

ICAR RC for NEH Region, A.P. Centre, Basar

ABSTRACT

Mr. Monbhai Thamoung, an educated tribal youth involved himself through developing small multi-species livestock based farm comprising poultry, piggery, dairy and goatry and gain popularity among the farming community at Namsai district (Lat. 27.670826°; Long. 95.916087°) of Arunachal Pradesh. The young entrepreneur acquired his knowledge and skill in the field of livestock based farming system through various trainings and demonstrations conducted by KVK Namsai. The overall net income generated from his existing model of farming is Rs.61200/- a year with benefit cost ratio of 2.8 (B:C ratio) by selling 36900 eggs and 1350 kg of poultry meat, 40 piglets and 2 fatten pigs, 1620 liter of cow milk, 1 goat and around 2q of farmyard manure. He encouraged many farmers of the district to develop his model of livestock based farming system in scientific way by utilizing household resources for maximum profit. He is conferred as best farmers award for his contributions in livestock sector during 2023 by the district administration of Namsai district.

Situation analysis

Mr. Monbhai Thamoung, an educated unemployed tribal youth at Kaisu village of Namsai district, Arunachal Pradesh completed his B. Tech. degree during the year 2010. The family holds a total of approximately 4.5 ha of land and utilized only 1 ha of land for paddy cultivation traditionally as a tool of livelihood like other village family. Due to small family size and non availability of labour in Namsai district, his family cannot grow crops in entire land. They have a small area of 0.5 acre upland adjoining to their house where they practiced in rearing of local cattle, pig and poultry in traditional way and utilized their products mostly for family consumption. After completion of his graduation, he engaged himself by running a computer centre in Namsai township and started earning of rupees 10-15 thousands per month with total annual income of around Rs.1.5lakh. Mr. Thamoung was not satisfied with that income and decided to involve himself in livestock and poultry based farming system. Initially he started rearing broiler chicken with the capacity of 100 birds per batch during the year 2018. He sold the broiler meat

directly in the market without involving middlemen and satisfactory income was generated. At this point, he felt the huge market demand of poultry meat and egg at Namsai district and almost all poultry meat and eggs were outsourced by Namsai district. As per vision document of Namsai district 2030 (2018) there was demand of 1170 (MT) meat in the district against production of 911(MT) where as requirement of 18500000 nos of egg against production of 2800000 nos (18th Livestock Census 2007). Though the market was there, Mr. Thamoung was reluctant to increase his batch strength due to early chick's mortality.

Plan, implementation and support

The poultry farmers of Namsai district are mostly unorganized and they are being exploited at various stages of the value chain. Due to lack of awareness and technical knowledge on standard farm operation and farming system, most of the farming community of Namsai district deprives to earn satisfactory income with their existing resources despite of investing hard labour and time. In the course of time, Mr. Thamoung came in



Poultry unit

contact with KVK Namsai and approached the KVK scientist for technical guidance as well as skilling in the subject.

Subsequently, the experts of KVK Namsai had visited the farm site of Mr. Thamoung and put few suggestions to him considering the existing land of 0.5 acre and small family size. They recommended establishing a small multi-species livestock based farming system comprising poultry, piggery, dairy and goatry to explore maximum utilization of land and labour. Accordingly, Mr. Thamoung agreed to establish the units as per the direction of KVK, Namsai and

setup two poultry units separately with the capacity of 500 birds each, a piggery unit of 10 animal's capacity (8 sows and 2 boars) and a small goat house in scientific way. Training on Scientific poultry (broiler, improved variety and local chicken), piggery, dairy and goatry were also imparted simultaneously by the expert of KVK Namsai. He was also undergoes 7 days hands on training conducted by KVK Namsai on “health management of livestock and poultry” skilling with how to infuse medicines and vaccines in different routes to farm animals and birds.



Piggery unit

Engineer Becomes Agri-Preneur through Livestock and Poultry Based Farming System

Initially, KVK, Namsai offered 100 numbers of DOC of Kalinga brown variety and 100 DOC Sonali chicks. The KVK also provided 4 numbers of cross-bred (Hampshire & Yorkshire) piglet. Later, 100 more BV-380 variety and 3 more cross-bred piglets were provided to him. He was also asked to inseminate his local cattle with improved semen viz. Sahiwal, Jersey or Red Sindhi semen straw exist in local veterinary dispensary and asked to mate his estrous female goat at breeding centre ran by KVK Namsai with Sirohi, Jhakrana and Assam hill buck. He followed all the instructions provided by the experts of KVK Namsai and started generating more income from the flock. Later on he has strengthen his farm complex by purchasing more nos. of animals and birds and at present he holding 525 numbers of poultry birds (217 improved variey poultry. 200 broiler, 108 chicks), 17 pigs (5 sow, 3 boar, 9 piglets), 5 goat and 6 cattle (3 milch cow).

Output

As per KVKs suggestion, Mr. Thamoung adopted scientific way of livestock and poultry management practices including feeding, breeding and healthcare. Broiler and pigs are reared as intensive system of management whereas improved variety poultry bird, cattle and goat are reared as semi-intensive system of management. At present, his overall net income generated from his existing model of farming is Rs.612000/- a year with benefit cost ratio of 2.8 (B:C Ratio). The farm product is mainly sold in the local market whereas demand also comes from the adjoining areas of Namsai district.

From the poultry enterprise, earned net income of Rs.391000/- by selling 36900 numbers

of egg and 1350 kg of poultry meat with B:C ration of 2.8. Improved variety poultry birds viz. Sonali, BV-380, Kalinga brown etc. are kept for production of eggs whereas broiler are reared for meat purpose sold at the age in between 2-3 months. However, the extra male of improved variety birds are also sold at their maturity after keeping required numbers of male in the flock for production of fertile egg at 1:7 ratio.

A total of 40 piglets and 2 numbers of fatten pigs are sold from his model farm directly in the local market with net income of Rs.345000/- (B:C ratio 2.4). Cross-bred pig of Hampshire and Yorkshire are being reared by Mr. Thamoung utilizing market feed along with homemade feed prepare through locally available unconventional feed stuffs to reduce burden of feed cost. The sows farrowed average 8-9 piglets with good body weight at birth. He also practiced fattening of pig and sold at market as raw meat (pork).

Around 1620 liter of milk produced from his three local cows in a lactation period earning net income of Rs.61000/- with B:C ration of 4. His cows grazed at the community grazing field whole the day. Moreover, a little amount of concentrated feed is offered to the animals at morning and evening.

Mr. Thamoung rears his goats investing minimum expenses by utilizing locally available feeds and fodder. He started mated his estrous doe with Jhakrana and Sirohi buck at KVK Namsai goat breeding unit for production of quality kids. From goatery enterprise, he earned Rs. 15000/- as net income by selling one goat with the B:C ratio of 6.

Simultaneously, Mr. Thamoung also sold farm yard manure prepared utilizing farm waste



Goatry unit



F₁ Serohi cross kid



Dairy unit

viz. dung, poultry drops and other farm residues which have high market value and sells in the markets regularly. He earned amount of Rs.30000/- as net profit by selling the farmyard manure.

Outcome

Keeping small flock size of Cattle, Pig, Goat and Poultry for family consumption is common in almost every village household of Namsai district but they rear with local variety mostly in traditional way. Introducing high performing breed/crossbreed of livestock and poultry with scientific intervention may lead to develop a livestock based entrepreneurship in every household to generate family income. However keeping 3-4 enterprises together facilitate efficient utilization of land, labour and time.

Mr. Monbhai Thamoung has earned a good annual income by adopting multi-species livestock based farming system and now become a source of inspiration for the farming community in the district. He sells his farm products in the name of M/S. M.T. Enterprise owned by him, technically supported and guided by KVK Namsai. He also practiced hatching of fertile eggs with local chicken (Natural hatching) for production of quality chicks to maintain his flock size. By seeing the success of Mr. Thamoung, many farmers of his locality now adopted his farming model. They took the fertile eggs from Thamoungs farm and produced chicks through natural hatching. Mr. Thamoung also supplies quality piglets to the farmers in low price to establish new enterprises. He also practiced traditional “Adhi” system of livestock and poultry rearing where his livestock and poultry are maintained by other farmers and in return gets 30 percent of its production. In this way he also



Farmyard manure/ pit

encourages the poor needy farmers to develop their own enterprise. Being a skilled animal health worker as trained by KVK Namsai, Mr. Thamoung engaged himself to treat and vaccinate his farm animals and birds regularly as well as to the other farms of his locality. He also demonstrated in front of the farmers how to utilize locally available unconventional feedstuff for farm animals to reduce production cost since maximum cost of production comes from animal feed.

Impact

The new model of multi-species livestock based farming system practiced by Mr. Thamoung utilizing mostly household resources gain popularity amongst the farming community of the Namsai district. Farmer use to visit his farm complex for practical learning and to seek guidance to develop such model. Beneficiaries of agriculture and allied departments of the district are also made visited his farm with their farmers as a part of exposure visit.

The progress and success of Mr. Thamoung is highly appreciated by the district administration of Namsai district. They invite him to put stall with his farm products at district as well as state level celebrations like Arunachal Pradesh Statehood Day, Republic Day, Independent day etc. He was also awarded as best farmer as well as best stall during the statehood day 2023 by the district administration. He has also rendered his service as a member of Scientific Advisory Committee of KVK Namsai.

REFERENCES

- 18th Livestock Census 2007, Govt of Arunachal Pradesh (Namsai District Vision 2030).



Housewife sustained livelihood through Climate Resilient Technologies

M. Sonowal Bora, Nancy Munglang, B. K. D. Borah, Utpal Braua and Lobsang Wangchu
ICAR-KVK Namsai, Arunachal Pradesh - 792102

ABSTRACT

Climate change is one of the most pressing issues of this time. Temperatures are rising, drought and wild fire accidents are more frequent, rainfall patterns are shifting, glaciers and snow are melting, global mean sea level is rising. Agriculture, which is the backbone of the Indian economy, is directly being affected by these adverse changes in climate. Namsai, an aspirational district which has been identified as one among the most vulnerable to climate change. The district where farmers are already facing incidences of flash flood, mild drought, insect pest infestation, etc. Livestock are also experiencing heat stress, stress due to animal feed shortfalls and spread of parasites and vector-borne diseases. In order to mitigate the such adverse effects of climate change, the Krishi Vigyan Kendra (KVK), Namsai undertook demonstration programmes of various climate resilient technologies through National Innovation in Climate Resilient Agriculture (NICRA) project under Technology Demonstration Component (TDC). Smt. Nang Samathi Longkan of Mengkeng Khamti village adopted under the NICRA project has shown impressive results by following diligently all the risk management technologies and advice given based on the vulnerability of the region. Agriculture being the primary source of income of the family, prior to the interventions in the village Smt Samathi's family income was around 1 lakh only. In 2022-23, post intervention, her hard and smart work paid off by doubling their family income, improving their financial state. She has inspired and motivated many of the other co-farmers in and around her village.

Situation Analysis

Namsai, the 18th district of Arunachal Pradesh, established on 25th November, 2014 with 1587 Sq. km of geographical area. It is situated in the north-eastern most part of India, lying in the foothills of the Eastern Himalayan zone with 95.45° to 96.20°E longitudes, 27.30° to 27.55°N latitude and an altitude less than 200 mtrs above the mean sea level. The only plane district of Arunachal Pradesh, located beside the river basin of Dihing, which is a tributary of the Brahmaputra River. The maximum and minimum temperature of this district is 10°C - 25°C in winter and 28°C - 38°C in summer. The vegetation has the general characteristics of the tropical wet semi-evergreen forest of the Himalayan mountain ecosystem. The district, has abundant scope for agriculture and allied sectors and is predominantly an agrarian district. It has a warm and sub-tropical climate with an average annual temperature of 22.8°C and

average rainfall is about 2728 mm. Most of the farmers are small and marginal, cultivate traditional landraces of lowland rice. Medium and long duration rice varieties like Ranjit, Khamti Lahi, Sali and Bora rice are popularly grown as rainfed crop in the region with average productivity of 2.5 t/ha. The rainy season starts with one or two spells of rain in the month of March, followed by heavy rain during June – August. The rainy season ends in October. The district is prone to flash floods. Every year, some parts of the district experience 2-3 spells of flash floods inundating the village with 2-3 feet of deep water for a duration of 5-7 days in each spell. The months of December – February are the driest season. There is a lack of irrigation facilities during winter months in the district. Despite having fertile alluvial soils, the cropping intensity of the district is low as farmers keep their land fallow during the winter months. Some areas of the district experience drought like situations during

winter months. There is vast scope for varietal substitution in rice with varieties which are suitable for the lowland rice ecosystem and combat challenges of climate change. The farmers are unaware of such lowland varieties. The KVK, Namsai undertook demonstrations on the introduction of lowland rice varieties followed by cultivation of other crops as rice fallow during winter months through the NICRA project since 2022.

Plan, Implementation and Support

Mengkeng Khamti, a small village with 50 households situated in Piyong circle of Namsai district, has a total population of 230, out of which the male population is 114 while the female population is 116. Literacy rate of mengkeng khamti village is 37.39%. The riverine dwellers mostly Khampti and Adi tribe and are dependent on agriculture and livestock for livelihood. The village is prone to climatic adversities like flash floods, intermittent drought like situations. On the basis of climatic vulnerability, the village was adopted under NICRA for demonstrating climate resilient technologies to sustain livelihood in the year 2022.

Smt. Nang Samathi Longkan, a 46 year old hardworking lady, seemed intrigued with the new technologies showcased by KVK Namsai. She has a family of 5 members, including her husband and 3 children. The family is solely dependent on agricultural farming for their source of income. Holding 6 ha of land, she cultivates paddy in 3 ha, 2 ha area is covered by seasonal crops and 1 ha area is marshy land. After every harvest from the farm, she would sell the products directly to a market, which is at a distance of 9 km from the farm. However, lately the changing weather conditions have led to increase in incidences of flash flood every monsoon in the paddy field resulting in poor crop performance and dry spell during the rabi season affecting the production of toria and other seasonal crops. Along with the cultivation of agricultural crops, she is also keen on livestock farming and has been rearing some local pigs in a traditional method since the last few years. Despite all her dedication and hard work, the family still faced financial instability. She was not satisfied with the traditional way of farming because she

was determined to do farming with improved agricultural technologies. Selecting her as a beneficiary under the NICRA-TDC project was like a boon to her family and aided the family to increase its family income.

Initially, she along with other beneficiaries of the village were informed about the vulnerability of climatic change by KVK Namsai. Then demonstrations were undertaken on different climate resilient technologies based on their local vulnerability issues. She was facilitated with a submergence tolerant rice variety Swarna Sub-I which can withstand flash flood situations. The flash flood situation occurred in Mengkeng Khamti village for at least 6-7 days from 17th July-23rd July, 2022. The rice seedling in nursery bed submerged upto 60-65 cm depth of water. The rice var. Swarna sub-I survived but the local variety Khamti Lahi was completely destroyed. The farmers broadcast urea when rice seedling receded under water for emergence of newly leaves and tillers after 6 - 7 days. The toria variety TS-67 that is suitable in paddy-toria cropping sequence under late sown condition and thrives well in drought situation was also introduced. She cultivated Swarna Sub-I in 1.0 ha of land during the Kharif season. In the Rabi season, cultivated Toria TS-67 on 1 ha of land after harvesting of paddy. She was advised to add borax during the land preparation of toria since the soil of Namsai district is deficient in boron. She has been rearing local pigs, which were found to be unproductive in terms of body weight gain and piglet production. Moreover, she was not following any scientific housing for pigs and reared pigs only feeding with locally available material. A number of training was provided on various aspects of the scientific way of rearing pigs so that she could draw maximum profit out of pig farm. Two numbers of 3 months old cross-bred piglets and 50 kg of starter pig feed were provided to her initially. She sincerely followed all the instructions and advice given by KVK scientist on scientific rearing practices including scheduled deworming and vaccination for swine fever. She also renovated her pig shelter from kuccha to pucca floor with the technical guidance from KVK. The trainings she attended helped her built confidence in managing improved pigs for breeding and motivated her to invest more time

Housewife sustained livelihood through Climate Resilient Technologies



Flash flood situation in mengkang khamti village for 6-7 days(17th July- 23rd July)

and energy in managing her pigs. Time to time, diagnostic visits were carried out by KVK Namsai scientists and provided various assistance on plant health, veterinary services, training, etc.

Output

Year 2022-23, the year of KVK Namsai intervention in the village of Mengkeng Khamti, Smt. Nang Samathi Longkan, with her own capability, enthusiasm and our institutional assistance she could witness with impressive growth and bounty yield from the crops and a good net return from the livestock sector throughout the year. She is in constant touch with the KVK and adopted innovative and sustainable farm practices resulting in enhanced returns and developed a model of a sustainable integrated farming system which is worth replicating in the region. During Rabi season, she grows oilseeds like toria while in



Survival of rice seedlings var. Swarna sub-I after flash flood

Kharif season she grows paddy. She has become one of the progressive farmers in piggery farming within a short period of time. Her pigs attained sexual maturity at the age of 8 months and gained an average body weight of 80 kg at 12 months of age, which was reported far much better than the average body weight (45kg) of local pigs. The sow had a good little size of 12 and is now 1 month pregnant.

The net income of her enterprise is about Rs. 2 lakhs a year. The farm produce is mainly sold in the local market as there is high demand for locally produced crops. Simultaneously, she runs a small piggery unit of 2 pigs of improved breed which is highly profitable as there is high demand for pig meat in the area and also the rate of cross bred piglets ranges between Rs. 5000-5500/-

Table 1. Economics of intervention (for crops)

Economics of the farmer before the intervention.					Economics of NICRA farmer after the intervention				
Yield (q/ha)	Cost of production (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B.C ratio	Yield (q/ha)	Cost of production (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B.C ratio
Paddy - 37.5	40603.5	116250	75646.5	2.8	55.6	52959.95	165000	112040.1	3.1
Toria-5	11760	20,000	8240	2.4	9.6	38400	49455	15755	3.1
% increase in yield after the intervention									
Paddy : 67.4% , Toria : 52.08%									
% increase in net return after the intervention									
Paddy : 67.5% , Toria : 52.3 %									

Table 2: Economics of intervention for piggery

Economics of the farmers before the intervention.					Economics of farmers after the intervention				
Yield (q/unit/year)	Cost of production (Rs/unit/year)	Gross return (Rs/unit/year)	Net return (Rs/unit/year)	B.C ratio	Yield (q/ha)	Cost of production (Rs/unit/year)	Gross return (Rs/unit/year)	Net return (Rs/unit/year)	B.C ratio
5 piglets/year	8430	20000	11570	1.72	12 piglets/year	20420	66000	45580	3.2
% increase in yield after the intervention-41%									
% increase in net return after the intervention-25.4%									



Distribution of rice seed to the farmers of mengkang khamti village



Demonstration of submergence tolerant rice var., Swarna sub-I at Nang Samathi Longkan



Data collection for statistical analysis



Demonstration of toria var. TS- 67 at Nang Samathi Longkan

Housewife sustained livelihood through Climate Resilient Technologies



Demonstration of an improved breed of pig

Outcome and Impact

Smt. Nang Samathi Longkan has become a source of inspiration for the farming community in the region. She has demonstrated the low cost piggery shelter and efficient and effective use of feed formulation as well. She has been instrumental in the transfer of farm technology in the region. She is always keen to assist and guide fellow farmers for adoption of new technologies. Now the farmers have a positive attitude towards

climate-resilient technologies of the NICRA project. She and the other farmers learnt about the current threats due to climate change and their ground-level solution. The new technologies also acted as an eye opener for the farmers. The project could successfully achieve its goal upto a good extent, however the villagers need more of such awareness and interventions to cope up the changes and uplift their livelihood on household level.



Improvement of Livelihood of Tribal Families through Scientific Backyard Piggery Farming

Kangjam Sonamani Singh, Hb. Lungni Anal and A. Ameeta Devi
Krishi Vigyan Kendra, Chandel

ABSTRACT

Backyard piggery rearing has always been an excellent enterprise which can be a feasible means for curtailment of poverty and unemployment in tribal belt. Almost every household in Chandel district is already in traditional backyard piggery for their personal consumption, but remunerative returns is still beyond the reach of the farmers. In this regards, Krishi Vigyan Kendra, Chandel identified the existing technological gaps in and around the villages by conducting various PRAs, field visits and diagnostic visits to the existing traditional piggery units and mobilised the farmers to replace the existing local pigs with improved cross breed Hampshire pigs which would be highly profitable as well rewarding. Due to the high proximity of the Chandel district to international border, the local pigs are highly susceptible to numerous heat and cold stress induced parasitic infections and non-specific viral/bacterial fever affecting their body growths well as high mortality rates as a result of which pig farmers often incurred huge losses. Also, low feed conversion ratio (FCR) is a common trait in the traditional local pig breed. The cross breed Hampshire pigs were found to be resistant to heat stress induced parasitic infections of skin and gastro intestine & non-specific viral/bacterial fever, showed better FCR and impressive body weight gain (105-110 kg/pig in 9 months) as compared to 48-50 kg in traditional pigs. In order to improve the skills and technical knowhow of these farmers, several training and capacity building programmes were held. They were trained on various aspects of scientific piggery farming along with provision of all the necessary inputs for the same. Being guided and nurtured by the KVK experts, a huge tremendous and fantastic change was seen in the life of these farmers. Farmers who were earlier having a meagre income are now not only earning around Rs. 112875 per unit with a B:C of 2.49 on an average but are also enjoying a good social status. The successful farmers are now congregated and have pooled in their activities in the form of a Self Help Group.

Situation analysis

A lot many of the farmers in Chandel district are either landless cultivators or have small land holdings who are mainly engaged in activities of backyard piggery farming in their backyard. But they are unable to reap good returns from the traditional backyard piggery due to adoption of crude and obsolete traditional practices. They reared local pigs in the backyards on household wastes with hardly any other extra attention or efforts invested. With close proximity to international border, local pigs are prone to numerous heat and cold stress induced parasitic infections and non-specific viral/bacterial fever

affecting their body growths well as mortality rates. Besides being highly susceptible to disease, low feed conversion ratio (FCR) is a common trait in the traditional local pig breed. Notably, in such cases, there was lesser body weight gain of the pigs. Predictably, these piggery units were just good enough to suffice for family needs and consumption.

Plan, implementation and support

With the intervention of KVK Chandel, backyard piggery rearing has now been accepted as a promising enterprise for mitigating poverty and unemployment and has a strong potential for employment generation among the tribal youths.



Fig 1 Different scenario of the cross breed Hampshire pigs in backyard piggery units

But obsolete and age-old system practiced by the majority of the farmers in the district has made this enterprise far from being remunerative. In this context, Krishi Vigyan Kendra, Chandel chalked out a proper strategy for making the farmers achieve a sustainable livelihood and profitable activity through implementation of various scientific interventions. They have identified the huge technological gaps through several PRAs, field visits, diagnostic visits and group discussions and finally motivated the tribal farmers to replace the existing pigs with improved cross breed Hampshire pigs which suits the demand of rural masses in terms of higher body weight gain, earlier sexual maturity, better litter size, improved feed conversion ratio (FCR) and disease resistance. Several On-Farm-Trials conducted by KVK Chandel clearly indicated that the cross breed Hampshire pigs procured from ICAR National Research Centre on Pig, Guwahati proved to be a promising breed to cater to the present needs of the farmers of the district.

With the age-old habit of pig rearing, KVK Chandel focussed on improvising the present skills and know-how of the tribal farmers of the district through several training and capacity building programmes on “Backyard Piggery Farming”. They were trained and sensitised on

various aspects of pig rearing like pig sty management, sanitation, feeding, disease management, vaccination, etc to ensure higher output and better returns. To set up an example and to further make the demonstrations effective, KVK, Chandel established a piggery demonstration unit at its premises to make the piglets available to the farmers. The beneficiary farmers were provided 3 numbers of 6-month-old piglets each. The piggery units at the farmers' backyards were regularly monitored by KVK experts and all the necessary technical support were provided.

Output

The improved piggery breed thrives and performs well in the local conditions (Table 1). The pigs in the district are susceptible to a lot of heat stress induced parasitic infections of skin and gastro intestine & non-specific viral/bacterial fever. The cross breed Hampshire is widely desired by the farmers as it is more disease resistant to these infections. As is seen in Figure 1, the improved cross breed Hampshire showed impressive litter weight (1 kg) as against 700 g in case of the traditional breed. The litter size too was on an average 10 compared to 5-6 in old breed. The feed conversion ratio (FCR) was recorded to be 3.5 in the improved demonstrated breed

Improvement of Livelihood of Tribal Families through Scientific Backyard Piggery Farming

Table 1 Economic analysis of the improved piggery farming

Technology adopted/ demonstrated	BW/animal	Selling price (Rs/animal)	Cost of production (Rs/animal)	Gross returns (Rs./unit)
Cross breed Hampshire	105-110 kg/ animal	@ Rs. 350/kg 37625/-	15100	112875
Traditional breed in open rearing system	48-50 kg	@ Rs300/kg 14,700/-	12,100	44,100

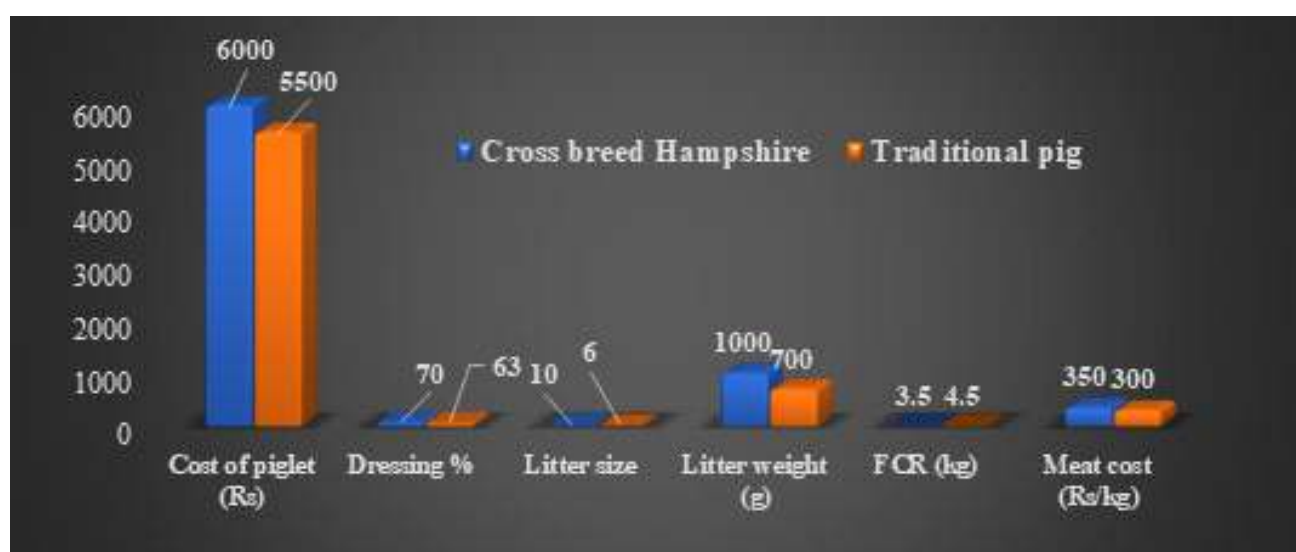


Fig 1: Comparison of Cross breed Hampshire and traditional pig

whereas it was 4.5 in the old system.

The improved cross breed pigs displayed earlier sexual maturity (at 9 months) and have good resistance power to heat stress induced parasitic infections of skin and gastro intestine & non-specific viral/bacterial fever.

Impact

After the adoption of the improved breed, a tremendous change in the lives of these tribal farmers has been noticed. In addition to achievement of financial and economic independence to the 35- 45 tribal families, a huge

moral boost has been injected in them as a result of improved social status. It has also indirectly helped in overall socio-economic development of their respective villages. With the prevalent cost of meat of Rs. 350 per kg, the tribal farmers are now earning on an average Rs.11,2875/unit. Encouraged by the interventions, KVK Chandel is now flooded with more and more numbers of interested and inquisitive tribal farmers who definitely want to empower and improve their livelihoods through remunerative backyard piggery.



Income Enhancement through Crop Diversification in Chandel District under NICRA Project

Kangjam Sonamani Singh and Hb. Lungni Anal
Krishi Vigyan Kendra, Chandel

ABSTRACT

Soybean is an important crop of Chandel district but as a general trend the productivity has not been satisfactory due to some technological and extension gaps. The major factors identified by Krishi Vigyan Kendra (KVK) Chandel for low yield of soybean can be listed as traditional and habitual use of local seed, low seed replacement rate, and non-adoption of recommended scientific package of cultivation practices. KVK Chandel conducted extensive frontline demonstrations in several villages for popularization of improved soybean along with recommended package of practices. Also, KVK Chandel organised both on-campus as well as off-campus capacity building programmes for the farmers, field days, group discussions, farmer-scientist interaction meets etc. to popularize cultivation of the hybrid soybean. As an impact of these vigorous efforts put in by KVK, the area under hybrid soybean cultivation increased from 4 ha in 2019 to 21 hectares in 2023 resulting into almost 81 percent increase in area under soybean. An extensive evaluation of economic returns revealed that the additional production of soybean due to the introduction of improved variety resulted in an additional net income of Rs 92,184/- with a BCR of 3.92 during 2023. Besides being an excellent cover crop (of 125 days duration), it makes possible for the farmer to grow another following crop. The technology has been a great means for moisture conservation. Great yield and surplus demand for soybean for fermentation purpose has boosted the farm income. The time and efforts invested by the subject experts of KVK Chandel has started giving good returns to the tribal farmers of the district by fetching them enhanced farm income from increased farm productivity.

Situation analysis

Chandel is a hilly border district adjoining Myanmar. Soybean is another major crop grown in rainfed condition, which is consumed mainly in fermented form by a huge majority of the population. The yield of soybean in the district has always been considerably lower than the state average. And the prime factors identified for the low productivity in soybean are: use of local seed, low seed replacement rate and non-adoption of scientific package of agricultural practices. Earlier farmers used random seed spacing and seed rate during planting. Very often, disease and insect-pest induced losses were also high as seeds were not treated with fungicide or insecticide. Due to these practices, the farmers used to harvest 20-30 per cent lesser yield. The tribal farmers were initially reluctant in experimenting with the new

variety and were sceptical that the new variety might be more water and labour intensive. The subject experts of KVK Chandel took aggressive role to convince farmers of the district to grow hybrid soybean for enhancing farm productivity.

The approach adopted by KVK Chandel to popularize hybrid soybean and transfer the proven technology among the tribal farmers of the district to enhance the production were: organizing both on-campus as well as off-campus training programmes for the farmers/farm women to mobilise and create awareness and to provide latest information, demonstrate the yield performance of soybean (DSb-19) by conducting on-farm trials (OFTs) and front line demonstrations (FLDs) at the farmers' fields. On top of that, field days, farmers' scientist interaction meets, group discussions etc. were also conducted,

wherein film shows and leaflets were circulated for generating awareness among the tribal farming community. KVK Chandel has organized more than 28 training programmes during the last seven years, to disseminate the technology on soybean DSb-19 and its scientific package of practices. In these programmes; trainings were imparted on different aspects of soybean cultivation to 563 beneficiaries which included farmers, farm women and rural youth of several villages of Chandel district. On farm trials were also conducted related to crop diversification, integrated farming system, integrated nutrient management (INM), weed management and integrated pest management (IPM) to evaluate and standardize local and area specific technologies. Frontline demonstrations (FLDs) on the proven technologies were conducted on the farmers' fields to demonstrate the scientifically proven production technologies. A total of 63 demonstrations were conducted on soybean crop by the subject experts of the KVK Chandel wherein proper mobilisation, precise implementation and continuous technical support greatly changed the production scenario of soybean in Chandel district of Manipur.

Output

Certified seeds of soybean (DSb-19) were distributed to the trained and motivated farmers under NICRA Project. With a view to promote horizontal expansion (farmer to farmer) of the technology, a total of eight (8) field days on soybean were organized. In the said field days, a total of 334 farmers participated. Interactions and discussions during the routine follow-up of the activities revealed that besides the farmers of the adopted villages who had grown the new soybean variety with a firm trust and zeal, the farmers of the neighbouring villages have also replaced their traditional seed with the hybrid soybean seed. With an aim to further motivate and boost the morale, group discussions were also organized in which 198 farmers of several villages participated and shared their experiences with the fellow farmers. Moreover; during several state-level agri-fairs, the successful farmers shared their experiences and hurdles and the success they achieved. Since 2009, KVK Chandel has given an

additional thrust to its approach towards effective extension activities so as to motivate/convince farmers to replace their outdated soybean seed with high yielding hybrids. The number of front line demonstrations laid was increased several fold to infuse the zest for successful implementation of the new technology. Extensive training programmes brought a revolutionary scenario at Chandel district. The age-old practice of mono-cropping system wherein fields were left fallow, was discarded and this gave Chandel district of Manipur a sense of food as well as social security by demonstrating the potential of hybrids to give enhanced farm productivity.

As a result of continuous on-field programmes and activities, KVK Chandel, the rate of adoption of the soybean hybrid increased impressively and farmers started supplying both grains as well as the seeds to other districts. The area under soybean increased from 4 hectares in 2019 to 21 ha in 2023 which is 80.95 percent change.

There is significant increase in the productivity of soybean in the last few years. An extensive evaluation of economic returns revealed in Figure 1 that the additional production of soybean due to the introduction of improved variety resulted in an additional net income of Rs 92,184/- with a BCR of 3.92 during 2023. Besides being an excellent cover crop (of 125 days duration), it makes possible for the farmer to grow another following crop. The technology has been a great means for moisture conservation. Great yield and surplus demand for soybean for fermentation purpose has boosted the farm income.

Outcome and Impact

Hence conclusion can be drawn that there is significant enhancement in productivity of soybean due to adoption of the new technology. The efforts of the subject experts of KVK Chandel have resulted in farmers reaping happiness with the introduction and adoption of soybean as is seen in figure 2. Thus, the tribal farmers have been able to significantly improve their farm productivity which has revolutionized and made Chandel the soybean production hub in the state.

Income Enhancement through Crop Diversification

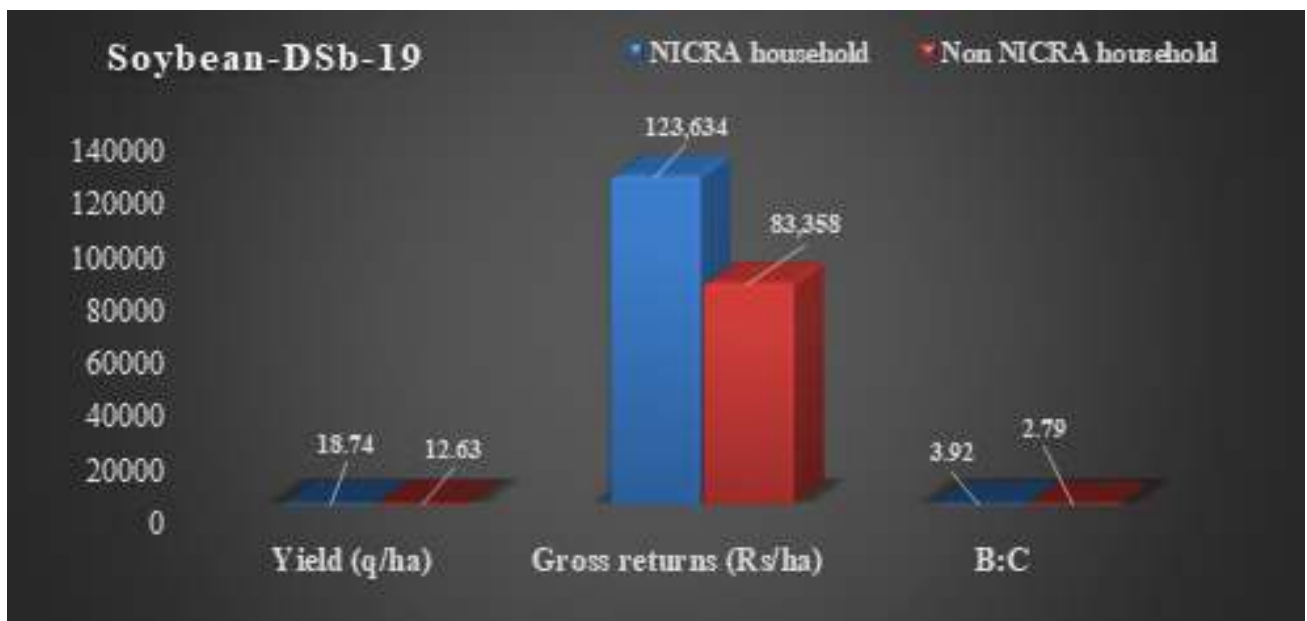


Fig 1 Performance of soybean (DSb-19) as against the traditional variety



Fig 2: Soybean (DSb-19) production in the farmers' fields



Integrating Flower and Inland Pisciculture An Innovative Method for Climate Resilience in Wetland Ecosystem of Kanyakumari District

Nazreen Hassan S, Kavitha K, Suresh S, A Selvarani and R Latha
ICAR, Krishi Vigyan Kendra, Thirupathisaram, Kanyakumari-629901

ABSTRACT

An immediate challenge to the Kanyakumari district's production system is climate change effects. In order to adjust to the changing environment, farmers are investigating novel farming techniques. Innovative methods are becoming more popular in wetland ecosystems. The COVID predicament has given rise to a number of new strategic methods. This case study investigates how the wetland ecosystem of the Kanyakumari area views a novel approach of combining inland pisciculture and flower farming. The innovative approach that was used was combining lotus with fish aquaculture in wetland ecosystem. Pink, red, and white cultivars of lotus are used for this approach. In addition to being cut flowers, they can be utilized as loose flowers, potted plants, and in pond landscaping and has a lot of medicinal uses. A case study was conducted to enlighten on the perceptions and opportunities in the novel approach that can boost up the income of farmers.

INTRODUCTION

Climate change poses an acute threat to the production system in Kanyakumari district. As the region's economy is predominantly rainfed agriculture farmers are exploring innovative farming systems adapting to the changing climate. Uptake of novel approaches has been trending in wetland eco systems. Several new strategic plans have emerged since the occurrence of COVID situation. The present case study examines the perceptions of such an innovative method of integrating flower and inland pisciculture in the wetland eco system of Kanyakumari district. Integrating Lotus with fish farming was the innovative method followed, Lotus is widely distributed in subtropical and tropical regions of south and southeast Asia. In India, it occurs throughout the country exhibiting enormous morphological and genetic diversity with a large number of racial variants in different shapes, sizes and shades of pink and white flowers. The beautiful cultivar of pink, red and white flowers are used for cutflower having 4-5 days of vase life. Apart from being used as a cut flower, they are also used as loose flower, and potted plant and in landscaping of ponds and huge lakes. Besides its

floricultural uses, lotus is a plant where all parts viz. roots, stems, leaves, flowers and buds are commercially being utilized in food or for traditional medicinal purposes.

Novel Approach- Integrating Lotus and Fish Farming

Lotus is propagated by the division of rhizomes and seeds. Rhizomes with new sprouts are cut into small pieces having at least three nodes. Seeds are scarified at both the ends for early germination. They are grown in damp soil usually a combination of loam and clay soil. They require at least six hours of sunlight a day and should be sparingly fertilized in the first year. It is important to protect the lotus roots from freezing. About 35000-40000 rhizomes are required for planting one hectare of land. It can be cultivated commercially by utilizing some pond management practices, fertilizer application etc. The multiple benefit of this method of cultivation has been recognized in recent decades from provision of water and food and support the biodiversity for regulation of climate, mitigation of water related disasters and supporting livelihood. Wetlands are preferred for cultivating Lotus because of their higher monetary return.

Farmer Details

Name and address of the achiever

**Abdul Kadher
Madhavalayam
Thovalai Block
Kanyakumari District**



Telephone and telephone numbers	9025797645
Details of area under the intervention	Land Size : 3 Acres own land : 1 Acre Leased land : 2 Acres (Shammugapuram)
net income	Rs 764750 per annum
Extend of diversification	Decentralization of lotus cultivation , procurement of flowers from small and marginal farmers and marketing to outside states like Delhi and Mumbai. Extended to Importing and growing new varieties of lotus plants and encouraging other farmers to purchase flowers to generate income and stabilize the supply chain to ensure sustainable income.

Beneficial Effects

Lotus possesses many medicinal, economic and nutraceutical properties. In the ancient medicinal literature, it has been reported in several *Ayurvedic* formulations as sweet, cooling, astringent, demulcent useful in weakness, dysentery, diarrhoea, and also in curing cough and cold. The flowers are recommended as cardi tonic, liver, urinary and veneral disorders. The seeds are highly valued in conception, blood disorders and as cooling medicine. The leaves and rhizomes in powdered form are prescribed for the treatment of piles. The rhizomes and fresh seeds are edible and cooked for the preparation of several delicious dishes. The rhizomes are edible and sold in the vegetable market. The leaf and leaf stalk are eaten as vegetable. The leaves are also used as plates in rural areas for serving the food. Lotus flowers are in great demand in the floriculture market. The leaves can be used for making plates, boxes and packing materials. Whole flowers, petals and seed pods can be used as dried floral crafts.

Potentials of Integrating Lotus and Fish Farming

Kanyakumari district experiences tropical climate with a rainfall of around 1400mm per annum. Wetland Habitat have been an integral part of our socio- cultural ethos in the district. The district has 2623 tanks having 159000ha. There are 1486 rain fed tanks and 161 system tanks (fed by canals). Hence there is vast scope of getting better remuneration to the wetland farmers.

Successful Intervention

A demonstration unit was established for integrated flower and fish farming at KVK Kanyakumari. The unit integrates lotus cultivation and composite fish culture with IMC and GIFT Tilapia. Demonstration of integrating flower and inland pisciculture for profitable farming and training was provided to farmers. Awareness was created among farmers. Training was provided to 25 farmers and the demonstration unit was showcased to visitors under ATMA from the district and nearby districts, RAWE students and farmers. So far more than 500 farmers have visited the unit. A success story of Mr Abdul Khader was recorded at Madhavalayam village at Thovalai block of the district. He owns one acre of wetland and two acres of leased land.

Integrating Flower and Inland Pisciculture An Innovative Method

Lotus Component (One Acre)

Nature of input	Measurement/ Quantity	Cost involved (Rs)
Unit area of water body:	One acre Cost of establishment and land preparation+ Number of lotus plants per acre : 3000 nos Labor Wages for Harvesting :	Rs 200000/ - Rs 365000
Gross Cost of Production	Establishment +labour	Rs 565000
Lotus Harvesting @500 Nos /day from 2 nd month	Income from Lotus @ Rs 5/ - on an average Price range -Rs 2 -35	Rs 750000/ -
	Lotus leaves @Rs 70/ - per bundle of 100 - 20 bundles/day	Rs 280000/ -
	Average yield of lotus flower	500 nos
Gross income		1030000
Net Returns		665000
BCR in first year		1.8
BCR from second year		2.82

Fish Farming Component (One Acre)

Nature of input	Measurement/ Quantity	Cost involved (Rs)
Unit area of water body:	One acre	
Stock size	3000 nos	15000
Period	10 months	
Species	Rohu , Katla , Mrigal	
Pond Depth	6.5 to 10 feet	
Recommended diet	A mixture of bran and chickpea flour in the ratio of 4:1 . 500gm/day dose up to 5 - 6% of body weight After the body weight reaches 500-1000 grams, reduce the feed to 3.5%	
Gross income		Rs 243000 / acre
Net Returns		Rs 228000
Gross Profit		Rs 893000
Overall BCR		2.19

CONCLUSION

The association of lotus-fish integration yields substantial returns. Economic analysis comparing the production costs and farm-gate sale prices indicates significantly higher profits for farmers. Integration requires high initial investment but results in much higher income that the initial establishment cost is obtained during first year itself and higher levels of profit in the

subsequent years. Relatively higher income is obtained compared to non-integrated farming method with less effective labour and resource utilization. With land being a limited resource, integrated farming provides a viable solution to produce more income from existing nonproductive waterlogged land. This integrated farming method is likely to play a crucial role in boosting production, ensuring remunerative

PHOTOGRAPHS



Integrating Flower and Inland Pisciculture

returns, creating employment opportunities for rural populations, improving livelihood, and has been valued as an opportunity for improved incomes and for coping with unfavorable soil conditions. Scientists initially framed lotus farming as a means to adapt to climate change and cope with flood extremes. Regardless of the



Lotus Harvesting

feature of climate adaptation, the farmer is operating in response to the commercial opportunity brought about by lotus cultivation, with the help of other farmers. The lotus farming integrated with fish farming, as indicated by this novel approach, is the most profitable under the wetland ecosystem.



Mushroom Cultivation conferred recognition

Rachna Singla and Rajni Goel
Krishi Vigyan Kendra, Patiala

ABSTRACT

Sardar Sukhdev Singh has shown their phenomenal presence from traditional to hi-tech farming and ability to adapt with tremendous challenges posed by changing climate and market demands which can increase his income and status in the society. He acquired vocational training on mushroom cultivation from KVK Patiala and later on technical guidance from ICAR-Directorate of Mushroom Research, Solan and PAU, Ludhiana helped him in establishing S.S Mushroom Farm. He has developed several innovations in mushroom production techniques including low cost mushroom houses with locally available material. He has produced very high quality pasteurized compost, and white button mushroom 1800, and 1450 quintal during 2023-24, respectively. His total net income during 2023-24 from pasteurized compost and white button mushroom was 1.87 lakh and ₹11.05 lakh, respectively. He has also popularized mushroom production in several villages of the District Patiala by providing quality compost to mushroom growers. The state of the art facilities developed by him at his farm including compost pasteurization and mushroom production in low cost mushroom houses has proved very effective demonstration centre serving for KVK trainees, mushroom growers, agriculture officers, students of the different universities, etc. He has also formed mushroom club and providing technical know-how to the members of the club. As a part of mushroom unit, he has also established a vermi-compost unit in 2019 with the assistance from KVK, Patiala. He earns a net income of 1.5-2.0 lakh every year from selling the vermi-compost to the nurserymen and urban people. He is fully contented and is determined to expand this enterprise in future.

Situation Analysis

Poor crop productivity, small land holdings and lack of other income generating activities have made the cultivation of mushroom an economic compulsion in the region. Sardar Sukhdev Singh, Village Meeranpur, District Patiala, Punjab who was engaged in traditional farming, cultivating paddy and wheat crops on his five acres land. Although he had reasonable income from farming, but he knew that it will not be enough to meet his family's increasing needs and demands. He was not satisfied with the ongoing farming and wanted to do something challenging to establish himself a successful farm entrepreneur. He has decided to go for some agriculture based enterprise which could complement with the existing farming system and increase his net income.

Plan, Implementation and Support

In search of agri-based enterprise, he came to know about KVK, Patiala and visited there. He held detailed discussion with KVK scientists and got the idea to start mushroom cultivation in order to realise his dream. Keeping this in view, he attended a vocational training on Mushroom cultivation at KVK, Patiala in 2014. Initially he faced many problems but his hard work and technical guidance and close supervision of KVK Patiala make him a successful mushroom grower. Later on he also established contact with ICAR Directorate of Mushroom Research, Solan and PAU, Ludhiana for increasing the efficiency of his mushroom farm.

Output

Mr. Singh converted to prove that if one has patience and perseverance, there are still many

opportunities to flourish. With this zeal, he approached the doorstep of KVK-patiala (during 2014). After getting training from KVK Patiala, he started a mushroom production unit known as “S.S Mushroom Farm” with the available resources, where he soon realised some associated problems. In the first year, he prepared compost from 100 quintal of wheat straw and attained first hand experience in growing mushrooms. He harvested 35 q of mushrooms from 100 quintal wheat straw. In 2nd year, he prepared compost from 200 q wheat straw and constructed 6 sheds. Unfortunately, 4 out of 6 sheds got burnt in a fire accident at his farm. He suffered a huge loss. But, he didn't loose heart and continued mushroom farming. First sowing of mushrooms is done by mid September and 2nd during December at his farm. He constructed 32 sheds each of 100 q compost capacity in 2023-24. He has developed an eco-friendly casing media with a combination of FYM + burnt rice husk + cocopeat+ lime which are locally available with nominal cost. Looking ahead with the scenario of shortage of labour, he introduced mechanical pole digger which is used for pole fixing in the structure and other necessary machinery for making compost etc. The low cost sheds were constructed by using Bamboo, polythene and paddy straw. He is producing mushrooms by using 150 quintal paddy straw during this season with full enthusiasm. He visited Mushroom Research Center, Solan (H.P) besides private successful mushroom farmers at Narela, (Delhi) Kurkushetra and Karnal (Haryana) to gain more expertise in mushroom cultivation. He then shifted to the short method of composting and started preparing pasteurized compost with guidance with technical guidance from ICAR-Directorate of Mushroom Research, Solan and PAU, Ludhiana.

Outcome

His ambition for better economic status and guidance from KVK scientists lead him to establish a scientific mushroom farm .In 2016, He has constructed compost chamber at his mushroom farm after getting subsidy from Department of Horticulture. Size of compost chamber is 12'x40' with a capacity of 30 tonne. The production and net income he earned from

pasteurised compost in different years are presented in Fig. 1. It shows that he has produced 500 qtls pasteurised compost during 2016-17 and gradually increased it to 1800 qtls in 2023-24. His net income also increased from Rs.35000/- to Rs. 187200/- during the same period. Approximately, 100 farmers started cultivation of mushroom after taking ready compost from him.

S.S Mushroom Farm has fabricated low cost mushroom houses with locally available material of 500 sqm each. Table 1 indicates that during 2014-15, he cultivated 82 qtl white button mushroom from 2 such sheds and his net income was `0.80 lakh. Similarly in 2023-24 he cultivated 1450 qtl white button mushroom from 32 such sheds and his net income was 11.05 lakh. The start-up grew up steadily day by day and presently they have provided employment to 20-25 people. For marketing of mushrooms, he himself sells his produce at Patiala, Ludhiana and Sangrur markets. In order to increase the scale, As he gained experience and insight in mushroom cultivation, he has developed number of innovations viz. use of paddy straw in place of wheat straw for compost preparation and fabrication of low cost mushroom houses with locally available material. Similarly; he designed and fabricated compost bag filling machine, low cost bunkers for compost preparation and low cost compost pasteurize chambers. Moreover; he standardized a very high yielding formula for compost preparation by short method of composting, a very good casing mixture and cultivation of milky mushroom in rainy season. As a part of mushroom unit, he has also established a vermi-compost unit in 2019 with the assistance from KVK, Patiala. He earns a net income of 1.5-2.0 lakh every year from selling the vermi-compost to the nurserymen and urban people. He is fully contented and is determined to expand this enterprise in future. He received “Sardarni Parkash Kaur Sra Memorial Award” from PAU Ludhiana during Kisan Mela on March 24, 2023.

Impact

All the successful people have one thing in common and that is ability to inspire others. This success story is about a man who has hunger for achievement. Inspiration, diligence and

Mushroom Cultivation Conferred Recognition

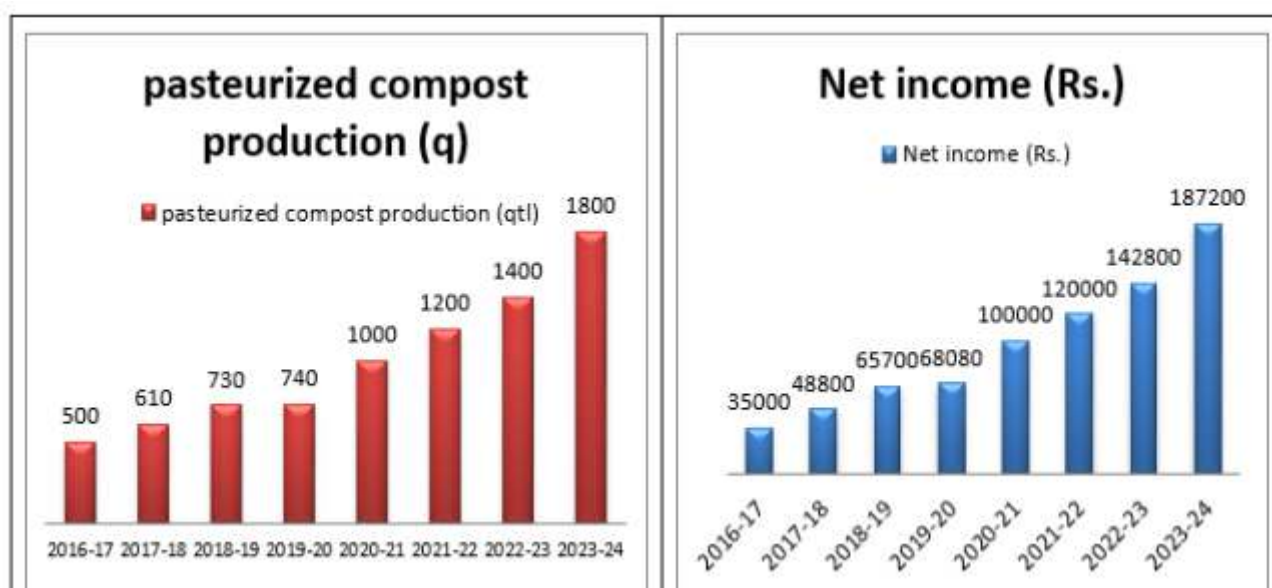


Figure 1: pasteurized compost production and net income

Table1. Performance of the mushroom farm.

Year	Sheds (each shed 500 sq. meter)	Yield (q)	Gross expenditure (Rs.)	Gross Returns (Rs)	Net Income (Rs.)
2014 -15	2	82	18000	98400	80400
2015 -16	6	105	35000	106000	71000
2016-17	10	310	65000	372000	307000
2017-18	14	385	85000	462000	377000
2018-19	18	468	105000	561600	456600
2019-20	20	525	112000	630000	518000
2020-21	22	630	155000	756000	601000
2021-22	26	805	225000	1050000	825000
2022-23	30	1210	290000	1250000	960000
2023-24	32	1450	345000	1450000	1105000

persistence became the hallmarks of his success. S. S Singh has set an example for other small and marginal farmers on efficient and effective use of limited resources through Mushroom Farming System approach to earn handsome sustainable returns. Further, adoption of mushroom farming by the farmers of the district has also helped in generation of employment as more labour was engaged to handle the increased produce. This also resulted in lowering down the rate of migration of the unemployed rural youths to urban areas. Adoption of mushroom production by

farmers of various villages may be credited to the S.S Mushroom Farm as it made the availability of high quality of compost to mushroom growers of Patiala. The state of the art faculties at integrated mushroom unit including compost pasteurization and mushroom production in low cost mushroom houses has proved very effective demonstration centre serving for KVK trainees, mushroom growers, agriculture officers, students of the different colleges, etc. Trainees of KVK who are landless **scheduled caste** farmers has been purchasing pasteurised spawn run compost for the

Rachna Singla and Rajni Goel



last five years from this farm only. His hard work and reservoir of experience in mushroom production has earned him a status of very successful farm entrepreneur in the District. Many developmental agencies such as department of Agriculture, Horticulture, working in the state, District administration, NABARD, etc. take his expertise as a resource person for further mobilizing the farmers to adopt Mushroom Farming System. Many farmers visit his farm for experiential learning and to seek his guidance. He also motivates farmers and advises them to adopt

latest technologies in agriculture, animal husbandry and allied vocations. The Mushroom club formed by him gives technical know-how to the members regarding compost preparation, spawn and spawning, casing, management practices, marketing etc. Due to his constant hard work and indomitable will, his work has been recognized at different platforms (district level and state level) for his outstanding contributions in developing and dissemination of mushroom production technologies in the country.



Mystical Stone of Gurdaspur (Punjab): S. Gurdial Singh

Rajwinder Kaur, Ravinder Singh Chhina, Satwinderjit Kaur and Sarbjit Singh Aulakh
Krishi Vigyan Kendra, Gurdaspur, Punjab

ABSTRACT

S. Gurdial Singh Saini, a resident of village Sallopur, district Gurdaspur is an enterprising and industrious farmer, who has taken a lead in the adoption of crop diversification and subsidiary occupations. He has proved his credentials and became an icon for those farmers who are getting stress due to unprofitable farming. He got linked with PAU in 1999-2000 and participated in various trainings relevant to agriculture and allied practices which were organized by KVK, Gurdaspur. Presently, he is cultivating turmeric, processing it and marketing his products by himself in the market. He is not dependent on the third person to sell his produce. He chose a different path from the rest of the farmer to make his own identity in the society. He had made a self help group named 'Green Gold SHG' and FPO named 'Sallopur Foods FPO' to include local farmers and youth for turmeric processing, value addition to pulses and seasonal fruits like preparation of pickles and chutneys. Besides this, he is also successful beekeeper having 200 bee hives. He is successfully using his machinery via custom hiring centre. Besides this, he is providing employment to 50 rural youths which include machine operators, mechanics and daily wagers. He is also earning two times more profit by growing turmeric crop as seed. He also engaged himself in various extension programmes as a member of various clubs, committees, boards, societies and Scientific Advisory Committee of the KVK, etc. S. Gurdial Singh has been conferred with many awards for his achievements in crop diversification, processing, packaging, marketing, entrepreneurship, bee keeping and crop residue management. Many eminent personalities and scientists have visited his farm and praised his dedicated effort.

Situation Analysis

Punjab is agricultural dominated state, where the farmers have potential to wipe out food deficiency from the country but now due to land fragmentation and increased cost of production made farming stagnated and less profitable for small and marginal farmers. From the last few years many farmers committed suicides which show the distress situation of farmers in Punjab. For making farming a profitable occupation the Punjab Agricultural University made a call for crop diversification as well as adoption of subsidiary occupation which are utmost important for economic upliftment of farmers to live a prosperous life. To achieve the goal of diversification, many progressive farmers of Punjab took a step forward to bring about a change in the traditional cropping system. S. Gurdial

Singh Saini is an example of such successful farmers. Born to S. Nand Singh in Village Sallopur of district Gurdaspur (Punjab), he completed his secondary education from Govt. School, Kahnuwan. After passing his matriculation he tried for government jobs, but getting failed after many attempts. Then he decided to go hand in hand with his father to support him in farming and engaged in traditional farming, cultivating paddy and wheat crops on his five hectares land. From the beginning, he was never satisfied with the conventional farming methods, as he knew that it will not be enough to meet daily needs of family and he wanted to do something better to establish him a successful farm entrepreneur. To increase his net income, he has decided to start some agriculture based subsidiary occupation which could complement with the existing farming system.

Plan, Implementation and Support

In order to do something challenging, S. Gurdial Singh got linked with Punjab Agricultural University, Ludhiana in 1999-2000. A man of determination, S. Gurdial Singh is one of the firm belief, “where there is a will, there is a way”. He has proved his determination by participation in various trainings (Table 1) organized by PAU, Ludhiana; KVK, Gurdaspur; NABARD; Department of Agriculture & Farmer's Welfare and Department of Horticulture, Punjab.

His village (Sallopur) was adopted by KVK, Gurdaspur and conducted various extension activities, provided technical help in raising crops, agricultural engineering, value addition, etc. In 2004, he experimented with turmeric cultivation on a small land with the guidance of KVK. For more exposure and practical knowledge, he visited to many departments like, Deptt. of Food Processing (PAU, Ludhiana), IARI (New Delhi), Turmeric Processing Plant (Sanaura, Jalandhar), Citrus Mela, (Nagpur), Turmeric Processing Plant (Kang Mai, Hoshiarpur), Pingalwara Farm (Dhirkot, Amritsar) and the centre of Excellence for Vegetables (Kartarpur). Krishi Vigyan Kendra, Gurdaspur, besides providing him trainings also motivated him to go for self marketing of their products. So at present he is not dependent on the third person for the sale of his produce. Now, he is cultivating turmeric, processing it, marketing his product himself and selling it in the market. Besides turmeric processing, he started production of agri-horti and value added products. The KVK also facilitates him to exhibit his products by providing stalls during *kisan melas* and other different programs for wider publicity of his products. Besides turmeric marketing, he is also involved in production, packaging and marketing of honey, value added products of vegetables (pickle & chutney), cereals (wheat, wheat flour, organic basmati rice), pulses (Mash dal, Moong dal, lentil dal, besan), oilseeds (sarson oil/ cake, linseed), jaggery (flavoured gur & shakkar), etc.

Output

S. Gurdial Singh is in constant touch with the KVK and adopted innovative and sustainable farm practices resulting into enhanced returns.

After starting turmeric cultivation at small scale, he found processing of turmeric into turmeric powder without using any machinery is backbreaking. He decided to switch to mechanized processing and eventually, installed mechanized processing unit for turmeric powder production in 2007. He named his unit as 'Green Gold Haldi Processing Plant' and 'Haldi Green Gold Spice' is one of the products of this plant. The KVK also provides guidance and consultation regarding various technical problems faced by him in production, packaging and marketing of the produce. After installation of processing plant, he also purchased raw turmeric from other farmers. He is also earning two times more profit by growing turmeric crop as seed. S. Gurdial Singh cultivates basmati, wheat, paddy, moong, mash, gobhi sarson, turmeric, lentil, gram, garlic and sugarcane. Beside turmeric, he also started processing of pulses, cereals, oilseeds & sugarcane and preparation of pickles & chutneys and bee keeping. In 2015, he had made a FPO 'Sallopur Foods FPO' and self help group 'GREEN GOLD SHG' to involve local farmers and youth. S. Gurdial Singh is president of this FPO. Krishi Vigyan Kendra, Gurdaspur, besides providing him trainings also encouraged him to go for self marketing of their products so he developed a very unique way of marketing of his products by innovative concept which involves getting orders on whatsapp and then supplying the same to their doorsteps after sufficient orders. He is the founder member of Kisan Bazaar which has been initiated jointly by ATMA, Department of Agriculture and Farmer's welfare, Gurdaspur and KVK, Gurdaspur. This Kisan Bazar is scheduled on every Thursday and Sunday at a prime location in the city Gurdaspur to sell their produce to consumers directly.

Being a nature lover, he has adopted crop residue management practices in his field and never set fire to wheat and paddy straw for last thirteen years and preferred green manuring with dhaincha and moong after making wheat straw (Toori). He uses Zero till drill for sowing of wheat since 2001 and since last seven years sowing wheat with happy seeder. In addition, he has installed underground pipe line system and solar system for irrigation purpose at the Farm. For

Mystical Stone of Gurdaspur (Punjab): S. Gurdial Singh

Table 1: The details of the training acquired.

Sr. No	Name of the Training	Dates/year	Department/Agency
1	Correspondence course in Agriculture (One Year)	1999-2000	Department of Extension Education PAU, Ludhiana
2.	Bee Keeping	15-22/2/2000	Department of Agriculture & Farmer's Welfare, Gurdaspur
3.	Dairy Farming	14-23/2/2001	Krishi Vigyan Kendra, Gurdaspur
4.	Mushroom Cultivation	20-27/9/2005	Krishi Vigyan Kendra, Gurdaspur
5.	Hybrid seed production of Chilli	May 2006	Krishi Vigyan Kendra, Gurdaspur
6.	Scientific cultivation of Turmeric	April 2007	PAU, Ludhiana
7.	Processing and packing of Turmeric	February 2008	PAU, Ludhiana
8.	Producer Organization Development Fund	19 -21/1/2015	NABARD, Bikaner, Rajasthan
9.	Value addition of cereals, Pulses, and preparation of Seasonal Summer Fruits and Vegetables.	14-27/6/2019	Krishi Vigyan Kendra, Gurdaspur

resource management he has leveled his entire farm with laser land leveler and repeats it after the gap of two years on regular basis.

His family including wife and two sons plays a major role in all the activities related to the farming operations. In addition to this, currently he is providing employment to 50 rural youths which include machine operators, mechanics and daily wagers.

Outcome

S. Gurdial Singh has different roles by profession- a farmer and an entrepreneur. Presently, he is being recognised as a “King of turmeric” in the gurdaspur district. He is involved in production, packaging and marketing of turmeric powder, honey, value added products of honey, vegetables (pickle & chutney), cereals (wheat, wheat flour, organic basmati rice), pulses (Mash dal, Moong dal, lentil dal, besan), oilseeds (sarson oil/ cake, linseed), jaggery (flavoured gur & shakkar), etc. The details regarding annual production of major products, share of different products in annual turnover and net return during last 9 years is presented in Figure 1 (A, B and C, respectively).

Impact

As per S. Gurdial's saying, with the help of KVK Gurdaspur, he attained more knowledge about new technologies, value additions in agricultural produce, financing solutions and new ways of creating market linkages for its produce. His hard work and reservoir of experience in every aspect has earned him a status of very successful farm entrepreneur in the country. Therefore, several organizations invited him to deliver lecture in different trainings organized by the PAU, KVKs, banks, different societies, department of horticulture and department of agriculture & Farmer's welfare etc. S. Gurdial Singh is president of Sallopur Foods FPO and Green Gold Self Help Group, Sallopur. He has been an active member of PAU, Farmer's Committee, Ludhiana; Bee keeper Association, PAU, Ludhiana; PAU Kisan Club, Ludhiana; District Production Committee, Gurdaspur; Governing Board, ATMA, Gurdaspur; Punjab Bee Keeping Board, Chandigarh; Potato Production Association, Jalandhar; Scientific Advisory Committee, KVK Gurdaspur and Young Progressive Farmers Producers Organization. The

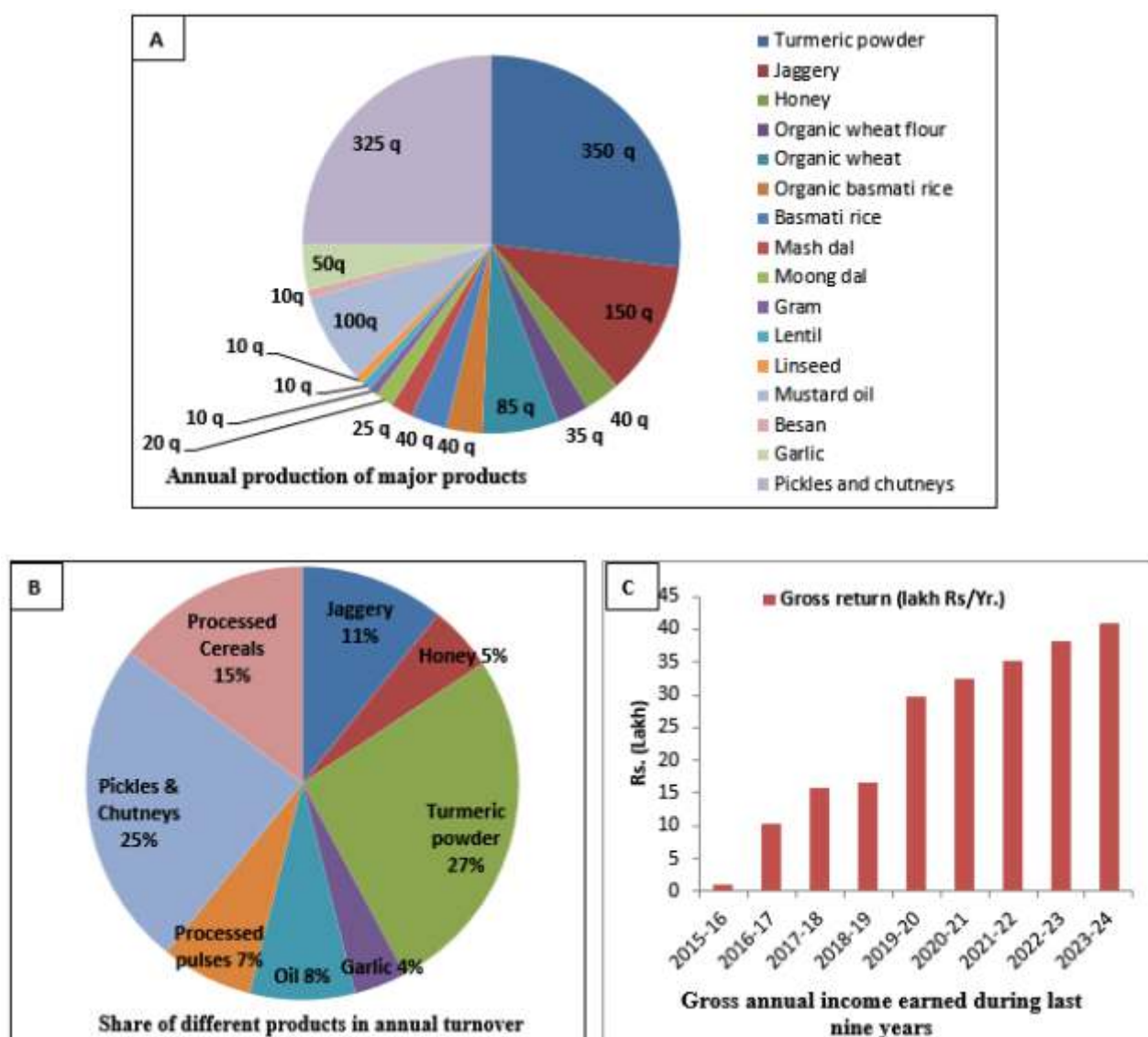


Figure 1: A, Annual production of major products; B, Share of different products in annual turnover; C, Gross annual income earned during last nine years.

farmer is also involved in the KVK's campaign against paddy straw burning and other campaigns like Jal shakti abhiyan, Swachhta abhiyan, Parthenium control, Nutrition week, Energy conservation etc. S. Gurdial Singh has been conferred with number of awards, prizes and appreciation certificates at district level, state level

and national level for his hard work (Table 2). Recently, he has been honored with Millionaire Farmer Award (Dec, 2023) (Krishi Jagran) by Governor of India. Many eminent personalities and scientists have visited his farm and acknowledged his dedicated efforts.

Mystical Stone of Gurdaspur (Punjab): S. Gurdial Singh

Table 2: Awards/honors/certificates

Sr. No	Name of the Award	Particulars	Department/Agency
1.	Udmi Kisan Award (Rs. 51000)	Crop Diversification & Processing, Packaging & Marketing of Turmeric powder	Progressive Punjab Summit, Mohali (2014)
2.	JAT Expo 2015	Crop Diversification	Advisor Publications, Jalandhar (22.11.2015)
3.	Best Enterprise Award	Best Entrepreneurship Award	PAU, Ludhiana (11.9.2007)
4.	Appreciation Certificate	Self Help Group & Crop diversification	Deptt. of Agriculture & Farmer Welfare, Gurdaspur (22.10.2005)
5.	Merit Certificate	Agriculture	Deputy Commissioner, Gurdaspur (15.8.2007)
6.	Second Prize	Quality production of Turmeric	PAU, Ludhiana (18 -19.3.2008)
7.	Consolation Prize	Quality production of Turmeric Powder	PAU, Ludhiana (Sept. 2009)
8.	Appreciation Certificate	Stall Competition	CII Fair, Ludhiana (2016)
9.	Best Farmer Award	Crop Diversification & Processing, Packaging & Marketing of Turmeric powder	Krishi Vigyan Kendra, Gurdaspur (2022)
10.	Appreciation Certificate	Permanent member of Kisan Bazar	Deptt. of Agriculture & Farmer Welfare, Gurdaspur (1.4.2019)
11.	Appreciation Certificate	Crop Residue Management	Deptt. of Agriculture & Farmer Welfare, GOI (9.9.2019)
12.	Appreciation Certificate	Crop Residue Management	Deptt. of Agriculture & Farmer Welfare, Gur daspur (16.11.2021)
13.	Honour Certificate (Rattan -e- Baghbani)	Bee Keeping and Turmeric processing	State Level Function of Deptt. Of Horticulture, Punjab.
14.	Special Honour Certificate	Crop Residue Management	Honourable Speaker, Vidhan Sabha, Punjab



Sale of products at Kisan Bazar, Gurdaspur



Training-cum Demonstration on CRM Technologies at my Farm



A visit of ICAR team to his fields



Appreciation Certificate for Crop Residue Management by Govt. of India



Udmikisan Award



Progressive Farmer Award



Exhibition-cum-sale of products



Onattukara Sesame – Success Story from Declinal to Revival

S Jyothilekshmi and V Mini

Onattukara Regional Agricultural Research Station, Kayamkulam , Kerala Agricultural University,
Thrissur 690 502 (Kerala)

ABSTRACT

Onattukara region of Kerala is famous for sesame cultivation and the varieties released from Kerala Agricultural University received GI tag. Sesame is grown as third crop in Onattukara after the harvest of rice. Sesame grown in this area is unique due to its medicinal properties. But due to low yield and lack of scientific knowledge about cultivation farmers were reluctant to take up sesame as third crop in the rice fields of Kerala. Onattukara Regional Agricultural Research Station of Kerala Agricultural University along with Department of Agriculture and registered farmers agency-Onattukara Vikasana Agency took extensive efforts in this area so as to revive sesame cultivation. After continuous trainings and field visits farmers raised the crop and on an average they got an additional income of 40,000/hectare. Area expansion is going on and in the next season it is expected to cover an area of 1000 hectare under sesame cultivation.

INTRODUCTION

Onattukara region of Kerala is predominantly a sandy tract, which is very well suited for sesame cultivation. Onattukara region includes 4 municipalities and 41 panchayats spread out through the districts of Kollam, Alappuzha and Pathanamthitta of Kerala state. In Onattukara, sesame is cultivated as the third crop after the harvest of rice. Farmers generally grow sesame utilizing the residual moisture available in rice fields. The area experiences a moderate climate, mean minimum temperature ranging from 22.0 °C to 25.2 °C and mean max. temperature ranging from 29.0 °C to 32.9 °C . The relative humidity ranges between 70.0 to 81%. The annual rainfall in Onattukara region is 2600mm. Sesame grown in this region is unique for the quality of seeds and oil. Even though the crop has been cultivated since time immemorial, farmers were using local cultivars and they were reluctant to adopt high yielding varieties released from Kerala Agricultural University. The varieties released from Kerala Agricultural University viz. Kayamkulam 1, Thilak, Thilathara and Thilarani along with local cultivar Ayali received GI tag and further interventions made by Onattukara Regional Agricultural Research Station, Kayamkulam of Kerala Agricultural University

along with Department of Agriculture and registered farmer group, Onattukara Vikasana Agency convinced farmers regarding use of improved varieties as well as scientific cultivation of Sesame which helped farmers to earn additional income.

Situation analysis

Farmers were not practising scientific cultivation and was thinking of keeping the land fallow in the third season. In Onattukara region sesame is grown mainly in two seasons making use of available soil moisture. The upland cultivation is carried out from August- September to December-January and in the low lands it is practiced during January- April. All the varieties released from Kerala Agricultural University is suited for both upland and lowland cultivation as well as high yielding(500-600 kg/ha). But due to unscientific cultivation farmers were getting only very low yield and moreover they were forced to sell the seeds for low prices. Proper marketing facility was lacking and the farmers were facing severe loss due to these factors. Sesame oil and sesame candy were the only by products made from the seeds and hence value addition was a field to explore more for getting good value products. Hence the extension functionaries felt that there is



an immediate need to intervene in the cultivation of this traditional oil seed crop.

Plan, implementation and support

The status of GI tag was well utilized by the research station along with agriculture department so as to promote farmers for practising scientific cultivation of Sesame. The varieties released from Kerala Agricultural University is rich in many biochemical components (Table 1.) Scientific cultivation was initially promoted with the demonstration of cultivation through participatory seed production programme in the selected farmers field under the monitoring of the scientists of research station. Extensive sessions on scientific cultivation were conducted at 7 different blocks of Onattukara region comprising of 45 Krishi bhavans (Agricultural extension and facilitation centre in each panchayath) consisting of more than 600 representative farmers during 2023-24. Trainings were provided well in advance of planting season. From the research station 1710 kg seeds of university released varieties were supplied to farmers free of cost covering an area of 427.5 ha in addition to cultivated area of 225 ha using local varieties. Moreover Department of agriculture provided a subsidy for cultivation at the rate of Rs.10000/ha.

Selected women group were trained on sesame value addition and diversified products like sesame candy, sesame pickle, sesame-coconut chutney powder, Sesame halwa etc were demonstrated. Meantime Department of Agriculture along with registered farmer group took initiative to form Farmer Producer Organizations (FPOs) and trainings were provided on various aspects starting from cultivation to marketing.

Output

Sesame cultivation regained its full potential and through the trainings farmers were made aware of scientific cultivation practices. Through field visits and through social media groups farmers interacted with scientists and timely information were passed regarding cultivation and pest and disease management. Through scientific cultivation the crop gained its potential yield and farmers got additional income through this third season crop. Farmers got reasonable price for seeds. Previously it was Rs.200 per kg and now it increased to Rs.400 per kg. The sesame oil fetched an amount of Rs.800/kg and now farmers are getting the benefit of Rs.40000 to Rs.45000/ha through sesame cultivation. The cropping area increased and now

Onattukara Sesame – Success Story from Declinal to Revival

Table 1. Biochemical parameters of Onattukara Sesame

Sr.No	Biochemical Parameters	Onattukara sesame
1.	Antioxidant (Absorbance)	0.207 - 0.294
2.	EC 50	83.00 -144.00
3.	Oil content (%)	43.26 - 48.42
4.	PUFA	37.35-39.97
5.	Oleic acid (%)	42.44-45.29
6.	Linoleic acid (%)	37.06-39.74
7.	Palmitic acid (%)	8.81-9.32
8.	Palmitoleic acid (%)	0.07-0.11
9.	Linolenic acid (%)	0.23-0.30
10.	Vitamin E (mg/100g)	3.81-7.92



Supply of sesame seeds and Area expansion activity of Sesame



Value addition of sesame seeds

production also increased through timely intervention and women entrepreneurs are now willing to take up sesame value addition as a small-scale enterprise. Farmers could either sell their seeds directly or facilities were provided for procuring the seeds by research station or registered farmer group.

Impact

With the timely intervention of Kerala Agricultural University, Department of Agriculture and Onattukara Vikasana Agency , farmers were routed to take up scientific cultivation of high yielding varieties of Sesame as a summer crop after the harvest of paddy so as to get additional income. As a result farmers started



GI logo of Onattukara Sesame

cultivation thereby intensifying the existing area and there by encouraging other farmers also to participate in the activity. Now the demand for seeds increased and it is planned to cover an area of 1000 ha in Onattukara region in the coming cropping season and also the same is now getting expanded to north Kerala also. Onattukara sesame oil is having high medicinal properties and hence traditional Ayurveda practitioners as well as companies prefer this oil for making *Ayurvedic*

preparations. Farmers groups can make use of the GI logo and the registered farmers will be much more benefitted by selling the products. Government has already sanctioned a processing unit and quality assurance lab for scaling up the production and marketing of value added products from GI tagged sesame varieties which can make a remarkable change in the income of sesame growing farmers and can be benefitted from both national and international markets.



Overcoming Low Farm Returns Limitations through Cultivation of Improved Rice Variety in the Aspirational District of Chandel

Kangjam Sonamani Singh, Hb. Lungni Anal, Kl. Levish and A. Ameeta Devi
Krishi Vigyan Kendra, Chandel

ABSTRACT

Rice is the most significant *kharif* crop of Chandel district of Manipur State, being cultivated over an area of 23,520 ha. Traditionally, the cultivators in the district grow local varieties of rice viz., *Drum*, *Thoibi* etc. However; the productivity of rice in the existing scenario is not very remunerative. The major reasons identified by the KVK for low productivity of rice include use of local seed, high incidence of neck blast and non-adoption of modern agricultural practices by the farmers. The low yield of local rice varieties and consequently low economic returns has severely affected the morale of the farmers especially the younger lot. Rice produced by the farmers has mostly been only for personal consumption and there was a very little marketed surplus available in the district. The farmers get 15-20 per cent lesser yield as compared to the farmers of neighbouring districts. Observing the lack of motivation in the rice growers of the district, KVK Chandel popularized RC Maniphou-13. This variety besides is not only resistant to neck blast but also gets harvested within 100 days which helps in saving residual moisture for secondary crop. It thus improves cropping system and farm income. The age-old mono cropping system has been discarded and rapeseed cultivation is taken up. The average productivity of rice increased from 37.33 to 59.66 q/ha giving an increase of 37.42 per cent in grain yield against that of traditional varieties. The additional yield of 22.33 q/ha helped the farmers to gain a net income of Rs. 1,47,810/ha with a B:C of 2.94.

Situation analysis

Rice is the most significant Kharif crop of Lambung village, Chandel, Manipur. About 80% of cultivated land is under paddy cultivation, being cultivated over an area of 23,520 ha. Traditionally since long, the farmers in the district grow local varieties of rice viz., *Drum*, *Thoibi* etc which are low yielding and of long duration. This often results to low productivity which in turn makes farming having very low economic returns. Rice produced by the tribal farmers of the district has mostly been only for consumption at household level and a very negligible surplus amount is marketed in the district. The farmers get 15-20 percent lesser yield as compared to the farmers of neighbouring districts. Observing the on-going trend and the lack of enthusiasm and motivation in the rice growers of the district, KVK Chandel popularized the rice variety RC Maniphou-13 which has an average duration of 125-130 days.

The local farmers have sensed and perceived the importance of cultivating the improved variety for higher returns. A significant number of farmers have been trained by the Krishi Vigyan Kendra (KVK), Chandel on the package of practices and KVK helped them in establishing the demonstration plots.

Plan, implementation and support

KVK Chandel procured certified seeds of RC Maniphou-13 from ICAR, Manipur Centre in the year 2019 and conducted several demonstrative trials. The KVK has standardized and refined the recommended technology for farmers of Chandel district. Through well framed annual action plans, KVK Chandel conducted On-farm trials, Frontline Demonstrations and imparted specialized farmers capacity building programmes to impart skill and knowledge involved in the production of this variety of rice with the apparent objective to prepare the farmers



Fig 1: Field photographs of the rice variety RC Maniphou-13

of the district to produce yields better in both quality as well as quantity at par with the neighbouring districts. Non-availability of seed on time has always been an important factor in restricting the horizontal expansion of agricultural technology, especially of field crops in the district. Keeping this in mind, under a proper strategy, KVK, Chandel assured timely procurement of seed for kharif season from ICAR, Manipur Centre for distribution to the farmers of the district. To start with, KVK concentrated its activities in the fields of the selected progressive farmers of the district. These sincere farmers who kept themselves abreast of the latest technologies, were purposely selected, for achieving greater impact of proposed intervention in transforming rice farming as remunerative yielding better farm income. Routine training programmes, follow ups, frequent farmers'-scientist interaction, field days, film shows, radio talks and frequent print media coverage were used as extension tools to create a great impact.

Output

KVK Chandel has given a stressed focus on RC Maniphou-13 by continuously mobilising the farmers to enhance the demonstration plots.

The area for conducting the demonstrations on RC Maniphou-13 has increased from 3.0 ha in 2019-20 to 12.0 ha in 2022-23. In 2023 alone, 14 farmers were covered under demonstrations. On the concept of “seeing is believing” and by word of mouth now the area as well as farmers cultivating RC Maniphou-13 has expanded in Chandel district. The performance of RC Maniphou-13 in comparison to traditional rice variety over the years is presented in the Table 1.

As can be seen from Table 2, the number of tillers/hill was 12 in the introduced breed as compared to 9 in local varieties. The number of filled grains/panicle (Figure 2) was 78 and 65 in the rice variety RC Maniphou-13 and the local variety respectively. Also, field days on were organized at the harvesting stage of the crop during the last week of November. It was during these field days where participating farmers of the village as well as the neighbouring villages who had not adopted the technology were greatly influenced and motivated. Thus, now not only farmers of the villages where demonstrations were conducted are adopting the RC Maniphou-13, but the farmers of the surrounding villages of

Overcoming Low Farm Returns Limitations through Cultivation

Table 1: Yield attributes of RC Maniphou-13

Yield (q/ha) before intervention	Yield (q/ha) after intervention	% increase	Gross cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C Ratio
37.33	59.66	37.42	76000	223810	147810	2.94

Table 2: Parameters recorded for RC Maniphou-13

Parameters	Test weight (g)	No of tillers/hill	No of filled grains/panicle
Beneficiary Farmer	24.42	12	78
Farmer's Practice	24.11	9	65

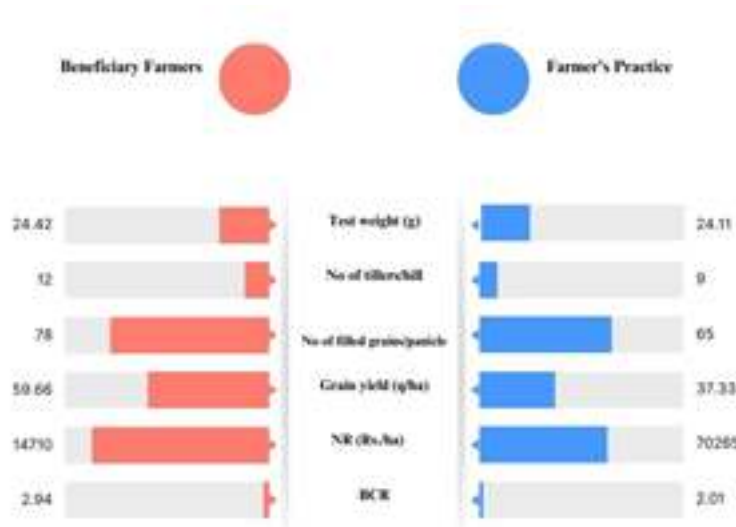


Fig 2: Performance evaluation of paddy RC Maniphou-13

demonstration area have also adopted the technology. A whole new set of farmers have shown interest in the variety which has been proven very suitable for their area.

Outcome and Impact

The area under the demonstration plots on RC Maniphou-13 increased from 3.0 ha in 2019-20 to 12.0 ha in 2022-23. In 2023 alone, 14 farmers were covered under these demonstrations. The efforts of the KVK helped the rice growers of Chandel district to realize more yield per unit area. As is evident from Figure 1, the average

productivity of rice increased from 37.33 to 59.66 q/ha. The additional yield of 22.33 q/ha helped the farmers to gain a net income of Rs. 1,47,810/ha with a B:C 2.94. KVK, Chandel has still a long way to go to achieve the goal of making farmers achieve self-sustainability in rice cultivation and to popularize RC Maniphou-13 in every nook and corner of the district. Thus the task of making the intervention has resulted not only in enhancing the cropping intensity, yield and farm income but also increased the farm employment in the villages.



Quality Fish Seed Production Led to Doubling Farmers Income

M A Salam, Hemam Ramananda Singh, Nandini Chongtham and Gunajit Oinam

Krishi Vigyan Kendra, Imphal East, Manipur
Central Agricultural University, Imphal

ABSTRACT

Shri Kangujam Bunbul is responsive and determined for taking up quality fish seed production as his source of income earning. Accordingly, with the help of Krishi Vigyan Kendra, Imphal East Scientist a low-cost fish production unit has been constructed in his available land area of 0.12 ha for production of quality fish seed. Before starting of his journey in farming he has attended different multi-disciplinary awareness programme in Agri and allied sector organized by Krishi Vigyan Kendra, Imphal East, Manipur. From the knowledge gained from different awareness programme, he has selected fisheries sector as his choice and started attending training programme on different aspect of scientific fish farming organized by KVK, Imphal East.

INTRODUCTION

In the course of his journey, he took advice from the KVK scientists and started growing fish brooder of *Anabus testudineus* in two numbers 10000 litre tarpaulin sheet during the year 2021 with support from KVK, Imphal East. Moreover, he has developed 3 numbers of low cost tanks using tarpaulin having a size of 40 ft x 35 ft x 3 ft for stocking spawn and fry. The KVK Scientists not only provided him with technical backstopping but also constantly boosted his moral by providing platforms to showcase his innovative ideas at the state and national level. The untiring effort of Shri Kangujam Bunbul has helped to earn a net income ranging from Rs. 157000/- to 309000/- in a span of 3 years of his hard work. During the year 2022 and 2023 the net income was Rs 157000/- and Rs. 309000/- with a B:C ratio of 2.9 and 8.5, respectively.

Situation analysis

Shri Kangujam Bunbul Singh is 31 year old rural unemployed youth of Bashikhong village in Keirao Bitra Block of Imphal East District, Manipur. He has completed his formal education up to Master of Sociology during the year 2017. After completion of his study he has shown keen interest in taking up farming in Agri and Allied sector. Before starting of his journey in farming he has attended different Multi-disciplinary awareness programme in Agri and allied sector

organized by Krishi Vigyan Kendra, Imphal East, Manipur. From the knowledge gain from different awareness programme he has selected fisheries sector as his choice and started attending training programme on different aspect of scientific fish farming organized by KVK, Imphal East. Shri Kangujam Bunbul is responsive and determined for taking up quality fish seed production as his source of income earning. Accordingly, with the help of Krishi Vigyan Kendra, Imphal East Scientist a low cost fish production unit has been constructed in his available land area of 0.12 ha for production of quality fish seed.

Plan, Implementation and support

In the course of his journey, he took advice from the KVK scientists and started growing fish brooder of *Anabus testudineus* in two nos. 10000 litre tarpaulin sheet during the year 2021 with support from KVK, Imphal East. Moreover, he has developed 3 nos. of low cost tanks using tarpaulin having a size of 40 ft x 35 ft x 3 ft for stocking spawn and fry. The KVK provided him with all possible support to continue with his idea for successfully production of quality fish seed. The KVK Scientists not only provided him with technical backstopping but also constantly boosted his moral by providing platforms to showcase his innovative ideas at the state and national level.



Broodstock tanks



Fish seed stocking tanks

Outcome

The untiring effort of Shri Kangujam Bunbul has helped to earn a net income ranging from Rs. 157000/- to 309000/- in a span of 3 years of his hard work. During the year 2022 and 2023 the net income were Rs 157000/- and Rs. 309000/- with a B:C ratio of 2.9 and 8.5 respectively.

Impact

Shri Kangujam Bunbul is planning to expand his farm area to 1 ha for production of quality fish seed. He has now become the role model in his village. The farmers from different parts of his district as well as from other districts of State have approached him for his help and expressed their desire for taking up such farming system in their field as well. The farmers have also

shown interest for production of low-cost fish feed with the locally available raw materials. In recognition of his innovative approach for production of low-cost fish feed, KVK, Imphal East has prepared an innovative project proposal and submitted to College of Fisheries, Tripura during the year 2022. Considering the farmers innovative approach for production of low-cost fish feed with locally available raw materials, College of Fisheries, Tripura under RKVY-RAFTAAR Agri-Business Incubator (R-ABI) has provided a start up grant of Rs. 3 lakhs. During the same year Shri Kangujam Bunbul have also been provided a financial assistant of Rs. 2.8 lakhs under PMMSY Scheme for establishing small scale fish hatchery unit.

Quality Fish Seed Production Led to Doubling Farmers Income

Output

Economic of fish seed production of Shri Kangujam Bunbul

For the Year 2021 (First Year)		
Capital Cost		
1.	Plot leveling	1000.00
2.	Construction of tanks (2 nos.)	30000.00
3.	Miscellaneous	10000.00
	Total (A)	41000.00
Working Cost		
1.	Cost of fish fry (6000 fry)	15000.00
2.	Fish feed	26000.00
3.	Medicine	1000.00
4.	Miscellaneous	5000.00
	Total (B)	47000.00
	Total Cost (A+B)	88000.00
	Net Return	Nil
For the Year 2022(Second Year)		
Capital Cost		
1.	Plot leveling	2000
2.	Construction of tanks(3 nos.)	30000
3.	Miscellaneous	10000
	Total (A)	42000
Working Cost		
1.	Fish hormone	20000
2.	Fish feed	10000
3.	Medicine	1000
4.	Miscellaneous	10000
	Total (B)	41000
	Total Cost (A+B)	83000
	Production Details	
1.	Spawn	80 bati
2.	Fry	160000 fry
	Selling Details	
1.	Spawn @ Rs. 1000/bati	80000
2.	Fry @ Rs. 1/fry	160000
	Gross return	240000
	Net return	157000

For the Year 2023 (Third Year)		
Working Cost		
1.	Fish hormone	20000
2.	Fish feed	10000
3.	Medicine	1000
4.	Miscellaneous	10000
	Total	41000
Production Details		
1.	Spawn	150 bati
2.	Fry	200000 fry
Selling Details		
1.	Spawn @ Rs. 1000/bati	150000
2.	Fry @ Rs. 1/fry	200000
	Gross return	350000
	Net return	309000



Construction of small-scale fish hatchery unit



Sehar Ki Duniya: A World of Resilience, Mobilization and Empowerment

Parveen Kumar* and Raj Kumar**

Krishi Vigyan Kendra-Ramban,

Shere – Kashmir University of Agricultural Science and Technology –Jammu

ABSTRACT

Sehar Ki Duniya is a story of young farm woman entrepreneur, her remarkable accomplishment in mobilizing fellow farmers especially farm women, breaking their glass ceiling and showing them the way how self reliance can be achieved, sustainability can be brought in and empowerment can be attained. Today this young entrepreneur is amongst the recognized and prosperous farm women of the area, owning a *pucca* house with all basic amenities and taking care of all the needs of her three small daughters. Her progress over the last couple of years is a result of her hard work, persistence and her inquest desire to learn. She has now become a role model for her local community of farmers, proving that with a focused approach everything is impossible.

INTRODUCTION

Agriculture in India is dominated by marginal and small farmers. National Sample Survey Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI) conducted a Situation Assessment Survey (SAS) of Agricultural Households during NSS 77th round (January 2019- December 2019) with reference to the agricultural year July 2018- June 2019 in the rural areas of the country. As per the Survey, the percentage distribution of agricultural households owning less than two hectares of land is 89.4%. For a vast majority of the farming population in the country, agriculture is related to only growing food crops like wheat, paddy, maize, fodder crops like Barseem, Jowar, Bajra for animals and pulses if the land holding permits. The farmers have been carrying out this mono cultural legacy over the generations. In the present era, a lot of inputs from seed to chemical fertilizers to plant protection chemicals including pesticides are required for growing different crops, which increases cost of cultivation. The cost is further escalated by the labour and machinery charges incurred while performing different operations in the fields. Ultimately, it results in a situation where the cost of cultivation exceeds the output. This is basically the

reason why the farming is considered as a non-remunerative enterprise. The problems becomes more severe in case of small and marginal farmers who find it difficult to bear the brunt of increased cost escalation and are left with no option except to quit agriculture. The situation thus demands exploring other opportunities which are more remunerative, more environmental friendly and do not result in over-exploitation of natural resources. Of late, some of the farmers in the country have now understood and changed the course of agriculture with diversification.

Diversification *vis-a-vis* integrated farming system approach involve the farmer to take on other allied enterprises like floriculture, goatry, bee keeping, mushroom cultivation, poultry, vegetable and many others. It gives the farmer an advantage that the failure of one component to give desired results is compensated by other component. It also makes best and optimum use of the family labour, local resources and the output of one enterprise becomes the input of other enterprise. Integrated farming systems (IFS) can be described as a judicious mix and positive interaction between two or more components such as horticulture crops, livestock, aquaculture, poultry/ducks, apiculture, and

Corresponding Author's Email: pkumar6674@gmail.com

*SMS (Ag. Extension) KVK-Ramban

**Sr. Scientist & Nodal Officer KVK-Ramban



Fig. 1: Marigold: Standing crop and flowers in boxes for marketing

mushroom cultivation. It uses the cardinal principles of minimum competition and maximum complimentary with advanced agronomic management tools. Its goal is to sustain an environmentally friendly farm income, family nutrition, and ecosystem services (CEEW, 2021). Among the various enterprises, Marigold cultivation is an income generating option that does not require farmers to incur much on input cost and on the other hand, monetary output far exceeds that of corresponding yield.

The present story depicts the successful journey of Ms. Mubina Akhtar who took to diversification through vegetables, fruits, marigold and poultry along with a mix of sustainable practices and become an example for others to follow. A young woman and a mother of four daughters, studied up to higher secondary level, Ms. Mubina hails from a village Boon Bari, located at a distance of about two kilometers from block Batote in Ramban District. Her husband is engaged in transport business. The village Boon Bari represents a picturesque; a small hamlet located against the backdrop of Shivalik hills; far from the chaotic and congested city life. The village having a population of 1500-1700 represents unity in diversity. One can find mutual respect for human values and shared emotions, peoples are very much happy and contented with what they have. Womenfolk still carry on the cultural legacy, the tradition of 'purdah' system; hesitate to sit on chair in front of their elders. They do not see it as an infringement on their personal

liberty; but for them it is a sort of respect for their elders.

The area has a mountainous topography, farming is rainfed (ICAR-CRIDA), size of holding is very small, and fragmentation of holdings hinders farm mechanization operations. Despite the numerous challenges of living in a small village, Mubina committed to support her family through hard work and dedication. She took the lead in mobilizing her fellow farmers and farm women and establishing a collective association by the name of '*Sehar Ki Duniya*'; Sehar being the name of her smallest daughter.

With only 0.75 acres of agricultural land, she decided to do something different. Her quest for doing something new took a practical shape only after she came in contact with institutes and organizations working for the upliftment of agriculture in district. Those include Krishi Vigyan Kendra-Ramban, Rural Self Employment Training Institute (RSETI) of State Bank of India, Council for Scientific and Industrial Research (CSIR)-Indian Institute of Integrative Medicine (IIIM-Jammu), Department of Agricultural Production and Farmers' Welfare, Department of Horticulture and other allied in Union Territory of Jammu and Kashmir. Through SBI-RSETI SBI, she got training on Mushroom cultivation. About 45 women of her area got this training. CSIR-IIIM upgraded her skills in Marigold cultivation and Department of Agriculture and Farmers Welfare provided her expertise and inputs, Horticulture planning and marketing department arranged for

Sehar Ki Duniya: A World of Resilience, Mobilization and Empowerment



Fig. 1: Mubina in her Vegetable fields

the necessary marketing support for her produce.

KVK intervention

She learnt about natural farming and preparation of different components of natural farming like Jeevamrita, Beejamrita, AGNIASTRA, Brahmastra and various other microbial preparations. She prepares Jeevamrita and Beejamrita and applies them to her fields. On being asked about the difference in yield and soil health after application of Jeevamrita and Beejamrita, she replies in positive. Mubina has felt the difference in yields and quality of soil after adopting Natural Farming practices. She is promoting natural farming in the region by motivating other fellow members of her group by awareness and training sessions on preparation of different formulations under Natural Farming. Her services are also being utilized by KVK-Ramban, departments of agriculture and horticulture and others to educate other farmers on sustainable agricultural production practices.

Marigold cultivation

After getting the necessary expertise in cultivation of Marigold, she along with 120 others were provided hybrid Marigold seed (Variety: Mahavishnu Orange) by CSIR-IIIM Jammu under mission floriculture of the institute. She started cultivating Marigold from last year and has taken two crops of Marigold so far. In a year two crops of Marigold can be taken. From Marigold she has earned more than 10,000 in a year from a meagre 0.12 ha of land under marigold. Not only Mubina, but other members of her group who are



Fig. 2: Rearing of Chicks

cultivating Marigold are earning.

Mushroom production

She grew Mushroom in 20 bags and harvested 30 to 35 kilogram of mushroom which she sold in the market at rupees 200-250 per kilogram. This much produce fetched an income of rupees 7000.

Vegetable Production

Mubina very proudly says that she does not purchase vegetables from outside. She produces different types of vegetables in her own fields. The vegetables produced by her include Radish, Cucumber, Onion, Bottle gourd, Bitter gourd, Tomato, Potato, Beans, Spinach, Knolhol and others. Besides all this, she also purchases Potato from potato growers of her own and adjoining villages and sells them in market at higher price.

Fruit Production

Among the horticulture crops, she has Walnut, Peas and Persimmon or Japanese fruit locally called Amlook. Amlook is very rich in Fibre that helps lower the bad cholesterol level and also fuels the growth of good bacteria in our intestines. The high fibre content lowers the high blood sugar level and helps in smooth bowel movement. Mubina has about 15 walnut plants which are 20 years old and from which she harvested 2.5 qtls. of walnut this year. She sold the produce at the rate of 250-300 per kilogram to army personnels stationed in that area. This also gave her a gross income of rupees 40,000-50,000

after deducting the expenses she incurs while hiring labor for plucking, sorting and grading. From 12 Amlook plants, she had about 2.8 quintals of fruit which she sold at the rate of rupees 35 per kilogram. Mubina further tells that she sells them in crates with each crate having 10 kilogram of fruit. This year she had 28 crates of Persimmon which also gave her a net income of rupees 7200 after deducting all the expenses of packaging boxes, labour, transport and miscellaneous charges. She also has pear plants which also are sold in the market or are sold when they ripen and are still on the plants. This year pear were sold worth an amount of rupees 15,000.

Poultry

She has also now started rearing chicks. In her Poultry unit are one month old about hundred chicks which she purchased at rupees hundred per chick. Mubina hopes to have good income from these poultry birds once they grew up and are sold in the market or start laying eggs.

On the whole she earns about one lakhs from a small piece of land without any external inputs. Her cost of cultivation is also very less.

Marketing Linkages

The young lady has developed appropriate market linkages both in the local market, district level market as well as outside her district for marketing of her produce and also for the produce which she procures from her fellow farmers and farm women. In contrast to her visits to market, now many people including vendors and army personnel come to her for purchase of fruits and vegetables and other products. In the local market, Marigold does not fetches her a good price, so she sends it to Jammu where it is in high demand due to temples, banquet halls, restaurants and other places where flowers are required in sufficient quantities. She also collects the Marigold produced by other members of 'Sehar ki Duniya' and after proper packaging the marigold so collected is sent to Jammu for sale. The members of the group who have given their produce to Mubina for sale are then paid according to their share in the total quantity collected and sold only after deducting the expenses incurred by Mubina on the purchase of boxes for packaging, transport

and other miscellaneous expenses. For marketing of potato, she has developed her own marketing linkages with local shopkeepers. She earns a profit by this. In the last season, she had purchased potato at the rate of rupees 20 per kilogram from the local producers and sold it at rupees 40-45 per kilogram.

Mobilization and empowerment through Sehar Ki Duniya

Ms. Mubina started the 'Sehar Ki Duniya' by mobilizing the farm women and farmers in her village and adjoining villages. Today her group has more than 350 members of which she has linked 70 members with Bank. These 70 members are linked with branch of Jammu and Kashmir Bank at Batote. The mobilization of farming community by Mubina under the banner of '*Sehar Ki Duniya*' is a remarkable achievement given the very static nature of our farming community. Her endeavour assumes significant because most of her group members are farm women. She has made all of them to work and utilize their time in some productive work which otherwise goes in gossips. At present most of the women of her area are busy in doing activities like marigold cultivation, mushroom production, vermicompost production, poultry or kitchen gardening. The women also make money by selling their products and this has led to empowerment of these women. At present about 70 members of her group are linked to Bank, but she plans to link all the members with the Bank and start financial transaction through creating some revolving fund. She also had plans to set up dairy processing and animal feed unit to cater to the animal feed requirements of livestock owners of her area. Her group meets at least once in every month with informal meetings among group members taking more frequently. The group activities include planning for agriculture, horticulture, livestock, arranging for inputs for group members, meetings with agriculture and line departments, assessing training needs of members, development of market linkages and linkages with banks.

Mubina along with her group members proactively takes part in various activities and programmes of Krishi Vigyan Kendra-Ramban, Department of Agriculture and allied sectors of

Sehar Ki Duniya: A World of Resilience, Mobilization and Empowerment

Ramban district for her different needs related to good quality inputs like seeds, seedlings and planting material, awareness on latest agriculture related schemes, new practices and approaches in farming and other miscellaneous needs. Today Mubina continues to inspire many other young ladies in this Union Territory to come forward, take initiatives, lead from the front and set examples for others. She owes her success to all the agencies and institutes which helped her in one or other ways in becoming self reliance and empowered.

REFERENCES

- NSSO 77th round. Situation assessment Survey (SAS). Improving conditions of Small and Marginal Farmers.
- Integrated Farming Systems in India 2021. A report of Council on Energy, Environment and Water (CEEW). Cited at <https://ceew.in/integratedfarming>
- Jammu and Kashmir Agriculture Contingency Plan for District Ramban. Cited at <https://www.icar-crida.res.in/j&k19-Ramban2>.



Success of a Farmer through Enterprise Diversification

Parveen Kumar* and Raj Kumar**

Krishi Vigyan Kendra-Ramban,

Shere – Kashmir University of Agricultural Science and Technology –Jammu

ABSTRACT

A single enterprise in the farms runs the risk of ruining the fortunes of farmers in case some calamity strikes the fields and results in devastation of crops. The need therefore is to have approaches which ensure a regular income for the farmers even in case of failure of one crop/enterprise. One such approach is to have more than one enterprise or produce more than one product to avoid having your income totally dependent on the production and price of one product. If profit from one product is poor, profit from producing other products may prevent total profit from falling below acceptable levels. The present success story of an innovative farmer from District Ramban in Jammu and Kashmir highlights how the farmer doubled his income after enterprise diversification. This also helped him reduce his dependence on external inputs and recycle his farm and animal waste.

INTRODUCTION

Farming everywhere is subjected to various types of risks and uncertainties. These risk may be human induced or may be result of natural calamities. In a country like ours where farming is dominated by the presence of marginal and small farmers, such type of risk threatens the farm sector as well as communities engaged in this noble profession. Calamities like insect-pests and diseases, untimely rainfall, hailstorms, fast blowing winds result in considerable loss of yields ultimately making agriculture a non remunerative profession. Agriculture is not only confined to crops or livestock. Agriculture encompasses a wide range of enterprises which among others also include goatry, sheep, apiculture, sericulture, piggery, floriculture, horticulture, olericulture etc. Continuing with a single enterprise runs the risk of ruining the fortunes of farmers in case any calamity struck the fields and results in devastation of crops. We need to have approaches which ensure a regular income for the farmers even in case of failure of one crop/enterprise. One such approach is to have more than one enterprise or produce more than one product to avoid having your income totally dependent on the production and price of one product. If profit from one product

is poor, profit from producing other products may prevent total profit from falling below acceptable levels. This is what is called as enterprise diversification. Enterprise diversification is a self-insuring strategy used by farmers to protect against risk (Mishra *et al*, 2004).

Having more than one enterprise ensures that farmer gets compensated from one of the enterprise in case of failure of other. Infact, enterprise diversification is a self-insuring strategy used by farmers to protect against various risks. Promoting a Farming System Approach through Integrated Farming System IFS models is the best way towards enterprise diversification. In this paradigm, the output of one enterprise becomes input of other enterprise thereby helping in reduction of cost of cultivation and increased profit. Moreover the resources within the farm are judiciously used contributing to the sustainability of the system. The present success story of an innovative farmer also depicts how an integrated farming system model based on enterprise diversification has reversed the fortunes of the farmer.

Until a few years back farming for 58 years old Mr. Abdul Majeed Rounyal, hailing from a remote village Gandhri in district Ramban was a

Table 1. Income from different enterprises.

Enterprise	Net Income (in Lakh)	Share in Net Income (%)
Crops*	0.35	5.64
Horticulture	2.50	40.32
Livestock	1.00	16.12
Poultry	0.10	1.61
Vegetables	2.05	33.06
Floriculture**	0.20	3.22
Total	6.20	-

*Maize, Wheat, Mustard and Oats

** Marigold

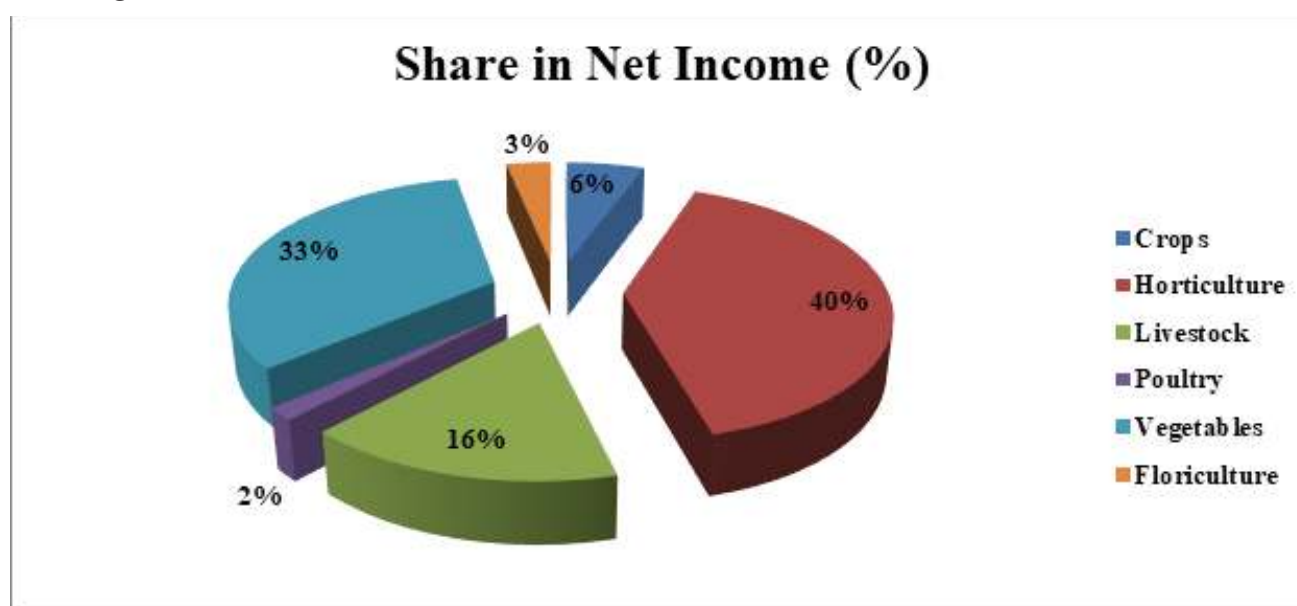


Fig.1: Percentage share of different enterprises in Net Income of Farmer

fatigue, a non remunerative preposition, a baggage that was handed over to him by his forefathers and which he was supposed to give it to next in his family. The traditional methods and same type of crops grown year after year had rendered his farm a subsistence one hardly enabling him to make his both ends meet. In his 17 kanals (0.85 ha) of unirrigated land, cost of cultivation always exceeded his net income putting him in distress and frustration. Mr. Rounyal always wanted to do something different which could make his farm profitable and sustainable. He wanted to set an example in farming for others in his region to follow.

It only became possible when he came in contact with department of Agriculture and Farmers' Welfare, UT of Jammu Kashmir and Krishi Vigyan Kendra-Ramban that winds of change started blowing for him. His thirst for modern farming finally was quenched when he started attending various awareness, sensitization and training programmes of the agriculture department as well as Krishi Vigyan Kendra-Ramban. He was advised and guided to adopt an Integrated Farming System (IFS) approach and turn his farm into an IFS model farm. Mr. Rounyal finally in the year 2017 started working to convert his farm into an IFS farm. Today his IFS model farm has become a role model for the farming community of his region as well as whole of UT.

Success of a Farmer through Enterprise Diversification



With no external input in the form of synthetic fertilizers or plant protection chemicals and recycling of farm and animal waste, he is able to considerably reduce the cost of cultivation. As the land is rainfed with no irrigation facilities, he has made a farm pond in his field. The water harvesting structure in his fields is 20 feet long, 10 feet wide and about 6 feet deep. The water stored in this pond comes to the rescue of Mr. Abdul Majeed while growing different vegetables and crops. From KVK-Ramban, he learnt scientific cultivation of different crops including vegetables and natural farming practices. He was given hands on training on preparation of Jeevamrita, Bijamrita, and various other microbial cultures.

His Integrated Farming System consists of crops, a poultry unit, a fishery unit, flower cultivation, an orchard and a vegetable unit. The different crops like Maize, Wheat, Oats and Mustard cover 0.50 ha of land, an orchard with fruit plants of Walnut, Apple, Pear, Quince, Pomegranate, Apricot and Plum on 0.25 ha and exotic vegetables on 0.10 ha of land. His annual income from different fruit trees stands at 2.50 lakhs. Abdul Majeed also has two sows one of

which is Desi and other is exotic. Both of them have milk yield of 10 litres per day. This also gives him an annual income of 1.00 lakh. Besides growing crops, Mr. Majeed also raises Marigold for commercial purpose which also fetch him an annual income of rupees 0.20 lakh. . He recently also has constructed a polyhouse in which he plans to grow vegetables in winter months when their cultivation in the open is not possible due to harsh climatic conditions outside. In his fish pond, he is rearing about 800 common carps and is yet to get any income from the rearing of fishes. In his poultry unit, he has about 200 poultry birds. He also earns by selling their eggs as well as the bird for meat purpose and he earns rupees 0.10 lakh on a annual basis by selling eggs and poultry birds for meat purpose. Cultivation of exotic vegetables is also another important source of income for the farmer. He grows different types of vegetables like Radish, Carrot, Cauliflower, Cabbage, Knolhol, Peas, Turnip, Spinach, Tomato and this also gives him an annual income of rupees 2.05 lakhs. All these enterprises fetch him an income of more than 6 lakh per annum which is many times more than his income a few years back from the same farm.

He sells all his produce in the district. Recycling, no dependence on external inputs, scientific cultivation and natural farming has brought the difference for him. It can also be inferred from table 1 that horticulture is having the major share in his total income. This is because fruit plants do not need any investment once they get themselves established in orchards. They continuously go on bearing fruits year after year. Horticulture sector is recognized to have the potential to raise the farm income, provide livelihood security and foreign exchange (Jha, et.al, 2019)

The efforts of KVK-Ramban in promoting and dissemination of sustainable agricultural practices were also duly recognized when Mr. Abdul Majeed Rounyal got innovative farmer award by Director ICAR-ATARI on its Foundation day at Ludhiana. He also has got appreciation from SKUAST-Jammu for his promotion of IFS model. His dedication and quest to adopt new technologies and natural farming practices has not only made him a role model in his area but also earn recognition at the national level too. Today, Mr. Majeed has proved that size of land holding is just a number. He is earning a handsome income from its farm by adopting an integrated farming system approach diversifying his farm with crops, oilseeds, fodder, vegetables,

flowers, fruit crops, backyard poultry, fishery and livestock. An Integrated Farming System approach has reversed the fortunes of this marginal farmer located in a remote corner with lack of resources and a limited access to different institutions and agencies. He is a source of inspiration for more than 80 percent of marginal and small farmers (S. Mahendra Dev, 2012) who dominate the Indian agriculture who has proved that with the commitment, dedication and scientific temperament marginal and small farms can also be made profitable. Mr. Majeed duly acknowledges the efforts of KVK-Ramban in promoting sustainable agriculture practices in the region which according to him have really resulted in doubling of farmers' income.

REFERENCES

- Jha G K, Suresh A and Punera B (2019). Growth of Horticulture sector in India: Trends and Prospects. *Indian J Agri Sci* **89**(2):314-21
- Mishra A K, Hisham S, El Osta and Carmen L Sandretto (2004). Factors affecting farm enterprise diversification. *Agri Finance Rev* **64**(2):151-166
- S Mahendra Dev (2012). Small Farms in India: Challenges and Opportunities. *Working Paper, 2012-014*. Indira Gandhi Institute of Development Research

