

Maximising Farm Income through Farmers' Innovations: Learning Experiences from Bihar and Jharkhand



ICAR-Agricultural Technology Research Application Institute
Zone IV, ICAR, Patna 801506, Bihar

Maximising Farm Income through Farmers' Innovations: Learning Experiences from Bihar and Jharkhand

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त्रिलोचन महापात्र, पीएच.डी.

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सचिव एवं महानिदेशक

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Foreword



Agriculture is the main stay of the Indian economy as more than half of our population is still dependent on agriculture and allied sectors. The growth and development of agricultural economy would not have been possible without inclusive agricultural policies *vis-a-vis* agricultural technologies. A number of innovative technologies in different areas of crop improvement, food processing and value addition, integrated pest disease management practices, integrated nutrient management, bio-fertilizers, improved farm machineries etc. have all played a potential role in increasing farm production, productivity and economic returns. However, gap in interaction among stakeholders coupled with variable resource base, small and marginal farmers continuously experiment and informally adopt indigenous technologies and regularly innovate to improve their livelihoods. Unfortunately, the indigenous technical knowledge and innovations of farmers have not got enough attention and appreciation for further scaling up.

I am happy to learn that ICAR-ATARI, Patna has taken lead to share and document the learnings from the innovator farmers in the form of a book titled "Maximising Farm Income through Farms Innovations: Learning experiences from Bihar and Jharkhand". I am sure, the document would serve as a strategic guide for the farmers, entrepreneurs, extension workers and other stakeholders related to farming and allied sectors, having a greater role to play in enhancing farm income. I extend my best wishes to the contributors and editors of this publication.

Dated the 10th December, 2018
New Delhi


(T. Mohapatra)



डा. अशोक कुमार सिंह
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Foreword



National Agricultural Research System is continuously striving to reach to the farmers for adopting modern technologies and inputs, improve economic viability of farming, create employment, ensure national food security and improve socio-economic development. In the course of earning livelihood from farming, numerous innovations, which brought good returns and recognition to practitioners, are being generated by the farmers themselves. Recognizing the innovations and Innovator farmers may be quite useful for their collaboration with different stakeholders in the system and scaling up of the ideas.

I am happy to learn that ICAR-ATARI, Patna has taken lead to create opportunities for farmers to share their innovations and facilitate mutual learning process of the farmers through organisation of farm innovators' meet and bringing out a publication. I am sure that the publication will promote social learning process of the farmers, outscale the localized success of farmers' innovations, promote effective communication in addition to enhanced income of the resource poor farmers.

I congratulate the team of contributors and editors for their initiatives intended for documentation and promotion of grass root level innovations and adoption process.

Dated 7th December, 2018

(A.K. Singh)

Preface

Agricultural transformation is possible with technological interventions. There are majorly two sources of innovations, one being generated at Research and Development institutes formally and another being done by farmers themselves informally. The later is usually not visible but is equally important in bringing out transformation at the grassroot level. These technologies and methodologies developed by some of the innovative farmers and rural youth are benefiting widely to farmers and have also been accepted across the system. Their local innovations include both "hard" technologies, such as tools or pest-management techniques, and "soft" innovations, such as new ways of communication or marketing. Such innovative technologies and methodologies are largely confined to some locations only. Benefits accrued from such innovative ideas need to be widely shared across the farming systems.

Of late, the focus of the government, planners and scientists has been on tapping the intellect of the farmers so that Indian farming becomes more sustainable, remunerative and globally competitive. Valuable ideas and techniques generated by the farmers largely go unnoticed owing to lack of proper documentation and opportunities for wider dissemination. Indian Council of Agricultural Research (ICAR) through various platforms is attempting to recognize and integrate such innovations for institutionalization of such experiences. Organising Farm Innovators' Meets region-wise at respective ATARIs in different zones of the country is a step to outscale the ideas.

This book is documentation of the successes of such Farm Innovators from the two states of Bihar and Jharkhand. I congratulate the efforts of respective KVKs for encouraging and mentoring these farmers. I congratulate the team of contributors and editors for their initiatives intended for documentation and promotion of grass root level innovations and adoption process.

Dated 7th December, 2018

(Editors)

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Institutionalisation of Farmer Led Innovations (FLIs) for Raising Farm Income : Present Imperatives

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Agriculture is an important sector of Indian economy as it significantly contributes to the total GDP and provides employment to over 60% of the population. Farming sector is witnessing heavy challenges and farm profits have declined to the level where even input costs are not recoverable. There is continuous fragmentation of land due to ownership multiplication and division of joint families into smaller nuclear families, resulting in low per capita availability of land. The land man ratio in our country is becoming very narrow. Due to low land man ratio, more and more farmers and their children are finding themselves out of work.

Despite these issues and grim scenario presented by media in front of us that farmers are the most discontented lot, there are numerous cases where farmers have been highly successful due to their entrepreneurial behaviour and innovation generated by them. In a study of 51 successful achiever farmers conducted at IARI during 2009-2014, innovativeness emerged as one of the most significant best practices adopted by successful farmer entrepreneurs. (Singh Rashmi *et al*, 2014). Innovativeness and entrepreneurship nexus is well known in the process of agripreneurship development.

Farmer Led Innovations

Millions of farmers are silently addressing livelihood constraints and exploring new opportunities by experimenting with unique combinations of indigenous knowledge and new ideas from a variety of sources for supporting food security of the country. Farmers also developed pest management technologies, low cost processing technologies for value addition, increased shelf-life and better marketability for various farm products. In addition, a number of farm implements and tools were designed and manufactured by the farmers to increase operational efficiency and productivity. Their local innovations include both “hard” technologies, such as tools or pest-management techniques, and “soft” innovations, such as new ways of communication or marketing.

Farmers are creative and generate relevant local innovation as a response to the existing situations they face. Innovation comes from a variety of sources including intuition, dreams, experience at work, training, the ideas of friends, observations elsewhere, trouble/poverty and 'no way out' without being creative. Farmer innovators (FIs) are those who have developed or are testing new ways of crop husbandry that combine production with conservation. The innovations may be simple cultural measures (perhaps a particular form of mixed cropping) or sophisticated structural designs combined with integrated production systems. The innovation may be an on-going experiment, or already proven and effective. It may even have become established as a local tradition. Thus we can say that, Farmers' Innovation is 'A practice started and later improved by a farmer on her/his own initiative (problem oriented), without any external influence at all' Farmer innovators (FIs) are those who (in local terms at least) have developed or are testing new ways of land husbandry that combine production with conservation. The innovations themselves may be related to crop production or livestock. They may be simple cultural measures (perhaps a particular form of mixed cropping) or sophisticated structural designs combined with integrated production systems. The innovation may be an on-going experiment, or already proven and effective. It may even have become established as a local tradition.

FI may be '*a practice started and later improved by a farmer on her/his own initiative (problem oriented), without any external influence at all, every innovation must include an element of 'own initiative'*'. Innovation may come from a variety of sources including: intuition, dreams, experience at work, training, and the ideas of friends, observation elsewhere, trouble/poverty and 'no way out' without being creative. It is important to draw attention to the fact regarding the differentiation of farm innovations and farm innovators to that of indigenous technical knowledge/ traditional knowledge. These socio-institutional changes are generated by groups or even individuals.

Institutional Efforts for FLI recognition

Of late, the focus of the government, planners and scientists has been on tapping the intellect of the farmers so that Indian farming becomes more sustainable, remunerative and globally competitive. Valuable ideas and techniques generated by the farmers largely go unnoticed owing to lack of proper documentation and opportunities for wider dissemination.

The technological and institutional innovations are not two different departments of the same system, but it is often very common to see instances where technological innovations causing institutional changes or institutional innovation stimulating technological innovations. In recent years, international appreciation for the potential of local innovation has grown. Program of Support for Poverty Elimination and Community Empowerment in Zambia , Scaling Up HIV/AIDS Interventions Through Expanded Partnerships (STEPS) in Malawi, strengthening CBO-LG links

in republic of Kyrgstan , Nirdhan Utthan Bank Ltd. (NUBL) in Nepal, Self Help Group Linkage Banking Program of the National Bank for Agriculture and Rural Development (NABARD) India, PROLINNOVA-Ghana LISF model, Syprobio operating in the three countries of Mali, Burkina Faso and Benin along with many others are the few programmes supporting the farmer innovations.

At international level, to develop mechanisms for local innovations to find their way into the formal research and development system, the Participatory Adaptation and Diffusion of Technologies for Rice-Based systems project initiated several activities to encourage their national partners to document, validate and disseminate local knowledge and innovations. This IFAD- funded project is coordinated by the African Rice Center (WARDA). The first phase of the project was implemented from 2000 to 2003 in Ghana, Guinea, The Gambia and cote d' Ivore. The Farm level Applied Research Methods for Eastern and South Africa (FARMESA) is a regional collaborative institute operating in five countries including Kenya, Tanzania, Uganda, Zambia and Zimbabwe with associate countries including Botswana, Malawi, Mozambique and South Africa. African Highlands Initiative (AHI) introduced numerous technologies to improve and enhance land productivity in a sustainable way within the intensive land-use systems of the highlands in eastern and central Africa while maintaining the quality of the natural resource base during 1998-99, where farmers modified some elements of the technologies in different ways and sometimes opposing some of researchers methodologies in their fields according to their experiences with locally available alternatives resulting to a formal survey to trace such innovations and search out the motivating factors for innovation and its effects on adoption.

The common activities for PROLINNOVA (Promoting Local Innovation) global programme are identification and documentation of local innovation, capacity building of different stakeholders, validation, promotion and up scaling of innovation which supports in livelihood of resource poor and low resource farmers. PROLINNOVA Cambodia started up action research on so-called Local Innovation Support Funds (LISFs) in 2007 where farmers are given flexibility and independence in doing their own research relevant to local problems and conditions and facilitated the sharing of such innovations and experiences through a workshop. Promotion of farmer innovation and experimentation in Ethiopia (PROFIEET) Later named as PROLINNOVA-Ethiopia worked on the process and products of local innovation-based partnership between farmers, the formally trained researchers/experts, the private sector, policy people, extension workers and other factors". The global community of practices included 16 countries mainly from Africa, Latin, America and Asia (PROLINNOVA-Ethiopia, 2006). Promoting Farmer Innovation (PFI) was the key activity of a project in East Africa upto 2001. The methodology and early results of PFI sought to use local farmer innovation in the field of land

husbandry as a stimulus to more appropriate research and extension systems in semiarid and marginal areas which led to documentation of selected innovations as one of the products. International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) in northern Malawi stressed and worked for convergence between informal innovation and formal research and development systems.

In Indian context, NIF (National Innovation foundation) took up the mission of making India innovative (documenting, adding value, protecting the intellectual property rights of the contemporary unaided technological innovators, as well as of outstanding traditional knowledge holders) and a creative society since 2000 with the active support of Department of Science and Technology, Government of India. In this, it supplements the work done by the Honey Bee network over the years. The NIF seeks to create an innovation-driven society by giving awards to outstanding grassroots innovators, helping transform those innovations that have economic potential into products that can be commercially produced (either by the innovator himself or through licensing of the innovation to another commercial enterprise), and linking grassroots innovators to the formal science and technology system to get inputs to improve upon innovations wherever necessary and create a new model of innovation-driven entrepreneurship. To support individual innovators, the Technopreneur Promotion Programme (TePP) has been used to provide capital to several of the individual innovators. To support the commercialization activities of the NIF, the government created a Micro Venture and Innovation Fund of about \$ 1million (to be operated by the NIF with the involvement of the Small Industries Development Bank of India) in 2002 and these funds are being used to scale-up innovations and facilitate the creation of viable enterprises.

The Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI), a global NGO based in India was set up in 1993 to provide support to the honey bee network and to enhance global networking and do research on problems related to diffusion and protection of grassroots innovations. Grass Roots Innovation Augmentation Network (GIAN), Gujarat set up in 1997 is involved in documentation and validation of farmer innovations. It provides small amounts of funding for prototype development, links innovators to science and technology institutions, and identifies commercial enterprises interested in licensing product technologies from the grassroots innovators.

ICAR organised a National farm innovators meet was organised at JSS Krishi Vigyan Kendra, Suttur, Mysore District, Karnataka and published Farm Innovators 2010. Intellectual Property and Technology Management cell (IP&TM) of ICAR oversees all matters related to intellectual properties and technology transfer/commercialization of new ideas. It is maintaining data base of successful innovative farmers for better dissemination. ICARs Zonal Technology Management and

Business Planning and Development units (ZTM & BPD) main objective is to protect Intellectual Property Rights, showcasing, transferring and commercializing the ICAR institutes innovations. They also act as Agri Business incubator to Incubate new startup businesses. Almost all the State Agricultural Universities, state departments, KVKs, ATMAs are documenting the farmer led innovations at district level and recognizing them through kisanmelas, exhibitions, seminars, conferences etc. (ICAR report 2015). Technology Information, Forecasting and Assessment Council (TIFAC) set up in 1988 under the Department of Science & Technology to look ahead in technologies, assess the technology trajectories, and support technology innovation by network actions in selected technology areas of national importance is providing the technical and financial support in the form of filing patents, extending post patent support for technology refinement and marketing and to upscale through various programmes.

Protection of Plant Varieties and Farmers Rights Authority (PPV&FRA) set up in 2005, is involved in documentation, indexing and cataloguing of farmers' varieties. National Bank for Agriculture and Rural Development (NABARD) set up a separate fund titled "Farm Innovation and Promotion Fund" (FIPF) to encourage specifically the innovations in the farm sector. The Fund has been created in NABARD with an initial corpus of 5 crores and it was operational with effect from 1 April 2005. It was initiated mainly to provide support on the analogy of venture capital for innovative ideas – technological and managerial (like supply chain management) in farm sector for further development (NABARD report 2010).

National Research Development Corporation (NRDC) was established in 1953 is recognizing a large repository of wide range of technologies spread over almost all areas of industries, viz. Agriculture and Agro-processing, Chemicals including Pesticides, Drugs and Pharmaceuticals, Bio Technology, Metallurgy, Electronics etc. It has licensed the indigenous technology to more than 4800 entrepreneurs and helped to establish a large number of small and medium scale industries. (NRDC annual report 2015). Recognizing the innovativeness of farmers creates fertile ground for their collaboration with other actors in innovation systems. There are many institutions recognizing and rewarding the grass root innovations like National Innovation Foundation, ICAR, IAR, PPV& FRA (Protection of Plant Varieties and Farmer's Rights), Biodiversity Authority of India, Excel crop Care, Mahindra and Mahindra etc.

For up-scaling the farm innovators at a larger scale in the country, ICAR is organising Farm innovators meet at various zones of the country under the respective Agricultural Technology Application Research Institutes (ATARIs) to share the experiences of farmers-led and institutionalisation of the FLIs. The present book is a compilation of successful Farm Innovators from two states, Bihar and Jharkhand.


Integrating Farm Innovators for Agricultural Transformation

Farm Innovators could effectively become consultants and entrepreneurs leading to off-farm income generation options after getting training and support in certain distinguishing capacities like foreseeing institutional requirements and linkages, comparative financial impact and success analysis ability in addition to analyze projected demand and required changes in socio cultural and infrastructural domain. Institutionalization of any farmer led innovation being a complex process requires capacity strengthening and change in individuals as well as change in organizations. Private players should assist in the commercialization of farmer-led innovations. Farmers should play a key role in planning the process of scaling out in their area to develop ownership and commitment to improving livelihoods. Supporting organizations need to facilitate the scaling out process beyond short term research or development projects.

Farm Innovators must be encouraged to be creative and entrepreneurial to bring about the desired transformation of our agricultural sector. For maximum farm profits, farmers need to harness all their skills so that they will be able to withstand harsh conditions which are as a result of environmental changes or social compulsion driven. Agricultural productivity is believed to be enhanced by the incorporation of strategic entrepreneurship skills. Also, farmer led innovations generated for immediate problem solving or creative application have helped in optimizing farm profits and managing agricultural activities conveniently.

Innovativeness has been found to be critical in entrepreneurial behaviour and it is imperative in the present context. Why there is so much focus now on Farmer led innovations is largely due to bottom up approach of extension at present. It is thought that farmer to farmer learning exchanges are more effective for bringing about desired changes. Success in various situations and contexts need to be out scaled to other areas as well for benefit of all concerned. There is also need to develop capacities of all stakeholders for undertaking scientific testing, refinement and validation of Farmer Led Innovations.

Diversified Farming

Name	Shri Alok Kumar	
Father's Name	Shri Sidheshwar Sharma	
Address	Village- Ekauna, Post- Tara PS- Obra, Block- Obra Dist-Aurangabad (Bihar)	
Age	38 years	
Education	B.A.	
Size of land holding (Ha)	25 acre	
Mobile No.	9934909051	

Problem/Challenge addressed

Low productivity and income from farming.

Description of Innovative Practice/Technology

Livestock Management (Dairy farming) and adoption of Zero tillage technique used in wheat and lentil. He has adopted scientific cultivation of field crops in nearly 25 acres of land, on which approximately 4 Lakh cost is incurred and net profit of 10 lakh/annum is achieved. In cattle farming, with 12 cows after deducting the annual 3 lakhs invested on feeding & management he is able to save 6 lakh/ annum. In fish pond of 5 kattha he is able to earn profit of 50000/annum with 15000/annum as cost of cultivation. He also providing custom hiring services to fellow farmers with agricultural equipment like Tractor, Mobile rice thresher, Rotavator, Zero tillage, Power thresher, etc. Able to earn a profit of 2 lakh annually. In addition with bio gas plant the soil conditions got improved and the saving is in terms of cooking fuel. By use of zero tillage machine, low cost of production was achieved, time saved and higher yield of field crops was being obtained. For control of disease he adopted the seed treatment, foliar spray of fungicide & insecticides when attack of insects. He is also involved in seed production of paddy, wheat and lentil. He cultivates paddy and wheat in 10 ha area of land where average yield of 60q per ha of paddy and 32.0 q/ha wheat are achieved. He adopted lentil in 10 acer area and use of post emergence herbicide resulted in enhanced yields of 18.5q/ha.

Practical Utility

This technology is easy to adopt by small and marginal farmers to enhance farm incomes.

Source of Information

Krishi Vigyan Kendra, Siris, Aurangabad

Economic Details

Enterprises wise production, income, cost-benefit ratio, income gross and net income year-wise

Year	Component	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2013-14	Rice-wheat, dairy, fish	10	605000	1060000	455000	1.75
2014-15	Rice-wheat, dairy, fish	10	601000	1135000	534000	1.89
2015-16	Rice-lentil, dairy, fish	10	480000	1120000	640000	2.33
2016-17	Rice-lentil, dairy, fish	10	510000	1300800	790800	2.55
2017-18	Rice-lentil, dairy, fish	10	525000	1518000	993000	2.89

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

In nearby villages, 27 farmers adopted this technology.



Zero tillage sown Lentil



Zero tillage sown lentil under seed production



Direct seeded rice



Paddy Residue management in wheat



Seed production of lentil under seed hub programe



Use of sprinkler system in Zero tillage sown wheat



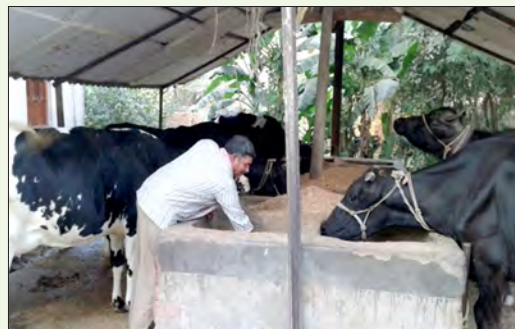
Paira cropping of lentil under ICRADA Project



Paira cropping under FLD




Dairy enterprises



Dairy enterprises

Integrated Dairy Farming and Conversion of Barren Land to Cultivable Land

Name	Mrs Bandana Kumari	
W/o	Shri Kumud Ranjan Choudhary	
Address	Village + P.O.- Merha Block- Katoria, Dist- Banka	
Age	35 years	
Education	M.A.	
Size of land holding (Ha)	40 acre	
Mobile No.	9934909051	

Problem/Challenge addressed

Low productivity of land & 50 % land was barren.

Description of innovative Practice/Technology

She has been engaged in animal husbandry and dairy enterprise now she has diversified with other crops. Plantation of Mango in 01 ha barren land with help of compost of cow dung. She converted 1.75 ha barren land into cultivable land in five years from use of compost of dairy farming. Now with the adoption of latest technologies and land reclamation through composting and other measures the cost of production has drastically decreased and the output has increased. The area under cultivation has also increased during last five years. Innovative techniques of cultivation such as Zero tillage, DSR, rainfed farming and incorporation of short duration Paddy varieties and pulse crop in her system payed remunerations. Suitable technology adoption played role in cost cutting and land reclamation.

Practical utility

Decrease of input cost and increase productivity by 4 times. Barren land which was treated as wasteland became cultivable.

Economic details of Innovative Practice/Technology

Year	Component	Area (Ha.)	Gross cost per ha (Rs.)	Gross income per ha (Rs.)	Net income per ha (Rs.)	B:C ratio
2013-14	Dairy	1	141442	134100	-7342	-0.05
2014-15	Dairy	1	128357	139500	11143	0.09

2015-16	Dairy	2	194359	247500	53141	0.27
2016-17	Dairy	3	298671	367200	68529	0.23
2017-18	Dairy	5	464380	738000	273620	0.59
2013-14	Mango Orchard	1	12000	0	-12000	-1
2014-15	Mango Orchard	1	12000	0	-12000	-1
2015-16	Mango Orchard	1	10000	18000	8000	0.8
2016-17	Mango Orchard	1	10000	27000	17000	1.7
2017-18	Mango Orchard	1	10000	49000	39000	3.9
2013-14	Paddy	8	35032	23533	-11498	-3.05
2014-15	Paddy	8	28554	30600	2046	13.96
2015-16	Paddy	9	28554	48217	19963	1.43
2016-17	Paddy	9	23054	61417	38363	0.60
2017-18	Paddy	10	21318	66750	45433	0.47

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Innovative techniques of cultivation such as ZTT, DSR, rainfed farming and incorporation of short duration Paddy varieties and pulse crop have potential for their adoption by the fellow farmers.



Barren Land



Mango orchard in Barren land




Paddy Crop



Dairy Farm

Mushroom Spawn Production and Mushroom Cultivation

Name	Mrs Binita Kumari	
W/o	Shri Vijay Kishore Vaidhya	
Address	Village + P.O.- Chutia, Block- Banka, Dist- Banka Pin- 813102	
Age	28 years	
Education	Graduation	
Size of land holding (Ha)	40 acre	
Mobile No.	9199492108	

Problem/Challenge Addressed

Being marginal farmer in nature, the problem of continuous source of income was tackled by taking up mushroom production, its marketing, spawn production after seeking proper training

Description of Innovative Practice/Technology

Smt. Binita Kumari was not having resources to start some new works other than routine work of home. Thus, she got training from KVK Banka to grow mushroom and mushroom spawn production. Since paddy was cheaper than wheat, she started following innovative works such as spawn production on paddy seed, Cultivation of mushroom on sugarcane leaves, maize and waste of paddy seed and direct marketing of mushroom. She is producing Mushroom round the year adopting different species of mushroom as well as production of mushroom spawn and providing other farmers of the nearby area. She has developed a good marketing system and numbers of people from far away come to purchase mushroom as well as spawn. She motivated other women of her village and formed a group and has established a sale counter at her village where all the group members sell their produce. All the women earn about 3 to 4 thousand Rupees per month. She is the master trainer of mushroom spawn production & mushroom cultivation within the district. Farm women of her village had no problem in marketing of mushroom, due to efforts of Binita Kumari. At present she is earning about 2.5 to 3 lakh per annum from selling of mushroom spawn & fresh mushroom. She got proper training in spawn production, and through loan she has purchased necessary equipment for spawn production.

Practical Utility

The practice requires skill and has the capacity to generate income with less investment. Can be taken up by small and marginal farmers and also landless families at commercial level. Spawn production has added opportunity to supplement the income.

Economic Details

Enterprises wise production, income, cost-benefit ratio, income gross and net income year-wise

Year	Component	Area (Ha.)/Unit	Gross cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2013	Paddy	100 bags	5320.00	8023.00	2703.00	1:1.50
2014	straw,		5110.00	8492.00	3382.00	1:1.66
2015	Spawn,		5020.00	8978.00	3958.00	1:1.78
2016	Chemicals,		4990.00	9955.00	4965.00	1:1.99
2017	fuel, etc.		4830.00	10700.00	5870.00	1:2.21

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Now, about 300 women farmers are cultivating mushroom in near by villages like Jhirwa, Chutiya, Amarpur, Shitalpur, Kheduraidih. The women are engaged with mushroom cultivation and earning livelihood.



Mushroom production by women group



Visit of Agriculture minister, Bihar to Mushroom production unit




Preparation of straw for mushroom production



Visit of RAWE Student to mushroom lab

Fishery and Fingerling Production

Name	Shri Birendra Kumar Singh	
Father's Name	Shri Ram Bilash Singh	
Address	Village- Persa, Post- Chaanpur Block- Navinagar, Dist-Aurangabad (Bihar) Pin - 824301	
Age	45 years	
Education	Graduation	
Size of land holding (Ha)	3 acre	
Mobile No.	9430442678	

Problem/Challenge Addressed

Low income in rice-wheat cropping system & poor economic condition

Description of Innovative Practice/Technology

After completing studies, he started working on fisheries and faced criticism from the local farmers, but received appreciation from family and his father motivated him with the saying that "Regular performance is Key to success". He started working from 4 kattha which gave good return during 2000 – 2012, since then, area has been increased up to 3 acre. Today his fish farm and production is the honor of Aurangabad district. Innovative interventions inducted in the system of production and management and good feeding and cultural practices helped in the enhancing production. He fully adopted new package of practices/management strategies, saved resources/inputs of land by cultivation of Arhar on the banks of the pond, broken technology barriers through experimentation and standardization of balance of oxygen, water level maintenance, prevention of outbreak of diseases and pests resulting to record production from land, water and animals which find its value in market. With time and experience he has initiated improvement in quality and size of fish products. Due to quality and variety products of my farm were advertised by customer and farmers nearby they prepared the pond.

Practical Utility

Fish rearing & cultivation in low lying areas is very easily manageable and profitable.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

In nearby district and villages about 42 farmers adopted this technology. Farmer approach him for training and advisory as per need.

Activity wise income, cost-benefit ratio, gross and net income year-wise (pervious five years)

(i) Fisheries in 3 acre of pond Rs. 6 lakhs income

Input-1 lakh 50 thousand

Profit-4.50 lakhs

37.5 thousand/month

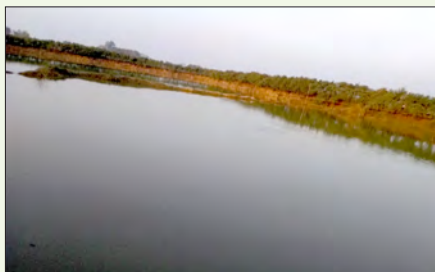
From last 5 years.

Pond embankment cultivation of arhar as cultivation.

(ii) Field crops - Cereal and pulse and mustard crop (7 acre)

iii) Horticulture crops - Self use veg. and fruit.

iv) Livestock - Self use and cow.



Arhar on Pond embankment



3 acre pond



Harvesting of fish



Spreading of Fish net

Diversification through Introduction of Strawberry

Name	Shri Brij Kishore Prasad Mehta	
Father's Name	Shri Ram Lakhan Mehta	
Address	Village- Chilkhibigha, Post- Amba, Block- Kutumba, Dist- Aurangabad (Bihar) Pin - 8241111	
Age	52 years	
Education	Intermediate	
Size of land holding (Ha)	1.2 acre	
Mobile No.	90069469752	

Problem/Challenge Addressed

Low income from wheat rice system has been supplemented by introduction of tropical fruit in subtropical region of Aurangabad

Description of Innovative Practice/Technology

During 2012 Sri Mehta visited Hissar, Haryana for personal reasons and there he observed that strawberry is being cultivated in large area. He related the climate of Aurangabad and Hissar and found almost same, and thought of trying strawberry cultivation at Aurangabad. He brought 40 plants of strawberry from Hissar, out of which only 7 plants survived. From those 7 plants/ suckers he was able to harvest 8 kg of strawberry, which motivated him to experiment with the cultivation of strawberry. During 2013, Mr Mehta cultivated strawberry in 14 katha where he succeeded. Strawberry being costly fruit, initially he was able to sell at Rs 400/kg which slowly decreased up to Rs 100/kg during the month of mid-March to 1st week of April. After initial success he increased the area and motivated fellow farmers of Chilkhi Bigha and other farmers of adjoining villages for cultivation strawberry which has increased up to 44 bighas. Fruit is being sold now even to distant market like Kolkata, Dhanbad, Raipur, Patna, Ranchi and local market of Aurangabad during peak season and lean season both.

Practical Utility

This technology is easily adoptable by small and marginal farmers and highly utilitarian.

Economic Details

Year	Component	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2013-14	Paddy, lentil, gram, vegetable	1.2	82000	193000	111000	2.35
2014-15	Paddy, vegetable, strawberry	1.2	151150	739150	633000	4.89
2015-16	Paddy, vegetable, strawberry	1.2	1047000	2044800	997800	1.95
2016-17	Paddy, strawberry	1.2	1714000	2826000	1117000	1.65
2017-18	Paddy, strawberry	1.2	3735480	5407500	1672020	1.45

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

By the year 2017- 18 the technology has been adopted in 44 bighas of own village and adjoining villages including 12 farmers and more number of farmers are willing to come forward.

Innovative Method of Paddy Seedling Preparation

Name	Shri Dan Bhushan Lakra	
Father's Name		
Address	Village- Mardanpur Post- Moktama, Block- Chatra Dist- Chatra, Pin - 825401	
Age	38 years	
Education	Intermediate	
Size of land holding (Ha)	5 acre	
Mobile No.	8986765515	

Problem/Challenge Addressed

Production of healthy seedling (10-15 days old) suitable for SRI practices.

Description of Innovative Practice/Technology

Soaked paddy seed in water overnight, put the seeds in jute bag mixed with ash ½ kg for 1 kg seed and kept it inside farm yard manure heap for about 36 hours for sprouting. The sprouted seed is then sown in well prepared nursery bed. The seedlings become healthy within 10 to 15 days and ready for transplanting under SRI technique.

Practical Utility

- ◆ Within the 10-15 days, seedlings become healthy.
- ◆ It is not complex technique so that farmers can adopt easily.
- ◆ This technique provide contingent seedling within short span of time when seedling loss occurs due to long drought spell.

Source of Information

KVK, Chatra

Economic /Profitability of innovative practice/technology(costs and return) (per intervention or area or household)

Gross Cost/ha Rs.24000/ha (Cost of cultivation of rice including seedling raising to harvesting)

Gross Income/ha Rs. 81000 (Price of grain)

Net Income/ha Rs. 57000.00

BC Ratio 3.37

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

About 300 farm families have adopted this technology.




Seedling raising for SRI
Cultivation



Seedling raising under SRI
Cultivation

Crop Diversification through Intercropping of Vegetables

Name	Shri Dilip Kumar Kushwaha	
Father's Name	Shri M.K. Kushwaha	
Address	Village- Manamdeo, Post- Reorha Block- Jale, Dist- Darbhanga Pin - 847302	
Age	34 years	
Education	B.Com	
Size of land holding (Ha)	1 acre	
Mobile No.	74639662506	

Problem/Challenge Addressed

Risk of crop failure, low profit, space utilization

Description of Innovative Practice/Technology

Hybrid vegetables production, cauliflower + pumpkin cultivation instead of cereal crop production. The adopted practices not only utilized the land but produced higher net profits from unit area. With the utilization of labour from his family members the cost of labour has been saved and ultimately the production cost reduced.

Practical Utility

Time & Space utilization

Economic /Profitability of innovative practice/technology(costs and return) (Per intervention or area or household)

Cost of cultivation = 1,10,000/ ha

Gross Return = 2,75,000/ha

Net Return = 1,65,000/ha

B:C ratio = 2.5


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

60 farmers have adopted the innovation in 20 ha



Intercropping of cauliflower + pumpkin

Japanese Quail Production -A New Avenue Explored

Name	Shri Jitendra Kumar Singh	
Father's Name	Late Shri Thaken singh	
Address	Village- Baruna, Post- Bihiya Block- Bihiya, Dist- Bhojpur Pin - 802183	
Age	39 years	
Education	MBA	
Size of land holding (Ha)	8 acre	
Mobile No.	7070708281	

Problem/Challenge Addressed

Having only 0.8 ha land in rainfed area, it was difficult to support his family. During 2016, he came in contact of KVK, SCADA, Bhojpur and proper technological support for the Quail production was shared in collaboration of Veterinary College, Patna. Finally the unit was established with his own earned money and support from friends and relatives.

Description of Innovative Practice/Technology

The marketing exposure had given an idea to Mr. Singh that poultry production may be a profitable avenue. He approached KVK for further technological help. Considering the high risk and market fluctuation, he was suggested for Quail farming. For marketing he used his previous contacts and network. For running his unit, he has established his own Quail hatchery unit having the capacity 15000/cycle (17-18 days) with monthly overall production of around 90000 eggs setting with minimum 60000 chicks /month. For the said purpose, he invested Rs. 15-16 lakhs from his earning and money lending from family friends.

Practical Utility

It has reduced the rearing cost and risk factors involved in poultry because Quail are least sensitive to disease.

Economic Details

Year	Component	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2016-17	Quell Chicks	3.5 Lakh Chick	Rs 3300000	Rs 4900000.00	1600000.00	1.49
2017-18	Quell Chicks	5 Lakh Chick	Rs 4800000	Rs 7500000.00	2700000.00	1.56

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Quell production technology had spread to more than 15 Villages having trained farmers more than 45 now in numbers who are rearing and marketing the Quell chicks. They are linked with the marketing network of Mr. Jitendra and with minimum one time investment of Rs.30000 (1000 chicks in 30 days became marketable with floor area 250 Sq. ft) they are earning Rs. one Lakh annually out of 10 cycles. During 2016-17, 24 farmers; and during 2017-18, 46 farmers adopted it.



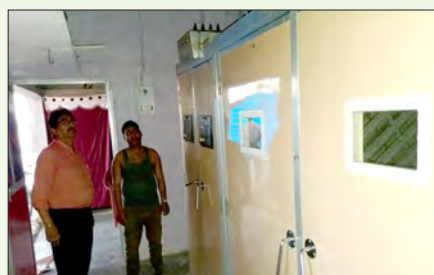
Quell chicks



Farmer showing his Chicks




Three day Old Chicks



Quell Hatchery unit

Innovative Moisture Retention Technique in Turmeric Field

Name	Mrs Saroj Lakra	
W/o		
Address	Village- Mardanpur Post- Moktama, Block- Chatra Dist- Chatra, Pin - 825401	
Age	40 years	
Education	Matric	
Size of land holding (Ha)	4 acre	
Mobile No.	9523164041	

Problem/Challenge Addressed

Moisture stress in turmeric cultivation at germination stage.

Description of Innovative Practice/Technology

Turmeric rhizome placing in furrows is a age old practices of turmeric growers. She innovated a technique in which mother rhizomes were soaked in a solution made with one kg cow dung mixed with five liter water for six hours before placing the rhizome in the furrows over vermi-compost. The modified method of sowing increase germination percentage. It also protects from root rot disease of crops, plant remains healthy and vermi compost helps in maintaining the soil moisture for longer period. Colour and quality of turmeric is improved and yield also increase up to 10 % compared to traditional method.

Practical Utility

Highly utilitarian in moisture stress conditions

Source of Information

Group discussion

Economic /Profitability of innovative practice/technology(costs and return) (Per intervention or area or household)

Gross Cost/ha - Rs. 55,000 (Cost of cultivation)

Gross Income/ha - Rs. 1,85,000

Net Income/ha - Rs. 1,30,000

BC Ratio - 2.36

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

About 460 turmeric growers adopted this technology in the district.




Moisture retention technique in turmeric



Moisture retention technique in turmeric Field

Vegetable Seedling Preparation under Protected Tunnels

Name	Shri Sunil Minj	
Father's Name		
Address	Village- Mardanpur Post- Moktama, Block- Chatra Dist- Chatra, Pin - 825401	
Age	30 years	
Education	Matric	
Size of land holding (Ha)	7 acre	
Mobile No.	8292814944	

Problem/Challenge Addressed

Raised seedling under protected tunnels and avoided losses due to unfavourable weather condition during rainy and winter season

Description of Innovative Practice/Technology

He is raising seedling of tomato, cauliflower, capsicum, chili under innovative tunnels to protect the seedling from unfavourable weather condition during rainy and winter season. The seedlings are sown in June and July in rainy season under protected environment in tunnel and tunnel are removed after the climate become normal. For making the tunnel, bamboo sticks and polythene sheets are used.

Practical Utility

It protects seedlings from rain, cold and hot waves, insect pests and diseases. It also provide favourable condition for germination and survivability of tender seedling.

Economic /Profitability of innovative practice/technology(costs and return) (Per intervention or area or household)

Gross Cost - Rs. 3000 (For one ha seedling)

Gross Income - Rs. 8000 (Price of seedling)

Net Income - Rs. 5000

BC Ratio - 2.66


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

About 1000 vegetable growers family adopted this technology in the district.



Farmer Innovative model for seedling growing in tunnel

Mushroom Production & Value Addition of Mushroom

Name	Mrs Sushma Gupta	
W/o	Shri Mritunjay Prasad	
Address	Village- Karma Masud, Post and Block, Rafiganj, Dist- Aurangabad (Bihar) Pin - 824125	
Age	33 years	
Education	Intermediate	
Size of land holding (Ha)	0.2 acre	
Mobile No.	7033572779	

Problem/Challenge Addressed

Low income, small holding size and poor socio economic condition

Description of innovative Practice/Technology

Smt Sushma Gupta, always wanted to do something new. She started cultivation of mushroom during 2013. Initially she faced problem in marketing but with the continuous support and visits from KVK Aurangabad not only helped her to increase production and facilitated marketing which ultimately increased income. Looking towards huge wastage she started making products like jam, jelly, pickles, papad, (*bari*) and mushroom flour etc. out of left over mushroom. Earlier she was having no awareness regarding these products which got good response from market. The users of these value added products reported not only nutritional benefits but medicinal value to cure pain, gastric problem, joint pain and swelling. With such diffusion of awareness and advertisement among people of the Aurangabad district her sale has increased drastically.

Practical Utility

This technology is most beneficial to landless farmers. They can enhance their income and livelihood.

Economic Details

Enterprises wise production, income , cost-benefit ratio, income gross and net income year-wise

Year	Component	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2013-14	Mushroom cultivation	0.2	5000	2000	-3000	0.40
2014-15	Mushroom cultivation and value addition in mushroom	0.2	3000	4500	1500	1.50
2015-16	Mushroom cultivation and value addition in mushroom	0.2	10000	55000	45000	5.50
2016-17	Mushroom cultivation and value addition in mushroom	0.2	12000	180000	168000	15.00
2017-18	Mushroom cultivation and value addition in mushroom	0.2	50000	350000	300000	7.00

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

In nearby villages 47 farmers have started mushroom cultivation.

औरंगाबाद आसपास 1927 नें उत्तर प्रदेश में सरकारीय संयुक्त प्रांत औरंगाबाद संघ का जन्म हुआ।

कोई गहली पालन तो कोई मुलाबा वी खेती में लिख रहा गया अख्खाय, किसानों को सज्जावित करेगा कृषि विज्ञान केंद्र

अपनी मेहनत से लिख रहे सफलता की गाथा

औरंगाबाद | संजय कुमार

अपनी मेहनत से लिख रहे सफलता की गाथा... 200% की वृद्धि... 200% की वृद्धि... 200% की वृद्धि...

खेती के नवरत्न

- औरंगाबाद जिले का पंचांग बजार को खेती के नवरत्न
- खेती के नवरत्न खेती करनी खेती को लिख आ रहा है सफल
- 200 किसान को बेहतर शिक्षा में और सफलता को आसानी



खेती से जुड़ी समस्याओं पर हुई चर्चा

औरंगाबाद | कन्नर संवाददाता

कृषि विज्ञान केंद्र, सिरिस में गुरुवार को वैज्ञानिक सलाहकार समिति को बैठक हुई। कार्यक्रम को अध्यक्षता कृषि विविधालय सचिव के सह निदेशक डा. आरएन सिंह ने की। बतौर मुख् अतिथि वरिष्ठ कृषि वैज्ञानिक डा. अभिजित हलधर थे।

कार्यक्रम का उद्देश्य किसानों को खेतों से जुड़ी समस्याओं को लेकर अनुसंधान तथा समाधान पर विचार-विमर्श करने तथा कार्य योजना तैयार करना था। कृषि विज्ञान केंद्र के समन्वयक डा. निरानन्द ने बैठक में दिये गये निर्देशों के अनुपालन हेतु उन्हें

गवें कठमों को चर्चा की। वैज्ञानिक सलाहकार समिति के अध्यक्ष व सदस्यों के द्वारा इसकी समीक्षा की गई। इसके बाद आपसी वर्क को कार्य योजना की रूपरेखा तैयार की गई।

इस अवसर पर सह-निदेशक प्रकाश शिवा, विहार कृषि विविधालय, सचिव ने पशुपालन एवं मत्स्य पालन से जुड़ी तकनीकी समस्याओं के समाधान हेतु आस-पास के कृषि विज्ञान केंद्र से वैज्ञानिक को बुलाकर प्रशिक्षण आयोजित करने की सलाह दी। डा. हलधर ने सलाहकार समिति को बैठक में अधिक-से-अधिक संख्या में महिलाओं को भीगदारी सुनिश्चित करने की सलाह दी। उन्होंने एकोकृत फसल प्रणाली को

किसानों के बीच बढ़ावा देने की बात भी कही। बैठक में उपस्थिति प्रातिश्रील किसानों ने अपने विभिन्न समस्याओं को अध्यक्ष के समक्ष रखा जिसे अगले वर्ष की कार्य योजना में शामिल किया गया। इस अवसर पर कृषि विज्ञान के कृषि वैज्ञानिक डा. विपुल कुमार मंडल, डा. राजेश सिंह, डा. सुनीता कुमारी, प्रवीण कुमार, जिला कृषि पदाधिकारी, नाबार्ड के डीडीएम, आन्ध्र के प्रोजेक्ट डायरेक्टर, जिला पशुपालन पदाधिकारी, पोस्को के मुख्य प्रबंधक, अग्रणी जिला प्रबंधक, जाविका, प्रखण्ड कृषि पदाधिकारी, इफको के क्षेत्रीय पदाधिकारी, प्रातिश्रील किसान अलोक शर्मा, उमेश मोहन, सुभमा देवी आदि थे।

Media coverage

SUSHMITA

मशरूम सजीवन वटी

पीथिक आहार (Health Tonic)

हमारे यहाँ मशरूम युक्त पीथिक आहार (Health Tonic) तैयार किया जाता है, जिसमें विभिन्न प्रकार के औषधीय गुण पाये जाते हैं।

मशरूम पूरी दुनिया में आयुषिक एवं पीथिक भोजन के रूप में एक ऐसा शाकाहारी खाद्य पदार्थ है, जिसके सेवन से कैंसर जैसी अत्यन्त विचारी को रोक करने में सहायक होता है। इसका प्रचलन आदिकाल में प्रायि-गुनी, राजा-महाराजा अपने शक्ति संबंधी के लिए उपयोग करते हैं।

मशरूम में उच्च कोटी के प्रोटीन का भंडार है, इसमें विटामिन B, C, D, एवं K प्रचुर मात्रा में पाया जाता है। मशरूम में 24 प्रकार के अमिनो अम्ल पाये जाते हैं। मशरूम में सबसे अधिक मात्रा में पोर्टेशियम, कैल्शियम, फास्फोरस, सोडियम तथा ताजमा मुख्य रूप से पाये जाते हैं। इसकी महत्ता चिकित्सा के क्षेत्र में दिनों-दिन बढ़ती जा रही है।

मशरूम सजीवन वटी के औषधीय गुण :-


1. इसके सेवन से रोगरोधी क्षमता का विकास होता है।
2. दमा, हफ्जा, एलर्जी, जुकाम, खाँसी, शीमे में दर्द एवं कजजोरी में अत्याधिक फायदेमंद है।
3. मधुमेह (Sugar) में अत्याधिक फायदेमंद।
4. सोडियम एवं पोर्टेशियम की संतुलित उपलब्धता के कारण उच्च रक्तचाप (High Blood Pressure) एवं निम्न रक्तचाप (Low Blood Pressure) में अत्याधिक उपयोगी है।
5. रेशा की उपलब्धता के कारण गैरकृटी एवं पेट संबंधी विचारी में फायदेमंद।
6. हिमोग्लोबीन की उपलब्धता के कारण महिलाओं के लिए उपयोगी।
7. ल्यूकोरिया एवं घात गिरने की विचारी में अत्यंत फायदेमंद।
8. त्वचासीर की विचारी में भी फायदेमंद।
9. पक्षाघात एवं मानसीक रोगियों के लिए उच्चतं ही उपयोगी।

मशरूम सजीवन वटी मिलने का पता :-

श्री राम नारायण प्रसाद, मृत्युंजय कुमार
 कच्चा मेला (गोह रोड), रफीगंज, औरंगाबाद
 Mob. : 9504528495, 7033572779

Brand promotional leaflet

Income Generation through Scientific Method of Vermicompost Making

Name	Shri Kumar Gautam	
Father's Name	Shri Krishna Kumar Mishra	
Address	Village- Harlatand Post and Block- Madhupur Dist- Deoghar, Pin - 815353	
Age	35 years	
Education	M.A.	
Size of land holding (Ha)	25,000 sq.ft.	
Mobile No.	9430721811	

Problem/Challenge Addressed

Livelihood and family security

Description of Innovative Practice/Technology

Sh. gautam had very small piece of land where the commercial cultivation was not profitable, thus he contacted Krishi Vigyan Kendra, Sujani, Deoghar for the training on Vermicompost. During 2015 he started a small company of vermicompost marketing through buying the cowdung and worms from nearby places and selling the Vermicompost to the nearby villages. His strong willpower, dedication, hard work and help of his near and dears brought laurel and now a days he is able to produce and market approximately 500 tonnes of vermicompost every month successfully.

Practical Utility

Promotes Organic farming, reduces dependence on chemical fertilizers. Scientific method of vermicompost making and its marketing is remunerative and employment generating also.

Economic Details

Yield of end product as of now is 500 tonnes per month, cost price comes out to be Rs. 300/- per tonnes. After deducting recurring cost of 3 lakh, a gross income of Rupees 15 lakh per annum is received. In addition, round the year employment to three person in the form of labour is ensured.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

About 10 farmers have adopted his innovative method of vermicompost making for their domestic purposes.



Vermicompost Ready for use




Making of Vermicompost



Complete Cycle covered Bed

Use of Dibbler for Cost Saving

Name	Shri Raj Pratap Bharti	
Father's Name	Shri Jaldhar Manjhi	
Address	Village + P.O- Chutia, Block- Banka Dist- Banka, Pin- 813102	
Age	45 years	
Education	Graduation	
Size of land holding (Ha)	10 acre	
Mobile No.	9470016183, 7654796846	

Problem/Challenge Addressed

Production Cost reduction and moisture conservation.

Description of Innovative Practice/Technology

He is cultivating maize by dibbler method during summer season and reduces his cost of cultivation about 50%. By seeing his field and crop condition, the other farmers of the village also introduced this technology gradually. By adopting dibbler method of sowing and other agronomical practices he was able to reduce 60% water requirement, 15 % less consumption of fertilizer, 35% less energy consumption as well as labour and 10 days advance maturity of crops. At present 155 families of the same and adjacent villages are adopting this dibbler technique and saving cultivation cost in terms of ploughing, water application, labour and energy etc.

Practical Utility

Saves resources and increase in production ultimately increased income. With proper practice and concerted efforts he has produced Maize by dibbler method continuously for four year with visible impact in productivity, profitability and sustainability also.

Economics Details of innovative Practice/Technology

Year	Component	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2014	Seed,	1	34500.00	99990.00	65490.00	1:2.89
2015	Fertilizer,	1	34000.00	101300.00	67300.00	1:2.97
2016	Manure,	1	33800.00	102600.00	68800.00	1:3.03
2017	Irrigation, Labour	1	32500.00	105200.00	72700.00	1:3.23

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

This technology is the best for all types of farmers and extended in the adjacent villages at mass level. This technology is boon for maize cultivators. About 70 acre land has been converted in dibbler practice from traditional method. Total Chutiya, Khamari, Babauridih, Sheetalpur, Kheduraidih, Jhirwa, Amarpuretc village farmers are adopting this technology.




Maize sowing by Dibbler method before 15 days of sowing



Maize experimental plot visited by BAU Sabour team & KVK Banka team

Integrated Farming

Name	Shri Rajendra Yadav	
Father's Name	Shri Gondali Mahto	
Address	Village- Chhotabandhdih, Post- Sonaraitarhi, Block- Sonaraitarhi Dist- Deoghar, Pin - 814150	
Age	40 years	
Education	B.A.	
Size of land holding (Ha)	2 Ha	
Mobile No.	9939587469	

Problem/Challenge Addressed

Mr. Rajendra Yadav, belonged to lower middle class family. After completing his graduation, he wasn't getting a job hence the issue of livelihood was embarked upon.

Description of Innovative Practice/Technology

After getting exposure from KVK , he started a small dairy of 5 cows in addition to routine farming on inherited ancestral land. Later he started a broiler poultry farm, then duckery, goatery, piggery, vermicompost unit, fishery and so on. Krishi Vigyan Kendra helped him, by giving him training and by linking with the schemes of the government and bank. Due to his strong willpower, dedication, hard work and assistance of near and dear, he has adopted the integrated farming successfully.

Practical Utility

Adoption of organic farming, animal husbandry, backyard poultry, fisheries, vermicomposting at a time reduced the risk of failure on one hand and increased the income on the other hand, as such is highly utilitarian.

Economic Details

Recurring cost 8 Lakh, Gross Income 25 Lakh per annum, Net profit 12 lakh per annum. Marketing is being done in Deoghar, Jharkhand.



Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

His field is a source of field visit and training for integrated farming. About 20 farmers have adopted his innovative method of farming.



Animal Husbandry




Azola Production



Duck cum- Fish Farming

Integrated Farming System

Name	Shri Ripu Sudan Singh	
Father's Name	Shri Nand Kishor Singh	
Address	Village- Bindi, Block- Banka Dist- Banka, Pin - 813102	
Age	46 years	
Education	Graduation	
Size of land holding (Ha)	8 acre	
Mobile No.	9431783105	

Problem/Challenge Addressed

Ripu Sudan Singh was getting less production and productivity due to continuous production of regular crops and soil health was deteriorating. Therefore, he started IFS model in his field for better and regular income from same land and lesser cost of cultivation. It was also suitable in mitigating risk of climate change and help in doubling the farmers' income.

Description of Innovative Practice/Technology

Mr. Singh has developed IFS model incorporating new techniques. At present, he has fish farming unit, high density orchard, crop cultivation unit and flower cultivation unit. He is using mulching technique in vegetable crop such as cucumber, brinjal, ladies finger etc. He is cultivating spices also. He is earning 8 lac rupees net income from different units of IFS. He is getting regular and enhanced income 5 times. The other farmers of the village also started adopting his new technologies and getting regular income. Other farmers started vegetable and spice cultivation by visiting IFS model. He is working as a role model for other villages and farmers of adjacent villages. He is also providing training to other farmers.

Practical Utility

IFS is practically profitable and reduces the risk at all levels.

Economic Details

Enterprises wise production, income, cost-benefit ratio, income gross and net income year-wise

Year	Component	Production (q/ha)	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2017	Fishery	250	3.2	905000.00	1858000.00	953000.00	1:2.05
	Vegetable	30					
	Cereals	40					
	Horticulture	5					
	Pulses	15					

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

IFS model should be adopted by the farmers of the district as it is the best source of regular income, proper utilization of resources. Technical support of KVK resulted in better performance of the model.



Moong Demonstration



Zero Tillage




Guava planted on fish pond embankment



Paddy SRI

Diversification through Vegetable and Strawberry Production

Name	Shri Ashutosh Pandey	
Father's Name	Shri Janardan Pandey	
Address	Village + Post- Naya Bhojpur Block- Dumrao, Dist- Buxar Pin - 802119	
Age	48 years	
Education	Master in Marketing Management	
Size of land holding (Ha)	5 acre	
Mobile No.	9431682188	

Problem/Challenge Addressed

Availability of good quality planting material of strawberry and their marketing

Description of Innovative Practice/Technology

Shri Ashutosh Pandey grows different vegetable in such a way that ensures year around production. He produces potato, beans, capsicum, cowpea and coriander to catch off season market. He started the cultivation of strawberry in 2016 in 0.25 ha area and got the good market price which was profitable to previous crop cultivation. In 2017 he cultivated strawberry in 0.4 ha area in own land and motivated some other neighboring farmers also to start the cultivation. He harvested 5 t/acre strawberry fruits and sold @ Rs 100 to 200/kg on the basis of market and demand. He cultivated potato and bean in broad bed; in each bed two row of potato and beans seed were planted. He obtained the potato yield of 140 q/acre and green beans yield of 50-55 q/acre. He produces coriander mostly in the month of August and September and earns about Rs. 50000 from coriander. In spring season he grows vegetable cowpea up to 2 acre and harvested 60 q/acre green pods of cowpea. He earns Rs 7 to 8 lakh per year from different vegetable and strawberry.

Practical Utility

High value vegetable crops viz. potato, beans and vegetable cowpea production are giving higher returns having more demand for hotels and local market. Strawberry cultivation is more profitable and giving opportunity to more employment generation and attraction of rural youth in smart farming.

Economic Details

Crops	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	Benefit cost ratio
Strawberry	450000	1250000	800000	1.78
Potato	86500	210000	123500	1.42
Beans	90000	246600	156600	1.74
Vegetable Cowpea	56000	150000	94000	1.67

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Acceptance level is very high and about 1000 nearby farmers doing smart farming of vegetable and 30 farmers started strawberry cultivation.



Field view of strawberry



Field view of potato



Field view of beans




Field view of vegetable cowpea



Receiving the award from Minister of Agriculture & FW Shri Radha Mohan Singh Je

Livelihood Security through Beekeeping

Name	Shri Manoj Kumar Singh	
Father's Name		
Address	Village- Rasen, Post- Rajpur, Block- Rajpur, Dist- Buxar, Pin - 802128	
Age	34 years	
Education	Intermediate	
Size of land holding (Ha)	0.75 acre	
Mobile No.	9576110626	

Problem/Challenge Addressed

Availability of flora in off season and marketing of honey.

Description of Innovative Practice/Technology

Mr. Manoj Kumar is a marginal farmer, who was unable to fulfill his family's requirement and was hand to mouth earlier. He came into contact with some beekeepers in Buxar and started beekeeping and the transformation happened after attending five days Beekeeping training for Rural youth. He began with 50 beehives and divided it into 92 bee hives in 3 months. Mr. Manoj Kumar started extraction of honey with the help of honey extractor in month of December and sold to the market @ 75-85 Rs. per kilogram. In the month of December, he earned about Rs. 3000.00 by sale of 40 kilogram of honey. In the month of January, production of crop was very high and through five times extraction of honey, he collected about 200 kg honey. At that time he earned about 17000.00 rupees by selling produce @ Rs.85 per kg to broker. At present he has 850 bee hives and six skilled labour to look after the apiary and extraction of honey. Presently he earns Rs 8 to 10 lakh per year and is satisfied with own business.

Practical Utility

Bee keeping is income generating and gives the opportunity for employment generation as well.

Economic Details

Honey bee unit	Cost of cultivation	Gross return	Net return	B:C ratio
850 unit	1025000	2125000	1100000	1.07

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Acceptance level is average and now a days more than 50 number of rural youth engaged in bee keeping.




View of honey bee in bee box



Training on honey bee

Crop Diversification with Medicinal and Aromatic Plant Cultivation

Name	Shri Kamlesh Kumar Singh	
Father's Name	Shri Awadh Bihari Singh	
Address	Village- Bharchakiya Post- Unwas, Block- Itarhi Dist- Buxar, Pin - 802123	
Age	45 years	
Education	M.Sc. (Maths.)	
Size of land holding (Ha)	2.5 acre	
Mobile No.	9525193262	

Problem/Challenge Addressed

Availability of mentha saplings and marketing of menthe oil for income enhancement.

Description of Innovative Practice/Technology

Kamlesh Singh worked in electronic and computer education during 1991 to 2000 and was earning about 3.0 Lakh rupees per annum. He suddenly met an accident in year 2000 and ultimately he decided to go back to start farming in village. He started mentha crop cultivation 3 years ago in area of 2.0 ha land and now he earn about 3.0 Lakh per annum from Mentha cultivation and inspire other farmers to adopt Mentha cultivation to earn more money. He has also installed a Mentha distillation plant (10x6x5) for oil extraction.

Practical Utility

Mentha cultivation can be popularized with proper water management and more demand of menthe oil in industries and medical companies.

Economic Details

Mentha Oil unit	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	Benefit cost ratio
01	45000	200000	155000	3.44

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Acceptance level is very high and more than 1000 farmers of the district engaged in menthe cultivation in summer.



View of medicinal plant block




Field view of menthe field



Field view of menthe field

Diversification through Dairying and Organic Farming

Name	Shri Sunil Kumar Satsangi	
Father's Name	Shri Shyam Sunder Barenwal	
Address	Village- Ghorlash, Post- Ghorlash Block- Deoghar, Dist- Deoghar Pin - 814152	
Age	38 years	
Education	B.A.	
Size of land holding (Ha)	5.6 acre	
Mobile No.	9234625292	

Problem/Challenge Addressed

Low income from dairy and agriculture and need for excellence.

Description of Innovative Practice/Technology

His father Shri Satyaprakash Barnwal, started a small dairy with 2 cows and 2 buffaloes. He started selling the milk and its byproducts to the nearby villages. But he wasn't getting the appropriate price in time. So, he had to deal with financial crisis many times. After the death of Shri Satyaprakash Barnwal, the dairy farm went through a downfall for a year in 2009. Mr. Sunil Kumar Satsangi took over the Dairy inherited from his father after his death in 2009 with the support of Dairy Development Department and technical support of Krishi Vigyan Kendra, Sujani they revamped the dairy farm and added 100 lactating hybrid cows from National Agriculture Development Schemes. With this the milk yield was 900-1000 ltrs of milk/day. Later he started a milk processing plant and branded the products as 'Satya' products (on the name of their father) which is marketed under same name. Now it is a well-known brand of Deoghar and nearby. The farm maintains approximately a total of 100 lactating cows and around 50 pregnant cows in their Modern Dairy Farm. He received Rashtriya Dugdh Utpadak Puraskar.

Practical Utility

A dairy farm of 100 Hybrid Cows is sufficiently supportive for organic farming, running biogas plant for domestic fuel consumption and other associated benefits.

Adopting scientific method of milking and processing milk into other products like Dahi, Paneer, Sweets etc to diversify the enterprise and reduce the risk as well as enhance system productivity.

Economic Details

Yield is 12-15 ltr milk/day/cow, selling @ Rs. 40/ltr milk, processing of milk into different products require a recurring cost is 45.00 lakh per annum which yields gross income is 8.5 lakh/annum and net profit is 0.70 lakh/month

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Acceptance level of the enterprise is high, few farmers in the area have started with small number of lactating animals.




Animal Shed



Milk Processing Plant

Integrated Dairy Farming

Name	Mrs Savita Devi	
W/o	Sri Ugendra Manjhi	
Address	Village - Sijhua Panchayat Kolbuzurg, Block - Amarpur, Dist- Banka Pin- 813102	
Age	45 years	
Education	NA	
Size of land holding (Ha)	1 acre	
Mobile No.	8407005062	

Problem/Challenge Addressed

Low income and livelihood options.

Description of Innovative Practice/Technology

She got inspiration of dairy farming through attending different training and workshop. In 2007, she purchased one Holstein Friesian cow and started dairy farming, but in the beginning she was not getting enough income as her cow was not conceiving annually. Again she came to KVK Banka and got advice from Scientist. Now she started scientific dairy farming for better income. She started Urea treatment of straw as well as husk and rice bran and giving mineral mixture to animals. She also started round the year fodder production such as hybrid Napier, Berseem, Cluster bean and cowpea. She is using hydroponics technique of fodder production during lean period. She is herself using silage and also training to other farmers of the village regarding benefits and process of silage preparation and use of hydroponic. For selling of milk she has contracted with Sudha Dairy. She has 15 cows and she is supplying 150 lt of milk in Sudha Dairy daily and earning money from selling of milk as well as compost. At present almost all family of the village have two cows and they are giving minimum 10 litres milk in Sudha Dairy.

Practical Utility

The enterprise has the potential to be adopted by low literates as well as supplement the livelihood requirements. The government support is also available to for loans as well as technical backstopping.

Economic Details

Year	Component	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2017	Dairy Farming	14 Cow	83485.00/ cow	124586.00/ cow	41101.00/ cow	0.49:1

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Out of 50 household 43 are rearing cross bred animal and village income through dairy farming is 17 lakhs (As per Sudha Dairy records) and through agriculture nearly 23 lakhs per annum. Hence, village income achieved double through dairy farming.



Dairy Unit



Dairy Farm



Hydroponics for fodder production



Preparing Silage

Conservation Agriculture

Name	Shri Vimlesh Kumar	
Father's Name	Shri Kumar	
Address	Village - Gopalpur, Post - Akopur, Block- Cheria Bariarpur, Dist- Begusarai, Pin - 848202	
Age	35 years	
Education	Matric	
Size of land holding (Ha)	3 Hectare	
Mobile No.	7631803692	

Problem/Challenge Addressed

Traditional method of crop cultivation and livestock rearing were economically non-viable and there was declining factor productivity.

Description of Innovative Practice/Technology

Direct Seeded Rice (DSR) by machine. Sowing of wheat, lentil and Rai by zero till drilled machine. Sowing of wheat by zero tillage technology with reduction of seed rate from 100 kg to 80 kg/ha which led to the higher production of wheat by achieving healthy plants of wheat along with curtailment of seed rate. This technology was found remunerative mainly due to reduction in cost of cultivation and higher yield. Irrigation of zero till drilled sown wheat just after 14 days of sowing gave desirable plant population per square meter along with healthy plants which ultimately gave higher yield. First time sowing of Lentil and Rai was started by zero tillage machine by which higher yield and income was achieved. Adoption of HYVs of turmeric (Rajendra Sonia), Sugarcane (CO-238), Rai (Rajendra Sufalam), Lentil (HUL-57) and hybrid Paddy & Maize. Use of Maize sowing machine. Transplanting of Paddy seedling by Paddy transplanter. Use of recommended fertilizer, organic manures and bio-fertilizer. Quality enhancement of dry fodder by urea treatment in wheat straw, Paddy straw and Maize stalk. Production of Vermi-Compost to the tune of 450 q/year. Production of green fodder like Maize, Berseem, Jumbo gold, Butter grass, Neutri-feed, Jai and Janera. Cultivation of sugarcane by bud chip method. Construction of silage unit in order to ensure the availability of green fodder round the year for the milch animals. Urea treatment to the straw for quality improvement in dry fodder, it was also found to be instrumental in reduction of cost for animal maintenance. Use of

Vermi-Compost and Bio-Fertilizer, Neem, Karanj & Mahua in field and Use of Trichoderma for seed treatment reduced production cost. Cultivation of Dhaincha and Moong for green manuring improved soil conditions and organic matter.

Practical Utility

conservation agricultural practices reduce cost of input and are capitalizing on available resources for higher net profit.

Source of information

KVK, Begusarai

Economic Details


For year 2017-18

Crop/ Technology	Production	Cost of Production (Rs.)	Gross Income (Rs.)
Wheat (zero tillage)	55.46 q	29980	88736
Sugarcane (Bud chip method)	850 q	88775	204000
Rabi Maize (Raised bed Transplanted)	95.8 q	40338	114960
Paddy (DSR)	53.69 q	28667	75166
Milk Production (Using Technologies as mentioned above) litre/day	71 litre/day	1500	2272
Vermi-Compost Production	85 q	24980	51000

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Sri Vimlesh Kumar has participated as resource person in trainings organized by KVK, Begusarai. He started zero tillage technology on his own field first time in the year 2012-13, thereafter 30 farmers have adopted same technology under his guidance in the village Gopalpur and this technology has also spread in nearby villages. Firstly, he started to use self-propelled transplanter for Paddy seedling on his own field in year 2013-14, then many farmers showed interest in aforesaid technology, consequently this technology has covered about 25 ha of land in same village. Modern livestock management, practices were promoted and make aware among the farmers like use of deworming medicine, vaccination, mineral mixture, suitable water management, maintaining hygienic condition, clean method of Milky, green fodder management, silage pit construction, urea treatment, cow dung management, and vermi-compost production. In this way, it has been observed that farmers have adopted and change the mind set in relation to abovementioned practices

Mushroom Enterprise

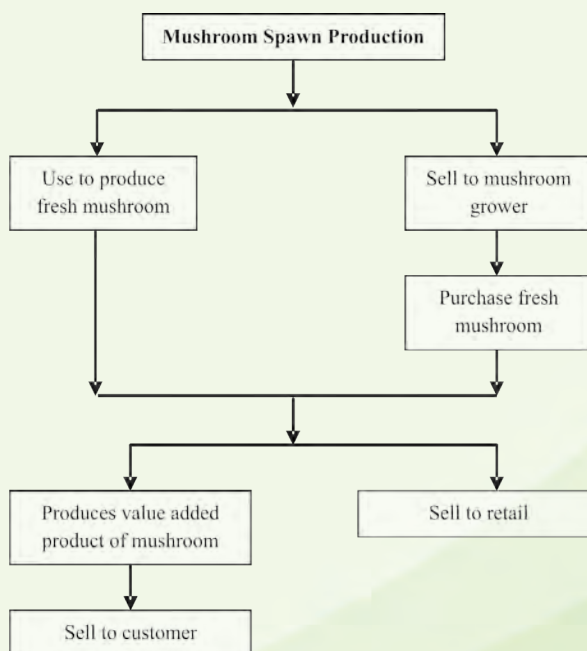
Name	Shri Preetam Kumar	
Father's Name	Shri Nageswar Paswan	
Address	Village- Fatehpur, Post - Fatehpur, Block - Sabour, Dist - Bhagalpur, Pin – 813233	
Age	30 years	
Education	Diploma in speech therapy	
Size of land holding (Ha)	Nil	
Mobile No.	8581056125	

Problem/Challenge Addressed

Non Availability of quality spawn nearby and low remuneration from marketing of fresh mushroom.

Description of Innovative Practice/Technology

Preetam belongs to a landless family but was a meritorious student during student life. His innovative thinking made him different from his peer group. Initially, he was a teacher on contract basis in Saharsa district. Unfortunately his father was paralyzed. So it was difficulty for him to manage office and take care of parents at Bhagalpur. So he resigned the job and started mushroom enterprise. This facilitates to take care of his family besides earning. He ventured into mushroom spawn production and its marketing along with buying back the fresh mushroom from others to add value in it and supply to the customers in the market. His operative model is shown in figure.



Practical utility

He engaged few unemployed youth with him to purchase raw mushroom from farmers, who have no access to market and also supply spawn to facilitate mushroom production. Besides income, innovation also facilitated him to take care of his family. He engaged unemployed youth and provided them employment at their doorstep.

Economic Details

Cost of cultivation : Rs. 8.32 lakh

Gross income : Rs. 13.5 lakh

Net Return : Rs. 5.18 lakh

1. Mushroom Spawn – Rs. 3.25 lakh
2. Button mushroom – Rs. 1.83 lakh
3. Oyster mushroom – Rs. 0.095 lakh

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Extension of mushroom farming business in the area of value addition and product making of mushroom and it's marketing.

Presently, more than 100 farmers are associated with him and about 10 farmers started their own venture at commercial level. Besides Bihar, his spawn is also supplied in Uttar Pradesh, Jharkhand and West Bengal.



Sri Preetam Kumar demonstrating the spawn production technique

Custom Hiring Centre and Farm Mechanization

Name	Shri Anant kumar	
Father's Name	Shri Dwarika Parshad Singh	
Address	Village - Kapsona, Post - Kapsona, Block - Shahkund, Dist - Bhagalpur, Pin - 813108	
Age	30 years	
Education	Matric	
Size of land holding (Ha)	2 acre	
Mobile No.	09771797376	

Problem/Challenge Addressed

Initially he was doing his farming through traditional methods, but he was not able to generate enough income and was unable to fulfil all the requirements of his family.

Description of Innovative Practice/Technology

He started to use the farm machineries like Laser Land Leveller and Zero Tillage machine for sowing of wheat. After the use of laser land leveller, his agriculture output grew up, while input went down. His irrigation requirement decreased, while his net crop area increased due to laser land leveller. He also started to use Zero tillage machines, which increased his wheat output and benefitted him immensely.

Due to the use of these methods his income grows by 50-55 % within 2-3 year. At least 500-550 farmers have got introduced modern farming methods and machines. He is now having 14-15 farm implements and operating custom hiring center by renting his machines and getting additional income.

Practical utility

Saving of resources and input.

Economic Details

Initially, he was getting an income of around Rs. 40,000 to 50,000 through conventional methods of cultivation his land. But after the use of modern mechanization methods his total income increased to Rs. 2.50 lakh to Rs. 3.00 lakh. Now, He is also earning about Rs. 1.3 lakh from custom hiring of implements.


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

It has covered Sultanganj, Shahkund and Goradih block. 1000 farmers were benefitted with his implements.



Sri Anant Kumar with his implements

Resource Conservation Technology

Name	Shri Ranjan Kumar Suman	
Father's Name	Shri Sarveshwar Mandal	
Address	Village - Barahari, Post - Badalu chak, Block - Goradih, Dist - Bhagalpur	
Age	48 years	
Education	Graduation	
Size of land holding (Ha)	8.0	
Mobile No.	9430025237	

Problem/Challenge Addressed

Sri Ranjan Kumar Suman needed to fulfil livelihood requirements of his family members as he was totally dependent on agriculture and there was no any alternative source of income. He used to cultivate only 1.0 -1.5 ha land for rice with traditional system and the remaining 6.5 – 7.0 hectares of land was leased out.

Description of Innovative Practice/Technology

Rice is directly seeded through multi crop planter machine under dry condition before monsoon and sown at 2-3 cm depth with the seed rate of 30 kg/ha after field preparation. Spray of bispyribac sodium 10% SC (100 ml/acre) at 20 days after sowing for the weed control.

Wheat is sown with zero tillage (ZT) technique after harvest of rice crop at proper residual moisture. Spray with Glyphosate 4-5 days before sowing for weed management is done. Sulfosulfuron @ 13g/acre is sprayed as post emergence at 30 days after sowing.

Before 2011, he earned Rs. 1.25 lakh / year from agriculture. Now he is able to save cost of cultivation by Rs. 10500/ha in rice and 4500 Rs./ha in wheat without reduction in yield as compared to TPR (Rice) and broadcast wheat sown method, respectively. He also uses resource conservation technology (RCT) for the reduction of cost of cultivation with least involvement of farm labour in rice based cropping system though DSR.

Also to avoid delay in sowing and reduce the cost of production, he started adopting resource conserving technologies such as zero Tillage.

Practical utility

The practice is adoptable even by the small and marginal farmers those cannot afford each and every equipment and custom hiring of the machinery has good scope of livelihood earning.

Economic Details

Given in Table 1 as below-

Table 1. Cummulative income of Sri Ranjan Kumar Suman


Crop	Area (ha)	Cost of cultivation (Rs.)	Net return (Rs.)
Rice with DSR	8.0 ha	120360	499240
Wheat with ZT	5.5 ha	82250	122400
Chickpea with ZT	0.8 ha	8400	38900
Lentil with ZT	1.0 ha	12000	50000
Mustard	0.8 ha	6900	21000
Sprayer on hire basis	300 ha	125000	275000
DSR on hire basis	30 ha	15000	46000
ZT on hire basis	36 ha	22500	67000
Total		392410	1119540

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

1. DSR area - 150 ha
2. ZT wheat area - 200 ha



Innovations in Vegetable Cultivation

Name	Shri Yadunath Gorai	
Father's Name		
Address	Village - Churda, Post - Lacssipur, Block - Patamda, Dist - East Singhbhum, Pin - 832105	
Age	40 years	
Education	I. Sc	
Size of land holding (Ha)	6.25 acre	
Mobile No.	99939158025	

Problem/Challenge Addressed

Damping off in seedlings, Non availability of quality vegetable seedlings in the market, Seedling mortality and to save water during vegetable cultivation and to maximise production

Description of Innovative Practice/Technology

During Kharif and Rabi season he used to cultivate tomato in more than 5 ha area. To solve the problem of seedling mortality he correlated growth of seedlings with growth of roots. Then he tried to grow seedlings over the brick under poly house during Kharif. He placed a mixture of soil and FYM (10:1) at two inch over the bricks and sowed the seeds of tomato. This practice resulted in 98% viability, healthy vigour with cluster of roots. But to cover his whole field he was in need of comparatively more number of seedlings and seed beds and it was not possible for him to arrange such a huge number of bricks. He replaced bricks with polythene sheets and over it he added 10: 1 ratio of soil and well decomposed FYM (750kg of FYM was treated with Trichoderma and Pseudomonas @ 250gm each for all 50 beds). He modified pump set and joined one bypass pipe line which enable pump set to run continuously. Now there is no need to fill water in foot valve to restart the pump set when it is stopped during irrigation. This technique has been adopted by 7 numbers of neighbouring farmers. He also developed hand shower irrigation methodology for cucurbitaceous (Bottle Gourd), Cole crop (Cauliflower & Cabbage) & for solanecious (Tomato) crops. He transplants cabbage, cauliflower, tomato and Bottle gourd on raised bed and up to 15 days he irrigate the crops with this method which wets soil & help the plant to start (2 times, first 25 days of transplant 2 nd at 45 days i.e. just before flowering) Hand shower irrigation methodology just wets the bed soil & make available the added fertilizer to plants which resulted in healthy

growth of plants and increased production. Increase in yield has been observed up to 20%. He also raised a low cost poly house with gutters which incurred total of Rs. 19637.00 (Rs. Nineteen thousand six hundred thirty seven only). Inside this poly house small beds (12×4.5 feet) of 50 numbers were made to raise the seedlings.

Practical utility

During Kharif due to continuous and heavy rainfall field activities like nursery and field preparation and transplanting of vegetable seedlings are affected drastically. It results in over aged seedlings, less number of seedlings etc. which causes low production of tomato. His practice is quite utilitarian to solve the problem. Modification of pumpset save their time as well cost of labour during irrigation. Hands shower irrigation method increased fertiliser use efficiency that makes vegetables crops healthier.

Economic Details

By his innovative methods he is able to save 25% cost on the inputs and 20% more yield of the vegetables which ultimately culminate in lakh of rupees.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

By using this method the farmers of Patamda used to raise seedlings of more than 50ha from last 4 years and they are getting good benefit. The technology becomes more popular in Patamda and Boram block and more than 300 farmers getting benefit with this technology.




Modified pumpset



Poly house modified with bamboo to make its cost effective

Pear Cultivation and Nursery Raising

Name	Shri Ashok Kumar Singh	
Father's Name		
Address	Village- Nagauli, Post - Basantpur, Block - Basantpur, Dist - Siwan, Pin – 813233	
Age	54 year	
Education	Graduate	
Size of land holding (Ha)	3.5 ha	
Mobile No.	7260058153, 9431475479	

Problem/Challenge Addressed

Low return from traditional farming and high income opportunity from fruit cultivation

Description of Innovative Practice/Technology

With the traditional cropping he was only able to sustain livelihood. He observed the demand and cost of fruits in nearby market and found that pear fruit was very costly in Siwan @70 per Kg, which was out of reach of poor man. Upon discussion with experts he was able to find its suitability to his area and expected good return to farmers. He tried to cultivate pear in his nursery so that it can be multiplied among local people. He purchased mother pear plants from PAU Ludhiana and started multiplying the plant in his farm for marketing amongst fellow farmers. He motivated other farmers to grow pear and sold the plant at reasonable cost to other farmers.

Practical utility

Interested farmers are getting quality pear plant at reasonable cost at their doorstep. The farmer got good profit for nursery raising.

Source of information

KVK, Siwan

Economic Details

Cost per ha	Profit per ha	Net profit
1,56,000	2,75,000	1,19,000

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Farmers accepted this new fruit very eagerly. They are very optimistic about its cultivation. 20 farmers purchased seedlings from the farmer.




Cultivation of pear



Propagation of pear

Diversification through Medicinal and Aromatic Plant Cultivation and Processing

Name	Shri Ashwani Kumar Singh	
Father's Name		
Address	Village- Purshottampur, Post - Chaurgaon, Block - Asarganj, Dist - Munger, Pin - 813201	
Age	39 years	
Education	Graduate	
Size of land holding (Ha)	1 ha	
Mobile No.	9931450073	

Problem/Challenge Addressed

Low returns from wheat and paddy crops in the whole village and poor condition of farmers motivated him to do something for upliftment of socio economic condition of himself as well as fellow farmers.

Description of Innovative Practice/Technology

He diversified the traditional crops with high valued medicinal / aromatic plants. He has started cultivating menthe, khus, lemon grass(citronella), Tulsi and other aromatic or medicinal plants. Upon contact , farmers were trained by KVK scientist with scientific method of medicinal and aromatic plant cultivation and its marketing.. Mr Singh has formed a Kisan club and motivated farmers to cultivate high valued medicinal and aromatic plants in place of paddy, wheat or maize. upon motivation few farmers joined Kisan club and started cultivating medicinal and aromatic plants with him. Initially he started primary processing and later he has also established a distillation plant to process aromatic and medicinal plant. He has also innovated and modified the distillation process of available aromatic and medicinal plants reducing the cost and more oil/product with best quality with the same input.

Practical utility

The diversification of traditional crops with high valued medicinal and aromatic plants is easily acceptable in the area looking towards the economic returns. With the diversification through medicinal and aromatic plants, farmers are able to save resources and achieve maximum returns from unit area of land in unit time.

Economic Details

The innovation has brought change in socio-economic status of farmers. They were getting Rs 75000/- annually from one ha land by cultivating wheat and paddy in previous. At present, they are achieving Rs 312500/- to Rs 375000/- from one ha land by cultivating mentha, khus or other medicinal plant or aromatic plants. Thus this innovation has scaled up economic status of farmers.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

The potential of this technology is high. Its acceptance among farmers is medium because of less knowledge level. Farmers have notions that the land may become unfertile by cultivating medicinal and aromatic plant and there is no marketing facilities, though which it is changing slowly. This technology is spreading slowly and horizontally among farmers. About 865 farmers have been practicing this technology.



Demonstration of Mentha cultivation




Mentha distillation unit



Khus field

Disease and Pest Management in Cow through Floor Management

Name	Shri Chandradeep Kumar	
Father's Name	Shri Hari Nanden Poddar	
Address	Village - Jalalgarh, Post - Jalalgarh, Dist - Purnea Bihar, Pin - 854327	
Age	31 years	
Education	B.A. (hons)	
Size of land holding (Ha)	6.0 Acres and 6 Cows	
Mobile No.	9852844496	

Problem/Challenge Addressed

The diseases and pests in domestic animals especially cow

Description of Innovative Practice/Technology

Keeping cow at Pakka floor invite many infectious diseases because the floor remained always wet and the udder of cow pressed often coming in the touch of the floor which causes mastitis in dairy animals. Foot and mouth diseases are serious problems and causes significant economic losses in dairy cattle by reducing milk yield. He used Pakka floor for feeding and milking the animals. After feeding he kept cow at the floor which is made of sand (sand 3 feet depth of soil). Due to sand, floor remains wet and soft for cow. They prefer soft surfaces for walking and lying down. This floor management was helpful to control different types of disease such as, laminitis, hoof overgrowth, sole ulcer, mastitis etc. He is also spraying ecto-parascite drug to control ticks and mites.

Practical utility

The diversification of traditional crops with high valued medicinal and aromatic plants is easily acceptable in the area looking towards the economic returns. With the diversification through medicinal and aromatic plants farmers are able to save resources and achieve maximum returns from unit area of land in unit time.

Economic Details

Having 6 acre land and 6 dairy animals and annual income is about 5-6 lakh

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

After applying the above methods in dairy shed, animals having the problem of lameness & mastitis getting reduced gradually. Thus the disease management become easy in herd and so milk production increased as well as the cost of medicine treatment got reduced.




Use of sand on floor of dairy shed



Pakka floor used only for milking

Conversion of Unfertile Land into Highly Profitable Agricultural Practice

Name	Shri Md. Faiyajuddin Khan	
Father's Name	Shri Md. Maiyaddin Klen	
Address	Village - Ward No-1, Unchari, Post - Garhwa, Dist - Garhwa, Pin - 822114	
Age	41 years	
Education	8th	
Size of land holding (Ha)	2.5	
Mobile No.	8809067878	

Problem/Challenge Addressed

No crop was being grown in the low fertile land and remained fallow from long period. No source of income.

Description of Innovative Practice/Technology

Md Faiyajuddin Khan is a physically challenged youth and was not earning anything due to his physical condition. After contact with Scientists of KVK, Garhwa the idea of cultivating drum stick plants clicked and then he planned to cultivate in his low fertility fallow land with low cost investment. Initially Md Khan started commercial organic cultivation of twice bearing drum stick in 2.8 ha low fertile upland fallow land under dry land agro ecosystem. After successful cultivation of the crop, drip irrigation was installed with the help of state agricultural department. Now vegetables are also being grown in inter-space of drum stick. This way the low fertile fallow land has been converted into highly profitable agricultural practice by the farmer and he is earning his livelihood successfully.

Practical utility

There are considerable area (>5000ha) under fallow condition in the district. This innovation may help in covering the fallow lands by this type of plantation giving monetary benefits.

Economic Details

Production (q/ha)		Gross Income (Rs/Year)		Net Income (Rs Year)		B:C ratio	
Before adoption	After adoption	Before	After	Before	After	Before	After
Nil	50	Nil	1,50,000	Nil	1,35,000	Nil	5.63


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

There is heavy demand of drum stick vegetable in local market. But production is less. So there is scope of horizontal spreading of this technology. (out-scaling)



Drum stick cultivation in low fertile fallow land by Md Faiyajuddin Khan

Agri-Horti - Aromatic Cultivation changed Socio Economic Conditions

Name	Shri Gulab Mehta	
Father's Name		
Address	Village - Bandha, Post - Parmanandpur, Block - Murliganj, Dist - Madhepura, Pin - 852114	
Age	38 years	
Education	Matric	
Size of land holding (Ha)	4.4	
Mobile No.	9934000498	

Problem/Challenge Addressed

Low income from wheat rice system of cultivation. Low literate to earn livelihood through service sector to feed the 5 member family.

Description of Innovative Practice/Technology

Gulab Mehta with 5 family members was a low middle class family dependent on conventional rice- wheat farming system. He changed wheat- rice system to agri horti and medicinal cropping system. He started growing banana, menthe, elephant foot yam and brinjal. He has also established a distillation unit for menthe. He practices submerging the condenser of Mentha distillation unit into water tank in place of regular supply of water for cooling purposes which saves huge quantity of water loss and reduction in cost of distillation. For distillation he utilizes the services of human resources on contractual basis. For fuel in distillation unit he utilized crop residues and saved money and resources. As a whole the practices adopted by him in cultivation and processing of aromatic and medicinal plants including process of oil extraction at very grass root level proved to be remunerative and sustainable.

Practical utility

Agri-Horti-Aromatic cultivation can change the livelihood of farmer and helps in doubling farmer's income in addition to resource saving. The diversification from wheat rice system has decreased the risk of crop failure also.

Economic Details

Sl. No.	Particulars	Conventional method (Rs/ha) Paddy- Wheat	Banana, Mentha, Elephant foot yam, Brinjal
1	Cost of cultivation (Rs/ha)	148750	165650+55000+212000+90500 =523150
2	Yield (q/ha)	Paddy-41, Paddy straw-41, Wheat -23, straw-23 Potato-246	Banana-450, Mentha-125 lit, Ol-250, Brinjal-302
3	Gross Return (Rs/ha)	231550	270000+125000+375000+256700 =1026700
4	BCR	1.55	1.96

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Agri-horti and medicinal and aromatic cultivation of mentha, khas etc. is now being cultivated in 100 acres of land by 60-65 local farmers.

It helped in enhancing of farmer's income, more farmers are willing to adopt as an alternate to wheat rice cropping system



Field view of elephant footyam



Distillation unit of mentha




Field view of Banana Plot



Menthe after distillation

Income Enhancement by Adoption of Low Cost Poly Tunnel

Name	Shri Manoj Kumar Singh	
Father's Name	Shri Biswanath Singh	
Address	Village - Kila Tola, Post - Jalalgarh, Dist - Purnea Bihar, Pin - 854327	
Age	46 years	
Education	HSc	
Size of land holding (Ha)	9.5 acres	
Mobile No.	9771012887	

Problem/Challenge Addressed

Low income from traditional cropping system.

Description of the actual innovation

Earlier the seasonal vegetable cultivation was not so much profitable. Got training for vegetable seedling production in low cost poly tunnel and practiced it in his farming situation. In open field conditions the profit was less so he started low cost poly tunnel for seedling production and started early vegetable production, as such fetched the premium price and got good profit. Initially being not able to bear the cost of poly houses he prepared poly house with the locally available bamboo, plastic sheet, rope etc. Later he expanded vegetable seedlings growing not only for own vegetable farming but for local marketing also.

Economic Details

Vegetable seedling production in poly tunnels proved effective and profitable in terms of early production of vegetable seedling and also in getting the 100 % germination of seeds. Chili seedlings also can be protected from leaf curl virus inside mosquito net (on the place of poly sheet). Thus he is getting optimum quality seedling production in such low cost.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Being the popular effective method of seedling production for low and marginal farmers in normal farming can be easily adopted and have very low initial

investment He wishes that the methodology to be adopted in more area for local healthy vegetable seedling raising especially for small and marginal farmers in normal farming conditions also




Early vegetable production through poly tunnel seedling



Seedling raising under low cost poly tunnel

Organic Vegetable Cultivation

Name	Shri Manohar Kumar Mandal	
Father's Name	Shri Surender Parsad	
Address	Village - Bisantha, Post - Jalalgarh, Dist - Purnea Bihar, Pin - 854327	
Age	45 years	
Education	B.A. (Hons)	
Size of land holding (Ha)	3.0 acres	
Mobile No.	8809785698	

Problem/Challenge Addressed

High cost of pesticides and low efficiency of pesticides in vegetable farming and residual toxicity of pesticides.

Description of the innovation

He observed that people are suffering from different health problems due to residual toxicity in the vegetable they consume available from the local market. He decided to practice organic vegetables farming and applied Neem oil, Neem cake and vermicompost. He has two cows, so he decided to make bio insecticide using cow urine and cow dung. He made the organic insecticide and applied in his field, now he produce quality vegetables and people pay more for his vegetables as he is popular in his area for producing vegetables with organic insecticides. He mixed cow urine, cow dung and water in equal proportion and kept mixture in earthen pot for 4 days. After that he mixed lime stone in it and added 80 % water, then applied on crops. This prevented the adult insect to lay eggs on crops as well as prevent disease and attack of pest.

Economic Details

He earns 2.0 lakh / year. Production cost is reduced by 15 % by using organic insecticides

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

He wants to produce different types of organic insecticides using different weeds and neem plant parts and supply to other farmers also. He wished the innovation

to be validated before use by other farmers. Few farmers in the vicinity has tried the practice and satisfied with the results in terms of reducing cost of cultivation and pesticide residue




Preparation of Bio-insecticides using cow urine



Preparation of Bio-insecticides using cow dung

Off Season Protected Vegetables Cultivation

Name	Shri Ali Hasmat Rehan	
Father's Name	Shri Mehetab Uddin	
Address	Village - Dhadhar, Post - Terhagachh, Block- Terhagachh, Dist - Kishanganj, Pin - 855101	
Age	48 years	
Education	Master of Education	
Size of land holding (Ha)	1.6	
Mobile No.	9472475863	

Problem/Challenge Addressed

The market price of vegetables becomes very low during peak production season resulting low returns but during off season the rates are high and availability is less in the local markets. Hence the low income from on season vegetable cultivation was addressed.

Description of innovative Practice/Technology

Mr Rehman was cultivating vegetables in hid land and always faced the problem of low market price as the rates of vegetables drastically low during peak season. His produce always suffered glut in market. With the advise from KVK and national Horticulture Mission Md. Rehan started protected cultivation of tomato and capsicum with drip irrigation system during off season. He constructed poly house in 1000 m² with the funding under NHM. He produced good quality vegetables, saved water, managed weed, managed disease and insects effectively. His product was well accepted by the local consumers.

Practical utility

To get more return per unit area the technology is very practical in nature and need to be adopted by small and marginal farmers.

Economic Details

In comparison to open field condition, the cropping intensity in poly house condition increases. He got net return of Rs. 1.8 lack/ year with B:C ratio of 9.5 under poly house condition and in open field condition Rs. 0.16 lakhs/year with B:C ratio 3.5 from 1000 m² area.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

The technology is useful for small and marginal farmers as the government is providing subsidy on protected cultivation technology. Some farmers nearby villages shown interest in adopting the technology.



Tomato nursery preparation




Hand weeding



Vermicompost and drip irrigation

Seed Production Technology of Tomato through Alteration of Seed Beds

Name	Shri Amarjeet Kumar Sinha	
Father's Name	Shri Kanta Prasad Sinha	
Address	Village - Lodhipur Chandmari, Post - Lodhipur Chandmari, Block- Danapur, Dist - Patna, Pin - 855101	
Age	54 years	
Education	Matriculation	
Size of land holding (Ha)	1.5	
Mobile No.	9934713788	

Problem/Challenge Addressed

Quality tomato seed crisis motivated Sri Amarjeet to produce seed on alternate bed of 45 cm.

Description of innovative Practice/Technology

He made alternate bed of 45 cm and 18 cm width with channel of 15 cm for Tomato Seed Production. As per his perception in this practice there is no need of staking tomato plant. Fruiting happens on 45 cm bed and irrigating through channel serves the water requirement for all the plant on both 45 cm and 18 cm bed. This Practice is carried out in irrigated condition. As it is the matter of seed production proper care is taken into account during drought condition. Use of green manure in Kharif season helps to increase water holding capacity and organic matter content, resulting in escaping drought situations.

Practical utility

Only change in the width of row leads to proper utilization of moisture and reduce the cost of staking. Production of tomato on alternate bed resulted low pest infestation, ease in weed management and performance of the crop is better.

Cost Effectiveness of the Innovation: (Average of last five years)


SL. NO.	Crop	Area	Gross Cost (Rs/acre)	Gross Return (Rs/acre)	Net Return	Farm Productivity	Remarks
1	Vegetable Pea	7.0 acre	18600/-	74400/-	55800/-	390600/-	Good credibility Among Farmers for his seed.
2	Amarnaths	0.6 acre	11500/-	75000/-	63500/-	38100/-	Good credibility Among for his seed.
3	Cow pea	2.0 acre	59100/-	123000/-	63900/-	127800/-	Good credibility Among for his seed.
4	Onion	2.0 acre	75000/-	175000/-	100000/-	200000/-	Fluctuation In market price of seed, affect net sown area under onion
5	Brinjal	0.5 acre	36000/-	80000/-	44000/-	22000/-	Less demand of OP variety
6	Tomato	0.5 acre	38000/-	80000/-	42000/-	21000/-	Less demand of OP variety
7	Mustard	1.0 acre	12000/-	42000/-	30000/-	30000/-	
8	Linseed	1.0 acre	11500/-	28000/-	16500/-	16500/-	
TOTAL						994500/-	

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

The farmers of the nearby villages follow this technique even for tomato production. Approx 30 (Thirty) farmers have adopted this innovation. Other farmers are enquiring on it. His innovation is very much popular in tomato growing area of the district. Innovation is sustainable as it is resource efficient and economic. In this method the bed is permanently formed and irrigation is made through proper channel constructed in between the bed. It reduces in frequent irrigation ultimately saving of irrigation water. This innovation can be scaled up through training and demonstration.



Formation of Marketing Hub for Tomato

Name	Shri Arjun Singh	
Father's Name		
Address	Village - Masauna, Post - Sanjhauli, Block- Sanjhauli, Dist - Rohtas, Pin - 802220	
Age	45 years	
Education	Intermediate	
Size of land holding (Ha)	02	
Mobile No.		

Problem/Challenge Addressed

Livelihood earning from small piece of land.

Description of innovative Practice/Technology

He was born in a poor family in the year 1975 and struggled a lot during his childhood. He discontinued his study mid-way after Intermediate and had to switch over to livelihood earning through vegetable marketing during 1993. He started vegetable farming on leased land of 01-acres and its marketing. Due to unorganized market he got less price for his tomato. In Rohtas district, the acreage of tomato is more than 20 thousands hectares and productivity is also high. But farmers were not getting actual price due to unorganized market. So, he formed a farmers' group named Pragatisheel Kisan Club, Masona and registered under NABARD, Rohtas and also registered a SHG. Farmers of both the groups cultivated tomato crops in the area of 60-80 ha approx. in the Masona village. The sale of tomato by the individual farmers was shifted to group marketing and the bargaining power increased as a unity in growers. Later he initiated a marketing hub and now he fixes the price of tomato. He linked his marketing through mobile network and brokers to different cities of India like New Delhi, Meerut, Bettiah, Bhagalpur, Allahabad, Gopalganj, Ranchi, Kishanganj, Varanasi, Patna, Jamshedpur etc. Apart from the Indian markets this farmers group also supply tomato to adjacent countries like Bangladesh, Nepal, Pakistan etc with online/net banking. The farmers group supply tomato 10-15 big and 5-6 small trucks per day. His average income is 7.0 lakhs/ year.

Practical utility

Due to aggregation of produce the farmers are able to negotiate with big traders and get good return. For his outstanding contributions he has been awarded by BAU,

Sabour during farmers' innovative meet held August 2018 and also recognized many times by the State Govt., Bihar Agricultural University & KVK, Rohtas on various occasions. The model can be replicated for other crops as well as in other geographical areas.

Economic Details

Due to group effort the cost of cultivation is Rs.63000/- per hectare with gross return Rs.230000/- . The net profit is Rs.1,67,000/- and B:C ratio is 3.65.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

The group formation effort spread to many area in the district and farmers started formation of FPO, Farmers club and started direct marketing eliminating middlemen. It also helps in doubling farmers' income.




Aggregation of produce



Loading for marketing

Food Processing and Value Addition of Local Tamarind

Name	Miss Rosa Marandi	
D/o	Late Charan Marandi	
Address	Village - Mayerbandh, Post - Badkyari, Block - Maheshpur, Dist - Pakur, Pin - 802220	
Age	60 years	
Education	8th pass	
Size of land holding (Ha)	Nil	
Mobile No.		

Problem/Challenge Addressed

Low Profitability from local seasonal fruits.

Description of innovative Practice/Technology

Tamarind is wildy grown in Pakur area. The socio-economic condition of farmers of Pakur district is poor. The condition of Miss Rosa Marandi, was not different from other residents of the district. Before coming in contact to KVK, Pakur she was collecting local wildy grown tamarind and selling those in local market @ Rs. 20 per kg, totalling Rs. 2800/-for 140 kg collected tamarind fruits per years. She spends 9 man days for collecting 140 kg fruits. Hence her labour charges for collection 140 kg of tamarind fruits was Rs. 2250/- (Rs. 250/- Manday). KVK, Pakur provided technological back-stopping to the farm women through training, demonstration, Krishak Ghosti for preparation and marketing of sweet chutney of Tamarind. After KVK training she started her own enterprise and started selling.

Practical utility

Value added product, sweet chutney of local Tamarind has demand in local markets and nearby schools.

Economic Details

The economics and the net profit of this intervention is as follows

Raw material	Quantity of Raw material	Cost of material	Total amount required for an year(Rs)
Tamarind fruits	1 kg	20	2800
Molasses	2 kg	70	9800
Red chilli powder	25 g	10	1400
Edible Oil	200 g	20	2800
Water	2 litre	-	-
Ginger	50 g	5	700
Salt	20 g	0.50	70
Black paper	20 g	0.50	70
Panchforan	50 g	5	700
Fuel			1000
Total			19,340

Economic Analysis

Year	Component	Gross Cost (Rs.)/Kg	Gross income (Rs.)/Kg	Net income (Rs.)/Kg	Quality of life
2017	Tamarind Chutny	1400	5000	3600	Well sustaining

Economic Impact Analysis

Sl. No.	Impact factor	Before Adoption	After Adoption
1	Farmer Practice	Collection of tamarind fruits and its sale	Processing and value addition
2	Yield of Product	NIL	140/Kg/year/farm women
3	Fixed Cost	NIL	Rs. 2800
4	Recurring Cost	Rs. 2250	Rs. 16540
5	Gross Income	Rs. 2800	Rs. 70,000
6	Net Profit	Rs. 550	Rs. 50,660
7	B:C Ratio	1:1.24	1:3.6
8	Marketing	Rs. 20 per kg	Rs.200 per kg

Through preparation and selling of sweet chutney of tamarind, she added value to the raw fruits which ultimately increase the economics as well as social status

of the local people. Miss Rosa Marandi invested initial cost of Rs. 100 per kg and selling @ Rs. 240, she earned Rs. 33600 in total. Hence she started gaining net profit Rs. 19600 with the B:C ratio of the tune of 1:2.40. The value addition technology for raw tamarind converting it in to sweet chutney has been adopted and spread to 10percent among local people.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

High level of acceptance among women farmers (60-70%). Spread in 4-5 adjoining villages. 20 farm women have adopted. Net profit increased upto 3 times.



Raw Tamarind



Processing for Preservation




Women at work



Ready to market

Quality Paddy Seed Production in Organised Manner

Name	Shri Birbal Oraon	
Father's Name		
Address	Village - Kharatia, Panchayat-Dhadhu, Post - Bhaisadon, Block- Blumath, Dist - Latehar, Pin-820202	
Age	35 years	
Education	10th	
Size of land holding (Ha)	7.0 ha	
Mobile No.	7633967167	

Problem/Challenge addressed

Sri Birbal Oraon is matriculate educated medium farmer. He started his life through labour works in ETABHATA (one who make bricks). Suddenly he thought for cultivation of crops and vegetable during off season in commercial manner. He started growing paddy and off season vegetable specially tomato in rainy season and got good price by growing these crops.

Description of Innovative Practice/Technology

Five year before he came in contact with Krishi Vigyan Kendra, Latehar and started to produce seeds. He formed farmers club named 'UjawalKisanClub' comprises of 250 farmers in 8 villages. He motivated other farmers to produce paddy seeds with new technologies such as SRI, SWI, Green Manuring, drip irrigation, vermi composting. Initially he started seed production of paddy and supply to farmers of nearby Dhadhu villages. Later he supplied 700 qts of paddy seeds to Government of Jharkhand and got Rs.19.60 lakhs in direct fund transfer to account of 250 farmers.

Economic Details

700 qts of paddy seed produced and supplied to Government of Jharkhand and got Rs.19.60 lakhs in return.

Practical utility

KrishiVigyan Kendra, Latehar

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

250 farmers benefitted by these efforts.

SRI, SWI, GreenManuring, drip irrigation, vermi composting technologies are transferred to 250 farmers.




Awarded as Progressive Farmer of Latehar district in Soil Health Day 5-12-2017 by Deputy Chairman.



Awarded as Progressive Farmers in Agro Tech Kisan Mela 2018 by VC of Birsa Agricultural University



Innovative Pig Shed Management

Name	Mrs Punam Devi	
W/o	Shri Jagganath Rao	
Address	Village - Tumba, Post - Morangi Block - Sadar, Dist- Jharkhand, Pin - 825 301	
Age	33 years	
Education	8th	
Size of land holding (Ha)	0.4	
Mobile No.	9955368376	

Problem/Challenge addressed

The challenge of high mortality in piglets during summer season is a major problem in Jharkhand. Two factors, body weight and climate conditions are closely associated with their productivity. The most comfortable range of temperature for animal is 10 to 20 Degree Celsius and humidity up to 30%. When the temperature and humidity go above this range the heat stress is experienced among animals. Heat stress has a direct bearing on the productivity of pigs in terms of reproduction efficiency, embryo/ foetus growth, lesser body weight of piglet, duration of gestation period, sometimes resulting in blindness of new born piglets and even high mortality rate. The management of heat stress is important to achieve higher productivity. Conventional heat stress management with installation of air conditioners or coolers is very expensive for poor farmers and usually it is not practiced by them.

Description of innovative Practice/Technology

Ms Punam Devi of village Tumba in Jharkhand is devised an innovative floor for the pig shed which could mitigate the problem of heat stress. She spread 2 inches thick soil on pucca floor in summer season for three months (April to June) to reduce the floor temperature and it resulted in less heat stress in pigs. The lowering of heat stress increased the body weight in new born piglets, increased the milk production, stopped premature farrowing, and the birth of blind piglets, panting in pigs and reduced mortality in piglets

Practical utility

Soil layer acts as a thermostat, maintains the ambient temperature by checking radiation of heat. Keeping pigs on pucca floor covered with 2 inches thick soil

can be practised easily by any farmer. It is cost effective when compared to air conditioning etc. The soil is usually removed after three months.

Source of information

KVK , Jharkhand

Economic Details

Year	Component	No. of piglets	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2011-12	Piglet	20	20,800.00	40,000.00	19,200.00	1.9:1
2017-18	Piglet	20	22,000.00	44,000.00	22,000.00	20:1

She has also initiated goat farming, fish rearing and vegetable cultivation as adoption of Integrated Farming System Model for higher profits recently


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Sixty eight farmers in the nearby regions have also imitated this technique to manage their pig farms effectively.



Pig farm of Punam Devi

Drudgery Reduction through Mechanization

Name	Shri Panna Lal Mahato	
Father's Name	Shri Yogender Mahato	
Address	Village - Upper Dungary Basti, Post - Jamadoba, Block - Dhanbad, Dist - Dhanbad, Pin - 828112	
Age	39 years	
Education	10th	
Size of land holding (Ha)	0.8	
Mobile No.	7261039353	

Problem/Challenge addressed

Description of Innovative Practice/Technology

Weeds are undesirable reducing profitability of farm as they compete for resources with the crop planted. Chemical weedicides are undesirable due to toxic traces left and their costs. Manual weeding is tiresome. The problem of high cost of weeding led Sh Panna Lal to design innovative weed removing machine after improvising a bicycle. Its efficiency motivated him to develop a cycle based cultivator as well. These indigenous cycle cultivator and indigenous cycle hoe contribute to timely operations by small farmers with lesser efforts and investment.

Practical utility

For small piece of land, the indigenous cycle hoe and cultivator are very effective and economical with less effort and less labour. With the help of cycle cultivator, two persons can plough land easily saving money. It frees them from the situation when hiring tractor at peak time of agricultural operations becomes difficult.

Source of information

KVK, Dhanbad

Economic Details


Name of Innovation	Cost of Innovation	Operating cost/ Ha	Gross Saving with innovation / ha	B:C Ratio
Indigenous Cycle Cultivator	5000/-	800/-	1800/-	2.25:1
Indigenous Cycle Hoe	3000/-	800/-	3100/-	3.87:1

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

This innovation is in initial stage. It has been demonstration district and state level Kisan Mela. This technology is also being utilized by the farmers of same village on hire basis from Shri Pannalal Mahto. The technology has immense scope of being outscaled and being taken up as an entrepreneurial venture by Sh Panna Lal.



Organic Farming

Name	Shri Raj Kishor Mahto	
Father's Name	Shri Shiv Shanker Mahto	
Address	Village - Nawadih Para, Block- Senha, Dist - Lohardaga,	
Age	34 years	
Education	Graduate	
Size of land holding (Ha)	5.5	
Mobile No.	9006738085	

Problem/Challenge addressed

Description of Innovative Practice/Technology

Raj Kishor Mahto was earlier growing vegetables by conventional method but after technological support of KVK Lohardaga, he started his own nursery and produced various types of vegetable under protected cultivation. He has adopted poly mulching in vegetable crops for conserving soil moisture, using fertilizer through fertigation method and utilised drip irrigation. He is preparing organic mixtures like Jeevamrit, Ghanjeevamrit and developed bio-pesticide Dush Parmmi Ark for use in vegetable production. This bio-pesticide is used by bio-fertigation or drip method. No infestation occurred in field after application of dush parmami ark which saved him Rs. 2 lakh. He established nursery for supply ready saplings of tomato, cauliflower, brinjal and ornamental flowers and also produced "Jeevamirt", "Dush Parmmi Ark", vermi-compost for selling to other farmers.

Practical utility

Increase of vegetable production without any adverse effect on land. Innovation has resulted in quality produce with increase in net income from farms.

Economic Details

SI. No	Crop	Yield (q/ha)	Cost of cultivation	Gross return (in Rs.)	Net return	B:C ratio
i	Cucumber	375	150000	375000	225000	2.50
ii	Watermelon	375	150000	562500	412500	3.75

iii	Bottle Guard	375	187500	375000	187500	2.00
iv	Tomato	750	150000	600000	450000	4.00
v	Capsicum	300	200000	600000	400000	3.00

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Almost 150 farmers of different blocks have used this solution and given feedback that it has given a 25% increase in vegetable production.



Innovation to Enhance Potato Tuber Size

Name	Shri Rajesh Sahu	
Father's Name	Shri Dhiraj Sahu	
Address	Village & P.O. - Nawadih, Post - Ghaghar, Dist - Gumla	
Age	28 years	
Education	10th	
Size of land holding (Ha)	2.0	
Mobile No.	9801550220	

Problem/Challenge addressed

Water requirement in Potato is very high as compared to other tuber crop so that cost of cultivation goes high during rabi season. Application of irrigation water is critical limiting factor for cost effective better returns.

Description of Innovative Practice/Technology

Mr. Rajesh Sahu is an enthusiastic young farmer who developed an innovative practice of enhancing potato size by reducing number of irrigation on the basis of past agriculture experience. He has 2 ha of land near his house. He used to grow crop intensively with an objective to minimize the cost and maximize income/unit. During Rabi season he used to cultivate Potato in a regular way since 2009. Major critical input involved in potato cultivation was minutely observed by him. He observed that Rs. 10000-12000/ha cost has been incurred on irrigation, which has accounts 20-25% of the total cost. Considering the irrigation cost. He felt that last two irrigation is not more effective on the yield, if the vegetative part is removed 15-20 days before maturity. This practice will not only save the no. of irrigation but also enhance the size of the tuber. The reason behind this hypothesis is whatever the water is provided during the last phase the maximum part of it, is being utilized by the vegetative part and very less water is required for the tuber. And thus he implemented his idea in the field since 2013 and got better tuber size (avg. 65-70 gm) yield. By this idea he succeeded in the cost reduction of Rs. 1500-1800/acre (20-25% of the total production cost).

Practical utility

This innovation exemplifies that input cost reduction is also very important for enhancing farm profits. Farmers' own experiences and critical observation coupled

with experimentation in field resulted in giving him higher profitability from the same land.

Source of information

KVK, Gumla

Economic Details

Crop	Area (ha)	Adoption area in the village (ha)	Net income before adoption (Rs/ha)	Net income after adoption (Rs/ha)
Potato	0.4	126 ha	69800.00	76800.00

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

His innovative idea is now being adopted by the villagers in more than 50 acre of land. And this idea succeeded in saving of about Rs. 6500-7000/ha. This innovative idea is being replicated by the villagers and they are also getting benefit. Idea can be commercialized with convergence of the horticultural department especially in potato production area in the district.




Potato crop



Nursery

Low Cost Cattle Feed for Higher Farm Returns

Name	Shri Ramashankar Paswan	
Father's Name		
Address	Village - Mahingaon, Post -Hatwar, Block - Kishanganj, Dist - Kishanganj, Pin - 855107	
Age	31 years	
Education	9th	
Size of land holding (Ha)	0.8	
Mobile No.	9631069847	

Problem/Challenge addressed

This innovation is best suited in difficult (drought / flood) situation

- The cost of milk production has been reduced.
- Milk yield increase.
- Increase in net daily income.
- Reduction in calving interval.
- Reduction in parasitic load.
- Better resistance against disease

Description of Innovative Practice/Technology

Contribution of farmers in development of refinement or value addition, new varieties, breeds of animals, package of practices, management strategies, saving of resources and inputs, Control of diseases and pests, alternation/modification/design of farm implements, etc: - Low cost cattle feed for higher return.

A low cost feed for animal was prepared from locally available material like maize (35%), mustard cake (35%) and mixture of wheat, rice, pulses by product (26%) salt (1.5%), Calcite powder (105%) and mineral mixture (1%). Along with dry and green fodder, 4 Kg above prepared concentrate and 2 kg Azolla is recommended for a cross breed cow having 10 liters milk per day. The cost of concentrated feed comes to Rs. 17 per kg.

Practical utility

Balance feeding for better health and increase in productivity. It results in increasing

milk production, net daily income of farmers, increase in reproduction efficiency , better health status of animals and decrease in parasitic load in animals

Source of information

Krishi Vigyan Kendra, Kishanganj

Economic Details

Effect of Implementation of Balance feeding and Time bond management on milk yield, oestrus and feeding cost.

SI. No.	Parameter	Before	After
1.	Milk yield(Kg/day)	8 Kg.	10 Kg.
2.	Oestrus	anoestrous	Oestrus
3.	Feeding cost per cow/day	Rs. 98	Rs. 78

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

About 10-15 nearby farmers are using this feed and due to its ease in preparation and cost effectiveness. It has the potential for large scale adoption and is sustainable as raw materials for preparing the feed are available in the local markets and it can be prepared easily by the farmers.



Azolla Unit



Low cost feed prepared by farmer




Women at work



Feeding the animals

Floriculture Enterprise

Name	Shri Ranjeet Kumar	
Father's Name	Shri Ramesh Sharma	
Address	Village - Chiroura, Post - Chiroura, Block - Naubatpur, Dist - Patna	
Age	31 years	
Education	Graduate	
Size of land holding (Ha)	1.25 acre	
Mobile No.	9973433138	

Problem/Challenge addressed

Low farm profits from rice - wheat cropping system

Description of Innovative Practice/Technology

Ranjeet Kumar took up cultivation of Gerbera and Dutch rose on raised bed under poly house equipped with dripper, fogger and exhaust system having good yield potential. Previously he was engaged in traditional crop cultivation (Rice-Wheat) which was not giving him enough returns. Thus he leased 3000 m² area under poly house equipped with dripper, fogger and exhaust facilities. Gerbera, Dutch Rose and Capsicum are being taken up regularly now with good profits. Before taking up the flower cultivation, he surveyed the market opportunities of cut flower in Patna, Muzaffarpur and other nearby towns. Before taking up poly house on rent, he worked as a worker and gathered knowledge from poly house fabricator, planting material supplier and govt officials regarding govt. initiatives for promotion of floriculture. Thus he acquired all knowledge and skills associated with the venture before taking it up himself. this entrepreneurial ability to be prepared before has benefitted him.

Practical utility

Protected cultivation with water conservation, nutrient management and cultivating high value crops gives higher returns from the farm.

Source of information

KVK, Patna

Economic Details

Sl. No.	Crop	Gross Cost (Rs./ha)	Gross return (Rs./ha)	Net Return (Rs./ha)	B:C ratio
1.	Gerbera	350000	800000	450000	2.28
2.	Dutch Rose	250000	400000	150000	1.60
3.	Capsicum	100000	220000	120000	2.20
Total		70000	1420000	720000	2.02

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Protected cultivation of high value horticultural crops has been taken up in nearby villages of Naubatpur block of Patna district. Six poly houses have been constructed after seeing the profitability of Mr. Ranjeet Kumar's Farm. This innovation has vast potential for the district under report.



Visit of Honorable Agriculture minister, Bihar along with other progressive farmer




Monitoring of crop performance at flowering stage



Good Capsicum crop at fruiting stage

Hybrid (F1) Tomato Seed Production during Rabi Season under Protected Condition

Name	Mrs Rita Davi	
W/o		
Address	Village - Durdigach, Post -Manganpur, Block - Gola, Dist - Ramgarh, Pin - 829110	
Age	27 years	
Education	Matriculation	
Size of land holding (Ha)	1 Ha	
Mobile No.	-	

Problem/Challenge addressed

Farmers are not getting good quality seeds and private companies are overcharging for the poor or questionable seeds. In this scenario, if quality seeds are produced by the farmers themselves, it will enhance their capacities and consequently income from their farms.

Description of Innovative Practice/Technology

Smt Rita Davi took up hybrid Tomato seed production under protected structures. For this she linked up with Syngenta foundation and invested Rs 1.5 lakhs for establishment of net house. She raised seedlings during Nov to Dec for 0.25 acre and transplanted seedlings at spacing 60 cm x 30 cm for male plant, 60cm X 45 cm for female plant. Hybrid tomato is produced through hand emasculatation and pollination. She was trained in the skills by breeders and obtained good seed yield.

Practical utility

The technology may benefit a large number of rural poor in terms of availability of good vegetable and flower seeds, thus fulfilling the demand of farmers for quality seeds of varieties of higher productivity and profitability. Also, the farmers who take up this enterprise are benefited in terms of their own seed production enterprise earning them higher profits.

Source of information

KVK Ramgarh

Economic Details

SI. No.	Crop/Enterprise	Type and Qty. of value added product produced	Net income (Rs.)/ per annum
1.	Hybrid tomato seed production	22 Kg seed	2,20,000.00

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Many women farmers are involving in this high return skill oriented hybrid seed production in vegetables. Buy back arrangement with seed companies like Syngenta is a win win situation for both the company as well as farm women.




Foliar Spray of fertilizer and micronutrient in Net house on tomato crop



Advisory given by KVK Ramgarh during Polination of crop

Layer Farming Entrepreneur

Name	Shri Samit Kumar Singh	
Father's Name	Shri Dharendra Narayan Singh	
Address	Village - Telwara, Post - Rupauli, Block - Singheshwar, Dist - Madhepura, Pin - 852128	
Age	47 years	
Education	M. Com	
Size of land holding (Ha)	3.6	
Mobile No.	9709317724	

Problem/Challenge addressed

Traditional farming was hardly fulfilling the requirement of family. To make farming profitable it requires adoption of new techniques and methods. Option of layer farming gives scope to farmers for enhancing their incomes.

Description of Innovative Practice/Technology

Poultry sector is possibly the fastest growing and most flexible of all livestock sectors in the country. He wanted to shift from being a job seeker like others to a progressive farmer and businessman. Doing farming in a new manner with new technological options like layer farming gives good returns. Adopting layer farming and setting up enterprise has made Samit a millionaire in short time. He is a well recognised entrepreneur and earns hugely from his farm. Layer poultry farming means raising egg laying poultry birds for the purpose of commercial egg production. Layer chickens are such a special species of hens, which need to be raised from when they are one day old. They start laying eggs commercially from 18-19 weeks of age. They remain laying eggs continuously till their 72-78 weeks of age. They can produce about one kg of eggs by consuming about 2.25 kg of food during their egg laying period.

Practical utility

Egg production from a Layer Poultry Farming depends on the care and farm management. If you take good care of your birds and manage them properly, then the production and profit will be high. Within the first 20 weeks of age, about 5% of hens start laying eggs. About 10% birds start laying at their 21 weeks of age. When they reach 26 to 30 weeks of age, they produce highly. Although, it may be

different depending on their strain. At present, there are 10000 layers placed in battery cage system. Now production of eggs started which is sold at farm by the local traders and vendors. His farm is well established and productive unit which inspires the other farmers.

Source of information

KVK Madhepura

Economic Details

Particulars	Details of Pre adoption		Details of Post adoption			Total (2017-18)
	Farm 1	Total	Farm 1	Farm 2	Total (2016-17)	
Crop/Area/ Work Details	Paddy/ Wheat	Paddy/ Wheat	Paddy/ Wheat	Egg Production (10000) Layer	Paddy, wheat & Egg Production	Rs. 8233344 Per annum
Crop/ Quantity of Produce (qt.)	Paddy – 16 q/acre Straw – 16 q/acre Wheat – 10 q/acre Straw – 10 q/acre	144 q 144 q 90 q 90 q	144 q 144 q 90 q 90 q	328500 Piece / year	Rs. 686120 Per annum	
Rate of Produce (Rs/q)	Paddy – Rs.1300/q Straw – Rs. 200/q Wheat – Rs. 1550/q Straw – Rs. 400/q	187200 28800 139500 36000	187200 28800 139500 36000	Rs. 13140000 (Rs. 4/ Piece.)		
Rate of Input (Seed, fertilizer, Pesticides, Field preparation, Sowing, Irrigation, Harvesting, Threshing and other)	Paddy – 12000 Wheat – 10000	108000 90000	108000 90000	Rs. 9829400		

Labor Cost (Rs.)	Paddy 2000 Wheat 2000	18000 18000	18000 18000	Rs. 400000		
Other cost (Rs.)	Paddy 1000 Wheat 500	9000 4500	9000 4500	Rs.200000		
Total Input Cost (Rs.)	Paddy 15000 wheat 12500	135000 112500	135000 112500	Rs. 10429400		
Net Income/ Savings (Rs.)	Paddy 9000 Wheat 7000	81000 63000	81000 63000	2710600		
Individual Annual Net Income			144000	Rs. 542120		


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Samit's success has impressed many farmers who regularly seek his advice and few of them have also initiated egg farms.



Layer Farming Unit

Pig Based Integrated Farming System

Name	Shri Samsai Oraon	
Father's Name		
Address	Village - Belagarha, Post - Belagara, Block - Ghaghra, Dist - Gumla, Pin - 835231	
Age	51 years	
Education	Intermediate	
Size of land holding (Ha)	2 Ha	
Mobile No.	9308489565	

Problem/Challenge addressed

Sh. Oraon faced the problem of economic viability, procurement of improved breeds, variety and organize marketing.

Description of Innovative Practice/Technology

Shri Somsai Oraon is an innovative farmer with a small holding. He is engaged in different farm activity like traditional pig farming, vegetables and cereals cultivation, but was not getting low income due to lack of proper skill and knowledge about IFS .

Gumla is a tribal dominated district of Jharkhand. About 70% farmers belong from scheduled tribe community. Farming situation is entirely rainfed. Rice, Maize, Ragi, Blackgram, Niger and groundnut are the major crops. In general land holding is small and their livelihood mostly depends on forest based products, Livestock rearing and Crop production. By nature they are meat lovers and hence huge demand exists for poultry, pork and meat. Hence in order to maximize farm productivity and income the technology interventions through Integrated farming system were developed in participatory mode by the KVK Gumla on farmer's field.

Considering the physical, social and economic limitation of the district, a small Integrated Farming System model was developed in the field of Somsai Oraon (Tribal farmer and retired from Indian Army) in Belagarha village of Ghaghra block during 2010-11 to 2013-14. The model comprises in two ha area in the vicinity of tribal settlement and integrated with six components. The critical input assistance was provided under NICRA. Technological intervention was made through 03

piglets (Cross breed T & D), Fifty thousand Fingerlings for fish production, high yielding paddy variety (Lalat), Maize (Suwan-1), Plantation of Sixty Mango fruit plant, Vegetable seed crop Pumpkin, One Vermicompost unit for waste recycle and renovation of well (one unit). The capacity Building programme and technological backstopping was provided to the villagers in whom the beneficiary farmer also participated. Besides all these components priority was given on pig farming intervention as per his interest and enthusiasm, and accordingly the well managed housing facilities with all the necessities was developed under NICRA in his homestead in 2011-12.

Practical utility

IFS provided him as an a opportunity to increase economic yield per unit area by the intensification of crop and allied enterprises. Due to integration of different enterprises viz. horticulture crops, fish, pig, and vermin compost provides sustainable income round the year. Maintaining income in regular way gives an opportunity inducement to the small/marginal farmers to go for the adoption IFS module in sustainable income in / ha for round the year.

Source of information

KVK, Gumla

Economic Details

Impact factor	Area (ha)	Before Adoption Net income (Rs.)	After Adoption Net income (Rs.)/annum
Piggery	0.20	0	150000
Fisheries	0.50	3000	10000
Fruit plant (Mango-60 nos) + Vegetables	0.20		18000
Vermicompost unit (2 no)			2500
Total			180500

The average net return of IFS Rs. 126000/ha/year and B:C ratio of IFS 3:34

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Year	No. of village	No. of farmer	No. of piglets taken from breeding units	No. of total piglets at farmers level
2011-12	01	02	09	35
2012-13	03	05	11	56
2013-14	04	07	18	112

2014-15	06	09	22	132
2015-16	09	13	30	146
2016-17	11	16	35	155
2017-18	10	14	47	201
Total	44	66	172	



Pig Unit developed at Belagarha



Pig unit visit by Dy PD Gumla




Pig unit visit by hon'ble Secretary (Smt. Raj Bala Verma) Govt. of Jharkhand



Somsai Oraon receiving honor by Hon'ble Union Cabinet Minister of Micro, Small and Medium Enterprises, Shri Kalraj Mishra

Dairy Farming Entrepreneur

Name	Shri Santosh Kumar	
Father's Name	Shri Baldev Yadav	
Address	Village - Sheikhwara, Post - Sheikhwara, Block - Bodhgaya, Dist - Gaya, Pin - 824234	
Age	43 years	
Education	Graduation	
Size of land holding (Ha)	4 acre	
Mobile No.	8210018734	

Problem/Challenge addressed

Milk shortage in dry South Bihar region.

Description of Innovative Practice/Technology

Sh Santosh is the harbinger of white revolution in the dry South Bihar region. He observed that in north Bihar there was at least one cow per house so they were having enough milk for their use but in south Bihar, milk was costlier as it was brought from far away. He was motivated to make south Bihar also self sufficient in milk production. He set up his dairy with a cow in 2003 now he is having 70 cows with a cow shed capacity of 150. He sells 300-350 liters of milk daily in summers and 400-450 liters in winters and is earning approximately Rs.25 Lakhs per year. For distribution he has also developed a milk vending machine and set up a marketing innovation with 25 booth points in Bodhgaya. He also trained and mentored 22 other dairy farmers and established a Farmers cooperative-Sangh. He also installed a 1000 lit. capacity cool chamber and manufacturing some of the processed product like lassi, ghee, paneer etc.

Practical utility

Mobile milk vending machine and dairy processing can be widely accepted.

Source of information

KVK, Bodh Gaya

Economic Details

Gross expenditure – Rs. 43.6 lakh

Gross return – Rs. 68.2 lakh

Profit – Rs. 24.6 lakh

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

The innovation has been spread by him among farmers in his area and activity as master trainer of the innovation.



Dairy Unit



Vermi-compost unit



Mobile Milk Vending Machine



Dairy Chilling Machine

“Single Malt Honey” A Value Added Product

Name	Shri Shashi Kumar	
Father's Name	Shri Mahesh Shanker Vidyarathi	
Address	Village - Surhari, Post - Bhadeji, Block - Manpur, Dist - Gaya, Pin - 823 003	
Age	48 years	
Education	Graduate	
Size of land holding (Ha)	1.2 Ha	
Mobile No.	9431224880, 7544999921	

Problem/Challenge addressed

Lack of availability of labour.

Description of Innovative Practice/Technology

Initially, he started his firm in bee keeping entitled “Shiva Honey” and started to his honey under brand name “Shiva Agro”. But he sold his product only @ Rs. 300/kg. Now he started selling his product under brand name “Single Malt Honey” in which he added value in honey by bottling/packaging as Litchi honey, Guava honey, Karanj honey, etc. for which he is getting Rs. 1000/kg honey.

Practical utility

Bee keeping is a viable income generating option with diverse bee products-honey was pollen etc. which give high profit.

Source of information

BAU, Sabour

Economic Details

Year	Component	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2017	Single Malt Honey	1.2 ha	2100.00	40.00 lakh	12.00 lakh	1.43: 1

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

The innovation has been spread by him among more than 250 farmers in different parts of the state who are working with him.



Single Malt Honey



Beekeeping Training



Identification of queen honey bee



Bee Boxes




Honey Processing Lab



Honey Processing Unit

Organic Rice and Pulses Production System

Name	Shri Sumant Kumar Singh	
Father's Name	Shri Hari Krishna Singh	
Address	Village - Barki Biwa Funk, Post - Kurdag, Block - Kurdag, Dist - Simdega, Pin - 835 223	
Age	43 years	
Education	M.A.	
Size of land holding (Ha)	24	
Mobile No.	9931866512	

Problem/Challenge addressed

Unavailability and high cost of chemical fertilizers.

Description of Innovative Practice/Technology

Mr. Singh uses 60 acres of land for growing plant varieties like Kasturi Bhog, Garur Bhog, Shyam Zira (Chota dana), Shyam Zira (Bada dana) and Zira fal etc. He sells out excess of their produce after their own consumption @ Rs.50-60/Kg in the market. He gets production at an average of 14-15 kg/acre. His innovation is best suited for difficult situation like drought or flood. He has used only organic fertilizers like compost in the land and thus soil colour became black and no chemical fertilizers are being used by him.

Practical utility

Cost effectiveness of the innovations/practices developed. No extra cost is involved in his innovative ideas for its implementation. The compost is being prepared by him as he has dairy farming and hence reduces the cost. He has a herd of 10 cows and easily gets raw materials for compost. This innovative practice is best suited for the agro climatic zone of his village

Source of information

KVK, Simdega

Economic Details

Crop	Yield	Area	Profit (Rs.) Per annum
Paddy	40-45 qt/ha	24 ha	4,80,000
Pulses			
Pigeon Pea	10-12 qt/ha	2 ha	2,70,000
Black gram	10 qt/ha	0.2 ha	
Gram	10-12 qt/ha	0.5 ha	
			Total: 7,50,000

He has been doing organic farming since 1965 and has enhanced his income by 50-60%.


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Mr. Singh is preserving the germplasm of plant varieties. More than twenty farm family accepted his innovation.



Organic Paddy ready for selling

Low Cost Goat Housing Floor for Temperature Maintenance

Name	Shri Sudhir Kumar	
Father's Name	Shri Krishna Prasad Singh	
Address	Village - Muther, Post - Muther, Block - Jehanabad, Dist - Jehanabad, Pin - 804 408	
Age	39 years	
Education	Graduate	
Size of land holding (Ha)	2.0	
Mobile No.	8507174401	

Problem/Challenge addressed

After graduation, he joined a private job but the income was not enough to fulfil the requirement of his family. Therefore he wanted to involve himself in some self-employment activities while residing in the native village. Meanwhile, he came in contact with the Krishi Vigyan Kendra, Jehanabad where received training in the field of Animal Husbandry. He shown his keen interest in goat farming and attended the on-going training on goat farming (Housing, feeding, disease & nutritional management). He started goat farming in his village and now, he has 135 goats.

Description of Innovative Practice/Technology

During winter season mortality of kids along with adult goats was increased due to severe low temperature. So, he did some improvement in housing as well as feeding system. He made improvement with low cost housing system for goats consisting of concrete wall and straw roofing. He adopted improved housing system with floor made of bamboo sheet covered by paddy straw bag as layout for maintenance of room temperature during winter season.

Practical utility

First, he used to spray lime powder on the floor in goat house then bamboo sheet (chacherry in local language) is spread over it. After that, paddy straw was inserted in plastic bags to keep over the bamboo sheet. He also used electric bulb fitted within the goat house for control of cold during winter season.

Secondly, he made arrangement for stall feeding with use of local feed ingredients such as lentil straw, wheat bran, mustard cake, Rice polish (chunni), turmeric and gur (jaggery). Turmeric & jaggery are specially used for maintenance of body temperature during winter/cold season that resulted less mortality of goat along with kids.

Source of information

KVK, Jhenebad

Economic Details

Year	Selling of goats / year) No.	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2015-16	50	95000	243750	148750	2.57
2016-17	125	210000	656250	446250	3.13
2017-18	135	216000	648000	432000	3.0

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

He is now working as a master trainer of goat farming in the district. Locally, goat farming started near about village within the district and around 42 rural youths/ farmers started goat farm and they are supplying kids to another district also. He is involved in supplying goat milk to the Local hospitals.



Layout of bomboo & straw bag



Layout of straw bag




Stall feeding of goat



Vaccination of PPR

Reuse of Paddy Straw to Make Wall Scenery

Name	Mrs Sunita Kumari	
W/o	Shri Raju Kumar	
Address	Village - Tehta, Post - Makhdumpur, Block - Makhdumpur, Dist- Jehanabad, Pin - 804 427	
Age	35 years	
Education	Graduate	
Size of land holding (Ha)	Nil	
Mobile No.	7004320186, 9334026122	

Problem/Challenge addressed

To augment her family income she used her already learned skill to make it as a source of livelihood by preparing scenery from local materials.

Description of innovative Practice/Technology

Decorative household pieces like wall hangings, scenery etc. is prepared by using paddy straw. This process involves four stages; broadening of paddy straw by pressing- it is done by hot ironing on cut straw for spreading, pasting the broadened whole straw to the already decided design of supporting picture, scenery is drawn with paddy straw in actual shape and size, finally, pasting straw on the drawn picture after cutting.

Practical utility

This enterprise is very beneficial for women in rural areas for income generation as the raw materials (especially paddy straw) are easily available at the village level. The cost of making the wall hangings and other decorative items is also lower; therefore, it can be taken as the popular rural craft by farm women and youth. This is an eco-friendly innovation and helps in maintaining cleanliness in the environment by proper use of agricultural residue.

Source of information

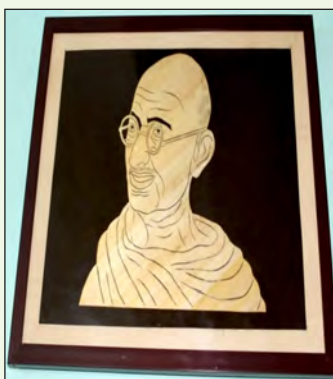
KVK, Jhenabad

Economic Details

Innovation	Size	Cost of cultivation (per unit) (Rs.)	Income (per unit) (Rs.)	Net Income (per unit) (Rs.)	B:C ratio	Remarks
Wall hanging made of paddy straw	8x10 Inch	150	300	150	2:1	Including framing, raw materials & labour charge
	12x18 Inch	600	1400	800	2.33:1	
	18x24 Inch	1200	2500	1300	2.08:1	

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Benefitting 300-450 farmers, with marketing taken of by Kshitij Agro (NGO), NABARD, other NGOs.



Prepared Products

Preparation of Besan for Dairy Animals

Name	Shri Uttam Kumar	
Father's Name	Shri Bir Nath Singh	
Address	Village - Mehta Chowk, Post - Madhubani, Block - Purnea East, Dist - Purnea	
Age	42 years	
Education	B.E. (Mechanical)	
Size of land holding (Ha)	5 acre	
Mobile No.	9128303899	

Problem/Challenge addressed

Providing quality feed to the dairy animals.

Description of Innovative Practice/Technology

He started mini feed factory for preparation of dairy animals feed. He also started making Dal Besan (supplemented with Vitamin and Minerals) for dairy animals. For the preparation of Dal Besan he was using locally available dal such as Moong, Khesari, Masoor and Urad. He also added supplements Minerals and Vitamin in Dal Besan which is helpful in animal digestive system and ultimately increases milk production and also reduces the infertility problem. The production in Dal Besan is following.

- Crude Protein % (Min.) : 25
- Metabolizable energy (K.Cal / Kg) : 2700
- Crude fiber% (Max.) : 4
- Ether Extract% (Min.) : 4

This Dal Besan is popular in dairy farmers because they know the benefits of feeding Dal Besan. He also prepared three typed of cattle feed.

S. No.	Characteristic Requirement	Grade 1	Grade 2	Grade 3
1.	Moisture (max)	11	11	11
2.	Crude protein (min)	22	2.0	16
3.	Crude fat (min)	3.5	2.5	2.5
4.	Crude fibre (max)	7	12	14
5.	Acid insoluble ash (max)	3.0	4.0	5

Practical utility

There was unavailability of balanced feed for the animals in the district and so the dairy producers were not getting the optimum production from their animals. After feeding the concentrate feed to the animals the productivity increased satisfactorily.

Source of information

Krishi Vigyan Kendra, Purnea

Economic Details

Quantity sold	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)
5140 qtl.	5306000	4820000	486000


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

He sold 5140 Q of concentrated animal feeds among about 650 dairy producers in Purnea district other farmers are also adopting in the nearby area.



Quality feed for dairy animals

Parachute Net for Neel Gai (Blue Bull)

Name	Shri Vijay Bahadur Singh	
Father's Name		
Address	Village - Sabeyan, Post - Rajpur, Block - Rajpur, Dist - Rohtas, Pin - 802219	
Age	52 years	
Education	Graduate	
Size of land holding (Ha)	05	
Mobile No.	8002119937	

Problem/Challenge addressed

Reduce damage to crops from Neelgai.

Description of Innovative Practice/Technology

Blue bulls were damaging farmers' fields frequently. He prepared a fencing net of parachute rope and covered an area of 2 ha of his farm in Sabeya village, block-Rajpur, Rohtas. This innovation of fencing net was very successful in controlling the blue bull entries in the his field. Gradually, his innovation against blue bull spread among the farmers of the district and thereafter in the country also.

Practical utility

Parachute net provides economical and durable protection from Neelgai menace.

Source of information

KVK, Rahtas

Economic Details

Year	Component	Area(Ha.)	Gross Cost (Rs.)	Saving
2013	Parachute net fencing	0.5	5464	100% loss occurs if the field is damaged by Blue bulls. Saving crop this way has helped him get returns from the crop.

				Fence making as an enterprise can earn him more. Hence scope for taking up as entrepreneurial venture is immense.
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Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

This innovative idea was recognized by many Govt. official of agriculture and highly appreciated. Gradually, his innovation against blue bull spread among the farmers of the district and thereafter in the country also. Cultivation of all high value crops are being done in net protected field.




Constructing Fence



Innovative fence for protection against neelgai

Pig Breeding

Name	Shri Vimal Hansda	
Father's Name	Shri Rooplal Hansda	
Address	Village - Gidhanipahadi, Post - Dumka, Block - Dumka, Dist - Dumka, Pin - 814101	
Age	32 years	
Education	Graduate	
Size of land holding (Ha)	2 Ha	
Mobile No.	7004574153	

Problem/Challenge addressed

Low productivity in desi piggery.

Description of Innovative Practice/Technology

Mr.Hansda maintains genetic purity of high quality breed of pig developed by BAU, Ranchi named Jharsuk. He keeps pure Jharsuk male and female pigs and avoids in-breeding so that piglets produced are of pure genetic trait. He sells the piglets at the age of 1-2 months and does not sells for the meat purpose.

Practical utility

There is demand of good breed piglets in locality and Dumka district. This also promotes piggery among farmers.

Source of information

K.V.K, Dumka

Economic Details

Rs. 1.5 lakh/annum from Jharsukh breed of pig


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Due to high demand and profitable enterprise, Pig breeding has good potential in the district. Since the district has 50% tribal population this innovation of pig breeding is spreading very fast in nearby villages of the district. At present 15-20 farmers are engaged in pig breeding.



Pig Hansda farm

Modifying Machineries to Local Needs

Name	Shri Wakil Prasad Yadav	
Father's Name	Shri Muneshwar Prasad	
Address	Village - Pandanbehera, Post - Deoghar, Block - Deoghar, Dist - Deoghar, Pin - 814142	
Age	32 years	
Education	B.A.	
Size of land holding (Ha)	18 Ha	
Mobile No.	9546787704	

Problem/Challenge addressed

Mr.Wakil Yadav, belonged to lower middle class family. After completing his graduation, he wasn't getting a job.

Description of Innovative Practice/Technology

He has modified cultivator into zero tillage machine. Prepared manually operated zero tillage machine by inserting pointed rod into wooden plank to sow ajwayan, millet in wet land area. He modified single nozzle sprayer into three emitting nozzle Tee fittings.He modified clearance between threshing drum and concave sieve of hadamba thresherto control mechanical loss of grain during threshing. He also modified sieves of thresher to grade the different size of grain. He has sown most of crops inline instead of broadcasting. He has ploughed deeply his field in summer and uses minimum tillage with zero tillage in timely sowing of different crops. He has irrigated his crops with sprinkler in place of surface irrigation. He has sprayed herbicides and fungicide with hollow cone or flat fan nozzle and insecticide or pesticides with solid cone nozzle cultivator into zero tillage machine. Manually operated zero tillage machine by inserting pointed rod into wooden plank to sow ajwayan, millet in wet land area. Modified single nozzle sprayer into three emitting nozzle T fittings. Modified clearance between threshing drum and concave sieve of hadamba thresher to control mechanical loss of grain during threshing. He also modified sieves of thresher to grade the different size of grain.

Practical utility

His farm is a good example of integrated farming which has benefitted from improvised machinery.

Source of information

Krishi Vigyan Kendra, Sujani, Deoghar

Economic Details

Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)
18.55	20 lakh	1,45,000

Recurring Cost 5 Lakh, Gross Income 20 Lakh per annum, Net profit 1.45 lakh per annum Marketing in Deoghar, Jharkhand.

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Source of field visit and training for integrated farming. He is one of the farmers to visit Israel for training tour. Extent of publicity of his innovation is available in neighboring village farms. Around 25 farmers have adopted his way of farming.



Mr. Yadav harvesting a bumper crop with use of improvised machinery

Mushroom Farming Entrepreneur

Name	Shri Santosh Nayak	
Father's Name	Shri Kamta Prasad Nayak	
Address	Village - Burdhwani Hata, Near Jail Chowk, P.S.- K. Hatt, Post - Purnea, Dist - Purnea Bihar, Pin - 854301	
Age	35 years	
Education	Graduate	
Size of land holding	2 Bigha	
Mobile No.	9334950300	

Problem/Challenge addressed

Quality Mushroom production requires appropriate practices and adequate disease management.

Description of Innovative Practice/Technology

Shree Santosh Nayak had to start a business after completing his graduation degree from Delhi University. He was interested in Agribusiness and finally he selected Button mushroom production as a agribusiness. For this he went Solan in Himachal Pradesh for proper training to start the business in 2009. He faced failures 38 times in 3 years. But he was not disheartened and has always wanted to do something new. He utilized the learnings from his failures and developed the following innovations by experimenting himself based on his observations:

1. Solution for Mites and Green mold problem
2. Growth enhancement in button mushroom
3. Shortening decomposition period of compost mixture materials;
4. Reduction in labour cost;
5. Maintaining thermo - regulation in growing room;
6. Maintenance of sterilize condition in growing room;
7. Reduction in chemical load for making casing material;
8. Reduction in period of making casing material;
9. Maintenance of self life in changing technique of harvesting;
10. For neutralizing the PH of compost he used lime @ 100 gm / 1000 Lit. of water and used waste product of sugar cane (which left after extracting sugar cane

juice) at the place of wheat straw, that reduced the mite & mold infection. And thus production increased by 5-7 % and cost reduced as wheat straw cost Rs. 5-7 / kg where as sugar cane waste cost Rs. 3-4/ kg.

11. Instead of only 2-3 times turning of compost he is practicing 4-5 times turning of compost which is helpful in maintenance of air temperature (58°C for 7-8 hours as compared to earlier for 5-6 hours) during pasteurization. Before casing during spawning those bags which completes it's spawn run faster than other bags used as spawn with seed of spawn of button mushroom production increased by 2 %.
12. In compost mixture heap previously 1.5 inch pipe were used at 4 feet distance for aeration and fast decomposition, so that there should be no smell in the compost. He used these pipes at 2 feet distance. This increased decomposition process by 5 %.
13. By using above such techniques the labour cost reduced. At the place of 90 laborers only 65 laborers required.
14. For thermo regulation in growing room ceiling of room were covered by thermo coal, which insulate walls but temperature of floor were not controlled so he also covered the floor with thermo coal. This controlled temperature as well as saved power bill by 2-3 %.
15. For making button mushroom growing room sterilized he used Potassium Paramagnet, Blue copper (Tutia) and Copper Sulphate with lime at the place of only lime application on white washing. This reduced the infection inside growing room as well as increased production by 10 %.
16. At the place of chemicals for sterilization of casing materials he used heating sterilization. It reduced the load of chemical as well as cost of production by 30 %.Production also increased by 15 %.
17. He used 3 % Zypsum in casing materials which reduced the time of sterilization of casing materials. By using this technique the period of sterilization reduced 7 days at the place of 10-11 days.
18. Earlier during the packaging of Mushroom, it was normally 3-4 times touched by hand like-keeping the mushroom in small boxes after cutting, keeping that boxes in carats and then packing them in 200gm polythene. He managed this hand touch by directly packaging mushroom in 200 gm polythene after cutting mushroom. Thus packaging is now being done with only one time hand touch. This increased the shelf life as well as marketing value of button mushroom. He is wishing to produce Shitake, Ganoderma and other world class mushroom in Bihar condition.

Practical utility

Solution of diseases and low production in button mushroom by innovation in different steps of mushroom production.

1. Mite and green mold problem in button mushroom reduced the production of Button mushroom due to low PH of compost and only one type of compost mixture having wheat straw;
2. Poor growth & low production compelled him to change different processes;
3. Being long decomposition period the production period was normally long;
4. Labour cost was too much in maintaining different steps of production;
5. Earlier it was too difficult to maintain the thermo regulation inside growing room;
6. Frequent infection in mushroom growing room;
7. There were high load of chemicals to sterilize casing materials as well as it was costly.
8. Using chemicals in making casing materials it takes 10-11 days, i.e. it would be shortened.
9. Due to methods being used in harvesting earlier the self life time of product was low.

Source of information

KVK, Purnea

Economic Details

15.0-20.0 Lakh / Year

All the innovations contributed 10 % increase in mushroom production and 10-15 % reduction in cost of production. Overall 12 % contribution of his innovation is in his annual turn over which is about Rs.1.65 lakh /-.


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Now 100 people has got employment in his business. He is also making people trained in mushroom production. His message to scientists is to validate his innovation and farmers in this business may also apply these innovations.



Mushroom agribusiness of Sh. Nayak

Edible Pearl (Popped Makhana) Harvesting from Waste Land

Name	Shri Bijay Prasad Yadav	
Father's Name		
Address	Village - Sadanandpur, Post - Jhilla Dumari, Block - Saraigarh Bhaptiyahi, Dist - Supaul, Pin - 852 131	
Age	50 years	
Education	Post Graduation	
Size of land holding (Ha)	30 acre	
Mobile No.	7352520144	

Problem/Challenge addressed

Use of water logged undulating area for farming.

Description of Innovative Practice/Technology

Sri. Bijay Prasad Yadav after his post-graduation analysed the problem and for his own livelihood, he thought to utilise the water logged area. First of all he cleaned a small portion of inundated area by removing the water hyacinth and other aquatic weed. Then brought some Makhana seed and started Makhana cultivation in water logged area. Initially he faced a lot of problem as local fish hunter use to disturb the Makhana area for fish hunting. Now he is cultivating Makhana in 60 acre of seepage water inundated area. Every year he used to clean water logged area and makes it free from aquatic weeds and then cultivates Makhana.

Practical utility

Huge quantity of water logged area is unutilized. Makhana cultivation in these water logged area can give an edge to the farmers of this region. They are equipped with traditional method of Makhana cultivation, harvesting and processing.

Source of information

KVK Supaul, Bihar

Economic Details

He is harvesting 200 quintals of 'Edible Pearl' (Popped Makhana) from 60 acres of water logged area. The gross income from Makhana cultivation is Rs 25 lakh and net profit is Rs. 15 lakh annually. The name "Edible pearl" has been given by us because of its shape, colour and place where it is grown i.e. water like the actual pearl.


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Water logged area are the farmers' own land. This area got inundated due to seepage water of Koshi river. They are basically deprived of farming due to seepage water. This particular innovation has been adopted by several farmers. Makhana cultivation employs large number of farmers in cultivation, harvesting and processing



Makhana Cultivation

Diversified Agriculture at the Farmers' Level

Name	Shri Binod Roy	
Father's Name		
Address	Village - Ravi Roy Tola, Post - Farda, Block - Jamalpur, Dist - Munger, Pin - 811 201	
Age	45 years	
Education	Matric	
Size of land holding (Ha)	7 Ha	
Mobile No.	8877349792	

Problem/Challenge addressed

His income was meagre from traditional agriculture where more labour was required besides there were drudgery also. Economic situation had forced him to enhance his income by adopting diversified agriculture.

Description of Innovative Practice/Technology

He had diversified his traditional agriculture by adopting high valued crops, mechanism of scientific water management & latest marketing facility. He started to cultivate all crops with scientific methods. He used innovative agricultural implements and machinery to perform agricultural operations timely with less cost and less drudgery. Now he has been achieving maximum returns from agriculture by cultivating high valued vegetables, spices and other crops. The diversification of traditional crops like maize, wheat with high valued crops like vegetables (green pea, onion, oal, vine vegetable, pointed gourd etc.), spices (ajwayeen, coriander, mangrella & others). He has been using innovative agricultural implements/machinery (Tractor, M.B. plough, rotavator, Zero tillage machine, multi-crop thresher, pumping set, sprinkler, mist blower cum duster, sprayer, flexible pipe and reaper) to perform efficiently agricultural operations.

Practical utility

the methods are quite appropriate for enhancing the income.

Source of information

KVK, Munger and BAU, Sabour Bhagalpur

Economic Details

CROP	Area (ha)	Cost of production (Rs/ha)	Gross Return (Rs/ha)	Net income (Rs/ha)
Wheat	4	28300	72700	44400
Greengram pulse crop	2	16200	82000	65800
Ajwain (spice)	0.5	12300	92000	907700
Onion	1	70300	180000	109700
Rabi Maize	1	35300	96000	60700
Coriander	0.5	41250	132000	90750
Provide custom hiring of agril. Machinery implements	-	621300	920230	298930
Cattle rearing	05	405000	620000	215000


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

About 30% farmer have been adopting diversified agriculture technology. About 1205 farmers have been accepting this technology to achieve maximum returns from unit area of the land. This technology has been spreading horizontally but its potential is high to double the farmers' income.



Binod in his farm and interacting with expert

Social Forestry- Integrated Farming System

Name	Shri Dhananjay Kumar Singh	
Father's Name	Shri Ranveer Partap Singh	
Address	Village - Paharpur, Post - Lohchi, Block - Haveli Kharagpur, Dist - Munger Bihar, Pin - 811 201	
Age	52 years	
Education	B.Sc.	
Size of land holding (Ha)	8	
Mobile No.	7631012966	

Problem/Challenge addressed

The land is sloppy, unfertile and having red soils at the foot hill. The cereal crops yields was low even after investing high inputs. These problems sparked them to establish long duration high returning fruit plants along with social forestry.

Description of Innovative Practice/Technology

He has diversified traditional low returns crop like cereals crops with high valued long duration fruit plants and forest plant. He has planted different latest variety of mango and forest plants like Mohagani, Sagwan & other timber plants. He has also constructed hi-tech nursery, polyhouse and shade-net house to prepare planting material of fruit & forest plants. He has established an integrated farming system model of one acre with possible other composite agricultural activities like biogas plant, vermicompost production, organic input production, storage structure, water management & farm mechanization. He is also a master trainer for farmer's training. He has been earning more returns per unit area of land in comparison to traditional agricultural patterns and methods.

Practical utility

The establishment of orchard with forestry plant is easy and low labour consuming activity. It lasts long and returns high per unit area of land. The inter space is being utilized for intercrops like pulses, oilseeds, vegetables or other crops up to five years. After 5 years established orchard gives high returns annually by investing low. Forest plants give high returns after 10 or 15 years after investing low inputs.

Source of information

KVK, Munger and RAU, Pusa

Economic Details

His innovation has changed the economical scenario of himself as well as of area. The neighboring farmers have also adopted this innovation and achieving more returns. He has achieved high B.C ratio (Gross Return/ Gross cost) 3:1 for fruit plants annually and 6:1 for forest plants(decadely or above decadely plants) . He has been achieving four lakh annually from his IFS model. He has increased fertility of soil with managing the leaves of fruit & forest plants. He is also earning Rs. 25000 per ha from orchard land with adopting intercrops like oal, turmeric and cakori(vegetable).

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

The adoption level of innovative technology is high. Most of large and medium land holder, farmers have adopted. About 1200 ha land has been covered by this technology in Haveli kharagpur block of Munger districts. About 682 farmers have adopted this innovation. About 15600 ha slopy land of hilly area of Munger district is covered by this technology.




Demonstration of Fruit plant Orchard



Demonstration of TimberPlant

Innovative Integrated Farming System

Name	Shri Krishankant Kamal	
Father's Name	Shri Ram Sevak Shahi	
Address	Village - Mandurisi, Post - Kharsawan, Block - Kharsawan, Dist - Saraikela, Pin - 832 008	
Age	48 years	
Education	Graduate	
Size of land holding (Ha)	3.0	
Mobile No.	8986762936	

Problem/Challenge addressed

The farming system was totally rainfed, monocropped and rice based not capable to cater the need of family livelihood.

Description of Innovative Practice/Technology

He standardized crop combination for better economic feasibility on his own with the help of KVK. Sanjay river water had been transported through underground pipes to the farm and storage had been provided in very innovative design covering the outer area of farm by digging out channel around the periphery of farm, so the water became available equally to all inner plots. The channel used to stock fish and the bund of each plot and channel had been used for cucurbitaceous vegetable on hanging stake. The idea of component inclusion and crop combination is very innovative and no area now has been left fallow. Observing the labour dearth, he then formalized a Kisan Club and each member participated on benefit sharing basis.

Women group were involved for better marketing of the produce. Two types of marketing channels; farm to local trader and farm to distant market have been adopted. Selling of the produce directly to local traders while standing in plot reduced the cost of harvesting and also prevents losses during harvesting.

The model is good blend of institution building and technology inclusion in local situation. Through this model he is able to generate 12 man day per day i.e., 1440 man-days per year. The model is popular in the district as well as in state. NABARD also financed some grant after the success of the model.

Practical utility

Fish, Rice cum fish, Vegetable, Floriculture, Mushrooms & Fruits, all add to the total income.

Source of information

KVK Agriculture Extension scientist involved in this model since inception and all information are based on observations and farmers narration.

Economic Details

Year	Component	Area (Ha.)	Gross Cost (Rs.)	Gross income (Rs.)	Net income (Rs.)	B:C ratio
2015	Fish	0.6	55000	120000	65000	2.1:1
	Rice cum Fish	0.6	45000	75000	30000	1.6:1
	Vegetables	1.0	70000	250000	180000	3.57:1
	Floriculture	0.4	20000	30000	10000	1.5:1
	Mushroom	On bamboo stake in fruit orchard shade	2500	7000	4500	2.8:1
	Fruits	0.4	70000	-	-	-
2016	Fish	0.6	35000	155000	120000	4.42:1
	Rice cum fish	0.6	35000	82000	47000	2.34:
	Vegetables	1.0	80000	350000	270000	3.37:1
	Floriculture	0.4	25000	55000	30000	1.2:1
	Mushroom	On bamboo stake in fruit orchard shade	5000	10000	5000	2.0:1
	Fruits	0.4	5000	40000	35000	8.0:1
2017	Fish	0.6	35000	120000	85000	3.4:1
	Rice cum fish	0.6	40000	85000	45000	2.1:1
	Vegetables	1.0	80000	342000	262000	4.2:1
	Floriculture	0.4	35000	50000	15000	1.4:1
	Mushroom	On bamboo stake in fruit orchard shade	5000	17000	12000	3.4:1
	Fruits	0.4	5000	150000	145000	3.0:1


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

The model is completely accepted in the area. The model was appreciated in the area and many farmers (8-10 ha) in the district and 2 farmers outside the district has established on PP mode.



Field view of diversified farm

Dairy Farming by Women: A Proven Tool for Poverty Eradication

Name	Mrs Almoti Devi	
W/o		
Address	Village - Kusherit, Post - Kusheri, Block - Barbigaha, Dist - Sheikhpura, Pin - 811105	
Age	55 years	
Education	Literate	
Size of land holding (Ha)	0.8	
Mobile No.	8581972458	

Problem/Challenge addressed

She had no money for feeding milk to her children. She has addressed the challenge of poverty and proper nourishment of children and family by establishing a mini dairy.

Description of Innovative Practice/Technology

She learnt about the role of dairy in poverty eradication from KVK and started with a single cow gifted by her father in 2003 and slowly grew the herd to 10 cross bred cows by 2010. She has a well-managed Dairy farm of 12 number of cows (Cross bred and Indian breed Cows) with average daily milk yield of 90 litres. The milk is sold locally @ Rs. 35/litre as well as by supplying 5 kg Peda(Sweet) in the local shop run by her husband. She is earnings is Rs. 6 lakhs per annum.

Practical utility

A mini dairy can be started by a women successfully after training and can eradicate hunger, poverty and malnutrition.

Source of information

KVK Sheikhpura , Dairy Development Office, Sheikhpura

Economic Details

Livestock/Enterprises	No. Of Cattle	Cost of Production* (Rs. Per unit)	Return (Rs. Per unit)	Net Income (Rs. Per unit)	B:C Ratio
Livestock/Dairy	12 milch Cows	35000/cow/year	Rs. 75000/ Cow per year	Rs. 40,000/ Cow/Year	2.14
Vermi Compost Production	300 Quintal	200/quintal	500/quintal	300/quintal	2.50
Value Addition by making Peda	10 Kg/day	150 Rs/Kg	220 Rs/kg	70 Rs./kg	1.47


Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Acceptance level is very good as 30 motivated poor women started rearing cow under her guidance. 25 farmers started preparing vermi-compost also. Presently she is acted as a role model for many women of the locality.



Dairy Farming

Income through Low Cost Semi Intensive Backyard Poultry Farming

Name	Shri Ranjay Paswan	
Father's Name	Shri Upendera Paswan	
Address	Village - Budhwa Parri, Post - Budhwa, Block - Alouli, Dist - Khagaria, Pin - 848 203	
Age	34 years	
Education	8th standard school drop out	
Size of land holding (Ha)	0.07 ha	
Mobile No.	8757950696	

Problem/Challenge addressed

Generally backyard poultry farming is not termed to be very useful as a source of income and is practiced for providing nutritional support to the farming families. The practice generally has poor growth rate and high mortality of chicks as well as low egg production due to extensive scavenging, absence of immunization programme and increased risk of exposure to diseases and predators. This compelled Mr Ranjay Paswan to look for some techniques of poultry farming which can be low cost, family managed and can provide substantial income.

Description of Innovative Practice/Technology

Construction of low cost poultry house using bamboo, thatching material and net. To protect Vanaraja poultry from wild birds and animals, fencing was made around open area including top using nylon net. To reduce cost of feeding and enhance nutritional support to poultry, azolla pits are made in the close vicinity of poultry farm. Apart from it green fodder is also being used for feeding poultry. Electric bulb is used as insect trapper in night to collect insect which are fed to poultry as a source of protein. Rest of the nutritional requirement of chicks is met with homemade concentrate of locally produced materials such as maize, wheat, soyabean with vitamin mineral mixture.

Practical utility

Feeding cost has been reduced reduced by more than 60% which has significant potential for enhanced profitability of small and marginal farmers.

Source of information

Krishi Vigyan Kendra, Khagaria

Economic Details

Production, consumption and sale of chicken (0.17 acre area)

Average production of chicken per annum per family	400 birds
Average consumption percentage	10.35 %
Average selling percentage	89.65 %

Production, consumption and sale of eggs

Average egg production per annum per family	20000 eggs
Average consumption percentage	27.57 %
Average selling percentage	68.91 %
Used for hatching	3.52 %

Economics of production


Cost of production (2 cycle annually)	Rs.0.64 lakh
Gross return	Rs.1.70 lakh
Net income	Rs.1.06 lakh

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

At present 50 farmers from 6 villages of Khagaria have adopted this model and they are earning profit of approx. 1.5 lakh annually by selling meat as well as egg of Vanraja poultry. About 300 farmers are in line to establish this model. Farmers from other districts like Samastipur, Begusarai are visiting these farms and are planning to establish the model. A video film on the success story was prepared and uploaded on You Tube by BAU, Sabour which has gained viewership of more than 85000 and Mr Ranjay Paswan is getting call from farmers from across the country for establishing the model in their farm.

Elephant Foot Yam based Multilayer Vegetable Cropping System (MLVCS)

Name	Shri Amrit Lal Singh
Father's Name	Shri Bhagirath Singh
Address	Village - Bhelwa, Post - Padampur, Block - Pauriahaat, Dist - Godda, Pin - 814 151
Age	38 years
Education	10th passed
Size of land holding (Ha)	03
Mobile No.	9771973728



Problem/Challenge addressed

Cultivating cucurbits like sponge gourd, ridge gourd, and bottle gourd since long back was not giving much returns. Hence new method and crops were tried.

Description of Innovative Practice/Technology

The improved variety of elephant foot yam (Gajendra) and hybrid variety of bottle gourd (Mahima), ridge gourd (local) and bitter gourd (US – 6214) was grown simultaneously in the same piece of land with leafy vegetables. So, it has been named elephant foot yam based multilayer vegetable cropping system.

A machan like structure was erected with the help of bamboo, wire and threads over 6.5 feet height from the ground level over the main crop i.e. EFY to spread the vines of bottle gourd, ridge gourd and bitter gourd.

Elephant foot yam (EFY) variety Gajendra was planted during the second fortnight of June at 75cm x 75cm spacing in the plot size of 1000m². A pit Size of 30 cm x 30 cm x 30 cm was dug out and 2 kg well decomposed cow manure was filled 3/4th of pit. 500 g cut tubers of elephant foot yam were treated with cow dung slurry (one kg of fresh cow dung in one litre of water) one day before planting on the pit and then filled the pit with the remaining soil and small mound was formed on the pit. The seeds (hybrid) of cucurbits bitter gourd, ridge gourd, and bottle gourd were sown in between two rows of main crop i.e. elephant foot yam at the recommended spacing for each crop.

All the plots were fertilized with 150 Kg N, 100 Kg P₂O₅ and 150 Kg K₂O/ hectare. Half dose of nitrogen and potash and full dose of phosphorus were applied at the

time of planting of main crop in pits and rest half of nitrogen and potash were applied after harvesting the companion crops i.e. at 95 days after planting (DAP). Recommended dose of fertilizer was also given to the companion crops i.e. bottle gourd, ridge gourd and bitter gourd as per schedule. All other cultural practices as per schedule for the cultivation of main crop as well as companion crops were followed to raise healthy crop.

Practical utility

Better utilization of inputs like land, fertilizer & irrigation etc, upliftment of livelihood and social status, more return/unit area, crop intensification.

Source of information

GVT – KVK, Godda

Economic Details

Farmers practice (Rs/ha/year)

Crop	Yield (Kg/ha)
Elephant foot yam (EFY)	36000
Ridge gourd	15860
Bitter gourd	15640
Bottle gourd	27789

Innovation (Rs/ha/year)

Crop	EFY Yield (Kg/ha)	Yield of companion crop (Kg/ha)
EFY+ Ridge gourd	35000	14000
EFY+ Bitter gourd	35800	15000
EFY+ Bottle gourd	35500	25000

Expenses incurred (Rs/ha/year)

Crop	Expenses (Rs./ha)
Elephant foot yam (EFY)	146500
Ridge gourd	54940
Bitter gourd	55480
Bottle gourd	59200

Crop	Expenses (Rs./ha)
EFY+ Ridge gourd	160000
EFY+ Bitter gourd	166400
EFY+ Bottle gourd	173400

Net returns (Rs/ha/year)

Crop	Net Return (Rs./ha)
Elephant foot yam (EFY)	339500
Ridge gourd	32990
Bitter gourd	132200
Bottle gourd	79745

Crop	Net Return (Rs./ha)
EFY+ Ridge gourd	389500
EFY+ Bitter gourd	496900
EFY+ Bottle gourd	430850

B:C ratio

Crop	B:C ratio
Elephant foot yam (EFY)	3.32 : 1
Ridge gourd	1.58 : 1
Bitter gourd	2.38 : 1
Bottle gourd	2.34 : 1

Crop	B:C ratio
EFY+ Ridge gourd	3.43 : 1
EFY+ Bitter gourd	3.99 : 1
EFY+ Bottle gourd	3.48 : 1

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Gradually increasing




Elephant foot yam + bottle gourd,
GVT-KVK, Godda



Elephant foot yam + bitter gourd,
GVT-KVK, Godda

Seed Production – Paddy (Var.: Sahbhagi)

Name	Shri Anirudh Singh	
Father's Name	Shri Sarju Singh	
Address	Village - Bhelwa, Post - Padampur, Block - Pauriahaat, Dist - Godda, Pin - 814 153	
Age	50 years	
Education	10th passed	
Size of land holding (Ha)	2.5 ha	
Mobile No.	9931390228	

Problem/Challenge addressed

Low availability of quality seeds of crops especially rice and low income from grain marketing.

Description of Innovative Practice/Technology

During the year 2015 – 16 training programme was organized on the topic, “Seed production Technology of paddy”. After that foundation seed of paddy var. Sahbhagi (drought tolerant variety, duration 110 days) was provided by the GVT – KVK, Godda for production of certified seed. He has followed all the norms of seed production. This was his first step towards grain producer to seed producer farmer. Registration was also done as seed producer in the Jharkhand State Seed Certification Agency facilitated by KVK, Godda. The yield was recorded 38 q/ha. Their seed was purchased by GVT – KVK, Godda to sell as certified seed to the other farmers of the district. During the year 2016 – 17 beej gram, Bhelwa (Seed Village Bhelwa) was constituted and about 60 farmers became member. Each farmer has grown the seed of paddy (Variety: Sahbhagi). The total area under paddy seed production was 50 ha. The Seed Village Bhelwa was registered in the Jharkhand State Seed Certification Agency (JSSCA). Raw seeds were processed at Seed Processing machine of KVK, Godda. Processed seed were sent to Seed Testing laboratory, Ranchi for testing of seeds as per seed norms. The total production was about 1700 q. After keeping for own purpose, sold by themselves they have made available about 70q to the Govt. of Jharkhand through DAO for procurement @ Rs. 1600/q as raw seed.

Practical utility

Self-sustainable in paddy seed, quality of seed and more income.

Source of information

GVT – KVK, Godda/BAU Ranchi

Economic Details

	Farmers practice (Rs/ha/year)	Seed Production Innovation (Rs/ha/year)
Crop yields (kg/ha) or productivity of the systems as applicable	3350 Kg/ha	3800 Kg/ha
Expenses incurred (Rs/ha/year)	30300	33500
Net returns (Rs/ha/year)	9900	27300
B:C ratio	1.33:1	1.81:1

Potential : Acceptance level, horizontal spread of innovation and number of farmers adopting

Beside the village Bhelwa nearby villages like Draupad, Dande, etc. have come forward in seed production. During the year 2017 – 18 again 50 ha area of Bhelwa is registered under seed production of paddy var. Sahbhagi in JSSCA.



Paddy Var Sahbhagi, GVT-KVK, Godda-1



Mechanized Harvesting, GVT-KVK, Godda



Paddy Var Sahbhagi, GVT-KVK, Godda



Processing and Seed Sampling, GVT-KVK, Godda

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