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Grassroots innovations in agriculture: Case studies of innovative farmers from Telangana

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Abstract

Farmers have innate abilities to innovate. The innovativeness of these farmers needs to be documented and analysed in order to learn lessons from the farmers experience, their best practices, ability to plan and manage the farm as an enterprise. Documentation of farmers innovations will provide a platform for selection and make way for identifying its usefulness and practicability scientists in terms of importance in farming. Hence, farmers innovations were documented through primary data and also by reviewing secondary sources. Farmers innovations were analysed using case study methodology. Innovative farmers possessed key traits such as inquisitiveness, technology orientation, achievement motivation, social networking ability, creativity and research orientation.

Keywords: Innovative farmers, innovativeness, case study

Introduction

In response to the evolving agricultural landscape, farmers have progressed beyond simply adopting innovations developed by external stakeholders. They are now actively engaged in creating their own innovations or adapting existing ones to better suit their specific socio-economic conditions within the broader innovation ecosystem. This shift highlights their proactive approach for addressing local challenges and enhancing agricultural sustainability. Farmers' innovations have yet to receive proper recognition. Due to limited horizontal and vertical expansion, these innovations have not reached other farmers. Recognizing the innovative potential at the grassroots level, the National Innovation Foundation (NIF) of India has been instrumental in identifying and documenting indigenous innovations. Since its establishment, NIF has compiled a database of over 325,000 technological ideas, innovations, and traditional knowledge practices from more than 625 districts across the country (nif.org.in). A significant portion of these documented innovations originates from the agricultural sector, reflecting the ingenuity of farmers in developing solutions tailored to their unique challenges. The identification of farmers' innovations is not primarily intended for dissemination through the traditional transfer-of-technology approach. Instead, innovations developed locally by farmers are tailored to address specific conditions and needs of their particular contexts, making them highly relevant and practical for local challenges.

The documentation and analysis of innovations are crucial as they preserve valuable knowledge, facilitate learning, and promote the sharing of successful practices. By systematically recording innovations, their processes, outcomes, and challenges, it becomes easier to understand what works, why it works, and how it can be improved or replicated. Analysis of these documented innovations helps identify key factors contributing to success or failure, providing practical insights for future applications. Hence, case studies on farmers innovation are essential to share them, foster understanding and strengthen partnerships among various stakeholders. For farmers, especially documenting and analyzing innovations ensures that local solutions to agricultural challenges are recognized, refined and made accessible to a wider community, enhancing productivity and sustainability across the sector. Keeping these points in view, the present study was formulated.

Objective

To document and analyse the case studies of farmer's innovations

Materials and Methods

Naturalistic design was used for case study documentation. This design was used to document, explore and develop a comprehensive understanding of the complex innovativeness of farmers in their real-life context. Unlike an experimental design with controlled variables, this

approach can help to capture the richness and complexity of on-ground realities.

Among the three case study approaches outlined by Stake (1995) [2] i.e., intrinsic, instrumental, and collective, collective case study approach was employed, examining multiple cases simultaneously (Sharma and Sharma, 2021) [1]. This enables to gain a broader understanding of the impact of farmers innovations and appreciate the diverse ways in which farmers innovate within their environments.

The data was collected by personal interview and observation to gather qualitative and contextual information from each case.

Results and Discussion

In the first section of each case of selected innovative farmers, comprehensive case analysis was presented. In the second section innovativeness traits that foster an innovation-sustaining climate were presented, drawing insights and patterns from the analyzed cases.

Case 1: Revolutionizing Irrigation: The Story of an Innovative Farmer on Designing Subsurface Irrigation Technology

Mr. M. Kirshna Reddy, a 54 years old innovative farmer hailing from Madaram village owns 11 acres of land. After pursuing ITI, he discontinued his higher studies and was not interested, to take up regular job that pays him less after ITI. He wanted to prove himself by farming in innovative way. Over the years, he followed crop diversification and used new technologies. He used to cultivate Paddy, Groundnut, Cotton and Maize till 2020. But during the years 2020 and 2021, he aspired to increase his farm income by diversifying from regular crops to horticulture crops i.e. Papaya and Sweet orange.

Initially, he practiced drip irrigation in his field. But he faced several problems with the drip irrigation i.e., rodent damage, extensive labour requirement, labour and maintenance cost. Several animals like rats, squirrels, mice, dogs and rabbits etc. caused damage to the drip lines. Hence, constant observation was required for the drip irrigation system. Exposure to sunlight affected the tubes used in the drip irrigation which shortened their life. The field operations were hampered due to laying down of drip lines on the surface of the land. These drip lines were repeatedly removed and laid down across the field after intercultural operations, which costs around ₹ 8000 each time. Maintenance cost of around ₹ 4000 is incurred every year as the pipes, emitters and valves were damaged due to repeated removal and installation. Labour requirement during the installation and removal of drip pipes, valves etc. was high.

In order to overcome the problems faced in drip irrigation, Mr. M. Krishna Reddy had decided to practice sub surface irrigation during 2020-2021. Initially, he installed sub surface irrigation in 3 acres land for sweet orange of Malta variety. The innovative farmer himself designed the architecture for sub surface irrigation to suit his requirements and field conditions. Initially, he used PVC (Poly Vinyl Chloride) pipes for main lines, sublines. Instead of laying lateral pipes across the entire field, as done in traditional drip irrigation systems, PVC pipes of 2-inch and 3-inch length were used to supply water directly to the plants. After designing the layout, he trained ten labour in his village for installation of the system i.e. marking the space between the lines and the plants, laying and installation of main lines, connecting the sublines to mainlines and outlet pipe to the plants. After few months, he realized that, the PVC pipes that were above the ground discharging the water directly to the plant were damaged due to the sunlight exposure. So, he replaced the PVC pipes with HDPE (High Density Poly Ethylene) pipes for longer lifespan and also it is flexible to water the plant around the root zone. The total system costed around 55,000 per acre as it involved customizations. i.e. construction of series of ditches or trenches of around 50-60 cm deep, PVC (costed around ₹12 per meter), HDPE (costed around ₹ 9 per meter) and extra fittings. Though the initial cost is more than the drip irrigation, through sub surface irrigation, the cost on drip pipes and maintenance of technology was reduced. It also reduced the labour requirement and also increased the life span of the technology.

After realization of benefits of precision farming, innovative farmer had installed sub surface irrigation system in the remaining 8 acres, adopted mulching in 2.5 acres and purchased a tractor drawn mulch spreader implement. Mr. Krishna Reddy had also constructed farm pond (21x21x6m with 15 lakhs liter storage capacity) for water conservation to provide lifesaving irrigations to crop during summer.

He also designed environment friendly solar energy operated insect trap suitable for agriculture and horticultural crops. Though, light traps are popular for tracking the insect infestation and helps in reducing the insect damage to some extent, their usage was limited due to irregular power supply and high costs as the number of light traps needed are more. Hence, he designed solar light trap. This innovative technology is being used since June 2021, to the present day.

Mr. Krishna Reddy had created the technology on his own. However, he received advisory support from KVK, Palem. Impressed with the results of Sub surface irrigation, about 6 fellow farmers consulted him and installed this technology in their fields and gradual spread of the technology was happened in other mandals

Major Reflections

1. As the farm income was low, the innovative farmer was always trying to practice new methods of cultivation and experiment on his field (Inquisitiveness and Technology Orientation).
2. Association with KVK, Palem. (Social network).
3. He was never content with existing situations and constantly improved his income by diversifying into horticultural crops i.e. papaya and sweet orange, seed production with buyback agreement from RARS, Palem (Achievement motivation).
4. He has incorporated subsurface irrigation in 8 acres of land and seed to seed mechanization in 3 acres of land. The successful blending of modern practices, mechanization, diversification and water conservation practices has made his farming a viable option (Research Orientation and Innovativeness).
5. The main propelling factors for the creation of the innovation were unavailability and high labour cost incurred in the drip irrigation for rolling and laying the

pipes and high maintenance cost (Problem/need identification ability).
6. This innovation had observability, trialability, compatibility and profitability attributes but had a bit complexity in installation. The impact of the this innovation was decreased cost of cultivation, reduction in use of manual labour and drudgery in operations

Case 2: Innovative Farming Solutions: A Young Farmer's Journey in Pest Deterrence

Sravan, a 25 year old innovative farmer hails from Pachala Nadukuda village in Nizamabad. He had to discontinue his studies due to his family's financial constraints. He joined his father in farming. He cultivates Maize, Soyabean, Turmeric and Paddy in his 10 acres of land. Maize is one of the prominent crops cultivated in his village. However, many farmers in the region had shifted to other crops due to the excessive damage caused by wild boars and birds. Despite this, Sravan remained committed and cultivated maize in 3 acres. To protect their crops, Sravan and his father would vigilantly guard their fields throughout the night to deter wild boars and spend the morning chasing away the flocks of birds. Realizing the difficulty of this routine, Sravan came up with an idea to create a device that could produce sounds to ward off wild board and birds.

Sravan designed a sound producing device using simple, readily available items at home in 2020. He has set up four sticks to form a framework and placed an old fan at the centre of the top, attaching two cycle chains to the fan. On the three sides, he positioned a steel plate, steel vessel and a cooker lid. He connected the fan to a power supply from the meter installed in the field and also integrated a solar power connection for additional functionality. When the fan is powered, it rotates, causing the attached cycle chain to come into contact with the connected steel components, producing a louder sound. Sravan used to turn on the device especially in the evening time, and leave, allowing the sound it produced to deter boars and birds. The total innovation costed him around Rs.500. "This single device is enough to protect my field, and even the surrounding fields are not attacked by wild boars, as the sound it produces is very loud," he adds.

To ensure further protection from wild boars and birds, he came up with the idea of adding a disco light device in the field to create visual deterrence and a ground-installed device that produces a siren sound. In 2024, to scare away birds that settle on maize cob heads, he tied long cloth ropes with waste plastic bottles (such as cool drink bottles) filled with stones to the cement poles in the field. When one rope is shaken or vibrated, it creates a loud, rustling sound that can startle birds. Two years ago, he has also designed a fertilizer dispenser using sink pipe.

The farmer has been using the innovations developed since their development to the present day. As, the sound producing device to repel wild boars and birds is simple and effective, about 20 farmers has adopted his innovation.

Major reflections

1. He developed new ways of scaring the birds with these innovative devices (Creativity, Critical thinking)
2. The major propelling force for the development of innovations was damage of crops due to wild boar and birds.
3. The attributes of innovation developed the innovative farmer were trialability, compatibly, observability and profitability.
4. The major impacts created by the innovations was increased profitability, drudgery reduction.

Conclusion

In the present study, qualitative innovative traits that enabled innovative farmers to excel in their field were identified by critically analyzing their cases. These cases illustrate that farmer-led innovations, grounded in local needs and practical knowledge, can have a transformative impact on farming communities. Key traits such as creativity, critical thinking, achievement motivation, research orientation, and strong social networks played a pivotal role in fostering an innovation-sustaining climate. Overall, both case studies emphasize the importance of encouraging grassroots innovations to make agriculture more resilient, efficient, and sustainable in the face of resource constraints and environmental challenges.

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Author's Contribution

Boppana Jagadeeswari has conceived the research idea, designed the study, collected data, performed data analysis, and drafted the manuscript, Jagan Mohan Reddy M has provided guidance in research design, supervised data collection, and contributed to data interpretation and manuscript revision, Ravinder Naik V had assisted in data analysis, interpretation of results, and critical review of the manuscript for intellectual content, Malla Reddy M has supported fieldwork, coordinated with Krishi Vigyan Kendra's (KVKs), and contributed to data validation and documentation and Srinivasa Chary has provided overall supervision, offered valuable suggestions during the research process, and contributed to final manuscript editing.

References

1. Sharma S, Sharma S. Agri-entrepreneurial innovations impacting livelihood security in Indo-Gangetic Plains: Case studies of innovative farmers from Uttar Pradesh and Haryana. J Community Mobil Sustain Dev. 2021;16(3):398-402.
2. Stake RE. The art of case study research. London: Sage Publications Ltd; 1995.
3. Guttikonda A. From innovators perspective: process of grassroots innovation in Andhra Pradesh and Telangana (Doctoral dissertation, Massachusetts Institute of Technology); c2016.
4. Pattnaik BK, Dhal D. Mobilizing from appropriate technologies to sustainable technologies based on grassroots innovations. Technology in Society. 2015 Feb 1;40:93-110.