Indian J Dairy Sci 77(5): 476-481
https://doi.org/10.33785/IJDS.2024.v77i05.012

RESEARCH ARTICLE

Dairy innovation portal: A web-based platform to address farmer-led innovations in the Indian dairy sector

Priyajoy Kar[1](✉), HR Meena[2], BS Meena[3], Gopal Sankhala[4], AK Singh[5], Rakesh Kumar[6], Pawan Singh[7], Salam Jayachitra Devi[8], Sunil Kumar[9], Amitava Panja[10], Vikash Kumar[11] and Ph. Romen Sharma[12]

Received: 02 August 2023 / Accepted: 09 April 2024 / Published online: 23 October 2024

Abstract: The study was carried out in four districts of Haryana and Punjab states to conduct the baseline survey about developing a Dairy Innovation portal for the dairy stakeholders. A first- of-its-kind Dairy Innovation Portal was developed consisting of the details of Farmer- led Innovations resulting from the preliminary survey. The portal was developed keeping in view the diverse needs of the stakeholders in the dairying sector. The multilingual portal was equipped with innovation submission forms in farmers' native language for easy access. The portal also directs the farmers to claim Intellectual Property benefits from government organizations. A central database for documentation of farmer-led innovations in dairying will make it simple for people who want to access it and beneficial for dissemination. Futuristic vision enables this portal to cover farmer-led innovation in pan-India exploration which can bring about a radical change in the Indian Dairy Sector.

Keywords: Dairy, Dissemination, Farmer-Led Innovation, Innovation Portal, Stakeholders,

Introduction

Dairy extension education aims to give farmers the know-how they need to carry out better dairy husbandry operations, to make timely information and better practices accessible in a way that is suitable for their level of literacy and awareness, and to cultivate in them a positive attitude toward innovation and change (Benor,1984).The lack of information based on the farmers' needs and the irregular times at which it was broadcast on radio and television were the significant limitations of traditional extension approaches (Singh.et al.2020). The majority of technical staff members in the State Departments of Animal Husbandry (SDAHs) and Dairy Development Departments were unable to interact successfully with the stakeholder group and the research system (Singh.et al.2018). According to the Working Group on Agricultural Extension in 2007, there are only around 0.1 million extension workers employed, which is insufficient to meet the demands of the farming community. 1.3 to 1.5 million workers are needed for extension work. Determining how to disseminate information in a way that meets the needs of the greatest number of people at any given time while also being cost-effective and easily accessible is therefore urgently needed (Singh.et al.2020). The creation of information and communication technologies based on the internet can address this. A positive relationship was reported between high educational status, internet access and improved nutrition information (Dominic et al.2023).

Indian agriculture has been increasingly characterized by a diverse set of actors, relationships, and policies that are required for coordinated actions to benefit farmers. The dairy industry, a vital part of agriculture, is also aware of this complex web of actors at play. India is the largest milk producer in the world with a 23% share of world milk production and has been growing at an annual rate of 4.2% for the last 2 decades (USDA, 2021). The demand for animal-based calories, such as those found in meat, dairy products, and eggs, is expected to more than quadruple globally between 2010 and 2050, particularly in developing nations due to population expansion, economic development, and urbanization (Gouel and Guimbard, 2019). Dairying is crucial for food security in many developing countries as it is the primary source of income and food for a large portion of the rural poor (FAO,2011). It is also seen as one of the important sectors for reducing poverty, unemployment and income inequality. In an era of global competitiveness, the greatest problem for dairy farmers is obtaining maximum output while using scarce natural resources, which can be solved by applying dairy innovations on every farmer's farm. Application of innovations at every stage of production since from cultivation of fodder to marketing of milk is the dire need of the present day.

ICAR-National Dairy Research Institute, Karnal[1,2,3,4,5,6,7,10]
ICAR-National Research Centre on Pig, Guwahati[8]
Assistant Professor, College of Dairy Science and Technology, RAJUVAS, Bikaner[9]
Assistant Professor, Rajmata Vijayraje Scindia Krishi VishwaVidyalaya, Gwalior[11]
ICAR-Indian Institute of Maize Research, Ludhiana[12]
Priyajoy Kar (✉)
Email- karpriyajoy@gmail.com

Dairying in India has persisted and thrived through periods of harsh market conditions and extreme environmental stress, mostly because of the inherent inventiveness and inherent innovative capacity of its farmers. Farmers' informal experimentation results in their innovations. Farmers are encouraged to take action to solve their difficulties as a result of the limited environment and new chances. Farmers' inventions are more quickly adopted by other farmers than the findings of official research that is pushed on them since they are less expensive, more accessible, locally relevant, and tested in genuine farm situations. Small and marginal farmers engaged in dairying constantly experiment with low-cost technology to meet their needs when faced with financial issues. In order to preserve, prepare, and package a variety of perishable products for longer shelf life as well as improved market potential, farmers have also developed innovative, affordable technology. Considering the scenario, the present study was taken up to design and implement the first-of-its-kind 'Dairy Innovation Portal' which will help in the parallel diffusion of Farmer-led Innovations among the farming communities of different regions. This will also help in generating awareness among the farmers about the prevalent farmer-led innovations in the dairy sector. The need of documenting and claiming the rights for innovation for farmers has been made easy and affordable through this interactive portal.

Materials and Methods

Haryana and Punjab states were purposively selected considering their prominence in the number of innovative farmers related to the field of dairying. From each state randomly two districts were selected. As a whole, a total of four districts were selected. From each district, two blocks were randomly chosen comprising eight blocks in total. From each block,35 dairy farmers were selected comprising a total of 280 dairy farmers as sample. Apart from that 10 government R&D (research and development) persons and 10 private R&D persons related to the field of dairying were selected from the district level. So, a total of 280 dairy farmers and 80 R&D persons (both public and private) were selected as complete samples for the study. 360 samples in total were therefore chosen. The baseline data was used to design the interactive web portal. Data Repository was created in MySQL Workbench. The Portal was created using several codes using SQL Workbench. The researcher has undergone basic training to develop this portal along with valuable inputs and suggestions from the project team. The coding was done for different Farmer-led Innovations in different ways. Separate windows were created for the different web pages under development. The project team and survey visits to the individual farmers were documented in the portal. The portal can be accessed on the weblink https://no1.in.net/farm_innovations.

Results and Discussion

The Dairy Innovation Portal is a platform designed to address innovations in the dairy sector by bringing together stakeholders from various sectors including industry, academia, and government. The aim of the portal is to foster collaboration and knowledge sharing among these stakeholders to drive innovation in the dairy industry. The portal offers a range of features including a knowledge library, news and events section, innovation challenges, and a collaboration space for industry experts to connect with one another. The knowledge library is a central repository of information on the latest developments in the dairy industry, covering topics such as sustainability, nutrition, and technology.

Farmers are gradually creating new methods, putting them into practice, and improving them over time. These farmer-led innovations have not received adequate documentation or recognition over time. (Baliwada *et al.*2016). Grassroot innovations should be given priority in every sector to increase its potential area of application in the different parts of the country. So, dissemination and scientific validation part is very much essential. This portal is a first-of-its-kind novel attempt to document innovations, particularly in the Indian Dairy sector. This portal covers innovations from different aspects of the dairy industry i.e., production, processing, and management. This portal briefly covers the innovations specified to different locations as per the secondary data analysed specifically in the states of Punjab and Haryana. Additionally, the Intellectual Property Rights (IPR) on agricultural innovations are frequently disregarded. Scientists have frequently overlooked the importance of traditional knowledge and its documentation. As a result, many agricultural technologies created by creative farmers have not been made available to other farmers (TAAS, 2011).

The creation of regionally specific content is crucial and differs from region to region. The value of bilingual information retrieval systems was underlined by numerous studies in a wide range of Indian regional languages, according to Sendil (2010). Agricultural education and extension can be a key component of the transformation process to transfer technology, encourage technological learning, help farmers solve problems, and make it possible for farmers to participate more actively in the agricultural knowledge and information system. The layout, content presentation style, and gestural design must be taken into consideration before designing a portal/module (Verma *et al.*2019). The portal is equipped with Google Translator and farmers from different regions can view and contribute towards it in their native language. A separate google form is created by the developers to submit an idea/innovation by the farmers. The portal also directs the farmers/stakeholders to several innovation websites like National Innovation Foundation, Indian Patent Office, Honey Bee Network, Prolinova etc.

Fig. 1 Summary of the Innovations reported in the Dairy Innovation Portal

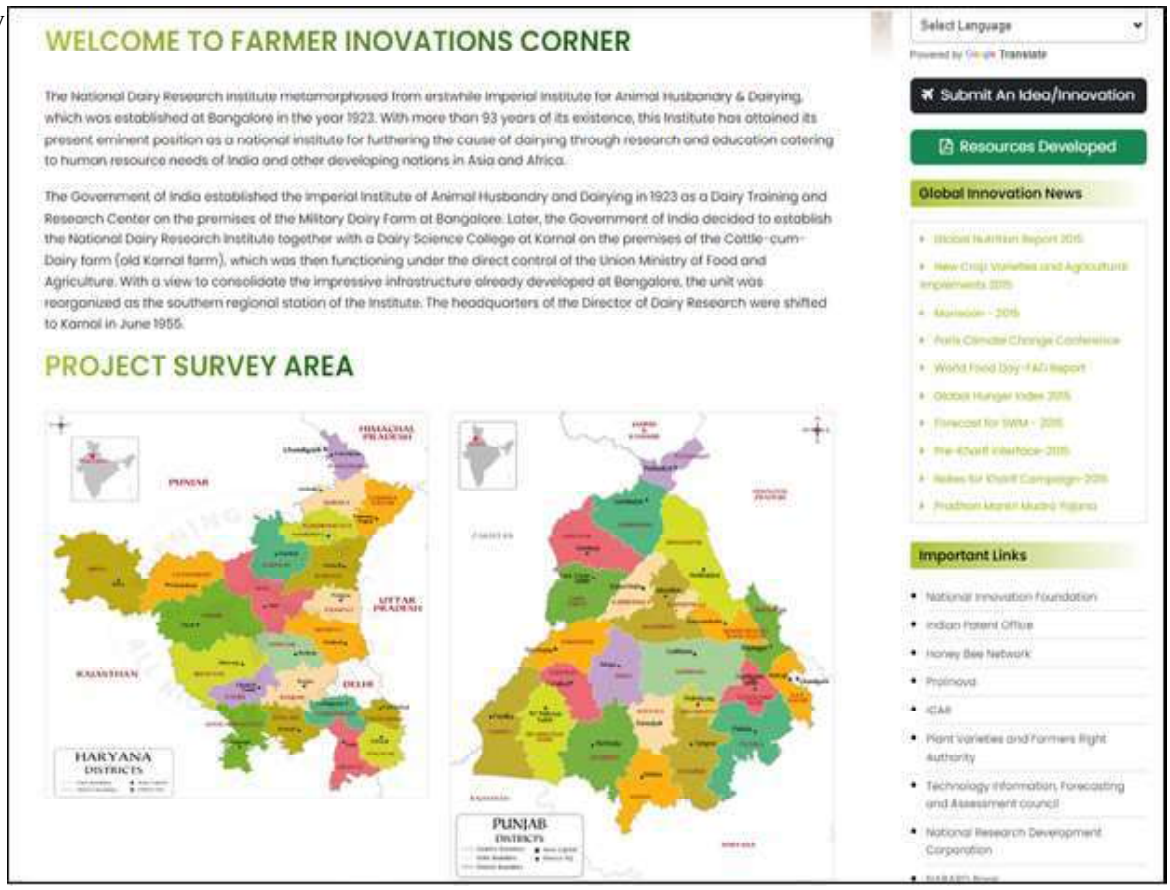

Fig. 2 Finalized Dairy Innovation Portal

Whatever the medium of communication, it should intelligently deliver information that is pertinent to the area with a strict degree of explanation. Information repositories are bringing new possibilities for data retrieval as well as new difficulties. Users worldwide can now instantly access previously unimaginable sources of knowledge thanks to the availability of online materials in a variety of different languages. The portal is equipped with different language provisions which in turn will made communication very easy for farmers. The farmers and stakeholders can view the portal in their regional language for easy access of the information. According to Keniston (2000), the creation of regionally specific content is crucial and differs

Fig. 3 Provision of reporting in different Intellectual Property registering website

Fig 4 Provision of all regional languages in the Innovation Portal for effective understanding of farmers from different regions of India

from region to region. They can see the different innovator's identity and the methodology of their innovations in their regional language. This will further develop a sense of innovativeness in the farmer to solve his own local problems.

Most of the time, grassroots inventors are completely unaware of their own innovations. According to Saraswathi et al.(2010), the growth of information repositories is leading to both new opportunities and problems for information retrieval. Users worldwide can now instantly access previously unimaginable sources of knowledge thanks to the availability of online materials in a variety of different languages. According to Mallinga et al. (2012), CD lessons were helpful in improving milk dealers' awareness of clean milk production. He said that the knowledge gain was 32.33 percent for maintaining animal sheds, 51.43 percent for management, and 32.08 percent for the system for storing and transporting milk. Meena et al. (2014) reported in their study that the created educational DVD was successful in terms of knowledge acquisition. The educational module developed for information dissemination of brucellosis disease has contributed to the increased knowledge about the disease transmission as reported by Verma et al. (2021). The majority of farmers expressed satisfaction with the content's relevance and appropriateness, as well as its usefulness in expanding knowledge, suitability of the information to the field scenario, improvement of self-confidence, and arousing of curiosity and interest.

Additionally, the IPR on the ideas created by farmers are frequently disregarded. A central database for documentation of farmer-led innovations in dairying will make it simple for people who want to access it and beneficial for dissemination. The database in the portal will be updated from time to time for proper documentation in different states. Futuristic vision enables this portal to cover farmer-led innovation in pan-India exploration. Research is

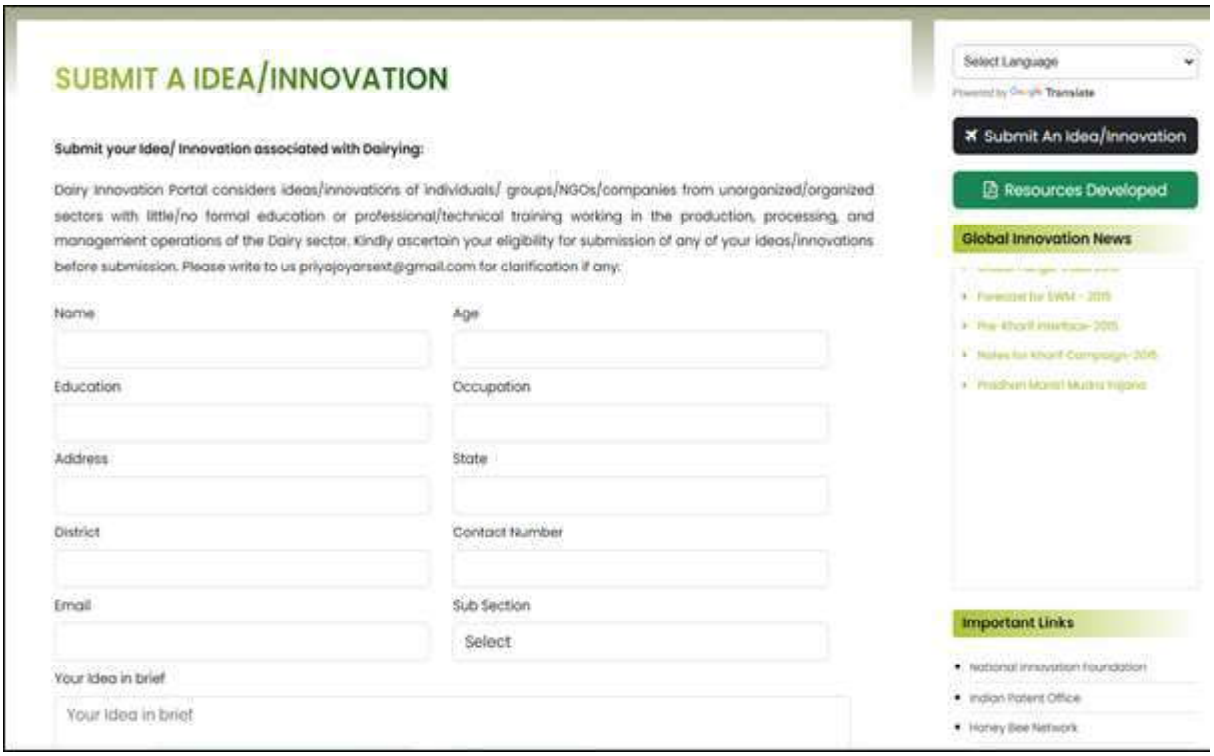

Fig. 5 Format for submission of a New Idea/ Innovation

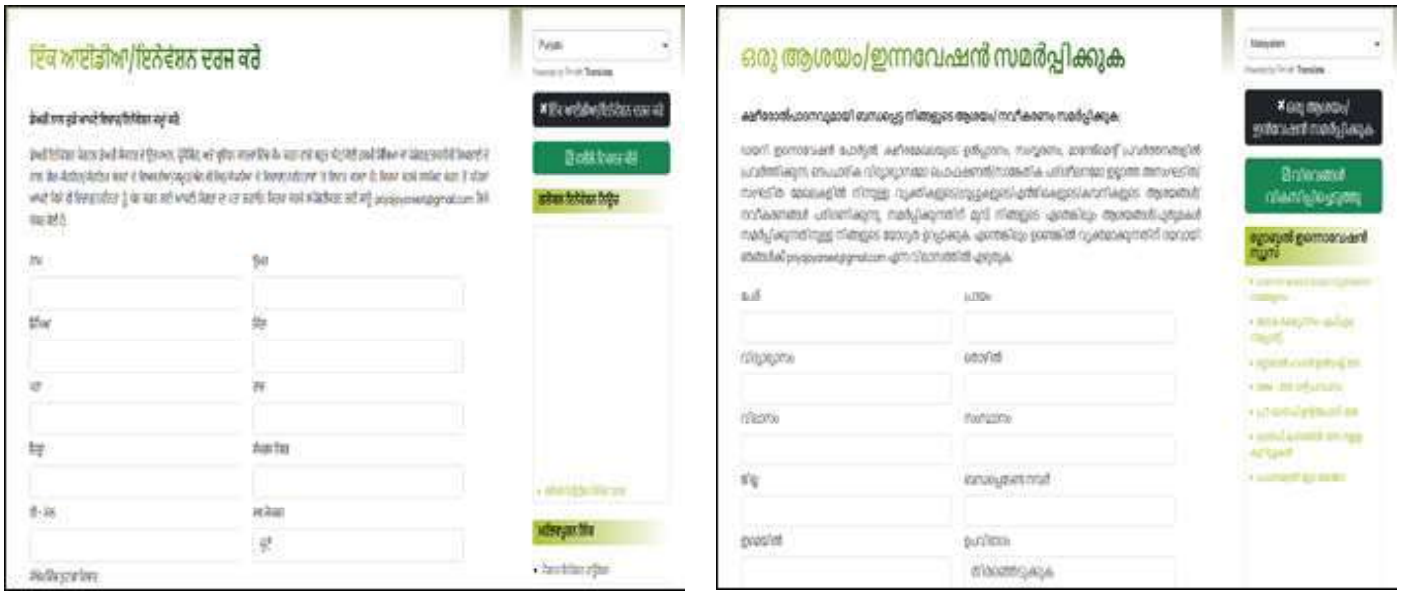

Fig. 6 Pan- India approach(multi-lingual) for exploring and reporting Farmer Led Innovations in Dairy Sector

required to determine whether industry-standard software or templates can be created to store Farmer Led Documentation data in a single database. The rewards of validating or further developing grassroots inventions may seem restricted because there are few opportunities to discover their true potential. Local innovators and bearers of traditional knowledge are under minimal, fragmented, and easily ignorable pressure to influence policies (Sci Dev, 2007). The lack of funding continues to be a barrier to the commercialization of grassroots inventions, according to Olga (2015). Farmers are not properly acknowledged as actors in the innovation system, there is little information supplied on the various knowledge sources involved or the flow of knowledge, and there is little focus on long-term effects on livelihoods (Brigidletty et al. 2012). This will facilitate access for people who are interested in the content and make it helpful for dissemination (Matthias, 2010). According to Prolinnova (2009), existing effective farmer inventions are deserving of greater distribution and do not necessarily need further study.

Conclusions

The Farmer-led innovation section in the portal provides a platform for industry stakeholders to collaborate and develop innovative solutions to pressing issues facing the dairy industry. The innovations were typically focused on sustainability, nutrition, and food safety, and participants can work together to develop new products, processes, or technologies to address these challenges. The collaboration space allows industry experts to connect with one another, share knowledge, and work together on research and development projects. This feature is particularly valuable for smaller businesses and startups who may not have the resources or expertise to undertake large-scale R&D projects on their own. Documentation of field experiences based on empirical evidence is necessary for various dairy innovations. Launching of separate network projects or All India Coordinated Research Projects (AICRP) on farmer-led innovations will have a better impact. The creativity of the innovators should be properly acknowledged and their intellectual property rights need to be protected. Front Line Demonstrations (FLD) in innovative farmer fields and agri-tourism around farmers' innovative efforts would not only generate awareness but will also help in revenue generation and motivates fellow farmers. Overall, the Dairy Innovation Portal is an innovative approach to addressing the challenges facing the dairy industry by bringing together stakeholders from across the sector to collaborate and drive innovation. The platform is helping to accelerate the development of new products, processes, and technologies that are critical to the future success of the dairy industry.

Acknowledgments

For their timely assistance and cooperation during the research work, the authors are thankful to the Director and Scientists of ICAR- National Dairy Research Institute in Karnal, India.

Conflict of Interest

The authors declare no conflict of interest.

References

Baliwada H, Sharma JP, Gills R (2016) Farmer led innovations: Retrospect and prospects. 86(July), 1257–1264

Benor D (1984) Training and Visit system. A World Bank publication. The World Bank Washington DC, 138

Brigidletty, Zanele Shezi and Maxwell Mudhara (2012) Agricultural Grassroots Innovation in South Africa: Implications for Indicator Development. Ideas for New Research Projects on LICS in Africa. African Globelics Seminar, Tanzania

Dominic DM, Meena HR, Niranjan DA (2023) Effectiveness of an Educational Module on Diet and Nutrition: A Farm Women Perspective from Aspirational Districts. Indian Jf Extension Edu 59(1): 28-31

Gouel C, Guimbard H (2019) Nutrition Transition and the Structure of Global Food Demand. Am J Agric Econ 101: 383–403

Keniston, K. (2000). Grassroots ICT project in India: Preliminary Hypothesis. Information Technology in Developing Countries 11(3):60-64

Mallinga, J., Narmatha, N., Uma, V., Akila, N. and Sakthivel, K. M. (2012). Effectiveness of CD lesson on the knowledge level of milk vendors in clean milk production practices. J Dairying Foods Home Sci 31(**1**):52-54

Matthias M. (2010) Farmer Led Documentation and Knowledge Sharing: Case Studies from Kenya, Tanzania, Uganda and Zambia. PROLINNOVA. Uganda.

Meena BS, Kumar R, Singh A (2014) Effectiveness of multimedia digital video disk on knowledge gain of improved dairy farming practices. Indian J Dairy Sci 67(5):441-445

Olga V Ustyuzhantseva. (2015) Institutionalization of grassroots innovation in India. Curr Sci (108): 14768

Prolinnova (2009) Notes on Local Innovation and Participatory Innovation Development, Available at: http://www.prolinnova.net.

Saraswathi S, Asma Siddhiqua, M, Kalimangal K, Kalaiyarasi M (2010) Bilingual Information Retrieval System for English and Tamil. J Computing 2(4):85-89

Sci Dev Report paper. (2007). Bringing science and development together through original news and analysis.

Sendil Kumar, R. (2010). Knowledge and information source utilization pattern of soybean growers. Indian Res J Exten Edu 10(3):71-74

Singh J, Kumar P, Singh A (2018) Constraint analysis of traditional methods of extension communication in adoption of scientific dairy practices. Int J Current Microbiol Appl Sci 7(08): 4522-4532

Singh J, Kumar P, Singh A (2020) Dissemination of information to dairy farmers in Jammu and Kashmir: Developing a web module. Information Dev 36(4): 546-558

TAAS (Trust for Advancement of Agricultural Sciences) Report. (2011). Proceedings of the National workshop on Farmer-Led Innovations. Haryana Kisan Ayog. Hisar, Haryana.

USDA (2021) India's Dairy Sector: Structure, Performance, and Prospects 49

Verma AP, Meena HR, Patel D (2019) Perceived effectiveness of educational module on brucellosis in dairy animals. Indian J Exten Edu 55(2): 43-47

Verma AP, Meena HR, Patel D, Meena BS (2021) Effectiveness of Educational Modules on Knowledge on Brucellosis among Dairy Farmers in Northern India. Indian J Exten Edu 57(4): 110-114

Working Group on Agricultural Extension (2007) Recommendations of working group on agricultural extension for formulation of eleventh five-year plan (2007–12). New Delhi: Planning Commission.