Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 04, Issue: 03 (MAY-JUNE, 2024)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Impact of Different Extension Mechanisms for the Selection of Beneficiaries on Technology Dissemination Process among the Women Farmers of Terai Zone: An On-Farm Trial

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Abstract
The factors influencing the utilization of agricultural extension communication channels vary, and their impact in emergency and non-emergency scenarios remains unexplored. It is found from different studies that in the Terai region of West Bengal, the majority of the women farmers technology adaptability levels were low. So, there is a need to identify an appropriate extension channel for the dissemination of new technology. Based on the issue, an experimental trial was conducted in the Cooch Behar district of West Bengal on the impact of different extension mechanisms for the selection of beneficiaries on the technology dissemination process among the women farmers. An experimental research design was used, and random sampling methods were followed for the selection of the sample respondents. It is found from the study that technology adaptability level and knowledge level of farm women were high among the farm women selected through SHGs; organising capability and leadership ability were high among the farm women selected through farmers clubs; knowledge levels of the farm women were high in cases of selection through SHGs and Farmers Club; and leadership ability of the farm women was high in cases of selection through gram panchayat. So, it is recommended that for technology dissemination, SHGs and farmers clubs play an important role at the grass-roots level.

Keywords: Communication channel, extension mechanisms, technology adaptability, knowledge, SHGs, organizing capability, leadership ability, farmers clubs

Introduction
Agricultural extension, by its nature, has an important role in promoting the adoption of new technologies and innovations (Jamilah *et al*., 2010). Poor communication as a result of uncoordinated channels of information delivery to farmers has been a major deterrent to information flow between researchers and farmers (Rees *et al*., 2000). Suleiman *et al*. (2021) concluded that group discussion and visits were the most preferred extension communication channels. The information from the extensionist to the farmer has to be communicated through a channel, hence the role of agricultural extension communication. This is defined as the transfer of an idea, advice, or information to a farmer through various channels with the hope of influencing his or her decision (Kurtzo *et al*., 2016). According to Okwu *et al. (2006),* for effective communication, the transfer of information from the source to the receiver should face little or no distortion. Okwu and Daudu (2011) considered colleagues

(relatives, friends, and neighbours) as a very regular channel of communication, hence their patronage. The adoption of smart agricultural initiatives by farmers can be achieved and upscaled by agricultural extension agents, who are the most prominent trusted source of information among rural farmers (Prokopy et al., 2015). The involvement of agricultural extension systems in playing this role is crucial in providing information and educational programmes on new technologies to farmers, and this is dependent on several factors related to knowledge, attitude, skills, technical competence, job characteristics, working conditions, as well as the socio-economic characteristics of the extension agents in relation to their extension service duties, among other factors. Their involvement is supposed to include improving farmers' access to climate-resilient technologies and practices and also the provision of adequate information and knowledge to increase farmers' productivity (FAO, 2016). Rural leadership is one component that has had a significant impact on the paradigm of rural development (Mohanty *et al.* 2009). Pradhan *et al.* (2015) found from their study that the self-help group was the best option for agricultural technology dissemination, followed by farmers clubs, farm and home visits, and panchayats. Therefore, self-help groups should be given more emphasis and taken care of during any developmental activity for women's empowerment. In such a situation, the farmer's club may also be utilised for the selection of women stakeholders to promote the adoption of innovation for their socio-economic upliftment and empowerment. However, the nature and extent of their involvement differ with the variations in agro-production systems. The best way to make optimum use of rural women as an important human resource was to provide them opportunities for self-development through training that improved their existing knowledge and skills, enhanced their capabilities, and improved their competency to meet the challenges of society and technology (Deo et al., 2010). The determinants of agricultural extension communication channel usage depend on several factors but have not been explored in the context of emergency and non-emergency situations. It was found from different studies that in the Terai region of West Bengal, the majority of the women farmers technology adaptability levels were low. So, there is a need to identify an appropriate extension channel for the dissemination of new technology. Based on the issue, an experimental trial was conducted in the Cooch Behar district of West Bengal on the impact of different extension mechanisms for the selection of beneficiaries on the technology dissemination process among the women farmers.

Methodology

The study was conducted in the Cooch Behar District of West Bengal during 2014–2018. An experimental research design was used, and random sampling methods were followed for the selection of the sample respondents. The total sampling frame of the study was 180, and the sample size was 160. The study was carried out using four different technologies and three different replications. For the selection of farm women, a group meeting was organised with representatives from Panchayet, Farmers Club, Self-Help Group, and some individual farm women. They were asked to nominate 40 farm women from each category. In normal practice, the respondents were selected through the grass root organisation (gram panchayat); in technology option I, respondents were selected through the individual contact method (farm and home visit); in technology option II, respondents were selected through the grass root organisation (Self Help Group); and in technology option III, respondents were selected through the grass root organisation (Farmer's Club). The technology was used for low-cost azolla cultivation as a feed supplement for domestic animals. The important statistical measures that were used to analyse the research data included frequency and percentage. The data had been gathered through a structured interview schedule. Secondary data sources were published and unpublished reports, records of panchayat offices, district agricultural

departments, farm science centres, published research papers, review papers, newspaper coverage, and other official reports. The sources of qualitative data were key informants, assistant directors of agriculture, universities, village leaders, NGO workers, farmer clubs, and SHGs. Leaflet distribution, training, and demonstrations were organised for each category separately, and monitoring with the help of different monitoring indicators is going on for follow-up action.

Results and Discussion

It was found that respondent selection through SHGs proved to be the best one with respect to knowledge (93.33%) and adaption level (86.66%), and respondent selection through farmer clubs was more focused on organising capability (93.33%) and leadership ability (93.33%), followed by the other extension mechanisms. It was also found that the knowledge levels of the beneficiaries were high (93.33%) in the case of respondents' selection through SHGs and Farmers Clubs. It may be due to high managerial capacity, high communication, and leadership ability within a small unit (Singh and Hansra 2018). Respondent selection through panchayat depicted high leadership ability (93.33%), but other parameters like knowledge and awareness level were poor. It may be due to low monitoring, low communication, a high work load, and other factors. Respondent selection through farm and home visits was low in all the selected parameters. It may be due to low communication and monitoring (long distance), low faithfulness, or other factors. It was also found that discontinuation of the above technology was high in respondents' selection through panchayat, farm, and home visits, followed by others. It may be due to low awareness and knowledge levels among the respondents.

Table 1: Impact of different extension mechanism on technology dissemination process

Treatments	Monitoring indicator					
	Knowledge test	Awareness test	Adoption rate	Organizing capability	Leadership ability	Discontinuation
Normal practice: Selection of beneficiary through grass root organization (Panchayat)	60.00 %	66.66%	53.33%	73.33%	93.33%	High
Technology Option I: Selection of beneficiary through individual contact (Farm and Home visit)	66.66 %	80%	60%	60%	60%	High
Technology Option II: Selection of beneficiary through grass root organization (Self Help Group)	93.33 %	93.33%	86.66%	80.00%	86.66%	Medium
Technology Option III: Selection of beneficiary through grass root organization-Farmer's Club	80%	93.33%	73.33%	93.33%	93.33%	Medium

Conclusion

It is concluded from the study that the technology adaptability level and knowledge level of farm women were high among the farm women selected through SHGs. It is revealed from the study that organising capability and leadership ability were high among the farm women selected through farmer clubs. It is also found from the study that the knowledge levels of the farm women were high in cases of selection through SHGs and the Farmers Club. It is found from the study that the leadership ability of the farm women was high in cases of selection through gram panchayat. So, it is recommended that for technology dissemination, SHGs and farmers clubs play an important role at the grass-roots level, but the majority of the technology is disseminated at the panchayat and block level under MGNREGA. So, it's difficult to separate panchayet from other selected extension mechanisms. So, there is a need for the integration of all selected technology dissemination channels to increase the adaptivity of new technology and its outcomes.

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