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Constraints Experienced by Extension Professionals in using Technology Dissemination System of State Department of Agriculture in Andhra Pradesh

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ABSTRACT

Extension Professionals were the grass root level workers who worked directly with the farmers implementing the development activities. Competency and satisfaction of extension Professionals on their job makes all the difference in smooth functioning of the development initiatives. However, there are constraints experienced by extension professionals in using technology dissemination systems of State Department of Agriculture (SDA) which needs to be studied for effective implementation of the programmes and schemes of State Department of Agriculture. Hence, A survey was conducted among Andhra Pradesh extension professionals, with the sample size of 100 respondents who were actively involved in the fields of State Department of Agriculture through simple random sampling. The constraints were ranked based on the mean scores and also categorized the constraints based on their relative importance. Results showed that the major constraint faced by Andhra Pradesh extension professionals was technical and infrastructure problems associated with the SDA was the most important and first ranked constraint among fourteen constraints. Lack of training to employees on technology dissemination methods, accessibility to the ICT tools, uncontrollable changes in technology delivery methods, availability of required inputs to conduct demonstrations and lack of awareness on new approaches of technology dissemination were other most important constraints. In order to overcome these constraints so as to enhance the capability of extension

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professionals in utilizing technology dissemination systems of SDA, extension professionals expressed that, the vacant posts in the Department should be filled regularly to reduce the overburden on existing extension professionals as a most important suggestion with regular and relevant training programmes on latest technology dissemination methods for successful implementation of the extension delivery system.

Key words: Perception, Performance, Schemes, State Department of Agriculture, Technology Dissemination

Introduction

Agricultural extension in the developing countries indeed has a very new role to play and needs the serious attention of policy-makers for its meaningful reform and modernization. Extension workers could constitute a formidable force in this in reforming agricultural extension systems (Lafta *et al.*, 2021). Agricultural extension and advisory services are crucial to the development of agriculture and can enhance the welfare of farmers and other rural artisans. Agricultural extension is becoming increasingly pluralistic, with several players adopting various extension approaches at the same time. Agriculture extension is one of such development efforts taken up by government and non-government agencies that aim at reaching farming community for bringing about an increased level to total as well as per unit agricultural production (Poree *et al.*, 2021). Ridha *et al.* (2020) confirmed that the desired improvement of agricultural productivity and consequent agricultural development in a country is heavily dependent upon efficiency and performance of extension workers in their works. The extension workers' efficiency has an impact on succeeding of the extension organization since they perform great tasks in the changing of knowledge and attitudes of farmers and create the desire to improve the lifestyle through developing their agricultural skills (Lafta, 2011). Transfer of technology plays a major role in disseminating the research outcome to the farming community. In recent years, agriculture is facing severe challenge and coupled with limited man power of extension Professionals due to which information need of farmers are not met (Madan *et al.*, 2015). The role of agricultural extension is vital for the transfer of modern agricultural technology, but it is still failing due to some reasons. Due to different constraints, relevant information cannot be transferred to farmer's community resulting in low adoption and ultimately low production (Khan *et al.*, 2019).

Agricultural technology delivery is the main ac-

tivity of the State Department of Agriculture (SDA) in Andhra Pradesh. State department of agriculture is implementing various programmes for the benefit of the farmers. The success of these programmes depends on how well they are planned, implemented and how effectively they are reaching the farmers. State Department of Agriculture (SDA) in Andhra Pradesh, is about to undergo significant reforms to better serve the ever-changing demands and issues of its farming clientele. Agricultural extension Professionals of State Department of Agriculture (SDA) are Professionals who are responsible for meeting the goals of extension system. The effectiveness of extension services is highly dependent on the ability of extension workers who are competent because the entire extension process is dependent on them to transfer information from extension organizations to the farmers (Ravikishore and Seema, 2017). The extension Professionals who act as a key communicator between the farmer and the researcher and establishes two-way process of communication. The effectiveness of all these programs solely depends on the job performance and efficiency of Agricultural Officers who acts as an approachable extension personal at mandal level in SDA (Reshma and Anilkumar, 2019). Extension Professionals being the bridge between research stations, government schemes and farmers need to have certain skills and abilities to perform the roles properly. Perception and evaluation of the job, needs, values and expectations from the agricultural officers in turn affect their satisfaction and performance. Capacity, management and advisory services of any organisation are critical components of an effective extension system. However, in the contemporary scenario, agricultural extension organisations confront difficulties with extension professional competency. The problem of extension Professionals and indeed technology dissemination systems of SDA became prominent with the growing food demand of burgeoning population in India. Considering that more effective and refined SDA

technology dissemination systems are a veritable way to raise the level of performance of extension Professionals in carrying out the same at their best for greater outreach and utility among farmers (Ravikishore *et al.*, 2022).

The extension Professionals have a great responsibility on their shoulders to bring fruitful results. Problems faced by extension Professionals in carrying out their work responsibilities in turn affect the program implementation and farming community. The agricultural officers working in the Department of Agriculture Development and Farmers welfare face many constraints which ultimately affect their interaction with farmers and various decision-making processes (Raahalya and Sreedaya, 2021). Agricultural extension department was expected to play an important role in the overall development of agriculture but failed due to a number of weaknesses and challenges and cannot obtain the desired goals. There are many reasons for not being capable to having a significant impact such as no incentives for extension Professionals, lack of agricultural planning, weak policies, and communication gaps among the researchers and farming community resulting low adoption of improved practices (Takenaka, 2006). Political interference, farmers' interest in subsidies rather than technology and no proper office facilities were the major problems experienced by the agricultural officers which affected their competence and satisfaction levels. Suggestions offered by extension Professionals to improve their competency and satisfaction were good audio-visual aids, conveyance facilities and good working environment and office facilities (Kusumalatha *et al.*, 2022). It is obvious that the poor educational background of extension Professionals and the rapid changes occurring in the extension environment necessitate regular in-service training to help extension agents develop the knowledge, skills and attitudes in agriculture (Gebrehiwot *et al.*, 2012). The major constraints of extension Professionals that were facing in their jobs are the usual rejection of production recommendations of department by the farmers, delay or denial of promotion to the extension functionaries, inadequate salaries and allowances and too large areas for coverage by Extensions Agents (EAs) (Olatunji *et al.*, 2015). However, the major constraints experienced by extension Professionals in technology dissemination system of SDA had not yet been examined, which concerned policy makers in the state of Andhra Pradesh at all levels. In light

of this, the current study was carried out to determine the constraints of the extension Professionals in technology dissemination system of SDA and to provide relevant recommendations in order to improve the performance effectiveness of the extension Professionals working with technology dissemination system State Department of Agriculture.

Materials and Methods

The State of Andhra Pradesh with 13 districts has great potential for agriculture and allied sectors. Andhra Pradesh State consists of six agro climatic zones and five different soil types to grow wide range of crops throughout the year. Andhra Pradesh has six agro-climatic zones, and five different soil types. The state has 10.1 million ha of cultivated area, constituting 37% of the total geographical area of the state. The irrigated area is 36% of the total cultivated area. Andhra Pradesh has mostly red lateritic and black soil, with low fertility and salinity problems. The important crops sown are rice, cotton, groundnut, pigeon pea, sunflower, black gram, and sorghum. The climate of Andhra Pradesh is generally hot and humid in the low land coastal regions, while it is mostly semi-arid in parts of Anantapur district, Sri Sathya Sai district, Kurnool district and Kadapa district. These areas fall under the rain shadow region of the Western Ghats. The summer season in this state generally extends from March to May or June. During these months the moisture level is relatively higher than in winters, and it is generally higher in the coastal lowlands.

A survey was conducted during 2016-2018 among Andhra Pradesh extension professionals to evaluate constraints experienced by extension professionals in using technology dissemination systems of SDA for the betterment of farming community. The sample of the study constituted 100 respondents with a minimum of 50 extension Professionals each from the two regions namely, Rayalaseema region comprises Anantapur, Kadapa, Chittoor and Kurnool districts and Coastal Andhra region comprises Nellore, Prakasam, Guntur, Krishna, East godavari, West godavari, Vishakapatnam, Srikakulam and Vizianagaram districts. The Simple random sampling was done in the sampling area in order to arrive at valid conclusions regarding technology dissemination systems of State Department of Agriculture (SDA).

Based on discussion with the senior management

of SDA, experts in agriculture and also through relevant review of literature, some of the constraints experienced by the extension Professionals on technology dissemination system of SDA were identified. A list containing fourteen such constraints were included in the final questionnaire. The response to each constraint was obtained on a five-point continuum from most important to least important, with the score 'five', 'four', 'three', 'two' and 'one' respectively from the sample of 100 respondents. After which each of the constraint recorded score by all the 100 respondents was summed up wherein the maximum possible score was 500 (Most important score by each respondent for each constraint $5 \times$ Total Sampled respondents i.e. 100) and minimum possible score was 100 (Least important score by each respondent for each constraint $1 \times$ Total Sampled respondents, i.e. 100) for each of the constraints with the data range from 100 to 500 and based on the obtained total score for each constraint the mean scores were calculated using the following formula.

Mean Score for each constraint = Sum of the scores obtained for each constraint / Total sampled respondent

Based on the mean scores the ranking was done and the highest mean score constraint was considered as the first ranked constraint. At the time of interview, the respondents were asked to enumerate the suggestions to overcome the constraints faced by them. Therefore, suggestions with maximum responses could be counted and frequency/percentage was worked out. Hence the statement with maximum frequency was designated as the most important suggestion followed by the others in the decreasing order of importance.

The decision rule was administered to categorise the constraints and suggestions from most important to least important. The decision is determined as five + four + three + two + one divided by five = three, which stands as the decision rule. The decision rule for the constraints and suggestions were outlined in Table 1.

Results and Discussion

The completed and returned questionnaires from our sampled respondents revealed the constraints experienced and suggestions proffered by extension professionals in using technology dissemination systems of State Department of Agriculture (SDA) and ranking of the constraints by respondents.

Constraints Perceived by the Extension Professionals on Technology Dissemination System of SDA

A list of constraints faced by Andhra Pradesh extension Professionals with respect to technology dissemination system of SDA and the ranking of those constraints are presented in the Table 2.

It was evident from Table 2 that majority of the extension Professionals perceived that 'technical and infrastructure problems' was the most important and first ranked constraint. The other most important constraints as perceived by extension Professionals were lack of training to employees on technology dissemination methods, accessibility to the ICT tools, uncontrollable changes in technology delivery methods, availability of required inputs to conduct demonstrations and lack of awareness on new approaches of technology dissemination were the key impediment factors which affect the performance of extension Professionals. Insufficient financial assistance, erratic internet connectivity, lack of political consensus and commitment to policy issues on technology dissemination by government, availability of accurate information with respect to technology delivery methods of SDA and Insufficient number of technology dissemination tools in the organization were moderately important constraints. The least important constraints were lack of adequate database with respect to technology dissemination methods of SDA, lack of proper organizational support for technology dissemination and poor government commitment to implementation of policies and programmes in agriculture for technology dissemination were the least ranked constraints as perceived by extension Professionals.

Table 1. Categorisation of constraints and suggestions based on Decision rule

| S. No. | Constraints (Mean Scores) | Suggestions (Percentages) | Category |
|--------|---------------------------|---------------------------|----------------------------|
| 1 | 3.5 - above | 70% - above | Most Important (MI) |
| 2 | 3.0 - 3.49 | 51% - 69% | Moderately Important (MDI) |
| 3 | 1.0 - 2.99 | 1% - 50% | Least Important (LI) |

The probable reason behind the findings might be that the effective delivery of technology/information to the farming community directly related to the technical skills of the extension Professionals and infrastructural facilities that could be provided by the Department. Majority of the extension Professionals perceived that, they have not had adequate technical expertise to work up to their full potential and SDA could not afford the required infrastructural facilities to disseminate the information regarding the schemes and programmes. The number of trainings undergone by the extension Professionals on technology delivery methods of SDA directly influences the performance output in the Department. Indeed, it is so imperative to plan and develop a training module which bestow the ground level extension functionaries to work effectively with the ever-changing climatic conditions and farmer needs. Accessibility to the ICT tools in most of the rural areas of Andhra Pradesh is another major obstacle, where government intervention should be there to enhance the quality of internet connectivity to reach the unreached. There is near absence of training and re-training of both the extension workers and farmers on new innovations as the extension workers are not adequate to take care of the teeming population of the farmers (Lawallro, 2014). Therefore, the performance of the extension

Professionals to be effective, the identified constraints need to be given utmost importance in planning the training programmes. The results are in line with the findings of the study entitled farmers and extension Professionals view of constraints to effective agricultural extension services delivery in oyo state, Nigeria where lack of trainings on technology dissemination methods was the major constraint as perceived by extension Professionals (Apantaku *et al.* 2016).

Suggestions on Technology Dissemination System of SDA as perceived by the Andhra Pradesh Extension Professionals

A list of suggestions given by extension Professionals on technology dissemination system of SDA are presented in the Table 3.

The findings of the Table 3 reveals that, the first most important suggestion to overcome the constraints with respect to the technology dissemination system of SDA was the vacant posts in the Department should be filled regularly to reduce the overburden on existing extension professionals (80%). The other most important suggestions proffered by extension Professionals were organizing training programmes on latest technology dissemination methods like ICT tools (76%), providing a greater number of supporting staffs (74%) and perceived

Table 2. Ranking of constraints as perceived by the extension Professionals on technology dissemination system of SDA

| Sl. No. | Constraints | Extension Professionals (n=100) | | |
|---------|---|---------------------------------|------|---------|
| | | Mean scores | Rank | Remarks |
| 1 | Technical and infrastructure problems | 4.03 | 1 | MI |
| 2 | Lack of training to employees on technology dissemination methods | 3.91 | 2 | MI |
| 3 | Accessibility to the ICT tools | 3.85 | 3 | MI |
| 4 | Uncontrollable changes in technology delivery methods | 3.8 | 4 | MI |
| 5 | Availability of required inputs to conduct demonstrations | 3.72 | 5 | MI |
| 6 | Lack of awareness on new approaches of technology dissemination | 3.55 | 6 | MI |
| 5 | Insufficient financial assistance | 3.48 | 7 | MDI |
| 8 | Erratic Internet connectivity | 3.35 | 8 | MDI |
| 9 | Lack of political consensus and commitment to policy issues on technology dissemination by government | 3.26 | 9 | MDI |
| 10 | Availability of accurate information with respect to technology delivery methods of SDA | 3.16 | 10 | MDI |
| 11 | Insufficient number of technology dissemination tools in the organization | 3.08 | 11 | MDI |
| 12 | Lack of adequate database with respect to technology dissemination methods of SDA | 2.93 | 12 | LI |
| 13 | Lack of proper organisational support for technology dissemination | 2.70 | 13 | LI |
| 14 | Poor government commitment to implementation of policies and programmes in agriculture for technology dissemination | 2.41 | 14 | LI |

(MI = Most Important; MDI = Moderately Important; LI = Least Important)\

work load should be reduced (70%). Technology dissemination methods and schemes of SDA should be planned according to the farmers' needs (68%), internet connectivity should be better in agricultural offices (66%), considering field level extension Professionals suggestions in developing technology dissemination methods (65%), provide transportation facility to visit farmers field (62%), provision of more financial assistance (61%), providing good audio visual aids and infrastructural facilities for technology dissemination (57%) and coordination and planning among extension Professionals should be enhanced (55%) were moderately important suggestions. Provide enough freedom in the job to implement technology dissemination methods (50%) was perceived as least important suggestion by the extension Professionals.

Majority of the respondents suggested that, vacant posts in the Department should be filled up regularly to reduce the overburden on existing extension professionals as the first suggestion. The recruitment process in the Department is not regular from the past few years which resulted the number of vacant posts. The vacant posts in different parts of the state were undertaken by some in-charge officials in the Department to implement the schemes

and programmes. Hence, the existing extension Professionals in the department is responsible for a greater number of activities than his proficiency which results the lack of effective performance from the extension Professionals. Next most important suggestion is that, organizing training programmes on latest technology dissemination methods like ICT tools. The emerging technological innovations in communication networks aims the quick information dissemination with greater accuracy. Extension Professionals needs to cope up with emerging trends in agricultural technology to be effective in the organization. So, they suggested for the increased number of training programmes on ICT tools for effective information dissemination. The necessity for modern approaches of technological information dissemination was recognized by extension staff as a means of bridging the knowledge gap between the farming and scientific sectors. They recommended increasing the amount of training programmes on cutting-edge strategies for efficient technology diffusion to the farming community (Swanson, 2008).

Providing a greater number of supporting staff was the other most important suggestion given by the respondents. The extension Professionals felt

Table 3. Suggestions given by Andhra Pradesh extension Professionals on the technology dissemination methods of SDA

| Sl. No. | Suggestions | Andhra Pradesh extension Professionals (n=100) | | |
|---------|--|--|------------|---------|
| | | Frequency | Percentage | Remarks |
| 1 | Vacant posts in the Department should be filled regularly to reduce the overburden on existing extension professionals | 80 | 80 | MI |
| 2 | Organizing training programmes on latest technology dissemination methods like ICT tools | 76 | 76 | MI |
| 3 | Providing a greater number of supporting staffs | 74 | 74 | MI |
| 4 | Perceived work load should be reduced | 70 | 70 | MI |
| 5 | Technology dissemination methods and schemes of SDA should be designed according to the farmers needs | 68 | 68 | MDI |
| 6 | Internet connectivity should be better in agricultural offices | 66 | 66 | MDI |
| 7 | Considering field level extension Professionals suggestions in developing technology dissemination methods. | 65 | 65 | MDI |
| 8 | Provide transportation facility to visit farmers field | 62 | 62 | MDI |
| 9 | Provision of more financial assistance. | 61 | 61 | MDI |
| 10 | Providing good audio-visual aids and infrastructural facilities for technology dissemination | 57 | 57 | MDI |
| 11 | Coordination and planning among extension Professionals should be enhanced | 55 | 55 | MDI |
| 12 | Provide enough freedom in the job to implement technology dissemination methods of State department of agriculture | 50 | 50 | LI |

(MI = Most Important; MDI = Moderately Important; LI = Least Important)

that, the geographical area and number of farmers needs to be covered by them is very much high. Hence, to cater the needs of farming community, supporting staff role is mandatory for improved performance. 'Perceived work load should be reduced' was the other most important suggestion given by the respondents. In the current scenario considering the diversified needs of the farming community, there is a greater need to take up daily based activities for providing need-based solutions. Because of this, perceived work load of the extension Professionals was relatively increased. So, they suggested that, the workload should be reduced to derive the employee satisfaction and effective performance. 'Technology dissemination methods and schemes of SDA should be planned according to the farmers needs' was the moderately important suggestion given by the respondents. The information delivered through SDA programmes and schemes should be relevant and valid to their needs, problems and locations. Hence, extension Professionals thought that a comprehensive problem driven/need driven approach of technology dissemination methods produces grater satisfaction to the farmers. It's critical to understand that there is no one extension approach that works in every circumstance or for every purpose. Programmes for sustainable extension and rural development cannot be approached in a "one size fits all" manner. It is crucial to establish extension strategies that are specific to each place. The best-fit approach embraces both the pluralism of approaches used today and the diversity found within technology dissemination systems (Birner *et al.*, 2009).

Internet connectivity should be better in agricultural offices (66%), considering field level extension Professionals suggestions in developing technology dissemination methods (65%), provide transportation facility to visit farmers field (62%), provision of more financial assistance (61%), providing good audio visual aids and infrastructural facilities for technology dissemination (57%) and coordination and planning among extension Professionals should be enhanced (55%) were other moderately important suggestions expressed by the extension Professionals. 'Provide enough freedom in the job to implement technology dissemination method' (50%) was the least important suggestion expressed by the respondents. Hence, to improve the performance effectiveness of an extension Professionals the above said constraints should keep in mind along with

available resources for effective implementation at the grass root level of farming community. The suggestions are in line with the findings of Kedarnath *et al.*, (2013) who reported that the in-time availability of agricultural inputs, material availability, new technology and training in time, basic facilities improved the performance of Agricultural officers and in turn improved the farming community.

Conclusion

In conclusion, among the constraints experienced by extension professionals, technical and infrastructure problems was a major constraint followed by lack of training to employees on technology dissemination methods, accessibility to the ICT tools, uncontrollable changes in technology delivery methods, availability of required inputs to conduct demonstrations and lack of awareness on new approaches of technology dissemination were most important constraints. Majority of the extension Professionals suggested that, vacant posts in the Department should be filled regularly to reduce the overburden on existing extension professionals as a most important suggestion followed by requirement of training programmes on latest technology dissemination methods like ICT tools, providing a greater number of supporting staffs and perceived work load should be reduced were the other most important suggestions. The reported constraints need to be addressed seriously by the policy makers and government duly considering the extension professionals suggestions forenhanced and timely dissemination of agricultural information and technologiesto the farming community.

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Conflict of interest

Authors do not have any conflict of interests that are

directly or indirectly related to the work submitted for publication.

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