



## Role Performance of Agricultural Input Dealers in Agro-advisory Services in West Bengal

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### ABSTRACT

Agricultural input dealers, among many agencies in pluralistic extension systems, have the highest reach to farmers based on their location advantage, rapport building, and ease of accessibility. The study was conducted in two districts of West Bengal viz. Purba Bardhaman and Hooghly in 2020 to measure the role performance of agricultural input dealers in agro-advisory services. Eighty agricultural input dealers from these two districts were selected using random sampling procedure. Data was collected using personal interview method. Independent variables included personal and socio-economic, psychological, and communication variables. Majority of the variables were found to have a significant positive contribution to the role performance. In addition, variables such as cosmopolitanism, extension participation, credit orientation, information sharing behaviour, and types of inputs sold were found to have a significant positive contribution and explained about fifty-seven percent variation of the dependent variable. Path analysis showed that types of inputs sold had highest direct effect. Also, through this highest indirect effect of maximum variables had channelized.

### INTRODUCTION

Agriculture is India's leading employment generating sector, catering to almost 69 per cent of India's population as their livelihood. The agricultural sector in India was able to have a record food grain production of 296.65 million tonnes in 2019-20 and 310.74 million tonnes in 2020-21. India is also estimated to reach the milestone of 316.06 million tonnes of food grain production in 2021-22 (PIB, 2022). Small and marginal farmers predominate the context of Indian agriculture. They often lack resources, advanced knowledge, and technologies. They, with less than two hectares of land, account for almost 86.08 percent of all farmers in India. However, their landholding is only 47.30 per cent of the total crop area (Agricultural Census, 2015-16). Thus, extension advisory services with information, technology, and services should meet the needs and interests of these small and marginal farmers timely and

efficiently. Lack of knowledge is also a serious constraint in adoption of improved technologies such as IPM (Gupta et al., 2020). Sustainable development of farmers depends on proper consumption of information (Sinha, 2018). However, the ratio of extension agents to farmers has reduced than the recommended rate of 1:750 (Ravi, 2019), creating a gap between the situation that should have been and the prevailing situation.

Pluralistic extension system is a solution to this serious problem. Support of multi-agency in input and service delivery can play a crucial role in enhancing the effectiveness of extension advisory services. It is successful in areas where farmers are resource-poor by providing appropriate technologies and integrated extension services, including marketing facilities (Mukherjee & Maity, 2015). Several studies have indicated that agricultural input dealers are one of the important nodes of the social network of farmers, from where they can get information and knowledge on

various agricultural aspects. In India, there is an extensive network of almost three lakhs input dealers and is one of the most important sources of agricultural information in India after progressive farmers. They have advantage of the location, strong understanding, and easy accessibility to the farmers. Adoption of scientific practices in a farming system relies highly on the knowledge of the farmers (Nain & Chandel, 2013), and for that credibility should be placed on localized information sources (Bhagat et al., 2004; Ravikumar et al., 2015; Nain et al., 2015; Panda et al., 2019). Agricultural input dealers are best of those localized sources of information. National Institute of Agricultural Extension and Management (MANAGE), has initiated the Diploma in Agricultural Extension Services for Input Dealers (DAESI) in 2003, for building their technical competency in agriculture and facilitating them to act as para-extension professionals (MANAGE, 2012). In this context, study was undertaken to measure the role performance of agricultural input dealers in West Bengal.

### METHODOLOGY

The state of West Bengal was purposively selected for the study. Two districts viz. Purba Bardhaman and Hooghly were purposively selected. Both Purba Bardhaman and Hooghly districts were having four sub-divisions each. One block was selected randomly for the study from each subdivision, thus making eight blocks. Ten agricultural input dealers were randomly selected from each block as respondents. Thus, making a total sample size of eighty (80) agricultural input dealers. Criteria used for the selection of respondents included that agricultural input dealers must have undergone a Diploma in Agricultural Extension Services for Input Dealers (DAESI) programme, dealers should get their dealership license renewed regularly and the areas should have a large number of input dealers operating.

Role-performance was operationally defined as the manner in which the input dealers carry out or perform their perceived roles of agro-advisory services. A schedule developed by Ganiger (2012) with suitable modifications was used to measure the role-performance of agricultural input dealers in agro-advisory services. The schedule consisted of twenty-four items, which were validated with the help of experts and were measured on five-point continuum, i.e., most often (MO), often (O), sometimes (ST), Seldom (S), and never (N). The possible score for one respondent ranged between 24 to 140, which was then normalized. Cumulative square root frequency method was used to categorize the respondents into high, medium, and low levels of role performance. Data was collected from the respondents with the help of personal interview method. 'Exploratory' research design was employed for this study.

Appropriate variables were selected for this study after an extensive literature review and consultation with experts. Independent variables were selected under the category of personal and socio-economic variables, psychological variables and communication variables. Correlation analysis was used to measure the relationship between the selected independent variables and the role performance of agricultural input dealers in agro-advisory services, followed by multiple linear regression to find out the relative contribution of the selected independent variables and their

combined effect on role-performance. To find out the channelising effect of the independent variables on the role performance of agricultural input dealers, path coefficient analysis was used.

### RESULTS AND DISCUSSIONS

#### Item wise analysis of role performance of agricultural input dealers

The result given in Table 1 reveals hundred percent of the respondents had agreed to items like 'Delivering relevant and appropriate agro-advisory services to the farmers', 'Sending report to the company agents/agriculture officer regarding any serious pest and diseases problems and natural calamities prevailing in the area', 'Visiting the farmers field on fixed day to observe field activities and conditions of crops', 'Actively participating in training sessions conducted by company/AOs to gain knowledge and skills on new technologies and agro-advisory services', 'Holding regular meetings with farmers and rural institutions to discuss location specific problems'. Items viz. 3,5,6,9,10, 12,16,17,20 &21 (Table 1) were agreed upon by a majority of the farmers. Input dealers in the locale of the study, after going through the DAESI programme, felt the need to emerge as para-extension professionals. They provided solutions to the farmers as and when needed by the clients. This emerged as a 'win-win' situation for them, with farmers getting more and more advisory services from them, the more trust and credibility they are building and ultimately positioning them as repeat customers for the input dealers. Besides, respondents were keen to learn new technology, package of practices, etc., and transfer it to the farmers for better use. They regularly monitored the prevailing agricultural scenario in the farmer's field and helped them diagnose any disease infestations in the field. Respondents held regular meetings, training sessions, and demonstrations with farmers and experts and helped line departments implement any agriculture and allied activities schemes. Getting feedback from the farmers regarding any agro-advisory services also helped them emerge out to the farmer as the 'closest aid in any farming problem'. Input dealers used various modes of advertisements for awareness generation, knowledge dissemination, and advertising about their business. Among various modes of advertisements, progressive farmers stood out to have the highest rank (Panja, 2020). However, it was found 1 that respondents had not commercialized providing agro-advisory services. Items such as 'Providing agro-advisory services to the farmers on credit basis', 'Maintaining a daily record on agro-advisory services discussed with farmers', 'Working out the credit requirements and expenditure on agro-advisory services provided to farmers annually' had received most minor agreements from a majority of the farmers. They were neither selling agro-advisory services to the farmers nor maintaining any daily records for providing agro-advisory services to the farmers. Instead, they considered an integral part of their business as an agricultural input dealer. As discussed earlier, providing appropriate agro-advisory services and emerging as para-extension professionals were helping them grow their primary business, with an increasing frequency of repeat customers. Singh et al., (2021) conducted a research on input dealers for assessing their training needs in Banda district of Uttar Pradesh and had specified the areas where the respondents should

**Table 1.** Item wise analysis of role performance of agricultural input dealers in agro-advisory services

S.No.	Items of role performance of input dealers in agro-advisory services	Mean score	Percent of score obtained
1	Delivering relevant and appropriate agro-advisory services to the farmers	5.00	100
2	Sending report to the company agents/agriculture officer regarding any serious pest and diseases problems and natural calamities prevailing in the area	5.00	100
3	Visiting the farmers field on fixed day		
	i. To observe field activities and conditions of crops	5.00	100
	ii. To probe about the problems and suggest suitable measures	4.51	90.25
	iii. To assess extent of adoption of recommended agro-advisory services and reasons for non-adoption	3.38	67.75
	iv. To detect the incidence of pests, diseases, and natural disorders	4.41	88.25
4	Providing agro-advisory services to the farmers on credit basis	1.13	22.50
5	Reporting to the company/department of agriculture special achievements of farmers by using agro-advisory services provided by them	4.89	97.75
6	Evaluate the feasibility of agro-advisory services in field conditions	4.67	93.50
7	Provide high quality agro-advisory services to the farmers at low-cost	1.13	22.50
8	Attending training season to learn how to convince the farmers regarding adoption of any agro-advisory services	3.81	76.25
9	Motivating the farmers to adopt new and additional recommended agro-advisory services	4.65	92.75
10	Conducting campaign / demonstrations / seminars etc. on productive technologies related to diverse income generating enterprises for farmers	4.53	90.75
11	Actively participating in training sessions conducted by company/AOs to gain knowledge and skills on new technologies and agro-advisory services	5.00	100
12	Arranging field visit for company agents for getting solutions to problems of farmers which he is unable to get satisfactory solutions	4.85	97.00
13	Maintaining a daily record on agro-advisory services discussed with farmers	1.16	23.25
14	Aware of the demand and availability of agro-advisory services on new technologies and products prevailing in the market	4.36	87.25
15	Holding regular meetings with farmers and rural institutions to discuss location specific problems	5.00	100.00
16	Proper utilisation of mass media to disseminate agro advisory services	4.58	91.75
17	Preparing training schedules based on training content required for farmers	4.80	96.00
18	Assessing type of agro-advisory services essential in the area	4.26	85.25
19	Implementing government / company sponsored agriculture related programme.	2.68	53.75
20	Supervising the development of adoption of agro-advisory services	4.76	95.25
21	Regularly receiving feedback from farmers regarding the agro-advisory services provided to them	4.67	93.50
22	Attend any other work assigned by company/government authorities that do not conflict with the essential duties	3.71	74.25
23	Attentive against occurrence of pest and diseases of different crops in the area	3.57	71.50
24	Working out the credit requirements and expenditure on agro-advisory services provided to farmers annually	1.5	30.00

be given training for improving their business as well as their role performance in agro-advisory services.

### Relationship between independent variables and role performance

It was found in the correlation analysis (Table 2), that education, cosmopolitaness, types of input sold, self-confidence, extension contact, extension participation, deferred gratification, credit orientation, social participation, and information sharing behaviour had a significant positive relationship with role performance of agricultural input dealers in providing agro-advisory services to the farmers. Training received and mass media participation had a significant positive relationship with the dependent variable at a five percent significance level. The good education background of the input dealers had broadened their horizons in comprehending prevailing agricultural scenarios and providing the farmers with appropriate agro-advisory services needed for their farming activity and the right solution to the problem they are facing. More diverse types of inputs they were selling, more was their possession of the latest knowledge and information about various types of products. The result got a similarity to Ganiger (2012). Regular interaction with experts,

**Table 2.** Correlation coefficients between independent variables and role performance

S.No.	Profile characteristics	Role performance in agro-advisory services
1	Age	0.138
2	Education	0.372**
3	Annual income	0.059
4	Location of the enterprise	0.036
5	Cosmopolitaness	0.349**
6	Experience as input dealer	0.16
7	Types of agricultural inputs sold	0.512**
8	Self-confidence	0.437**
9	Training received	0.244*
10	Extension contact	0.424**
11	Extension participation	0.379**
12	Deferred gratification	0.316**
13	Competition orientation	0.176
14	Credit orientation	0.327**
15	Level of aspiration	0.067
16	Social participation	0.339**
17	Mass media participation	0.267*
18	Mode of advertisement	0.211
19	Empathy	0.111
20	Information sharing behaviour	0.378**

\*\* p< 0.01(2 tailed), \* p< 0.05(2 Tailed)

manufacturing companies, extension agents, KVKs, and other fellow input dealers, as well as participation in various activities such as training, demonstrations, etc., had helped them to learn about the latest information in agriculture, technology, modern agricultural skills, package of practices, etc. from various sources, resulting in having the significant positive effect of cosmopolitaness, social participation, mass media participation, training received, extension contact and extension participation were also having significant positive effect on role-performance of agricultural input dealers. The findings were in similar line with Anitha (2005); Ganiger (2011); Singh et al., (2016); Sharma (2017); Mamatha (2018).

Respondents also had good information sharing behaviour. Timely sharing of relevant information with farmers helped them build rapport with them and effectively play the role of a professional para-extension worker. Self-confidence was having a positive and significant relationship with the role performance of agricultural input dealers in agro-advisory services. Self-confidence in running the business motivated the agricultural input dealers to learn more about the latest technology and information and pass it on to the farmers. Self-confidence was having a significant positive

relationship with role performance of agricultural input dealers. The result found a similarity with Anitha (2005).

Table 4 shows the results of the multiple linear regression analysis carried out. The R<sup>2</sup> value in the regression model says that all the independent variables could explain 64.40 percent variation in the role performance of agricultural input dealers. Among all the independent variables, types of agricultural inputs sold and credit orientation were significant contributors at a one percent level of significance. Another independent variable, cosmopolitaness, was a significant contributor at a five percent level of significance. Considering a large number of non-significant independent variables, backward regression analysis was carried out to eliminate the least contributing variable at each step and simultaneously identify the highest significant contributing variables. The result of backward regression analysis shows that cosmopolitaness, extension participation, credit orientation, information sharing behaviour, types of agricultural inputs sold were having significant contributions and could explain about 57 per cent of the variation of the dependent variable. The credit orientation of an input dealer is significantly related to the growth of his business, which in turn

**Table 3.** Linear multiple regression analysis of independent variables with role performance

Independent variables	Unstandardized coefficients		Standardized coefficients	t	P-value
	B	Std. error	Beta		
(Constant)	-23.818	12.296		-1.937	.058
Age	.116	.097	.105	1.200	.235
Education	.134	.101	.140	1.322	.191
Location of the enterprise	-.029	.084	-.036	-.348	.729
Income	-.164	.102	-.161	-1.602	.114
Cosmopolitaness	.211	.098	.224	2.167*	.034
Experience as input dealer	.031	.075	.038	.414	.680
Types of agricultural inputs sold	.407	.095	.472	4.304**	.000
Self-confidence	.054	.128	.044	.422	.675
Training received	-.102	.114	-.096	-.889	.378
Extension contact	.032	.108	.033	.296	.768
Extension participation	.185	.115	.176	1.611	.113
Deferred gratification	.179	.108	.171	1.665	.101
Competition orientation	-.056	.089	-.060	-.632	.530
Credit orientation	.282	.090	.286	3.118**	.003
Level of aspiration	-.111	.079	-.124	-1.408	.164
Social participation	-.099	.083	-.118	-1.196	.236
Mass media participation	.105	.091	.122	1.153	.253
Mode of advertisement	-.014	.064	-.021	-.225	.823
Empathy	.027	.090	.027	.298	.767
Information sharing behaviour	.156	.085	.167	1.835	.072

R<sup>2</sup>= 0.644 F= 5.333\*\*, \*\*p< 0.01 level (2 tailed) \*, p< 0.05 level (2 Tailed)

**Table 4.** Backward regression analysis of independent variables with role performance

Independent variables	Unstandardized coefficients		Standardized coefficients	t	P value
	B	Std. error	Beta		
(Constant)	-23.125	8.301		-2.786	.007
Cosmopolitaness	.274	.072	.291	3.792	.000
Extension participation	.189	.085	.180	2.223	.029
Credit orientation	.275	.076	.279	3.597	.001
Information sharing behaviour	.206	.074	.221	2.783	.007
Types of agricultural inputs sold	.382	.068	.443	5.586	.000

R<sup>2</sup> = 0.570 F= 19.652\*\*, \*\* p< 0.01(2 tailed), \* p< 0.05(2 Tailed)

**Table 5.** Path analysis of independent variables on role performance

Variables	Direct effect	Indirect effect	Total effect	Variable through which highest substantial indirect effect got channeled
X1 Age	0.105	0.033	0.138	0.06935 (X7)
X2 Education	0.14	0.232 (6 <sup>th</sup> )	0.372 (6 <sup>th</sup> )	0.08667 (X7)
X3 Location of the enterprise	-0.036	0.072	0.036	0.02826 (X11)
X4 Annual income	-0.161	0.22	0.059	0.08099 (X7)
X5 Cosmopolitaness	0.224 (3 <sup>rd</sup> )	0.125	0.349	0.04775 (X12)
X6 Experience as input dealer	0.038	0.122	0.16	0.05042 (X11)
X7 Types of inputs sold	0.472 (1 <sup>st</sup> )	0.04	0.512 (1 <sup>st</sup> )	0.04488 (X11)
X8 Self-confidence	0.044	0.393 (2 <sup>nd</sup> )	0.437 (2 <sup>nd</sup> )	0.19418 (X7)
X9 Training received	-0.096	0.34 (4 <sup>th</sup> )	0.244	0.0814 (X5)
X10 Extension contact	0.033	0.391 (3 <sup>rd</sup> )	0.424 (3 <sup>rd</sup> )	0.14234 (X7)
X11 Extension participation	0.176 (4 <sup>th</sup> )	0.203	0.379 (4 <sup>th</sup> )	0.12028 (X7)
X12 Deferred gratification	0.171 (5 <sup>th</sup> )	0.145	0.316	0.0876 (X14)
X13 Competition orientation	-0.06	0.236 (5 <sup>th</sup> )	0.176	0.06091 (X7)
X14 Credit orientation	0.286 (2 <sup>nd</sup> )	0.041	0.327	0.05257 (X12)
X15 Level of aspiration	-0.124	0.191	0.067	0.06652 (X14)
X16 Social participation	-0.118	0.457 (1 <sup>st</sup> )	0.339	0.1094 (X7)
X17 Mass media participation	0.122	0.145	0.267	0.0875 (X5)
X18 Mode of advertisement	-0.021	0.232	0.211	0.06396 (X2)
X19 Empathy	0.027	0.084	0.111	0.03812 (X17)
X20 Information sharing behaviour	0.167 (6 <sup>th</sup> )	0.211	0.378 (5 <sup>th</sup> )	0.06054 (X7)

Residual value: 0.3563

is related to his role performance in agro-advisory services. With the growth of his business, he would diversify his sale into various types of inputs. His knowledge would also diversify and strengthen his presence as a para-extension worker. Participating in various extension activities such as field days, demonstrations, exhibitions, workshops, etc., helped the respondents develop their cognition of several technologies and services and developed their communication ability to convince their clients to adopt any technologies or services beneficial. Besides, good information sharing behaviour of the respondents in his strong network with progressive farmers, neighbours, other fellow input dealers, etc., had assisted them in building rapport with the farmers and traversing the last mile for improving their role performance in agro-advisory services.

#### Path analysis of independent variables on role performance

As presented in Table 5 the results of path analysis show the channelizing effect of the independent variables on the dependent variable, i.e., role performance of agricultural input dealers in agro-advisory services. Types of inputs sold had the highest total effect of 0.512, followed by self-confidence (0.437) and extension contact (0.424). With respect to the direct effect of independent variables, types of inputs sold had the highest direct effect of 0.472, followed by credit orientation (0.286) and cosmopolitaness (0.224). Social participation had the highest indirect effect of 0.457, followed by self-confidence (0.393) and extension contact (0.391). It is also clear from Figure 2 that through variable X7, i.e., types of inputs sold, the highest indirect effect had been channelized. Highest indirect effect of nine other independent variables had been channelized through this variable, followed by X11, i.e., extension participation, through which the highest indirect effect of three other variables had been channelized. Value of the residual effect in the path analysis reveals that despite splitting of the effect of independent variables into direct and indirect effect, 35.61 percent of the variation in the

role performance of agricultural input dealers in agro-advisory services could not be explained and required more variables to be incorporated to explain this variation.

Considering correlation analysis, regression analysis, and path analysis, it can be concluded that agricultural input dealers should be encouraged and trained about diverse types of inputs for selling. This would increase farmers' ease of accessibility of various inputs from a single input dealer and enhance the role performance of the agricultural input dealers in providing agro-advisory services to them. Input dealers should also be encouraged to increase their participation in any extension activity to gain practical knowledge about various agricultural scenarios and farmers' psychological components, decision-making abilities, and thought processes. Furthermore, input dealers should be encouraged to build a robust social network with the farmers and increase their information sharing behaviour for swift dissemination of information to them. Policy advocates should also consider improving the agricultural input dealers' financial knowledge and credit orientation. This would help them grow their business and diversify their sales, which strongly relates to their role performance in agro-advisory services.

#### CONCLUSION

Among many agencies of pluralistic extension system, agricultural input dealers had the best reach to the farmers in providing inputs and new technologies and other agro-advisory services. Majority of the respondents consider their role in providing agro-advisory services as an integrated part of their business. Majority of the profile characteristics of the respondents profile characteristics have a significant positive relationship with their role performance. Factors such as cosmopolitaness, extension participation, credit orientation, information sharing behaviour, and types of inputs sold had a vital contribution to the variation of the dependent variable and thus should be given due importance. The

results of this study would be helpful in policy advocations on agricultural input dealers for improving their ability and performance as para-extension workers. Further studies on the role-performance of agricultural input dealers in various agro-climatic zones are suggested to get a generalized view of the role performance of agricultural input dealers in agro-advisory services.

### REFERENCES

- Anitha, B. N. (2005). A study on knowledge, attitude and training needs of agricultural input dealers in eastern dry zone of Karnataka. *M.Sc., Thesis*, University of Agricultural Sciences, Bangalore. <https://krishikosh.egranth.ac.in/handle/1/5810086590>
- Bhagat, G. R., Nain, M. S., & Narda, R. (2004). Information sources for agricultural technology. *Indian Journal of Extension Education, 18*(3&4), 32-39.
- Ganiger, S. (2012). Knowledge, perception and role performance of input dealers in agro advisory services in northern dry zone of Karnataka. *M. Sc., Thesis*, Acharya NG Ranga Agricultural University, Hyderabad, India. <https://krishikosh.egranth.ac.in/handle/1/66814>
- Government of India. (2019). Agriculture Census. 2015-16. All India report on number and area of operational holdings. Agriculture Census Division, Department of Agriculture, Cooperation & Farmer's welfare, Ministry of Agriculture, Government of India. Retrieved from [https://agcensus.nic.in/document/agcen1516/T1\\_ac\\_2015\\_16.pdf](https://agcensus.nic.in/document/agcen1516/T1_ac_2015_16.pdf)
- Government of India. (2020). Agriculture Statistics. 2020 Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmer's welfare, Ministry of Agriculture, Government of India. Retrieved from [https://eands.dacnet.nic.in/PDF/Agricultural%20Statistics%20at%20a%20Glance%20-%202020%20\(English%20version\).pdf](https://eands.dacnet.nic.in/PDF/Agricultural%20Statistics%20at%20a%20Glance%20-%202020%20(English%20version).pdf)
- Gupta, B. K., Mishra, B. P., Singh, V., Patel, D., & Singh, M. P. (2020). Constraints faced by vegetable growers in adoption of IPM in Bundelkhand Region of Uttar Pradesh. *Indian Journal of Extension Education, 56*(4), 92-97.
- Mamatha, D. N. (2018). Impact of diploma in agricultural extension services for input dealers (DAESI) training on agricultural input dealers. *M.Sc., Thesis*, University of Agricultural Sciences, Bangalore. <https://krishikosh.egranth.ac.in/handle/1/5810114370>
- MANAGE, (2012). *Progress under diploma in agricultural extension services for input dealers as on 01-04-2011*. [www.manage.gov.in/daesi/daesi-distyearwiselist.pdf](http://www.manage.gov.in/daesi/daesi-distyearwiselist.pdf)
- Mukherjee, A., & Maity, A. (2015). Public-private partnership for convergence of extension services in Indian agriculture. *Current Science, 109*(9), 1557-1563.
- Nain, M. S., & Chandel, S. S. (2013). Knowledge vis a vis adoption of agri-horti system in Doda district of J&K state. *Indian Journal of Extension Education, 49*(1&2), 105-109.
- Nain, M. S., Singh, R., Mishra, J. R., & Sharma, J. P. (2015). Utilization and linkage with agricultural information sources: a study of Palwal district of Haryana state. *Journal of Community Mobilization and Sustainable Development, 10*(2), 152-156.
- Panda, S., Modak, S., Devi, Y. L., Das L., Pal, P. K., & Nain, M. S. (2019). Access and usage of Information and Communication Technology (ICT) to accelerate farmers' income. *Journal of Community Mobilization and Sustainable Development, 14*(1), 200-205. <https://indianjournals.com/ijor.aspx?target=ijor:jcmsd&volume=14&issue=1&article=037>
- Panja, A., Shivalinge Gowda, N. S., Kusumalatha, D. S., & Mamathalakshmi, N. (2021). Profile characteristics of agricultural input dealers in West Bengal. *International Journal of Current Microbiology and Applied Sciences, 10*(2), 2100-2109.
- Press Information Bureau. (2022, February 16). Second advance estimates of production of major crops for 2021-22 [Press release]. [https://pib.gov.in/PressReleasePage.aspx?PRID=1798835#:~:text=Asper 2ndAdvance Estimates for 2021-22%2C total, of food grain during 2020-21](https://pib.gov.in/PressReleasePage.aspx?PRID=1798835#:~:text=Asper%202ndAdvance%20Estimates%20for%2021-22%20C%20total,%20of%20food%20grain%20during%202020-21).
- Ravi, N., & Nedumaran, S. (2019). Agriculture extension system in India: A meta-analysis. *Research Journal of Agricultural Sciences, 10*(3), 473-479.
- Ravikumar, K., Nain, M. S., Singh, R., Chahal, V. P., & Bana, R. S. (2015). Analysis of farmers' communication network and factors of knowledge regarding agro-metrological parameters. *Indian Journal of Agricultural Sciences, 85*(12), 1592-96.
- Sharma, K. C. (2017). A study on the entrepreneurial behaviour of agri-inputs retailers in Bilaspur district of Chhattisgarh. *M.Sc., Thesis*, Indira Gandhi Krishi Vishwavidyalaya, Raipur. <https://krishikosh.egranth.ac.in/handle/1/5810038015>
- Singh, A. K., De, H. K., & Pal, P. P. (2016). Training needs of agro-input dealers in South 24 Parganas District of West Bengal. *Indian Research Journal of Extension Education, 15*(2), 7-10.
- Singh, N., Gupta, B. K., & Gautam, U. S. (2021). Training needs assessment of agro-input dealers in Banda district of Uttar Pradesh. *Indian Journal of Extension Education, 57*(2), 56-62.
- Sinha, A. K. (2018). Information seeking behaviour and role of mass media in socio-economic of the Santals of Birbhum, West Bengal. *Journal of Library and Information Sciences, 8*(2), 237-246.