



Farmers' extension priorities and service quality of extension agencies: Evidences from Maharashtra state of India

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ABSTRACT

The present study was carried out in Akola block of Akola district of Maharashtra to identify the extension priorities of cotton farmers as well as to assess the comparative effectiveness of selected extension agencies, viz. Department of Agriculture, KVK, Input agencies and NGOs against selected service quality indicators. Descriptive statistics were used to analyse extension priorities of the cotton farmers. Major information and training needs were related to pest management and pesticide application while timely access to seeds, fertilizers and pesticides was the major service required. Seventeen indicators under seven dimensions namely 'access', 'assurance', 'empathy', 'reliability', 'responsiveness', 'tangibility' and 'timeliness' were used for comparison of agencies using Analytical Hierarchy Process (AHP). The comparison of overall effectiveness of the selected agencies showed that input dealers were most effective followed by department of agriculture and KVK.

Key words: Comparative effectiveness, Extension agencies, Extension priorities, Service quality, AHP

Agricultural extension system in India at present is not monolithic in nature. A large numbers of agencies public, private NGO and civil society sectors- evolved over time for the provision of information, advisory and support services to farming community. Weakening of public extension, diverse nature and changing demands of farming community and the scope for new entities were the major determinants of such a transformation. Pluralism in agricultural extension *per se* acknowledges the existence and potential of all these entities. Since the pluralism has become the norm, the next question is about their effectiveness in addressing the extension priorities of the farmers. Effectiveness is in turn determined by their service quality and hence improving service quality of extension agencies is imperative.

Cotton is a major crop and important commercial crop in India. The country has the legacy of cotton cultivation from time immemorial. With its importance in textile industry cotton is adding to the agricultural and industrial growth of the country. It is providing livelihood to millions across the value chain. India is the second largest producer of cotton in the world contributing to 36.5% of world's cotton production and has highest area under cotton in the world. Still there exist vast potential to improve the production and productivity of cotton in India. To sustain

the momentum in cotton production there should be remunerative income for the farmers. It depends on many aspects like increase in production, decrease in cost of cultivation, better price realization, reduced transaction cost, timely availability of inputs, access to market etc. To make gains of most of it farmers need quality information, advisory and support services in right time. Being a cash crop, cotton is an information intensive crop. Cotton farmers require information advisory and support services across the value chain. Information is required not only in relation to production, but in the context of post-harvest and marketing activities also.

Cotton farmers access information, advisory and support services from variety of actors in the agricultural innovation system. Assessing their extension priorities is imperative to formulate need based extension strategies by different extension agencies. In Akola district of Maharashtra, where cotton is the major crop, farmers were found to access different sources to address their extension priorities. The different actors will have varying strength in diverse arenas. For example, strength of KVKs lies more in training, capacity development and front line demonstration; but with limited out reach. So, it is better to compare the agencies on indicators which are related to quality of service provision. Such a comparison can help in identifying areas of strength and weakness of the selected agencies with respect to effectiveness of service provision.

MATERIALS AND METHODS

The present study was carried in Akola block of Akola

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district of Maharashtra. Extension priorities (Information, training and support service needs) of 120 randomly selected cotton farmers were assessed by using a five-point likert type continuum. Further respondents were classified into three categories (Low, Medium and High) based on the mean and standard deviation of their responses.

Further, to analyses the comparative effectiveness of extension agencies in terms of perceived serviced quality, 30 farmers were identified. Four agencies namely Department of Agriculture, *Krishi Vigyan Kendra* (KVK), input dealers and non governmental organizations (NGO) were selected. Analytical Hierarchical Process (AHP) was used for comparison of service quality. Indicators of service quality was used as criteria and extension agencies (Department of Agriculture, *Krishi Vigyan Kendra*, Non-Governmental Organizations and Input dealers) were identified as options in the prioritization calculation in AHP. The 17 items in the SERVQUAL inventory developed by Parasuraman *et al.* (1988) and further modified by Rana *et al.* (2013) for increasing their relevancy to agricultural extension were used as indicators of service quality. It has seven dimensions, viz. access, assurance, empathy, reliability, responsiveness, tangibility and timeliness.

The Analytical Hierarchy Process (AHP) is a decision making tool in complex situations with multiple criteria exist. The AHP was proposed by Thomas Saaty (1980), to develop priorities for making most suitable decisions. During the process a set of criteria are evaluated against set of options in pair-wise manner. Before pair-wise comparison weights were generated for each criterion based on the importance perceived by the decision makers. In the next step scores for each option is generated by pair-wise comparison of criterion. The option with higher score for a particular criterion will be the most suitable choice for that criterion. Final score for each option is calculated from criteria weight and option score. In effect, the process involves the derivation of ratio scale from pair-wise comparison through eigen vector calculation.

Following indicators (dimensions) were used for comparison of the selected agencies:

Access: Access involves approach, ability and ease of contact. It involves ease of approach and interaction. This measure consists of two items.

Assurance: It is the confidence of farmers in the service of agencies that agencies have required skill, expertise, resource and infrastructure to meet their requirements. It has four items.

Empathy: It is the measure of the interest and concern of the agencies towards individual needs and context of the farmers. It comprises of two items.

Reliability: It is the ability to provide relevant and quality service in an accurate and cost effective manner. It includes four items.

Responsiveness: It is the measure of concern and supportive service of agencies. It consists of two items.

Tangibility: It implies the physical facilities and materials for benefit of farmers. It has two items.

Timeliness: It is the measure of timely provision of response and service. It includes one item.

RESULTS AND DISCUSSION

Farmers' importance of information needs for cotton cultivation was assessed using a five-point Likert scale. Highest need for information related to cotton cultivation were found for pest management, pesticide usage, water management and soil fertility. Seed varieties and seed treatment. Medium level of information need was more for seed varieties and seed treatment (Table 1).

Important training needs expressed by majority of the cotton farmers were Integrated Pest Management followed by pesticide application and water management. Training need for composting, disease management , seed treatment and cotton bale making were given medium importance by most of the farmers (Table 2).

As far as the inputs and services needed by the farmers in both the regions, timely availability of seeds was the most prominent one followed by availability of bio pesticides and fertilizers (Table 3).

Akola and other part of Vidarbha region were haunted by farmers distress owing to multiple reasons. Many studies have pointed out that one of the major reasons for farmers distress is the indiscriminate use of pesticides, which eventually increases the cost of cultivation (Kale et al. 2014),

Table 1 Distribution of respondents according to information need in Akola (n = 120)

Information need	Low		Medium		High	
	F	%	f	%	f	%
Pest management	3	2.5	21	17.5	96	80
Disease management	30	25	48	40	42	35
Pesticide	6	5	21	17.5	93	77.5
Fertilizer	57	47.5	33	27.5	30	25
Inputs	24	20	87	72.5	9	7.5
Crop insurance	45	37.5	60	50	15	12.5
Credits and loans	35	29.2	67	55.8	18	15
Govt. Schemes	5	4.2	78	65	37	30.6
Seed varieties	15	12.5	48	40	57	47.5
Seed treatments	21	17.5	63	52.5	36	30
Best agricultural practices	27	22.5	70	66.7	23	19
Weather	18	15	84	70	18	15
Water management	6	5	38	31.7	76	63.3
Soil fertility	18	15	54	45	48	40
Agricultural machinery	30	25	78	55	12	10
Planting method	58	48.3	50	41.7	12	10
Best time to plant	75	62.5	39	32.5	6	5
Market and prices	29	24.2	70	58.3	21	17.5
Other crops to plant	56	46.7	52	43.3	12	10
Weeding	80	66.7	28	23.3	12	10
Harvesting	90	75	21	17.5	9	7.5

Table 2 Distribution of Respondents according to training needs in Akola (n = 120)

Training need	Low		Medium		High	
	f	%	f	%	f	%
Integrated Pest Management	0	0	23	19.2	97	80.8
Disease management	28	23.3	67	55.8	25	20.8
Pesticide application	7	5.8	19	15.8	94	78.3
Composting	9	7.5	78	65	33	27.5
Seed treatments	28	23.3	54	45	38	31.6
Water management	15	12.5	47	39.2	58	48.3
Bale making	17	14.2	54	45	49	40.8

and reduces the return from farming. Maharashtra is one of major pesticide consuming states followed by Punjab and Uttar Pradesh (Directorate of Plant Protection, Quarantine and Storage 2016). So information on pest management and scientific usage of pesticides were deemed important by the cotton farmers of Akola. In the same line, important training needs expressed by the cotton farmers was Integrated Pest Management followed by pesticide application and water management. Acquiring required skills in these aspects can help to successfully implement the information received. Also, Vidarbha region was facing challenges of extreme climate vagaries and water scarcity is prevalent in the region over last one and half decades (Hardikar 2010, Waghmare 2016). Kale *et al.* (2014)^b have observed during their study that 69 percentage of respondents from Vidarbha had no access to water resources, except the monsoon rains, for their fields. So, optimizing the available water for domestic and agricultural use is important. Moreover, cotton being a water intensive crop, information on water management is of critical importance.

Inputs, Plant protection and Natural resource management were the broad areas of information needs expressed by the farmers in the regions. This is not surprising as these aspects are of vital importance as far as the objectives (productivity and sustainability) of majority of the farmers are concerned. Timely access to quality inputs is always an important concern for the farmers to realize the production potential and hence the information regarding their availability. Similarly information related to plant protection (pest management, disease management, weed control etc.) assume significance in the wake of significant reduction in yield due to various biotic and abiotic factors. Further, degradation of natural resources due to over exploitation and non-judicious use of inputs has started impacting the farmers in terms of decline in resource productivity. Hence, requirement for accurate information on natural resources management is increasing overtime among the farming community.

In line with the information needs, important training needs expressed by majority of the cotton farmers were Integrated Pest Management followed by pesticide application and water management. Acquiring required skills in these aspects can help to successfully implement

Table 3 Distribution of respondents according to inputs and services needs of farmers of Akola (n=120)

Inputs and services	Low		Medium		High	
	f	%	f	%	f	%
Seed	3	2.5	18	15	99	82.5
Fertilizer	30	25	41	34.2	49	40.8
Bio-pesticides	6	5	21	17.5	93	77.5
Market linkage activities	9	7.5	81	67.5	30	25
Access to government services	24	20	87	72.5	9	7.5
Crop insurance	3	2.5	95	89.2	22	18.3
Custom hiring services	35	29.2	67	55.8	18	15

the information received. Training need for cotton bale making, points to the importance of value addition perceived by farming community to improve their share in consumer rupee.

Access to seed, fertilizer and pesticides was the major concern of farmers related to inputs and services required. Unlike the traditional farming practices where seeds were preserved and conserved by the farmers from the previous crop season, farmers have to depend on the market for the seeds of high yielding varieties. Since new varieties with new attributes and traits are continually evolving overtime from public and private R&D institutions, access to the seeds of those varieties is vital for the farming community to face various biotic and abiotic stresses emerging overtime as well as to enhance productivity. Demand of cotton farmers for biopesticide availability can be seen as an extension of their training need for integrated pest management. Further, requirement for crop insurance facilities can be accorded significance in the wake of drought proneness of Vidarbha region and susceptibility of cotton crop to various pests like white fly.

It was widely observed during the survey that farmers' access to extension agencies-in public and private spheres is influencing adoption of scientific farming practices. Glimpse at the results of Analytical Hierarchical Process for thirty randomly selected cotton farmers of Akola revealed that consistency ratio was more than 0.2 in case of three respondents. The scores obtained for the remaining twenty seven respondents for the seventeen items were used to draw the priority for seven dimension, viz. reliability, assurance, access, empathy, responsiveness, tangibility and timeliness as well as final priority of the farmers with respect to various agencies. Geometric mean of individual scores was used to arrive at the dimension-wise and over all priority. In Akola District, *Krishi Vigyan Kendra* received the highest score for the dimensions, viz. Reliability and Tangibility; while for all other dimensions of input dealers obtained highest score.

In case of dimensions like reliability, access, empathy, responsiveness and timeliness second preference was for State Department of Agriculture. Input dealers were accorded second preference in case of tangibility dimensions also. Further comparison of overall effectiveness of the selected agencies showed that input dealers were most effective

Table 4 Comparative effectiveness of selected extension agencies as perceived by cotton farmers in Akola vis-à-vis service quality indicators (n = 30)

	DoA	KVK	NGO	Private
<i>Reliability (Local priority = 0.25)</i>				
Extension services (information, advisory, training etc.) are highly relevant and suitable to the condition of the farmers.	0.231	0.261	0.085	0.421
Extension services (information, advisory, training etc.) are of high quality	0.248	0.576	0.291	0.0971
Services are cost effective	0.389	0.286	0.308	0.117
Information provided are accurate	0.354	0.354	0.107	0.151
Total	0.298	0.350	0.169	0.164
<i>Assurance (Local priority = 0.25)</i>				
Extension services (information, advisory, training etc.) are highly useful to the farmers	0.197	0.215	0.075	0.467
Since the service of the agency is highly efficient and of good quality, I am willing to pay for it if needed	0.237	0.235	0.07	0.464
The agency has sufficient expertise and skill to give required service in time	0.230	0.446	0.118	0.292
Have enough capital resources and infrastructure management skills to solve the problems	0.202	0.475	0.115	0.275
	0.21	0.321	0.092	0.363
<i>Access (Local priority = 0.49)</i>				
Personnel of agencies are easily approachable	0.463	0.248	0.135	0.861
Quick feedback mechanism	0.666	0.339	0.13	0.89
	0.56	0.29	0.132	0.875
<i>Empathy (Local priority = 0.49)</i>				
Involve regular interaction with farmers and give personalized attention	0.701	0.423	0.189	0.83
Localized solutions are given	0.373	0.049	0.198568	0.586
	0.511	0.144	0.193	0.697
<i>Responsiveness (Local priority = 0.5)</i>				
Personnel/officers are highly service minded and always willing to support the farmers	0.458	0.538	0.538	0.651
They inform farmers when service will be provided	0.441	0.399343	0.17	0.84
	0.449	0.463	0.303	0.74
<i>Tangibility (Local priority = 0.5)</i>				
Physical facilities are provided	0.517	0.856	0.365	0.428
Good communication materials on usage & process of technologies are provided	0.30315	0.623244	0.1330	0.901
	0.396556	0.731	0.22	0.621
<i>Timeliness</i>				
Consistent response within promised time frame is provided	0.92	0.546	0.315	2.254
	0.92	0.546	0.315	2.254
Overall	0.435	0.365	0.188	0.625

followed by department of agriculture and KVK. NGOs were found least effective by the farmers.

Farmers' preference for extension agencies depends on the perceived attributes of the agencies in relation to service provision. Along with technical expertise and resource availability, aspects like timely provision of accurate and reliable services were also perceived as important by farmers. Similarly, easiness of access and service mindedness of the agencies also matter. Farmers' preference for input agencies is the clear reflection of these facts (Table 4). Even though

the outreach was limited, KVK was rated high in terms of the reliability of the information and services provided. The major reason is the expertise of the subject matter specialists and facilities available with the KVK. Hence, it is important to increase the outreach of KVKs through various linkage partnerships with public, private and civil society organizations. New Information and Communication Technologies like mobile phones, interactive video calls etc. could further facilitate this. In case of 'Tangibility' dimension also, KVKs provide tangible information

products or 'take away information' like printed advisories, seeds, biofertilizers etc.

Second highest score of Department of Agriculture for 'reliability' dimension further add to the human resource quality of the public extension system in terms of technical expertise. Resources and infrastructural constraints notwithstanding, the department was found reaching out to the farmers through visits of Agricultural officers and Agricultural assistants ('*Krishi Sahayaks*'), through weekly and fortnightly visit to the villages. Personnel of the Department make visit to each village at least once in a fortnight and interact with the farmers. They inform farmers with various schemes and input provision programmes apart from advisory provision. Further, the feed back from the farmers is passed on to the higher ups in the hierarchy. They also oversee the timely provision of inputs to the eligible farmers. This is translated to the second highest score of department in the dimensions like access, empathy, responsiveness and timeliness.

Input dealers were found to be most accessible to the farmers, as the '*Krishi Seva Kendras*'-accredited input suppliers were operating in the vicinity of the villages. Apart from ensuring timely provision of required inputs, they provide plant protection advisories also. Since the operators are from the locality they better understand the problems of the farmers and act in a responsive manner. But many a time, lack of subject expertise constrains them from making correct recommendations as perceived by the farmer community. The finding adds to the results of the Situation Assessment Survey by NSSO (2005), which have revealed that 'input dealers' were the second most important source of information for farmers following other 'progressive farmers'. Also, those received information on improved seeds/varieties from input dealers 63% were from Maharashtra. Moreover, more than half of the respondent farmer households opined that information received from input dealers, extension agents, and progressive farmers were good and most of them had in fact tried the information so received. Situation Assessment Survey of 2013, further pointed out that private commercial agents (including input dealers) were the important source of information following progressive farmers and ICTs (both traditional and modern). They were rated high in terms of usefulness of information also along with the information received from extension agents, KVKs and progressive farmers (NSSO, 2014). Provision of extension services by input agencies is a part of their marketing activity and very often it is the marketing personnel that handle the extension related activities. Considering the importance of input dealers in the extension domain, it is very much important to orient them in respect of quality information provision. This recognition has led to the initiation of one year Diploma In Agricultural Extension Services for Input Dealers (DAESI) programme in distance education mode by National Institute for Agricultural Extension Management (MANAGE), Hyderabad. The concept was to augment the knowledge and awareness of input dealers in agriculture and legal implications of input

trading. Cotton farmers' preference for the Department of agriculture also goes in line with the findings of NSSO in various rounds. Harnessing the potential of private extension is very much important. Cotton being a commercial crop, dependence on input agencies is more. It has to be taken as an opportunity to reach out to the farmer for promoting sustainable crop production

Public extension agencies need to introspect and reinvent their approaches and strategies to serve the farmers more effectively. Improvement in the service quality of different actors in their respective areas of strength can add to the effectiveness of pluralistic extension system. This, in turn can promote the convergence of agencies with delineated roles and activities.

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