

Farmers' Perspectives on Quality of Agricultural Information Delivery: A Comparison between Public and Private Sources

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ABSTRACT

This paper aims at analyzing farmers' responses on quality of agricultural information services provided by public and private sources. The study is based on primary survey of 461 farmers in eight districts of Uttar Pradesh, India, using a structured questionnaire. Farmers' responses on quality of agricultural information services from public and private sources were analyzed using Analysis of Variance (ANOVA) technique. Findings of the study indicate that private sector information delivery sources provide significantly better quality information to the farming communities as compared to public sector information delivery systems. The results have far reaching implications for designing successful information and extension delivery models by the public, private or by collaborative efforts of the public and the private sector for better extension services delivery.

Keywords: Agriculture, Decision-making, Extension services, e-Choupal, India, Public and private sources.

INTRODUCTION

The use of information in agricultural decision-making has increasingly become important in changing the agricultural systems (Amponash, 1995; Cash, 2001; Galloway and Mochrie, 2005; Akpabio *et al.*, 2007). Rapid changes in technology and practices have significantly highlighted the importance of efficient transfer of advanced and real-time information and knowledge to the farmers (Birkhaeuser *et al.*, 1991). In most of the developing countries, agricultural extension is a public good and is considered as one of the primary vehicles for diffusing information and knowledge (Birkhaeuser *et al.*, 1991; Dancey 1993; Umali and Schwartz, 1994, Dinar 1996; Umali-Deininger, 1997). However, a significant change in publically-funded agricultural extension services has been noticed after 1980s in both the developed

and the developing world (Rivera and Cary, 1997; Anderson and Feder, 2004).

The role of public sector in agricultural extension has been refined and the participation of private sector has been strengthened to meet the information requirement of the farming communities in an efficient and effective manner (Farrington, 1995; Carney, 1995; Rivera, 1996; Umali-Deininger, 1997). Swanson (2006) supported the need of extension delivery decentralisation and shift from being a 'supply-driven' to a 'market-driven' extension system to cover locally suitable crops and/ or enterprises vis-à-vis the interests and resources of different farmer groups.

As pointed out by Sulaiman (2003), a large number of private agencies provide advisory and other support service to farmers engaged in agriculture and allied sectors. These include input agencies, producer cooperatives, agro-processing

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companies, agri-marketing firms, agribusiness houses and financial institutions. Several agribusiness companies in India have come up with innovative and integrated business models and have realized the potential benefits of being at every stage of the supply chain. In this process of business integration, agricultural advisory services and knowledge dissemination to the farming communities for better and informed decision making at the farm level has become an essential component of their business models.

In most of the cases, agricultural information delivery services provided by these organizations are non-priced value added services and their business profits are linked to business transactions in the form of handling of input, output and various services for the farming and rural communities. As the private sector intervention in delivering agricultural advisory services has significantly increased in the recent decades, a study on effectiveness of these service provisions becomes essential. This study analyzes the quality of information delivery from public and private sectors on various agricultural practices based on the primary structured survey of 461 farmers in eight districts of Uttar Pradesh through personal interviews.

Review of Literature

A common strategy for agricultural information delivery in most of the developing countries has been primarily institutionalized through a government-run agricultural extension system to serve the farming communities especially the smallholders. Agricultural research and extension have always been important areas of public expenditure across the world. However, the focus of public expenditure in agriculture has significantly changed over the decades. Lopez (2005) argued that it has been the tendency of most governments to under-invest in public goods such as agricultural research and extension, despite the high rates of return

from such investments. Increase in budgetary constraints has forced the public sector to identify an alternative source in the form of private agencies for providing agricultural extension services (Venkatakumar *et al.*, 2001). There has been mixed responses on the emerging role of public and private sectors in agricultural extension services delivery.

Hulme (1983) examined an alternative strategy for agricultural extension delivery i.e. the provision of agricultural extension services by capitalist enterprises as most of the public initiatives proved to be ineffective. He presented a case study of the privatization of extension services in Papua New Guinea and discussed the implications. The paper concluded that private agencies had the ability to boost agricultural production, but were unlikely to achieve the broader objectives of contemporary rural development.

Carney (1995) discussed a framework for analyzing the role of public sector in agricultural service provision and stressed on the fact that governments need to be responsive to local conditions and to seek innovative and especially collaborative solutions to the problems faced by the farming community.

Farrington (1995) argued that the public sector extension services in most of the less developed countries have been provided on the basis of external funding, which often achieves uneven impact on unsustainably high costs. He reviewed the pressures faced by conventional agricultural extension, examined the prospects of recent approaches that are participatory, institutionally pluralistic and geared towards cost-sharing, and suggested ways forward for governments.

Dinar (1996) analyzed the declining trend in expenditure for extension in several countries accompanied by structural and institutional changes in the form of decentralization, privatization, and commercialization. He suggested that the commercialized service neglected many traditional customers, but also added new customers who had not been approached in

the public extension era. He further argued that equity aspect deserves more research and should be addressed carefully by policy makers in the event of commercialization.

Picciotto and Anderson (1997) highlighted reconsidering the agricultural extension, where rather than pressing governments for increased budgetary allocations for public-sector extension systems, development assistance agencies should support policies aimed at increasing the role of users, private companies and voluntary sector, and should assist governments in enhancing the cost-effectiveness and quality of existing services through institutional innovation and outsourcing. They further argued that this approach would allow the public sector to concentrate its limited resources on providing services to neglected areas and high-leverage actions directed at education and training, information technology, and the creation of a proper framework for equitable and environmentally sustainable rural development.

Umali-Deininger (1997) examined the roles of the public and private sectors in agricultural extension by classifying the extension services according to their economic characteristics, using the economic principles of rivalry and excludability. The ability to exclude those who have not paid for the service provides incentive for the private sector to supply such goods. She argued that commercialization of farm operations has increased the demand for specialized client-specific and location-specific extension services that can be delivered by the private for-profit organizations, which may exclude marginal and small farmers. Therefore, extension services will require funding—although not necessarily public delivery.

Sharma (2002) argued for a holistic reappraisal of existing agricultural extension systems and the need to work towards an outlook that encompasses a whole new policy mix favoring a plurality of institutions due to the changing economic scenario and agricultural systems. She emphasized that public extension system would continue to play an important role in technology

dissemination. But pressures on government expenditure necessitate that public funds have to be more carefully targeted and more efficiently used. A strategy of institutional innovations in extension should be evolved for optimizing the strengths of the public-private sectors to service the needs of the farming community.

Anderson and Feder (2004) highlighted that the efficiency gains in agricultural extension system can come from locally decentralized delivery systems with an incentive structure largely based on private provisions. However, in poorer countries extension services should still remain publically funded to ensure better coverage of smallholders.

Hu *et al.* (2012) argued that the top-down public agricultural extension system in China and its early commercialization reforms during the 1990s have left millions of farmers without access to extension services. They further concluded that inclusive reform initiatives significantly improved farmers' access to agricultural extension services as well as the adoption of new technologies by them. Three key features of the reform initiatives were: (1) inclusion of all farmers as target beneficiaries, (2) effective identification of farmers' extension service needs, and (3) an accountability system to provide better agricultural extension services to farmers.

The above cited empirical pieces of evidence clearly indicate that there is a need for public and private intervention in delivering agricultural extension services. Countries across the world have tried to explore the possibilities of devising agricultural extension models involving public and private sectors (Sulaiman and Sadamate, 2000; Sulaiman and Hall, 2002; Anderson and Feder, 2003; Davidson and Ahmad, 2003; Shingi *et al.*, 2004; Sulaiman and Hall, 2004). Cornwall and Gaventa (2001) viewed that to some extent, private commercial provision of agricultural advice and services implies a degree of responsiveness and accountability on the part of the suppliers towards the customers. However, there is a possibility of exclusion of



the small and poor farmers in the process of commercialization of extension services.

In the current decade, a number of agribusiness companies in India have started providing complete farm solutions to the farming communities (Sulaiman and Hall, 2004; Gollakota, 2008). There are a number of private sector agribusiness companies involved in agricultural extension services such as Mahindra Shubh Labh Services Limited (MSSL); International Business Division of Indian Tobacco Company (ITC); DCM Shriram Consolidated Limited; Tata Chemicals Limited (TCL); EID Parry (India) Limited among others. Dossani *et al.* (2005) analyzed various information based initiatives and categorized the services offered by these initiatives into informational services, transactional services and e-Governance services. While most of the models offer multiple services, private sector initiatives focus primarily on the transactional processes and provide complete farm solutions to the farmers with complimentary extension services without any fee (Upton and Fuller, 2004; Dossani *et al.*, 2005; Rao, 2008). Besides, the private sector provision of agricultural advices and services depends on responsiveness and accountability for maintaining better relationship with the farming communities for their sustainable business development in the long run.

MATERIALS AND METHODS

Data Collection

This study is based on the primary survey of 461 farmers belonging to eight districts of Uttar Pradesh in India (Aligarh, Allahabad, Etawah, Bareilly, Hardoi, Pratapgarh, Raibareilly and Shahjahanpur). A questionnaire based survey was conducted personally and farmers' responses to various questions were obtained and recorded in the last quarter of 2007. To ensure proper representation of users and non-users of public and private sector based information system for agricultural decision-making, a

total of 30 villages were surveyed. For each village, a minimum of 15 farmers, selected randomly, were surveyed. For better representation of public and private initiatives of information service delivery, 15 villages were selected having e-Choupals, established by the private and public agencies. Out of total 15 village e-Choupals, 10 e-Choupals belonged to the private agency i.e. Indian Tobacco Company (ITC) and 5 e-Choupals belonged to the public agency i.e. Uttar Pradesh Bhumi Sudhar Nigam (UPBSN). A corresponding number of non e-Choupal villages were selected from a minimum distance of 15 km for recording the views of non e-Choupal users. Information service delivery by public sector includes sources such as UPBSN e-Choupal, Television, Radio, Extension Workers, and other public sector initiatives. On the other hand, private sector information delivery sources include ITC e-Choupals, input dealers and NGOs.

e-Choupals

e-Choupals are information-technology-based knowledge dissemination centers named after the *Hindi* word, *Choupal*, meaning traditional village gathering place where farmers gather in groups, mostly in the evening, to discuss village-level issues. ITC e-Choupal is one of the earliest and the most successful private sector ICT enabled initiatives started by the International Business Division (IBD) of Indian Tobacco Company (ITC) in the year 2000. ITC Limited is one of India's largest private corporations with diversified businesses in tobacco, hotels, paper boards, foods, fashion retailing and commodity export.

UPBSN

Uttar Pradesh Bhumi Sudhar Nigam (UPBSN) is a government of Uttar Pradesh Undertaking established in 1978 with a mission to preserve the health and productivity of land resources in a

sustainable manner, and to protect, rehabilitate, and regenerate all potentially cultivable lands through various interventions. For strengthening agricultural extension activities, UPBSN has established Sodic e-Choupals in selected project districts.

Survey Instrument and Data Analysis

A survey was conducted using a pre-tested structured questionnaire and responses about various agricultural practices were recorded through personal interviews. The questionnaire was developed in Hindi language to ensure greater participation of the respondents in the survey process on one hand, and to increase the confidence of the respondent in providing accurate and unbiased information on the other. The questionnaire was broadly divided into two parts comprising data on socio-

demographics profiles of the respondents and sources of information used for agricultural decision making. Farmers' responses on various agricultural information services were analyzed with simple statistical techniques such as descriptive analysis, cross-tabulation, and Analysis of Variance (ANOVA).

RESULTS AND DISCUSSION

Profile Analysis of Information Users

Table 1 provides the summary profile of sample farmers with respect to age, education, social category, income sources and landholding size. The majority of the respondents were of the age between 25 to 60 years with the average age of 43 years, indicating a mature group involved in agricultural practice. In terms of education, most of the farmers were matriculated

Table 1. Sample demographic characteristics.

Socio-demographics	N	%	Socio-demographics	N	%
Age (Years)			Monthly Income (Rs.)		
< 25	28	6.07	< 2000	178	38.61
25-40	207	44.90	2000-3000	125	27.11
40-60	170	36.88	3001-4000	65	14.10
> 60	56	12.15	4001-5000	33	7.16
Total	461	100.00	> 5000	60	13.02
Education			Total	461	100.00
Illiterate	53	11.50	Landholdings		
Junior High School and Below	170	36.88	Marginal (< 1 ha)	111	24.08
High School/Intermediate	174	37.74	Small (1-2 ha)	159	34.49
Graduate/Post Graduate	64	13.88	Medium (2-4 ha)	133	28.85
Total	461	100.00	Large (> 4 ha)	58	12.58
Social category			Total	461	100.00
General	205	44.47			
Other Backward Class (OBC) ^a	212	45.99			
Schedule Caste (SC)	44	9.54			
Total	461	100.00			

^a Constitutionally, Indian society has been divided into various social groups. These categorizations are predominantly based on the legacy of the Indian caste system. The Constitution of India listed two groups i.e. Scheduled Castes (SC) and Scheduled Tribes (ST). The Mandal Commission was established to identify the socially or educationally backward classes and submitted its report in 1980, indicating members of lower castes as Other Backward Classes (OBC), which were not included in SC/ST categories. The primary aim of these categorizations has been to devise special policy frameworks for these groups to reduce disparity in the society.



and/or above. As far as social groups are concerned, about 90 percent of the farmers were from General and OBC categories. With regard to income, more than 50 percent of the farmers had a monthly income of Rs. 3000 (Indian rupees – local currency). Regarding land ownership, about 60 percent of the farmers were from marginal and small groups with less than 2 hectares of land.

Quality of Information Delivery

The need for quality agricultural information is a basic necessity of the farming community in the current agricultural systems as it plays a pivotal role in enlightening them, raising their level of knowledge and eventually helping with their decision-making process regarding farming activities. Quality of extension services delivery is judged using product as well as user-based criteria such as timeliness of service, service accuracy and reliability, courtesy and hospitality in service delivery, convenience in obtaining extension services and affordability. The role of public sector in delivering services to agricultural community is changing across the globe and competitive market forces are demanding intensive involvement of private sector towards socially desirable ends (Carney, 1995; Haug, 1999; Sharma, 2002; Poole and Lynch, 2003; Davidson and Ahmad, 2002; Muyanga and Jayne, 2008; Rivera, 2009). The public extension by itself can no longer respond to the multifarious demands of farming systems and therefore new extension regimes should recognize the role of a multi-agency dissemination of agricultural information for catering the local and varied information needs of the farming communities (Haug, 1999; Davidson and Ahmad, 2002; Adiguru *et al.*, 2009).

It is widely accepted that the governments should withdraw from direct service provision in areas where competitive markets do or could exist (Carney, 1995; Sulaiman and Sadmate, 2000). Many argued

in support of pluralistic extension systems, where the private sector can provide services related to proprietary goods, while the public sector can provide extension services related to public goods, which are not being delivered by private-sector firms (Sulaiman and van den Ban 2003; Swanson, 2008; Adiguru *et al.*, 2009; Glendenning *et al.*, 2010).

In this research, the quality perceptions of the farmers have been recorded on a five point scale -very good, good, average, poor and very poor– on various agricultural practices (Table 2). The survey results indicate that on average, 68 percent of the farmers have received information from various public and private sources excluding information sought from peer groups, progressive farmers, friends and relatives. Responses of about 50 percent of the farmers were neutral on the quality of information regarding most of the agricultural practices except high yielding seeds, fertilizer application, crop protection techniques, storage methods, market price information and marketing and selling of agricultural produce. The results on mean value of responses on various agricultural practices, which are less than 3 in most of the cases, clearly indicate that farmers are receiving quality information for agricultural decision-making.

Table 3 presents the results on quality of information delivery from public and private sources as perceived by the farmers. The results on difference in mean value of responses for public and private sectors indicate that farmers are receiving significantly better quality information from the private sector initiatives on most of the agricultural practices except soil testing. A lower mean value of response on soil testing indicates that the public sector plays a comparatively better role in providing quality information on soil testing.

The magnitude of quality difference between public and private sources of information on various agricultural practices has been indicated in Figure 1. Though mean differences on all aspects of

Table 2. Farmers' perception on quality of information on crop production.

Agricultural practices		Very Good	Good	Average	Poor	Very Poor	Total	Mean	SD ^a
High yielding seeds	<i>N</i> ^b	96	163	129	3	0	391	2.10	0.773
	%	24.6	41.7	33.0	0.8	0.0	100.0		
Soil testing	<i>N</i>	13	60	81	13	1	168	2.58	0.770
	%	7.7	35.7	48.2	7.7	0.6	100.0		
Weather information	<i>N</i>	49	34	154	15	1	253	2.55	0.884
	%	19.4	13.4	60.9	5.9	0.4	100.0		
Irrigation methods	<i>N</i>	46	49	172	14	2	283	2.57	0.845
	%	16.3	17.3	60.8	4.9	0.7	100.0		
Fertilizer application	<i>N</i>	60	127	170	8	0	365	2.35	0.775
	%	16.4	34.8	46.6	2.2	0.0	100.0		
Crop protection techniques	<i>N</i>	59	139	168	11	1	378	2.35	0.785
	%	15.6	36.8	44.4	2.9	0.3	100.0		
Use of agricultural equipment	<i>N</i>	51	65	166	12	0	294	2.47	0.825
	%	17.3	22.1	56.5	4.1	0.0	100.0		
Crop harvesting techniques	<i>N</i>	51	68	141	8	0	268	2.40	0.826
	%	19.0	25.4	52.6	3.0	0.0	100.0		
Storage methods	<i>N</i>	63	124	135	8	0	330	2.11	0.792
	%	19.1	37.6	40.9	2.4	0.0	100.0		
Market prices	<i>N</i>	95	137	126	4	0	362	2.11	0.803
	%	26.2	37.8	34.8	1.1	0.0	100.0		
Marketing/ selling	<i>N</i>	95	97	137	3	0	332	2.14	0.846
	%	28.6	29.2	41.3	0.9	0.0	100.0		

^a Standard Deviation, ^b Number.

Table 3. Quality of information delivery from public and private sources.

Agricultural practices	Public			Private			<i>F</i>	<i>Sig.</i>
	<i>N</i> ^a	<i>Mean</i>	<i>SD</i> ^b	<i>N</i>	<i>Mean</i>	<i>SD</i>		
High yielding seeds	142	2.25	0.70	249	2.01	0.80	9.003*	0.003
Soil testing	108	2.54	0.69	60	2.65	0.90	0.829	0.364
Weather information	90	2.92	0.57	163	2.34	0.96	28.137*	0.000
Irrigation methods	115	2.79	0.58	168	2.41	0.96	14.499*	0.000
Fertilizer application	125	2.53	0.69	240	2.25	0.80	10.869*	0.001
Crop protection techniques	134	2.51	0.70	244	2.27	0.82	8.844*	0.003
Use of agricultural equipment	94	2.70	0.69	200	2.37	0.86	11.052*	0.001
Crop harvesting techniques	104	2.71	0.63	164	2.20	0.87	27.345*	0.000
Storage methods	112	2.54	0.68	218	2.13	0.81	20.722*	0.000
Market prices	128	2.38	0.66	234	1.96	0.84	23.288*	0.000
Marketing/ selling	96	2.50	0.66	236	2.00	0.87	25.590*	0.000

* Significant at 0.01 level.

^a Number, ^b Standard Deviation.

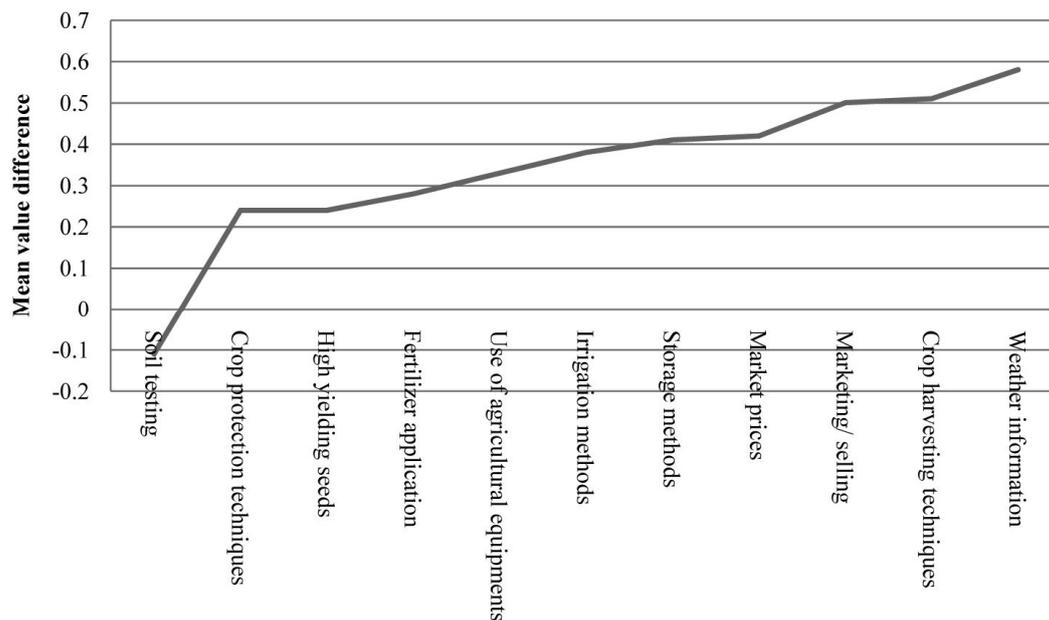


Figure 1. Mean difference in quality of information between public and private sources.

agricultural practices except soil testing favor private sources of information, the gap in quality perception on market related information becomes stronger for these sources. This implies that public sources have greater emphasis on information related to sustainable agricultural production and are performing closely with private sector counterparts.

Private sector agribusiness organizations are increasingly becoming important players in providing agricultural extension services in India. A number of agribusiness firms in India such as Mahindra Shubh Labh Services Limited (MSSL), International Business Division of Indian Tobacco Company (ITC), DCM Shriram Consolidated Limited; Tata Chemicals Limited (TCL) and EID Parry (India) Limited have reoriented their business models to provide agricultural solutions to their clients, who primarily belongs to large landholding categories and are mostly involved in commercial agriculture. Sulaiman and van den Ban (2003) argued that the performance of private extension agents varies widely and their presence is more skewed towards well-endowed regions. Although, the private sector

interventions in delivering agricultural extension services have increased, these initiatives are limited towards selected regions, crops and sectors, mainly focusing on contract farming arrangements for commercial crops and adoption and demonstrations of seeds, farm implements by enterprises supplying these technologies (Sharma, 2002).

The recent changes in agricultural extension service provisions by private sector invites policy attention for ensuring all round benefits to the farming communities. It is argued that the small and poor farmers are unlikely to gain much benefit due to resource constraints and limited coverage of the private extension services. Therefore, public extension system cannot be replaced by private extension system (Sulaiman, 2003). The Policy Framework for Agricultural Extension (PFAE) by Ministry of Agriculture envisages the promotion of a multi-agency driven extension system for complementing, supplementing and working in partnerships and even substituting the public extension for better service delivery to the farming communities. Therefore, there is a need for co-existence of both public and private

extension systems. Under PFAE, there is a provision for providing operational funding to both public and private extension agencies under Competitive Agriculture Extension Grant Fund (CAEGF) based on their performance in delivering quality extension services.

Private agencies have the ability to boost agricultural production and productivity due to their focused and organized efforts with proper technology and managerial mix. The private sector agencies should initiate the delivery of extension services beyond their cliental base by including non-client farmers in the process, which will help in developing the agricultural system in an efficient and effective manner. Extension services delivered by public or private sector will have to be demand-driven with good quality and reliable information on each aspect of agricultural activities starting from crop planning to marketing and value addition. Findings of this study clearly indicate that farmers perceive significantly better quality information being provided by the private sector sources than the public sector initiatives. However, an analysis of the mean value differences on various aspects of agriculture indicate that while private sector sources have comparatively strong quality perceptions on the information related to post-harvest management and marketing of agricultural produce, the public sector sources are also delivering good quality information on production aspects of agriculture.

The results have far reaching implications for designing information and knowledge dissemination systems through private sector initiatives, as the perception of the farmers on quality of information provided by private agencies is significantly higher. The study also provides insights for designing successful information and extension delivery models by the public sector initiatives or collaboration with the private sector. This would facilitate better service delivery on one hand and ensure the inclusion of small and poor farmers on the other. The study provides the following key

insights for the public and private sector extension service providers as well as the policy makers for designing agricultural extension delivery models:

The private sector initiatives are adopting comparatively better models based on Information and Communication Technologies (ICTs) for delivering integrated solutions to the farms. Public sector extension delivery models should also follow the ICT based models in delivering the required information to the farming community.

Most of the private sector initiatives are based on input delivery or output procurement based transactional models. Public extension services are largely informational models and provide advisory services to the farming community following only a one-way process.

Both public and private sector extension initiatives should re-evaluate their models and make necessary changes so that they are able to help farmers by providing complete information solutions. Public sector initiatives should emphasize more on providing information related to post-harvest management and market intelligence while private sector sources should work on providing information related to the agricultural production system.

REFERENCES

1. Adhiguru, P., Birthal, P. S. and Ganesh Kumar, B. 2009. Strengthening Pluralistic Agricultural Information Delivery Systems in India. *Agr. Econ. Res. Rev.*, **22(1)**: 71-79.
2. Akpabio, I. A., Okon, D. P. and Inyang, E. B. 2007. Constraints Affecting ICT Utilization by Agricultural Extension Officers in the Niger Delta, Nigeria. *J. Agr. Educ. Ext.*, **13(4)**: 263-272.
3. Amponash, W. A. 1995. Computer Adoption and Use of Information Services by North Carolina Commercial Farmers. *J. Agr. Appl. Econ.*, **27(2)**: 565-576.
4. Anderson, J. R. and Feder, G. 2004. Agricultural Extension: Good Intentions and Hard Realities. *World Bank Res. Obser.*, **19**: 41-60.



5. Anderson, J. R. and Feder, G. 2003. Rural Extension Services. The World Bank, Policy Research Working Paper 2976, Washington DC.
6. Birkhaeuser, D., Evenson, R. E. and Feder, G. 1991. The Economic Impact of Agricultural Extension: A Review. *Econ. Dev. Cult. Change*, **39**: 607-650.
7. Carney, D. 1995. The Changing Public Role in Services to Agriculture: A Framework for Analysis, *Food Policy*, **20**: 521-528.
8. Cash, D. W. 2001. In Order to Aid in Diffusing Useful and Practical Information: Agricultural Extension and Boundary Organizations. *Sci. Technol. Hum. Val.*, **26**: 431-453.
9. Cornwall, A. and Gaventa, J. 2001. From Users and Choosers to Makers and Shapers: Repositioning Participation in Social Policy. IDS Working Paper 127, Institute of Development Studies, Brighton.
10. Dancy, R. J. 1993. The Evolution of Agricultural Extension in England and Wales. *J. Agr. Econ.*, **44**: 375-393.
11. Davidson, A. P. and Ahmad, M. 2003. Privatization and the Crisis of Agricultural Extension: The Case of Pakistan. Ashgate Publishing Limited, Hants, England.
12. Davidson, A. P. and Ahmad, M. 2002. Effectiveness of Public and Private Sector Agricultural Extension: Implications for Privatisation in Pakistan. *J. Agr. Educ. Ext.*, **8(3)**: 117-126.
13. Dinar, A. 1996. Extension Commercialization: How Much to Charge for Extension Services. *Am. J. Agr. Econ.*, **78**: 1-12.
14. Dossani, R., Misra, D. C. and Jhaveri, R. 2005. Enabling ICT for Rural India: Project Report. Asia-Pacific Research Center, Stanford University and National Informatics Centre, Government of India.
15. Farrington, J. 1995. The Changing Public Role in Agricultural Extension. *Food Policy*, **20**: 537-544.
16. Galloway, L. and Mochrie, R. 2005. The Use of ICT in Rural Firms: A Policy-orientated Literature Review. *J. Policy Regul. Strat. Telecommun.*, **7**: 33-46.
17. Glendenning, C. J., Babu, S. and Asenso-Okyere, K. 2010. Review of Agricultural Extension in India: Are Farmers' Information Needs Being Met? IFPRI Discussion Paper 01048, Eastern and Southern Africa Regional Office, International Food Policy Research Institute, Washington, D.C.
18. Gollakota, K. 2008. ICT Use by Businesses in Rural India: The Case of EID Parry's Indiagriline. *Int. J. Inform. Manage.*, **28**: 336-341.
19. Haug, R. 1999. Some Leading Issues in International Agricultural Extension: A Literature Review. *J. Agr. Educ. Ext.*, **5(4)**: 263-274.
20. Hu, R., Cai, Y., Chen, K. Z. and Huang, J. 2012. Effects of Inclusive Public Agricultural Extension Service: Results from a Policy Reform Experiment in Western China. *China Econ. Rev.*, **23(4)**: 962-974.
21. Hulme, D. 1983. Agricultural Extension: Public Service or Private Business? *Agr. Admin.*, **14**: 65-79.
22. López, R. 2005. Under-investing in Public Goods: Evidence, Causes, and Consequences for Agricultural Development, Equity, and the Environment, *Agr. Econ.*, **32(s1)**: 211-224.
23. Muyanga, M. and Jayne, T.S. 2008. Private Agricultural Extension System in Kenya: Practice and Policy Lessons. *J. Agr. Educ. Ext.*, **14(2)**: 111-124.
24. Picciotto, R. and Anderson, J. R. 1997. Reconsidering Agricultural Extension. *World Bank Res. Obser.*, **12(2)**: 249-259.
25. Poole, N. D. and Lynch, K. 2003. Agricultural Market Knowledge: Systems for Delivery of a Private and Public Good. *J. Agr. Educ. Ext.*, **9(3)**: 117-126.
26. Rao, S. S. 2008. Social Development in Indian Rural Communities: Adoption of Telecentres. *Int. J. Inform. Manage.*, **28**: 474-482.
27. Rivera, W. M. 1996. Agricultural Extension in Transition Worldwide: Structural, Financial and Managerial Strategies for Improving Agricultural Extension. *Public Admin. Develop.*, **16**: 151-161.
28. Rivera, W. M. and Cary, J. W. 1997. Privatizing Agricultural Extension. In: "Improving Agricultural Extension: A Reference Manual", (Eds.): Swanson, B. E., Bentz, R. P. and Sofranko, A. J.. FAO, Rome, **PP??**
29. Rivera, W. M. 2009. Production and Beyond: A Defining Moment for Public Sector Extension. *J. Agr. Educ. Ext.*, **15(4)**: 371-384.

30. Sharma, R. 2002. Reforms in Agricultural Extension: New Policy Framework. *Econ. Polit. Weekly*, **37**: 3124-3131.
31. Shingi, P. M. Gaikwad, V. R. Sulaiman, R. and Vasanthakumar, J. 2004. *State of the Indian Farmer: A Millennium Study*. Agricultural Extension, Ministry of Agriculture, Government of Indian and Academic Foundation, New Delhi, **6**: PP??
32. Sulaiman, R. and Hall, A. 2004. Towards Extension-plus: Opportunities and Challenges. NCAP Policy Brief 17, National Centre for Agricultural Economics and Policy Research, New Delhi.
33. Sulaiman, R. and Sadamate, V. V. 2000. Privatising Agricultural Extension in India. NCAP Policy Paper 10, National Centre for Agricultural Economics and Policy Research, New Delhi.
34. Sulaiman, R. 2003. Agriculture Extension: Involvement of Private Sector. Occasional Paper 29, Department of Economic Analysis and Research, National Bank for Agriculture and Rural Development, Mumbai.
35. Sulaiman, R. V. and van den Ban, A.W. 2003. Funding and Delivering Agricultural Extension in India. *J. Agr. Educ. Ext.*, **10(1)**: 21-30.
36. Sulaiman, R. V. and Hall, A. J. 2002. Beyond Dissemination: Can Indian Agricultural Extension Reinvent Itself? NCAP Policy Brief No. 16, National Centre for Agricultural Economics and Policy Research, New Delhi, India.
37. Swanson, B. E. 2008. Global Review of Agricultural Extension and Advisory Service Practices. Food and Agricultural Organization of United Nations, Rome.
38. Swanson, B. E. 2006. Extension Strategies for Poverty Alleviation: Lessons from China and India. *J. Agr. Educ. Ext.*, **12(4)**: 285-299.
39. Umali, D. L. and Schwartz, L. 1994. Public and Private Agricultural Extension: Beyond Traditional Frontiers. World Bank Discussion Paper No. 236, World Bank, Washington DC.
40. Umali-Deininger, D. 1997. Public and Private Agricultural Extension: Partners or Rivals? *World Bank Res. Obser.*, **12**: 203-224.
41. Upton, D. M. and Fuller, V. A. 2004. The ITC eChaupal Initiative. Harvard Business School Case Study Number 9-604-016. Harvard Business School Publishing, Boston, USA.
42. Venkatakumar, R., Anandaraja, M., Sripal, K. B. and Sriram, N. 2001. Privatization of Agricultural Extension System in India: Preferences and Constraints. In: "*Private Extension in India: Myths, Realities, Apprehensions and Approaches*", (Ed.): Chandra Shekara, P.. National Institute of Agricultural Extension Management, Rajendranagar, Hyderabad-500030, AP, India, PP.91-100.

دیدگاه کشاورزان در مورد کیفیت ارائه اطلاعات کشاورزی: مقایسه بین منابع دولتی

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چکیده

این مقاله با هدف تجزیه و تحلیل پاسخ‌های کشاورزان در مورد کیفیت خدمات اطلاع رسانی کشاورزی ارائه شده توسط منابع دولتی و خصوصی انجام شده است. این مطالعه بر مبنای بررسی اولیه از ۴۶۱ کشاورز در هشت ناحیه از اوتار پرادش، هند، با استفاده از یک پرسشنامه ساختارمند انجام گردید. پاسخ کشاورزان در مورد کیفیت خدمات اطلاع رسانی کشاورزی از منابع دولتی و خصوصی با استفاده



از روش آنالیز واریانس (ANOVA) تجزیه و تحلیل شد. یافته‌های این مطالعه نشان می‌دهند که منابع خصوصی در مقایسه با سیستم‌های ارائه اطلاعات بخش دولتی به طور معنی‌داری اطلاعات با کیفیت تری به جوامع کشاورزی ارائه می‌دهند. نتایج به دست آمده تاثیر قابل توجهی بر طراحی موفق مدل‌های ترویج اطلاعات توسط بخش‌های دولتی، خصوصی یا تلاش‌های مشترک بخش‌های دولتی و خصوصی به منظور ارائه بهتر خدمات ترویجی خواهند داشت.