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Title of the Poster

Economics of Information in Developing Country Agriculture: Evidence from South India

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Economics of Information in Developing Country Agriculture: Evidence from South India

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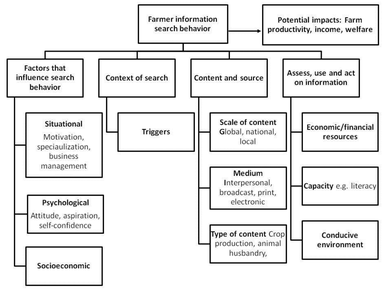
1. INTRODUCTION

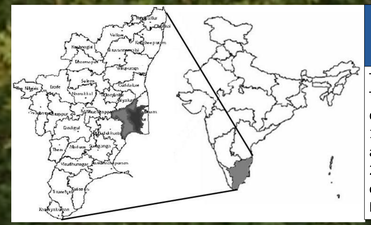
Agriculture in developing countries is increasingly becoming knowledge intensive. Farmers need access to reliable, timely and relevant information. Developing appropriate farmer educational and marketing strategies will depend on how farmer groups differ in their information search behavior, segmentation of farmers is crucial for designing effective extension and advisory services. Understanding what information farmers need, how they search for their information, which sources they depend for accessing information, and how much they are willing to pay for such information can help in designing effective extension programs.

2. OBJECTIVES

This study has two tasks. First, we develop a conceptual framework to analyzing information search among farmers. Second we present some basic evidence testing the implications of this framework by analyzing information needs of farmers and differences in needs across the farming households in 2 districts of south India. It uses a farm level survey of 576 farmers and 27 focus group discussions to examine farmers' information search and use behavior. Specifically it analyzes farmers' information needs, the sources of their information, preferences of their sources, factors affecting their information search, and their willingness to pay for information. The key questions this study seeks to answer are: What information do farmers need? How and where the search for their information? What factors determine their search behavior? And how much are they willing to pay for their information?

3. CONCEPTUAL FRAMEWORK





4. STUDY AREA and METHOD

The study examines farmer information search behaviors in two districts of the Indian state of Tamil Nadu, Thanjavur and Tiruvarur (Figure 1). Farmers were randomly sampled. From each district, 8 blocks were randomly selected. From each block, 4 villages were randomly selected. 18 farmers were randomly selected from the farm household list maintained by the village administrative officer. In total 576 farmers were interviewed, which was complemented with 27 focus group discussions in 8 randomly selected villages, from 2 randomly selected blocks in each district. Survey data collection and focus group discussions were carried out between March and May 2011.

5. RESULTS

Table 1. Summary statistics for the three variables used in the information search clusters

	All responders (N=576)				Thanjavur (N=288)		Tiruvarur (N=288)	
	Mean	SD	Min	Max	Mean	SD	Mean	SD
Number of sources accessed	3.54	1.91	0	12	3.75	2.04	3.32	1.73
Number of sources from which information tried	2.94	1.51	0	12	3.03	1.65	2.87	1.36
Mean of frequency of use (6=daily,5 =weekly, 4=fortnight, 3=monthly, 2=seasonal, 1=yearly, 0=none)	1.78	1.38	0	6	1.91	1.43	1.64	1.31

Table 2. Summary statistics for 3 variables used in the information search clusters

	Thanjavur	Tiruvarur
Search behaviors	Percent	Percent
High	30.88	21.05
Medium	32.98	41.75
Semi-medium	10.88	6.32
Low	25.26	30.88
		F=4.66, Prob>F=0.0032

Figure 1. Dendogram of cluster analysis for number of information sources used, frequency of information use, and number of sources from which information was tried by farmers

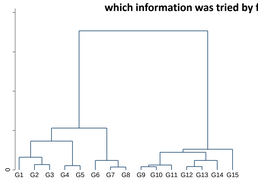


Table 3. Information search behavior clusters from Ward's cluster analysis

Clusters by search behavior	Sources accessed		Frequency of use		Information tried	
	Mean	SD	Mean	SD	Mean	SD
High searchers Obs=148 (26.0%)	5.95	1.61	1.87	1.44	4.76	1.39
Medium searchers Obs = 213 (37.4%)	3.63	0.69	1.70	0.99	3.00	0.63
Semi-medium searchers Obs=49 (8.6%)	2.24	0.72	4.17	1.16	1.92	0.73
Low searchers Obs=160 (28.1%)	1.73	0.50	1.06	0.93	1.60	0.54
	F=504.98 Prob>F=0.0000		F=358.65 Prob>F=0.0000		F=358.65 Prob>F=0.0000	

Table 4. information search behavior by socio-demographic characteristics

Variable	HIGH		MEDIUM		SEMI-MEDIUM		LOW		ANOVA
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Graduation (12+class)	0.16	0.36	0.07	0.25	0.06	0.24	0.04	0.19	F=5.47, Prob>f=0.001
APL	0.82	0.38	0.61	0.49	0.61	0.49	0.58	0.50	F=8.88, Prob>f=0.00
Cultivated area Samba (acres)	5.72	6.50	4.84	6.21	3.75	3.32	3.17	2.65	F=6.10, Prob>f=0.0004
Ag income (INR)	55 415	79 450	39 065	68 246	44 963	50 782	30 306	34 049	F=4.18, Prob>f=0.006
Member Coop bank	0.78	0.41	0.68	0.47	0.59	0.50	0.61	0.49	F=4.2, Prob>f=0.005
Member of FBO	0.30	0.46	0.11	0.32	0.08	0.28	0.11	0.31	F=10.67 Prob>f=0.0000

Table 5. Fraction of information medium used by each search beahvior

			High		Medium		Semi-medium		Low	
Fraction of each medium accessed	F	Prob>F	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Broadcast fraction	61.96	0.00***	0.42	0.29	0.26	0.27	0.27	0.25	0.06	0.17
Interpersonal fraction	53.3	0.00***	0.19	0.06	0.12	0.03	0.06	0.03	0.08	0.05
Print media fraction	2.72	0.04**	0.16	0.15	0.06	0.09	0.07	0.08	0.01	0.03
Electronic fraction	195.35	0.00***	0.02	0.10	0.00	0.05	0.02	0.14	0.00	0.00

Figure 2. Information sources accessed by number of sources accessed

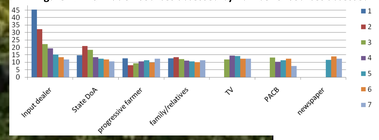


Figure 3, Information sources accessed by search behavior

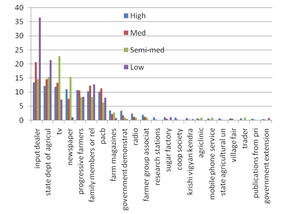


Figure 4. Preferred information medium

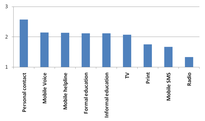


Figure 6. Willingness to pay for voice based mobile phone messages

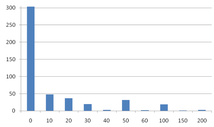


Table 7. Ordered probit regression model for willingness to pay for information

WTP	Coef.	Std. Err.	P>z
malehead	0.428	0.643	0.505
age	-0.008	0.005	-0.135
noSchool	0.123	0.216	0.570
memfbo	0.322	0.155	0.038**
Number of information sources	-1.908	1.121	-0.089*
cultsamba	0.028	0.011	0.013**
apl	0.338	0.156	0.030**
aginc	0.000	0.000	0.850
distmark	-0.024	0.013	-0.072*

Table 6. Logit regression on high info search and low info search categories

	High information		Low information	
Variable	Coef.	P>z	Coef.	P>z
Male head	-1.19	-0.13	1.60	0.15
Age	0.00	-0.77	0.00	-0.94
No School	0.13	0.76	-0.05	-0.89
Member of FBO	1.43	0.0000***	-0.56	-0.097*
Cultivated area samba	-0.02	-0.40	-0.08	-0.06*
APL card	1.26	0.0000***	-0.24	-0.39
Agricultural income	0.00	0.32	0.00	-0.52
Distance to market	-0.02	-0.40	0.03	0.21
Source problem	0.24	0.10	-0.51	-0.001***
High search	-0.23	-0.12	0.14	0.30
Ability	-0.14	-0.46	-0.33	-0.08*
Payoff	-0.05	-0.78	0.29	0.09*
Search costly	0.13	0.44	-0.02	-0.93
Post-harvest	0.20	0.16	-0.25	-0.07*
Production	-0.88	-0.0000***	0.86	0.00***
Protection and fertilizer	0.36	0.11	-0.14	-0.59
Finance	0.17	0.21	-0.08	-0.60
_cons	-0.74	-0.67	-2.71	-0.18
	Number of obs =471, LR chi2(17)=98.08, Problem>chi2=0.0000, Pseudo R2=0.1767 , Log likelihood=-228.45		Number of obs=471, LR chi2(17)=86.98, Problem>chi2=0.0000, Pseudo R2=0.1573, Log likelihood=-233.03	

6. DISCUSSION

This study confirms the heterogeneity within farming communities of information search behaviors. The results of this study can support targeted extension programs in the area. The main outcomes are discussed here:

Information search behaviors : The results of this study show that the low information searchers had smaller land holding size, lower level of education, and lower standard of living. Their information needs and crops also differed from the other search categories. Low searchers required information on crop practices and credit availability, and required information on less water intensive crops. The low searchers used a fewer number of information sources, and less frequently. The main sources of the low search behaviors were interpersonal - the input dealer, the state department of agriculture extension staff, family and progressive farmers. The results clearly show that to reach low information search farmers requires different delivery and content strategies in extension programs. Membership to FBO was associated with high search behaviors, so forming farmer groups could support reach to these farmers.

Most used information sources and preferred medium : The study shows that farmers' access information from a range of sources, but this in turn depends on their information search behaviors. To improve extension coverage, sources like the state department of agriculture, the agricultural cooperative banks, newspaper and TV could be targeted as appropriate sources for delivery of information. The heavy reliance on the private input dealer is of concern considering the conflict of interests inherent in this service. Training and capacity building of private input dealers would reduce misinformation and exploitation of poor farmers.

Mass media, ICTs, and Willingness to pay : The high search farmers already use newspapers, and TV is a key source of information for all the farmers, including low searchers. Newer technologies, like internet and mobile phones are currently under-utilized to access information. The contingent valuation exercise showed that fee-based delivery of information via mobile phone is not in high demand.

Information needs : Inappropriate or poor quality information could be a hindrance to farmers' use of information sources. The major constraints to information access are poor availability, poor reliability, lack of awareness of information sources available and untimely provision of information. Improving the organizational performance of extension and advisory services is an important need in India.

7. CONCLUSIONS

In the recent decades, the value farmers place on information has increased considerably as the agricultural systems in developing countries become knowledge-intensive. Access and use of current information is critical for the financial success of farmers. Yet, farmers are rarely consulted before the design of extension services about their needs and preferences. But by understanding farmers' access to and use of agricultural information, their agricultural information needs, and the factors that influence this behavior, programs disseminating agricultural information could better target farmers. The findings from this study have important implications for agricultural information dissemination that the public extension system and other programs carry out in developing countries. Targeting small holder farmers, with low agricultural income, is important as they search for less information. These farmers may lack motivation and interest in agriculture, so enhancing the timely delivery and reliability of information will be important to encourage small landholder farmers to improve their information search strategies and consequently their farm outcomes. Information needs of farmers could be targeted according to the farmer characteristics, and channeled through their preferred medium. Further research is needed to explore the organizational performance challenges in the extension approaches that are restricting timely delivery, appropriate availability, and reliability of information to farmers. In addition greater understanding of the differences in farmer information strategies across regions and farming systems is needed in developing countries.

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