
USEFULNESS OF INFORMATION SOURCES IN THE PROMOTION OF HYBRID RICE PROGRAM IN THE PHILIPPINES

Dario A. Cidro

Philippine Rice Research Institute

Maugaya

Science City of Munoz

Nueva Ecija, Philippines

E-mail: Ka_daryo@yahoo.com

Rama B. Radhakrishna

The Pennsylvania State University

Abstract

A variety of information sources are used in disseminating information to farmers. The usefulness of information sources—print, electronic, and human is very important to make informed decisions about the effectiveness of each information source. A number of studies have been published relative to the usefulness of information sources as perceived by farmers and extension agents. The Hybrid Rice Program (HRP) identified 10 key components for improving rice production in the Philippines. Of the 10 key components, two were related to information support service and training. In information support service component, promotion of print, broadcast, electronic media, and information campaign were identified as key strategies. This study examined the usefulness of information sources in the promotion of hybrid rice program as perceived by farmers and extension agents. Both farmers (n=257) and extension agents (n=132) responded to a three-section instrument. Data were collected using personal interview method for farmers and hand delivered survey for extension agents. Findings from the study revealed that both farmers and extension agents view electronic media such as radio and television more useful for learning about hybrid rice promotional activities. Leaflets/brochures and demonstration were also rated as “very useful” by both farmers and extension agents. Significant differences were found between farmers and extension agents relative to the usefulness of information sources. For all the 15 information sources, extension agents’ ratings were significantly higher than farmers’ ratings. Based on the findings and conclusions of the study, implications for further research and training were offered.

Introduction

Rice is the major calorie source for a large segment of the earth’s population. Among food grains, rice is viewed as the most important grain due to human nutrition, food security, and economic significance. In Southeast Asia, rice plays an important role as it accounts for a major share of cereal consumption. In the Philippines, rice is the main staple food for about 75% of the population. Over the years, the Philippines have made tremendous growth in rice production and productivity through its Hybrid Rice Program. Despite these efforts, there is still a need to improve rice production to meet the demands of the growing population. Redona et al (2001) predicts that by 2025, the country will need 40-50% more rice than what it needs today.

The Hybrid Rice Program in the Philippines was launched in 1998 with a goal to use hybrid rice technology as a new approach to increase rice production. The Hybrid Rice Program

(HRP) identified 10 key components for improving rice production in the Philippines (GMA Primer, 2002). Of the 10 key components, two were related to information support service and training. In information support service component, promotion of print, broadcast, electronic media, and information campaign were identified as key strategies for improving rice production and promoting Hybrid Rice Program. Limited research has been conducted relative to the usefulness of information sources in promoting Hybrid Rice Program in the Philippines.

A variety of information sources are used in disseminating information to farmers. The usefulness of information sources—print, electronic, human, and other is very important to make informed decisions about the effectiveness of each information source. For example, print media as an information source has the advantage of being a permanent record, easy to access and user does not have to rely on memory. However, it has certain disadvantages, the foremost being it can reach only the literate populations. On the other hand, electronic media as an information source allows for visualization and mass accessibility assuming that technology is available in all parts of a given country. Given the present day technological advancement, use of electronic media can become an important avenue for communicating information to farmers and at the same time enhancing the communication skills and competencies of extension agents. As reported by Flor (2002), conditions for using information and communication technologies (ICT) are ripe for agricultural extension to make use of the technological revolution that is taking place in the developing world. The challenge, according to Flor is two fold: 1) how extension should reposition itself to changing ICT environment and 2) how extension workers retool themselves within this new environment.

A host of studies have been completed in the United States and the developing world relative to usefulness of information sources as perceived by farmers and extension agents (Pezeshki Rad and Zamani, 2005; Radhakrishna, Nelson, Franklin and Kessler, 2003; Oladele, 2002; Bruening, Radhakrishna, & Rollins, 1992; Gamon, Bounaga & Miller, 1992; Bouare & Bowen, 1990; Richardson, 1989; Bounaga, 1989; Okai, 1986; and Radhakrishna and Thomson, 1996;). Consensus from these studies indicate that perceived usefulness of information sources depends on the subject matter or technical content taught, background characteristics of farmers, including their social situation, and infrastructure (Bruening, Radhakrishna, & Rollins, 1992). For example, farmers preferred television, newspaper, and radio to learn about energy conservation. Farmers needing information on environmental issues such as groundwater quality used farm magazines, newspapers, radio, and television (Padgitt, 1987). Further, farmers in Iowa tended to use neighbors, friends, family, other farmers, and agribusinesses when needing information on highly erodible soils (Bounaga, 1989). In a related study, Iowa farmers used face-to-face discussion, newspaper and magazine articles, and newsletters to learn soil conservation information (Gamon, Bounaga & Miller, 1992). In a Missouri study, Okai (1986) found that small scale farmers rated extension personnel, friends, and neighbors, radio, television as top four information sources.

In a study conducted by Radhakrishna and Thomson (1996), extension agents in eight states in the United States frequently used a variety of information sources: clients, another agent in the office, other colleagues, extension agents and specialists in other counties and states, local news agencies, and local business organizations. Radhakrishna and Thomson also reported that demographic variable such as gender, age, educational level, and primary area of program responsibility were related to the use of information sources.

Usefulness of educational delivery methods as perceived by South Carolina longleaf pine landowners was examined by Radhakrishna, Nelson, Franklin and Kessler (2003). In declining

order of utility, landowners rated newsletters, followed by publications, field tours, video, workshops, evening meetings, short courses, formal classes and the Internet. They also found significant relationships between age, gender, occupation, and perceived usefulness of educational delivery methods. Older landowners viewed video as most useful, while younger landowners considered the Internet as most useful. One plausible reason for this relationship may be attributed to the computer literacy of younger landowners.

Pezeshki Rad and Zamani (2005) in their study of information seeking behavior of Iranian extension personnel found that the top three information sources used were Persian books, Persian scientific magazines and scientific technical reports. Videos, newspapers, TV, the internet, radio, and telephone were occasionally used by the extension personnel. In another study Mohammadi (2002) found that age, level of education, and years of experience were related to information seeking behavior of extension workers in Zanzan province of Iran. Communication links among farmers, extension agents and researchers in south western Nigeria were examined by Oladele (2002). The top three methods frequently used by extension agents to reach farmers were personal contacts, modal farmer, and method and result demonstrations. Extension agents seldom used office calls and package of practices booklet. On the other hand, researchers used demonstrations, radio, and television to reach farmers. Oladele concluded that extension agents mostly rely on individual contact methods for reaching farmers. He suggested for including various agricultural programs on radio and using pictures. Finally, he stated that careful planning, adequate funding, strong commitment, and skills are needed to strengthen the links between farmers, extension agents and researchers.

Bruening, Radhakrishna, and Rollins (1992) indicated that understanding the communication process between farmers and extension agents should include the context in which farmers live and operate. In addition, it is important that in the present day technological world, one should take into account the broader social context as suggested by Fliegel (1984) and Lionberger and Gwin (1982). Fliegel suggests that effective communication requires thorough knowledge of the linkages which affect decision making. Lionberger and Gwin, on the other hand, suggest that the educator, to be effective, must know the social, situation, physical conditions, and infrastructure of targeted farmers.

Based on the foregoing review of studies, a framework for usefulness of information sources was developed (see Figure 1). First, usefulness of information sources used by extension agents and farmers were reviewed. Second, based on the literature, it was concluded that the usefulness of information sources depends on the subject matter or content taught in an extension/educational program. Further, the literature also indicated that usefulness of information sources also depended on demographic (age, gender, educational level, etc.) and situational (society/community, family groups, infrastructure in terms of finance, input supply, marketing, land resources, climatic conditions, etc.) characteristics.

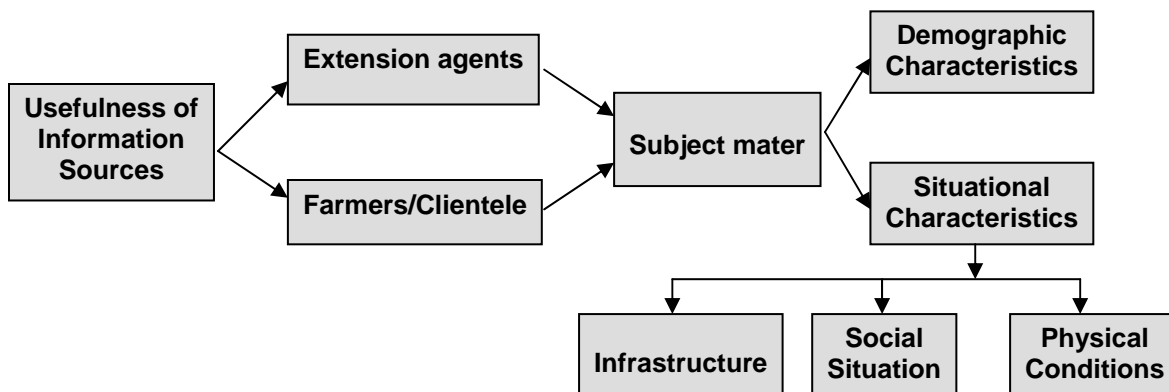


Figure 1: Framework for Usefulness of Information Sources

Purpose and Objectives

The overall purpose of this study was to determine the usefulness of information sources in promoting hybrid rice program in the Philippines. Objectives of the study were to: 1) determine perceptions of farmers and extension agents relative the usefulness of information sources, 2) determine differences, if any, between the two groups relative to the usefulness of information sources in promoting hybrid rice program.

Methods and Procedures

Data for this study came from a larger study entitled, “Assessment of Hybrid Rice Program in the Philippines.”

Population and Sample

The population of this study consisted of all hybrid rice farmers (N=865) in the province of Isabela, and all Extension Agents (N=132) involved in the HRP in the same province. Stratified random sampling procedures were used to select farmers. In this study, the subgroups or strata of farmers represented the different classes or levels (6) of municipalities in the Philippines. A total of 257 farmers were selected based on the procedures suggested by Krejcie and Morgan (1970). This sample size reflects 5% margin of error and 5% sampling error.

Instrumentation

A three-section survey instrument was used to collect data from farmer-respondents and extension agents. The instrument was developed keeping in mind the key components of the GMA program relative to information support and training (Primer, GMA Rice Program, 2002). Section one contained items relative to usefulness of 15 print and media information sources measured on a three-point scale that ranged from 1=not useful to 3=useful. Section two of the instrument contained socio-economic and demographic characteristics (gender, age, number of years in rice farming, marital status, number of cropping seasons in hybrid rice farming, and educational attainment) of the farmer-respondents and extension agents. Section three elicited comments, if any, from farmer and extension agents.

The survey instrument for this study was reviewed by a panel of experts consisting of thesis committee members of the researcher, PhilRice scholars in Japan, Taiwan, and in the United States and PhilRice staff members. The instrument was translated from English language to the Ilocano dialect with assistance from PhilRice staff members of the Development Communication Division, Technology Management and Services Division, PhilRice Hybrid Center in San Mateo, Isabela, and extension agents from Abra and Nueva Ecija. Approval for human subjects was obtained from the Office of Research Protections (ORP) at the Pennsylvania State University.

The instrument thus developed was pilot tested in Nueva Ecija province using 32 extension agents involved in the promotion of the HRP. These 32 extension agents represented two municipalities (Talavera and Muñoz) not included in the sample. The instrument was tested for reliability by calculating the Cronbach's alpha using data obtained from the pilot test. The instrument was found to have acceptable reliability (alpha coefficients ranged from 0.83 to 0.91 for the six information source groupings).

Data Collection and Analysis

The survey administration was personally supervised by the researcher. Prior to data collection, the Human Resource Management Office of the PhilRice Central Experiment Station in Nueva Ecija facilitated the recruitment of survey enumerators and data encoder for the study. The survey enumerators consisted of three PhilRice staff members and four recent graduates of agriculture-related degrees who were residents of San Mateo, Isabela. All of the enumerators were adept in speaking the local dialect which is Ilocano.

A one-day orientation regarding the study was conducted for the survey enumerators and data encoder. The orientation included the discussion of the survey instrument for a clear and uniform understanding of all items on the survey instrument by the enumerators and the data encoder. In addition, the approved authorization to conduct research with human subjects was also discussed. The data encoder was in-charge of translating the responses of farmers being well-versed with the Ilocano dialect. Data encoding was completed the following day after the survey instrument were edited and corrected for some missing and unclear information.

The enumerators were provided with the interview schedule for the day (4-6 interview schedules) including the Informed Consent Form from the Office of Research at Penn State. Prior to the interviews, farmers were informed of their rights as an interviewee, their rights to confidentiality of their responses, and their right to decline certain questions during the interview process. After the farmers agreed to be interviewed, they were made to sign the Informed Consent Form. In cases where the farmers were unable to write, the farmers requested other family members to sign the form on behalf of them. After reviewing the completed interview schedules, the surveys were then handed over to the data encoder. Encoding of the day's completed interviews was completed the following day.

The survey instruments for extension agents were delivered to the offices of the Municipal Agriculturists of the municipalities involved in the Hybrid Rice Program. Prior to the distribution of the survey, a courtesy call was made to the Municipal Agriculturist. The completed survey instruments were collected by the researcher after three days.

Data for this study was analyzed using the Statistical Program for Social Sciences (SPSS). The statistical modes of analysis included measures of central tendency and t-test for independent samples.

Findings

Demographic Profile of Farmers and Extension Agents

Majority of the hybrid rice farmers were male (87.2%), married (92.2%) and most of them were middle aged (below 51 years old - 63.1%). About 38.6% of the hybrid rice farmers completed a college education (these include farmers who finished a bachelor's degree, and some graduate studies), 12% reported completing some college, 16.3% had completed high school education, and 6.6% received a diploma from a vocational school, while 11.7% had completed elementary education. More than one half (56%) of the farmers have been planting rice for more than 16 years.

Majority of the extension agents (68%) were between 41 to 55 years old. Twenty-one percent were in the age group 19 to 40 years, while 11% were in the age group of 56 to 65 years. A little over one-half (54.5%) of the extension agents were male, while 45.5% were female. All extension agents had completed a bachelor's degree and approximately 10% had completed master's degree. About 19% of the extension agents had taken some credits leading to master's degree. Majority of the extension agents on average had 16 years of extension service (58%). A substantial number of extension agents (90%) were married.

Objective 1: Usefulness of Information Sources as Perceived by Farmers and Extension Agents

Both farmers and extension agents were asked to rate the usefulness of 15 information sources using a three-point scale (1=not at all useful to 3=very useful). Means, standard deviations and rankings of each information source as perceived by farmers and extension agents are shown in Table 1. Overall, both farmers and extension agents perceived most of the information sources as "very useful" in promoting hybrid rice program. It is interesting to note that extension agents rated all 15 information sources higher than farmers. However, there were differences in mean rankings. Both farmers and extension agents rated technical demonstrations as most useful ($M=2.77$, $SD=0.44$ and $M=2.99$, $SD=0.08$) for farmers and extension agents respectively). In addition, farmers also rated hybrid rice technical briefing and co-workers as "very useful."

It is also interesting to note that both farmers and extension agents rated traders and agro-chemical companies as "somewhat useful." Although farmers and extension agents rated all the information sources in the range of "somewhat useful" to "very useful," some interesting findings were observed in the mean rankings (see Table 1). For example, extension agents tended to rank radio much higher (12) than farmers (8). Further, extension agents ranked farmers as an informational source much higher (4) than farmers themselves (9). Extension agents ranked seed companies much higher (8) than farmers (13). Similar rankings were observed for posters (see Table 1).

Objective 2: Differences Between Farmers and Extension Agents Regarding Usefulness of Information Sources

To address objective two, the 15 information sources were grouped into six categories: print, electronic, technical experts, peers, demonstrations, and traders. The groupings of information sources allowed for making comparisons between farmers and extension agents relative to the usefulness of information sources. Independent t-test analysis was used to compare the differences. As shown in Table 2, significant differences at the 0.05 level were found between farmers and extension agents relative to the usefulness of six information groupings. For all the six information groupings, extension agents' ratings were significantly

higher than farmers' ratings (see Table 2). Although significant differences were found between the two groups, mean ratings for the information source, technical experts were very close ($M=7.74$ vs. $M=8.07$) for farmers and extension agents respectively.

Table 1. Perceived Usefulness of Information Sources as Perceived by Farmers and Extension Agents.

Information Source	Farmers (n=257)			Extension Agents (N=132)		
	<i>M^a</i>	<i>SD</i>	<i>R</i>	<i>M^a</i>	<i>SD</i>	<i>R</i>
Radio broadcast	2.48	0.59	8	2.61	0.57	12
Television broadcast	2.38	0.62	9	2.63	0.55	8
Leaflets/brochures	2.76	0.45	4	2.76	0.38	5
Technical demonstrations	2.77	0.44	1	2.99	0.08	1
PhilRice staff	2.70	0.49	5	2.76	0.45	5
DOA national staff	2.53	0.59	6	2.63	0.50	8
DOA regional staff	2.49	0.58	7	2.67	0.48	7
Co-worker/peer	2.77	0.46	1	2.93	0.29	2
Hybrid rice technical briefing	2.77	0.44	1	2.91	0.28	3
Farmers	2.38	0.60	9	2.79	0.41	4
Traders	1.81	0.66	15	2.04	0.69	15
Seed companies	2.20	0.60	13	2.63	0.48	8
Agro chemical companies	2.10	0.61	14	2.22	0.59	14
Posters	2.23	0.58	12	2.63	0.52	8
Billboards	2.25	0.60	11	2.58	0.53	13

A mean computed on a scale 1 "not at all useful" to 3 "very useful"

Table 2. T-test Results for Mean Differences Between Farmers and Extension Agents Regarding Usefulness of Information Sources.

Information Source	Farmers (n=257)		Extension Agents (N=132)		<i>Mean Diff</i>	<i>T value</i>
	<i>M^a</i>	<i>SD</i>	<i>M^a</i>	<i>SD</i>		
Print (3-9)	7.21	1.14	8.07	1.09	-.8586	-6.82**
Electronic (2-6)	4.85	1.11	5.24	0.99	-.3904	-3.23*
Technical experts (3-9)	7.74	1.39	8.07	1.30	-.3338	-2.18*
Peers (2-6)	5.15	0.85	5.72	0.56	-.5703	-7.68**
Demonstrations (2-6)	5.54	0.68	5.92	0.27	-.3764	-5.87**
Traders (3-9)	6.09	1.45	6.93	1.33	-.8350	-5.13**

A mean computed on a scale 1 "not at all useful" to 3 "very useful"

Numbers in parentheses reflect the range of scores for each category of information source

* $p < .05$; ** $p < .001$

Educational Importance

Findings from this study offer implications for redirecting efforts to develop information sources for effective promotion of hybrid rice technology. Results of this study also mirror findings from previous research.

First, PhilRice staff should continue to use traditional information sources such as brochures and demonstrations to convince farmers about adopting rice technology. Innovative ways of developing simpler, attractive, and less expensive leaflets/brochures should be employed to promote Hybrid Rice Program.

Second, PhilRice should also look into developing electronic information sources for faster dissemination. Of course, radio and newspapers are used effectively to communicate weather and market information. Use of radio and television to promote and/or advertise many activities of the Hybrid Rice Program should be undertaken. This is especially true when the target group/farmers have a low literacy levels.

Third, the role played by seed companies, traders, and agro-chemical companies need to be further examined. Traditionally and historically traders, seed companies, and agro-chemical companies have played a critical role in providing useful information to farmers on a variety of topics.

Professional development opportunities for Extension agents should focus on developing informational/educational resources so that they can effectively communicate with farmers.

Extension agents and staff should be trained in developing educational materials using electronic technology, including Geographic Information System (GIS), Webpage development, and digitizing of Strategic Agriculture and Fisheries (SAFDZ). Further research is needed to study the effectiveness of information sources in promoting hybrid rice technology.

Finally, as pointed out by Flor (2002), tremendous potential exist for the agricultural sector regarding information and communication technologies. The challenge for extension educators, staff development, and information and technology experts is how best to capitalize on the potential that global information and communication technology offers.

References

- Bounaga, L. (1989). *Preferred sources and methods of obtaining information related to adoption of soil conservation practices by landowners of highly erodible fields in Franklin County, Iowa*. Unpublished Master of Science thesis, Iowa State University, Ames, IA.
- Bouare, D., & Bowen, B.E. (1990). Communications methods used by agricultural extension agents. *Journal of Applied Communications*, 74(1), 1-7.
- Bruening, T.H., Radhakrishna, R.B., & Rollins, T.J. (1992). Environmental issues: Farmers' perceptions about usefulness of informational and organizational sources. *Journal of Agricultural Education*, 33(2), 34-42.
- Fliegel (1984). *Extension communication and the adoption process*. In Swanson (Ed). *Agricultural Extension – A Reference Manual*. Rome: Food and Agricultural Organization of the United Nations.
- Flor, A.G. (2002). *Information and communication opportunities for technology transfer and linkages*. Paper presented at the Expert Consultation on Agricultural Extension, Research-Extension-Farmer Interface and Technology Transfer. Food and Agricultural Organization Regional Office for Asia and the Pacific, Bangkok, Thailand.

- Gamon, J.A., Bounaga, L., & Miller, W.W. (1992). Identifying informational sources and educational methods for soil conservation information used by landowners of highly erodible soils. *Journal of Applied Communications*, 76(1), 1-6.
- Ginintuang Masaganang Ani (GMA) Rice Program (2002). The GMA Rice Program Secretariat. Department of Agriculture, Field Operations Service, Quezon City, Philippines.
- Krejcie, R.V., & Morgan (1970). Determining sample size for research activities. *Educational Psychological Measurement*, 30, 607-660.
- Lionberger, H.F., and Gwin, P.G. (1982). *Communication strategies: A guide for agricultural change agents*. Danville: The Interstate Printers and Publishers, Inc.
- Mohammadi, D. (2002). *An investigation of the factors influencing information seeking behavior of extension workers in Zanjan province of Iran*. Unpublished Master of Science thesis, Tehran University, Tehran, Iran.
- Okai, M.N. (1986). *The delivery of agricultural information to small farmers*. Unpublished Doctoral Dissertation, University of Missouri, Columbia, Columbia, MO.
- Oladele, O.I. (2002). Communication links in research-extension-farmers interface in southwestern Nigeria. *Journal of Extension Systems*, 18(2), 89-100.
- Padgitt, S. (1987). *Agriculture and groundwater issues in big spring basin and Winnesheik County, Iowa: Survey of farm and nonfarm households on perceptions, attitudes, and farming practices*. Cooperative Extension Service, Iowa State University, IA.
- Pezeshki-Rad, G., & Zamani, N. (2005). Information seeking behavior of Iranian extension managers and specialists. *Information Research*, 10(3). Retrieved December 20, 2005 from <http://informationr.net/ir/10-3/paper229.html>.
- Radhakrishna, R.B. & Thomson, J.S. (1996). Extension agents' use of information sources. *Journal of Extension*, 34(1). Retrieved January 16, 2006 from <http://www.joe.org/joe/1996february/rb2.html>.
- Radhakrishna, R.B., Nelson, L.E., Franklin, R., & Kessler, G. (2003). Information sources and extension delivery methods used by private longleaf pine landowners. *Journal of Extension*, 41(4). Retrieved January 16, 2006 from <http://www.joe.org/joe/2003august/rb3.shtml>.
- Redona, E.D., Virmani, S.S., Malabanan, F.M., Toledo, R.S., Javier, L.J., Casal, C.L., Rebuelta, P.I., Barroga, R.F. & Obien, S.R. (2001). Hybrid Rice Technology in the Philippines: From Laboratory to Farmers' Fields. In E.D. Redona & M.G. Gaspar (Eds.), *Hybrid Rice in the Philippines: Progress and New Horizons*. Rome: Food and Agriculture Organization of the United Nations and Philippine Rice Research Institute.
- Richardson, J.G. (1989). Extension information delivery methods: Detecting trends among users. *ACE Quarterly*, 72(1), 23-27.