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Abstract

An exploratory research study was conducted to determine the current practices of communicating information between officers of the Cypriot Department of Agriculture and farmers in Cyprus in an attempt to improve its effectiveness and efficiency and thereby strengthen the Extension Service of the Department of Agriculture. The variables studied were type and content of information, method of communication, and training received during 2009. The study used a descriptive survey research methodology, organized into three phases with two interview schedules developed to collect the data from a stratified random sample of 225 Cypriot farmers. A total of 124 farmers were interviewed, resulting in a 55% response rate. When the communication methods were analyzed, the farmers indicated a preference for receiving written materials while visits from officers were also popular. The farming television program was preferred to its radio equivalent while electronic communication methods were favored only by few farmers, mainly the larger commercial farms. A large number of the farmers indicated that they received very limited information or training from the Department of Agriculture during 2009 with some relying on information and training from other sources. Given these findings, it is recommended that a communication strategy be developed so that the Department of Agriculture will become more apparent and relevant to the farmers it serves.

Keywords

Agricultural extension, communication methods, communication efficiency, Cypriot farmers, Cyprus Department of Agriculture

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An exploratory research study was conducted to determine the current practices of communicating information between officers of the Cypriot Department of Agriculture and farmers in Cyprus in an attempt to improve its effectiveness and efficiency and thereby strengthen the Extension Service of the Department of Agriculture. The variables studied were type and content of information, method of communication, and training received during 2009. The study used a descriptive survey research methodology, organized into three phases with two interview schedules developed to collect the data from a stratified random sample of 225 Cypriot farmers. A total of 124 farmers were interviewed, resulting in a 55% response rate. When the communication methods were analyzed, the farmers indicated a preference for receiving written materials while visits from officers were also popular. The farming television program was preferred to its radio equivalent while electronic communication methods were favored only by few farmers, mainly the larger commercial farms. A large number of the farmers indicated that they received very limited information or training from the Department of Agriculture during 2009 with some relying on information and training from other sources. Given these findings, it is recommended that a communication strategy be developed so that the Department of Agriculture will become more apparent and relevant to the farmers it serves.

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Introduction

Cyprus is a small Mediterranean island with a total area of 9,251 sq Km and population of 779,000 (Cyprus Statistical Service, 2007). Although the country traditionally had a farming character, recently agriculture's contribution to the Gross Domestic Product (GDP) has declined to only 2.2% (Cyprus Statistics, 2007). Similarly agriculture contributes 6.6% to employment, and Agricultural exports contribute 23.8% to total exports (Cyprus Statistics, 2007). Prior to independence from Britain in 1960, Agriculture was the main occupation for Cypriots and the Extension Service played a critical role in agricultural development by helping to improve the quality and quantity of agricultural products (Andrew, 1975; Persianis,1996; Rappas, 2009). Since independence, however, more and more Cypriots chose to work in other sectors like tourism and services, which meant that the entire agricultural sector declined and the Extension Service became less important. Since Cyprus' accession to the European Union (EU) in May 2004, the Department of Agriculture (DOA) and the agricultural sector in general have been challenged even further (Press and Information Office, 2007). Apart from the fact that cheaper imports flooded the island resulting in much of the local produce remaining unsold; the DOA's role has also changed, from providing outreach programs to Regulation Policing. Under the EU rules, farmers and other beneficiaries can only gain funding if they abide by the standards and requirements of the EU.

The objectives of the Agricultural Extension Service is to inform the Ministry of Agriculture, Natural Resources and Environment as well as the Agricultural Research Institute (ARI) about problems that farmers encounter, to train farmers on innovations regarding agriculture and home economics, and to plan, promote and evaluate Extension programs and other agricultural projects (Neocleous, 1995). Extension employees use extension communication methods to carry out those objectives. The communication methods used by the Extension Service in Cyprus are classified into three categories (Neocleous, 1995; Cyprus Department, 2010): *Individual* methods (personal contacts, telephone contacts, written letters), *Group* methods (result and method demonstrations, lectures, seminars, short training courses, educational field trips), and *Mass* methods (television and radio agricultural programs, leaflets, bulletins, publications, a quarterly magazine, a biannual agricultural fair, information campaigns, daily press).

The widely accepted meaning of Extension "involves the conscious use of communication of information to help people form sound opinions and make good decisions" (Van den Ban & Hawkins, 1996, p. 9). However, for Agricultural Extension to be successful, several "ingredients" need to be present including innovative, relevant and systemized information which responds to the needs of the people that would use it (Jones & Garforth, 1997). Furthermore, a successful Extension incorporates a variety of methods used to disseminate the information (Jones & Garforth, 1997). Extension's clientele can be diverse in many ways (age, gender, education, access to resources such as land, water, labor, capital) (Campbell & Barker, 1997). Thus, disseminating information using a variety of delivery/communication methods is fundamental in reaching the largest possible audience/clientele.

Theoretical Framework

The study is guided by three theories/processes: (a) The Adoption-Diffusion theory, (b) The Communication Process, and (c) The Participatory Approach. The Adoption-Diffusion theory, developed by Rogers (1995), explains why farmers choose to adopt new ideas. Diffusion, "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995, p. 35) includes four important elements: the innovation (idea, practice or object that is perceived to be new by the receiver), the communication channel (the means by which information gets from the sender to the receiver), time (for the adoption to materialize), and the social system (the members of the group associated with the process) (Rogers, 1995). More specifically, Rogers (1995) argues that "mass media channels are more effective in

creating knowledge of innovations, whereas interpersonal channels are more effective in forming and changing attitudes toward a new idea, and thus in influencing the decision to adopt or reject a new idea" (Rogers, 1995, p.36). Adoption, on the other hand, is the decision made to accept and use the innovation (Seevers et al., 1997). The time needed and the rate of adoption depends on the innovation itself and the characteristics of the receivers. There are five stages in the adoption process: awareness, interest, evaluation, trial, and adoption.

The Communication Process Theory defines communication as "the process of exchanging messages and signals between social actors" (Leeuwis, 2004, p. 84). In Extension, the Source, Message, Channel, Receiver, Effect (SMCRE) Communication Model has been especially useful when analysis of communication factors is needed. The *Source*, which includes knowledge, skills, and attitudes of the extension officers creates (encodes) a *Message*, which could be the information that needs to be transmitted to the farmer. The *source* assesses which *Channel*, i.e. communication method, will be used to transmit the *message* to the *Receiver*. The *receiver* decodes the *message* according to his/her skills, knowledge, socioeconomic status and attitudes and makes a decision whether to use the information or not. This decision is the *Effect*. Finally, the *source* evaluates the *effect* and the impact that the message had on the *receiver* (Van den Ban & Hawkins, 1996).

The Participatory framework describes "approaches and methods to enable local people to share, enhance, and analyze their knowledge of life and conditions to plan and to act" (Chambers, 1994, p.1437). The intent is to involve the farmers to carry out their own analysis of their farming needs and priorities and make those needs known to the officers who can assist in fulfilling them. The participatory approach is particularly important in Extension as many farming systems can be diverse and complex and one solution may not be appropriate for all areas (Chambers, 1994). Additionally, participatory research methods tend to produce more detailed, accurate and in depth information resulting from the participants' motivation (Chambers, 1994). Participation increases the levels of trust and understanding among the participants and the facilitators and the process has the farmer at the heart of it (Feder, Willett, & Zijp, 1999). All three theories/approaches are important and can be interrelated as shown in Figure 1.

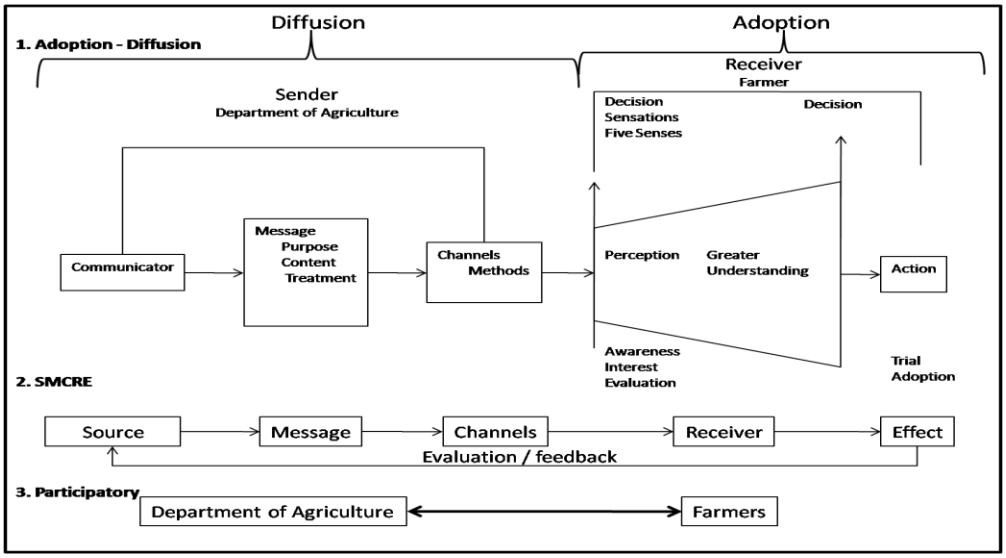

Figure 1. The Three Theoretical Models of the Study.

This study focuses on the channel (communication methods) aspect of the theories and whether the choice of delivery method is the appropriate one considering the knowledge, skills, socioeconomic status, needs and attitudes of the farmers (Campbell & Barker, 1997). The communication methods used in Extension can be classified by the way of contact: (a) Mass contact

(newspapers, magazines, publications, exhibitions, internet, radio, and television), (b) Group contact (speeches, meetings, talks and seminars, demonstrations, and group discussions), and (c) Individual contact (one-to-one discussions, farm visits, office visits, telephone calls and written correspondence) (Seevers et al., 1997).

Mass media are considered to be the least expensive way of sending information to a large number of people and they are important in increasing awareness and accelerating existing change processes; however, they are rarely influential enough to bring about behavioral change (Van den Ban & Hawkins, 1996). *Group* methods are interactive, usually highly focused and tailor-made to the interests of the group, they provide direct feedback and have the potential of an improved communication between Extension and its clientele. *Individual* extension methods, which include the traditional one-on-one discussion, usually address specific problems faced by particular farmers. Although this method is costly and time consuming, it can be considered as the optimal since close relationships and trust are generated in the process.

Over the last couple of decades, "electronic extension" also emerged as a new communication channel (Relado, 2008). Examples of new electronic methods include dissemination by CD-ROMs, electronic conferencing, the internet, text messaging, and mobile phones (Leeuwis, 2004). Although electronic extension can be a less expensive method of reaching many clients, it requires that the technology is in place and available to clients. A study conducted among county extension educators in the United States by Harder and Lindner (2008) on the adoption of electronic extension found that the electronic extension channel is still in its early stages. Additionally, Abbott (1989) in his survey among farmers identified that demand for the traditional information channels will not decline as a result of the internet revolution since farmers lack the skills and confidence in using new information sources (Riesenberg & Gor, 1989). Howell and Habron (2004) reported that the use of electronic communication methods is related to demographic characteristic such as age and education level.

Purpose and Objectives of the Study

The purpose of this study was to identify and assess the current communication methods between the DOA in Cyprus and the Cypriot farmers and suggest ways to strengthen communication both in terms of effectiveness and efficiency. The study sought to address the following objectives:

(a) Identification of the type of agriculture-related information which farmers receive from the DOA or other sources and the quality of this information.
(b) Identification of the type of agriculture-related training which farmers receive from the DOA or other sources and the quality of this training.
(c) Identification of the methods of communication currently used between the DOA and Cypriot farmers; and identification as to whether or not these are the farmers' preferred methods.
(d) Receive recommendations from farmers on how to improve the information, training, and contact between them and the DOA.

Methodology

The study used a descriptive survey research methodology to collect information describing opinions, beliefs, knowledge and attitudes of the participants through questions and answers (Fraenkel & Wallen, 2003). The study was structured into three phases. Phase one was designed to gather preliminary information to determine broad parameters for questions to be developed for use in phase two of the study. The researcher personally interviewed the Director of the DOA and employees from the Extension and the Horticulture sectors of the DOA in Cyprus to document (a)

the communication methods that currently exist between the DOA in Cyprus and the farmers, and (b) the number of Cypriot farmers and in which farming sectors these farmers are active.

Phase two consisted of interviews with 25 key personnel representing producer and farmer organizations. To identify participants for phase two of the study, the researcher was provided with a list of all the Producer Organizations that had been approved and recognized for operation by the Director of the DOA. Additionally, the researcher was provided with the names and telephone numbers of the owners of a poultry farm and an herb farm (for these two sectors are not organized in Producer Organizations). The researcher did not want to exclude these groups from this phase since feedback received from the DOA indicated that these sectors are also economically important. The leader of each Producer Organization or the key person corresponding with the DOA was interviewed in phase two.

The interview schedule for phase two included 21 open-ended questions to encourage the opinions of the interviewees and facilitate discussion. Questions asked about the frequency, method and quality of information flowing between the DOA and Cypriot farmers; the training and visits farmers received from the DOA and other sources; and the opinions of the farmers regarding the quality of these services and their preferred methods of receiving information and training. Using content analysis, the responses were coded for frequency of specific patterns that were indicative of the research questions and the data were analyzed for similarities across responses (Patton, 1990). Phase two was essential in establishing both research reliability and internal consistency, to ensure that the questions for the phase three interview schedule would be appropriate.

In phase three, data were collected from a stratified random sample of farmers in Cyprus. The population frame for phase three of the study included farmer registry lists that were provided by the Cyprus DOA. Using a published table, a sample size of ± 7% precision giving a confidence level of 95% and P= .05 was selected (Israel, 2009) which was equivalent to 225 farmers. All farmers identified by the DOA registers were categorized into strata according to the farming sector in which they were active and a proportionate stratified random sample was chosen so that most of the groups would be represented. For phase three, a second interview schedule was developed based on the results and data collected during phase two. This second instrument included 23 questions with most of the answers measured on a 5 or 6 point Likert-type scale. The questions in phase three were similar to those in phase two with the addition of demographic questions. The study and the instruments used received human subject approval from the Office of Research Protection (ORP) at The Pennsylvania State University (IRB#30627).

Both quantitative and qualitative methods were used to analyze the data. The surveys were coded, entered and analyzed using SPSS (version 17.0.1). Because the Likert-type scale information is being used as individual item by item rather than as a summated Likert scale, the Likert scale represents ordinal data at best (Good & Hardin, 2008). Miller (1991) indicated that it is permissible "to collapse" ordinal data to nominal data especially when the frequency distribution for the Likert scale is bimodal. Initially the intent was to analyze the data using both descriptive and inferential statistics. Prior to doing the Chi-square analysis, an exploratory data analysis was conducted to examine the distribution of responses. It became apparent that more than 20% of the cells had an expected frequency of less than 5. The statistical assumptions for inferential statistics could not be met (Harris, 1998). Therefore, inferential statistics were not used in this study. Qualitative responses were coded according to their similarity and then analyzed in a quantitative manner.

Findings

During data collection, three attempts were made to contact the farmers within the sample. A total of 124 responses were collected (55% response rate). Due to Data Protection legislation in Cyprus, the only participant contact information available to the researcher included the name,

cultivating sector, and telephone number of the farmer. The lack of additional contact information reduced the ability to follow up with non-responders.

Demographics

The participants adequately represented all districts in the country controlled by the government of the Republic of Cyprus. Among the participants 83% were male; 17% were female. The majority of the farmers (79%) were age 47 or older, an indication of the aging farm population in Cyprus. Almost half of the participants (48.4%) are educated only through the elementary level. Only 22.6% of the participants indicated that they have internet access.

The majority of respondents were horticultural farmers (43.5%) who grow mainly citrus, grapes, vegetables, fruit, nuts and potatoes, and livestock farmers (33.9%) who raise goats, sheep, cattle, poultry, and swine. Just over 11% were both livestock and agronomy farmers. Nearly 6% percent (5.6%) of the respondents produced only agronomy products. For more than half of the participants (57.2%), farming is the main source of income. However, the percentage of part time farmers (42.7%) is high mainly driven by the horticultural sector, which includes crops that do not need much cultivating care. In contrast, the labor intense sectors like livestock and agronomy sectors are characterized by a higher percentage of full time farmers.

Type and Quality of Agriculture-Related Information Received by Farmers

Just over 45% of farmers received information from the DOA regarding the Rural Development Program and 87.4% of those who received the information rated this information acceptable or higher. Only a small percentage of farmers (between 0.8% - 25%) received any other type of information from the DOA, mainly for diseases, pesticides and subsidies. Most of the farmers who received such information rated it as acceptable or higher. Farmers' ratings are shown in Table 1.

When asked if they received information from other sources, 10.5% of the farmers indicated that they received information on the Rural Development Program, 55.6% on farming subsidies, 61.3% on pesticides and 29.8% of the farmers indicated that they received information about agricultural diseases from other sources. The other sources included Cyprus Agricultural Payments Organization (CAPO) and private consultants and sales persons from agricultural companies that sell agricultural products, such as pesticides. The farmers have rated the information they received from other sources as very good or excellent with the exception of the subsidies where the farmers rated the quality of the information they received as acceptable.

Type and Quality of Agriculture-Related Training Received by Farmers

Almost 18% of farmers remembered training and visits from sources other than the DOA in 2009. These sources included the Veterinary Service, CAPO, and of the Agricultural Research Institute. In some cases the farmers could not remember whether the visits related to training or checkups (monitoring) required by European and National legislation. However, fewer farmers remembered receiving training and visits from employees of the DOA. Only 5.6 % of the farmers remembered attending a local DOA training, 4.8% attended a local DOA seminar, and 3.2% attended seminars organized by the DOA at a different location. Attendance at DOA trainings or seminars at the head office were virtually non-existent. It must be noted that these training options were not mutually exclusive (i.e. a farmer could attend any training or seminar in any location). Farmers' perceptions of the frequency of training received are shown in Table 2.

Table 1
Farmers' Rating of the Quality of Information Received from the DOA (n=124)

Information Type/Content	**% Not Receiving Info**	**% Receiving Info**	***Rating of Quality from those who Received Information***		
			Useless / Low value	***Acceptable***	***Very good / Excellent***
Rural Dev Program	54.8% (68)	45.2% (56)	*12.4% (7)*	*37.4% (21)*	*50.0% (28)*
Diseases livestock	92.7% (115)	7.3% (9)	*0.0% (0)*	*21.9% (2)*	*76.7% (7)*
Diseases agriculture	81.5% (101)	18.5% (23)	*0.0 % (0)*	*21.6% (5)*	*78.4% (18)*
Pesticides/Food Safety	75.0% (93)	25.0% (31)	*0.0% (0)*	*22.4% (7)*	*77.6% (24)*
Subsidies	78.2% (97)	21.8% (27)	*11.0% (3)*	*37.2% (10)*	*51.8% (14)*
New policies	91.1% (113)	8.9% (11)	*9.0% (1)*	*27.0% (3)*	*62.9% (7)*
New technology	91.1% (113)	8.9% (11)	*9.0% (1)*	*9.0% (1)*	*82.0% (9)*
News Cyprus	94.4% (117)	5.6% (7)	*14.3% (1)*	*14.3% (1)*	*71.4% (5)*
News Europe	94.4% (117)	5.6% (7)	*14.3% (1)*	*28.6% (2)*	*57.1% (4)*
News World	94.4% (117)	5.6% (7)	*14.3% (1)*	*42.9% (3)*	*42.9% (3)*
New techniques	91.9% (114)	8.1% (10)	*0.0% (0)*	*9.9% (1)*	*90.1% (9)*
Cultivations	90.3% (112)	9.7% (12)	*0.0% (0)*	*16.5% (2)*	*83.5% (10)*
Farm management	95.2% (118)	4.8% (6)	*16.7% (1)*	*0.0% (0)*	*83.3% (5)*
Marketing	96.0% (119)	4.0% (5)	*20.0% (1)*	*20.0% (1)*	*60.0% (3)*
Other	99.2% (123)	0.8% (1)	*100.0%(1)*	*0.0% (0)*	*0.0% (0)*

Table 2
Farmers' Perception of the Frequency of the Training They Received (n=124)

Training	**Never**	**1-3 per year**	**4 or more per year**
Department of Agriculture:			
Training locally	94.4% (117)	4.0% (5)	1.6% (2)
Training at head office	99.2% (123)	0.8% (1)	0.0% (0)
Training elsewhere	99.2% (123)	0.0% (0)	0.8% (1)
Seminar locally	95.2% (118)	4.0% (5)	0.8% (1)
Seminar at head office	100.0% (124)	0.0% (0)	0.0% (0)
Seminar elsewhere	96.8% (120)	2.4% (3)	0.8% (1)
Other sources:			
Visits	66.1% (82)	27.4% (34)	6.5% (8)
Training/ Seminars	82.3% (102)	16.1% (20)	1.6% (2)

The percentage of farmers who reported attending training during 2009 is higher among "young farmers". Young farmers are persons under 40 years of age who are preparing to head an agricultural holding for the first time. Under the Rural Development Regulation (Council Regulation (EC) No. 1698/2005), young farmers are eligible to receive financial support upon proving to possess adequate agricultural occupational skills and competence as well as submitting a viable business plan. Therefore, the DOA organizes compulsory in-house training for young farmers that do not possess the skills. Half of the young farmer respondents (N=3) indicated that they received training while only 5.1% of the remaining farmers (N=118) indicated that they received any kind of training.

Regarding the farmers' perceptions about the quality of the training they received, more than half (57.62%) of farmers who received training rated the quality of the training as very good or excellent; 38.57% rated the training as acceptable and only 3.81% rated the training as useless or of low value. When asked to rate the quality of the training they received from other sources, all (100%) of the participants (4.8%) who received such training, rated the training received as very good or excellent."

Methods Currently Used by DOA to Communicate with Cypriot Farmer

Farmers' responses indicated that communication with the DOA is not frequent. The most commonly viewed mass source of information was the television program "Countryside" with 62.9 % of farmers watching it. Written correspondence and District employee visits were the most frequent individual communication channels with 38.7% and 32.6%, respectively. The majority of farmers (58.9%) indicated that they do not receive the "Farmer" magazine, but they would like to receive it. The majority of farmers did not telephone (97.6%) or visit the head office (91.9%) of the DOA; however some communicated with the District offices; 25% by telephone and 27.3% by visiting the District office. Less that 1% (0.8%) of farmers had electronic information sent to them and only 3.2% used fax communication with the DOA.

When asked about their preferred communication methods, 93.5% of the farmers indicated that they preferred leaflets by mail. Factsheets (79.8%), a specialist officer visit (79.8%), the telephone (79%) and a visit by a district officer (78.2%) were also highly preferred by the farmers. Video/DVDs, CDs internet or email communications were the least preferred methods. Nearly 72% of the participants (71.8%) indicated that they preferred presentations and seminars in their locality but only 14.5% indicated that they preferred presentations and seminars at the head office of the DOA in Nicosia. More than half of the farmers (54%) liked watching the television program "Countryside", however only 28.2% listened to the radio program "The hour of the countryside". Table 3 lists in order of preference the methods by which farmers preferred to receive communication from the DOA.

Farmers' Recommendations for Improvements in Information, Trainings, and Contact

When farmers were asked what improvement should be made to the radio program for them to listen to it more frequently, 69.4% of the participants replied that they would not listen to the program no matter what changes were made. Almost one in five (18.5%) of the participants indicated satisfaction with the program, 5.6% recommended changes in the day and time of transmission and another 5.6% indicated other reasons (such as work shifts) prevented them from listening to the program.

Table 3
Preferred Communication Methods of the Farmers (n=124)

Methods	Prefer*		Methods	Prefer*
Leaflets by mail	93.5% (116)		Demonstration plots	25.0% (31)
Fact sheets	79.8% (99)		Field trips	23.4% (29)
Specialist officer visit	79.8% (99)		Newspaper articles	21.0% (26)
Telephone	79.0% (98)		Other magazines	16.1% (20)
District officer visit	78.2% (97)		Head office seminar	14.5% (18)
Farmer magazine	73.4% (91)		Head office presentation	14.5% (18)
Local seminar	71.8% (89)		Fax	12.9% (16)
Local presentation	71.8% (89)		Internet	11.3% (14)
TV program	54.0% (67)		Email	11.3% (14)
Leaflets at central point	31.5% (39)		Website	8.9% (11)
Radio program	28.2% (35)		CD	7.3% (9)
SMS Text messaging	27.4% (34)		Video/DVD	4.8% (6)

*Note: Percentages do not add to 100% as respondents could select multiple choices.

The responses regarding the television program "Countryside", however, were different. Only 11.3% claim that they would not watch the television program no matter the changes. Just over 15% indicated that they are satisfied with the current program and would like it to continue as it is. Over half of the participants (51.6%) indicated a problem with either the day or time the program was transmitted. More than one in four farmers (27.4%) preferred the program to be moved to a weekday during the evening hours. Finally, 14.5% of the farmers reported that they did not watch the program for reasons unrelated to the program, such as shift work or irregular hours.

Over half of the participants (58.1%) did not receive the farmer magazine, either because they did not know the magazine existed or because they did not know how to obtain the magazine; they could not make recommendations on improvements. Only 6.5% of the participants read the magazine from cover to cover which is 15.5% of the farmers who actually received the magazine. Just over 23.4% of the farmers preferred to read articles on their farming sector and some other articles that may "catch their eye". This represents 55.8% of the people that received the magazine.

Results and suggestions regarding visits by specialist officers were varied. More than one in five participants (21.8%) indicated no need for a specialized officer to visit them whereas 20.2% of the participants indicated that they would like to be visited by a specialist officer at least 1-3 times per year, and a further 9.7% indicated that they would like a specialist visit even more frequently, four or more times per year. In contrast, 14.5% of the farmers believed that they either have enough personal experience or their own experience is superior to the experience of the officers. Almost 17% of the farmers were satisfied with the service and visits they received by the District employees and did not believe that a visit from a specialized officer was needed or would add additional value. Only 5.6% reported satisfaction with the visits currently received from a specialized officer. When the percentage of participants who are satisfied with visits by specialist officers are disaggregated by District, less than 10% of participants in each district were satisfied with specialist visits.

A higher percentage of participants (24.2%) reported being satisfied with the current service they received from a District employee. Only 4% indicated that they would prefer a visit by a specialist officer, however, 29.8% of the farmers would like more frequent district employee visits. The percentage of participants believing that they have more experience than the district employee is 11.3%. Finally, 21% of the farmers indicated that they did not require a visit at all and a further

3.2% are satisfied with the service and visits from other sources. When analyzed by farming district, satisfaction results varied. More than half (54.5%) of participants from the Famagusta district expressed satisfaction. In each of the other districts, the percentages of those satisfied were lower; 31.8% in Limassol, 25% in Paphos, 20% in Pitsilia and 15.8% in Nicosia and Larnaca, respectively.

Using open-ended questions, survey participants were also asked what further information they would like to receive from the DOA. The majority (60.5%) did not provide any suggestions (Table 4). Among the remaining participants, 8.9% requested marketing information or information regarding Producer Organizations and another 8.9% requested information of any kind. Nearly five percent, (4.8%) requested general advice whereas 5.6% commented that any advice they receive should be timely, accurate and simple for them to understand.

Table 4
Suggestions for Further Information To Be Sent (n=124)

Further information	**Frequency**	**Percent**
No suggestion made	75	60.5%
Information on marketing or Producer Organization	11	8.9%
More information about everything	11	8.9%
Timely, accurate, simple information	7	5.6%
General Advice	6	4.8%
Other (farmer magazine, collaboration with ARI, visits)	4	3.2%
Information on innovations or machinery	3	2.4%
Information on the Rural Development Program	3	2.4%
Information on organic agriculture	2	1.6%
Information on pesticides	1	0.8%
District seminars	1	0.8%
Total:	**124**	**100.0**

Participants were also asked to express their opinions on what they perceived as obstacles in the effective and efficient communication between the DOA and themselves. Just over one in four (26.6%) participants expressed no opinion, (Table 5); almost as many (23.4%) were satisfied with the current situation (21% were satisfied and 2.4% were content in the sense that when requested, the officers addressed their problems). However, 33.9% of the participants perceived certain officer attributes, such as low knowledge, and poor attitude as obstacles. Furthermore, the farmers expressed their lack of trust and confidence in the officers. Most farmers reported that the officers did not visit as often as they did in the past; that they did not appear to care about the farmers; that they were young and inexperienced and many of the old experienced officers had retired.

Participants provided further recommendations regarding ways to improve communication related to training, seminars and presentations. Farmers indicated that the venue and timing of these functions were sometimes not convenient; evenings and a location near the participants' place of farming or residence were recommended as more convenient.

Table 5
Perceived obstacles to the efficient and effective communication between the Department of Agriculture and the farmers (n=124).

Perceived obstacles	**Frequency**	**Percent**
Officer problem (trust, knowledge, attitude, no visits)	42	33.9%
No opinion expressed	33	26.6%
Satisfied - no complaints	26	21.0%
Officer and farmer problem (e.g. do not depend on DOA)	7	5.6%
Disorganization of the service	6	4.8%
Worldwide Agriculture Problem	5	4.0%
Satisfied - officers visiting when requested	3	2.4%
Lack of funding	1	0.8%
Same communication as in the past	1	0.8%
Total:	**124**	**100.0**

Conclusion, Recommendations and Implications

Farmers' responses indicated that communication between the DOA and the Cypriot farmers is less than optimal. Farmers seemed to be the most aware of the DOA's role in promoting and implementing the Rural Development Program. Only a small percentage of farmers acknowledged receiving the more traditional "extension type" agricultural information from the DOA. A larger percentage of farmers indicated that they received "extension type" information from other sources. These findings suggest that the potential services of the DOA are underutilized. Similarly, more farmers remembered training and visits from officers of other Departments of the Ministry of Agriculture such as the Veterinary Services. The smaller percentage of farmers who did receive training from the DOA rated the training as very good or excellent. Perhaps many of the farmers who replied that they do not receive training were not aware of the availability of training, or the content of the training was not relevant to them, or they were unable to attend. Some farmers indicated that the timing of the training conflicted with their farming activities.

The farmers indicated that the weekly television program was the most frequently used source of information. Among individual communication methods, a District employee visit and written correspondence were the most common sources of information. While contact with the head office was not a common practice among the participants, they did seek information from their local District office, either by telephone or by visiting. This indication is in line with the "rationale" of the existence and operation of the District offices. Very few farmers have electronic information or fax communication with the DOA. The low usage of the electronic communication methods is consistent with the low internet access rate of only 22.6%. With the exception of some organized groups, telecommunications and internet technology have already been identified as a weakness. Cyprus has received funding approval from the EU for up to 900,000 Euros to improve broadband infrastructure in rural areas within the period 2010-2013 (Europa, 2009). The limited use of telecommunications is not surprising, since several farmers reported that they do not have the equipment, skills, or knowledge needed to use internet communications.

Farmers indicated that their most preferred communication methods were written material and specialized fact sheets which can be read at their own convenience or stored for future use. Most farmers also expressed the belief that discussion of ideas and experiences during visits with a District employee or a specialist officer were invaluable.

Most importantly, the use of participatory methods and strategies in the planning, conduct, and evaluation of Extension programs is crucial. Participatory methods create a demand-driven Extension that addresses the needs of the people it serves. The agricultural sector is changing therefore the needs of the farmers for information (content and quality) are also changing. The programs that Extension delivers have to be relevant to the needs of the farmer. A planned strategy to consult and dialogue with the farmers in Cyprus will help the DOA to identify and prioritize the needs of the farmers. Greater collaboration between the DOA and the farmers will increase the level of trust and open the lines of communication more widely between the Extension Service and the farmers.

Collaborations with the Agricultural Department of the new Technological University in Cyprus and the DOA could be mutually beneficial to both organizations. Working together, the University could conduct research on specific topics directly related to Cypriot agriculture, while the Extension officers benefit by updating their knowledge in these areas. Furthermore, the DOA could conduct internal research to assess the skills and knowledge of the officers and address any weaknesses by offering further training. Some officers may not feel confident using all of the communication methods which farmers prefer. Training in these methods could strengthen the lines of communication between Extension officers and farmers.

The success of the Extension Service in Cyprus depends, to a considerable extent, on the improvement of communication effectiveness and efficiency between the DOA and the Cypriot farmers. Although the efficiency of the communication was addressed in this study, the effectiveness of the lines of communication needs further study. Extension changes require major effort, long term commitment and can take time. However, the end result should improve communication between the Extension Service of the DOA and the Cypriot farmers in each agricultural sector especially with active participation from farmers. Adapting the Extension Service to meet the needs of the modern farmer should become the vision for the DOA and of the Cypriot government. Achieving this vision will not only strengthen the Agricultural Sector but support the whole economy of the country.

Based on the findings of this study, the following recommendations are offered:

(a) Compare and evaluate the information and training farmers receive from the DOA and other sources; and identify reasons why farmers are more likely to receive information and training from other sources than from the DOA.
(b) Develop participatory strategies that establish on-going dialogue and input from farmers in the planning, conducting and evaluation of Extension programs.
(c) Develop a marketing "campaign" to publicize the services available through the DOA ("farmer" magazine, TV and radio programs, seminars, presentations, training, etc).
(d) Compile a list of all communication methods and materials being sent to the farmers by sector and coordinate the activities according to the preferred communication methods of the farmers.
(e) Dedicate greater effort to the development of written materials and specialized factsheets; evaluate these and other written materials for appropriate literacy level.
(f) Conduct an evaluation of all methods currently used by the DOA to identify the strengths and weaknesses of each method for the targeted audience.
(g) Establish a regular visitation or contact schedule between District officers and farmers to strengthen the role of the district office.
(h) Using the evaluation/feedback process of the communication theory, identify practices of the Famagusta District office which had the highest satisfaction rates and assess transferability to the other District offices.
(i) Currently, the home economics section of the Agricultural Extension Service is experiencing limited activity and focus. A similar evaluative study of home economics may provide

recommendations for strengthening this sector of the Agricultural Extension Service in Cyprus.

(j) Collaborate with the new Technological University of Cyprus to provide up-to-date and relevant training for Extension officers.

(k) Monitor and evaluate all Extension programs to improve their quality.

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