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IMPACT OF THE AGRICULTURAL EXTENSION RADIO PROGRAM, "ARDEL-MAHROUSA", ON THE KNOWLEDGE OF VEGETABLE AND FRUIT CROPS ACQUIRED BY THE DELTA AND UPPER EGYPT FARMERS

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Abstract

The main objective of this study was to determine impact of the agricultural extension radio program, "Ardel-Mahrousa", on the acquired knowledge by vegetable and fruit farmers living in each of Upper Egypt (Fayoum and Menia governorates), and the Delta (Kalioubia and Behira governorates). The study data were collected during the period March-April as a part of a project, conducted by AERDRI, for evaluating the agricultural extension radio program, "Ardel-Mahrousa". The study sample encompassed 400 farmers living in four Governorates (Kalioubia and Behira from the Delta, and Menia and Fayoum from Upper Egypt). The study comprised 200 fruit and vegetable farmers from Upper Egypt, and another 200 fruit and vegetable farmers from the Delta (100 respondents from each Governorate). Three preconditions were determined previously to be met by the study participants: (1) they work primarily in agriculture, or agriculture and additional work(s); (2) they listen regularly to the program with a minimum of one episode/month; and (3) they are willing voluntarily to participate in the study.

A pre-tested written questionnaire and face-to-face, or interpersonal interviews were used in collecting the study data. Frequency, mean, standard deviation, t-test, Zero-order correlation, and step-wise multiple regression were used in analyzing the obtained study data. Relationships between farmers' knowledge related to each of vegetable and fruit crops accrued from listening to the radio program (the dependent variables), and some studied independent variables (age, education, family size, additional work(s), agricultural land ownership, wife's education, listening habits, and knowledge discussion with others) were determined. The study findings, the study limitations, and farmers' suggestions were explained.

INTRODUCTION AND THEORETICAL FRAMEWORK

Vegetables and fruits are vital food components needed for maintaining health of human body. They provide humans with minerals and vitamins necessary for building body immunity and providing body resistance against diseases. In Egypt, an increase in

fruit production has been achieved during a period of 18 years (1981-1999). Al-Migala Al-Zeraaia (2000:68-72) reported that the total Egyptian production of fruits, including dates, was increased from 2,368 thousand tons in 1981-1982 to 8,170 thousand tons in 1999/2000, with a total increase of 5,801 thousand tons (a total increase rate of 244.9% and an annual increase rate of 7.11). This came primarily as a consequence of two factors: (1) an increase in fruit cultivated areas (with an increase rate of about 168% and an annual increase rate of 5.6%; and (2) an increase rate of about 50.4% in fruit productivity with an annual productivity increase rate of about 2.3%. In addition and for the same reasons, fruit production (including dates) was increased to 9,200 thousand tons in the year 2000 instead of 8,170 thousand tons during 1999 (an increase of about 1,030 thousand tons).

Al-Migala Al-Zeraaia (2000:68) indicated also that the Egyptian production of vegetables was increased in a period of 18 years (1981-1999) from 9,031 thousand tons in 1981 to 18,033 thousand tons in 1999, with a total increase of 9.002 thousand tons (99.7% increase) and an annual increase rate of 3.9%. This came also for the two reasons mentioned above (increases in both cultivated area and productivity). Al-Ahram (2001) reported that the Egyptian minister of Agriculture and Land Reclamation and prime minister Deputy, Yousef Waly, announced that Egypt fruit production was increased to 7 million tons, and vegetable production increased to 6.2 million tons. This came (according to Al-Ahram, 2001) as a direct consequence to the increase in both governmental agricultural investment (8.2 billion Egyptian bounds), and the private sector investment size which contributed to about 64.5% of the total Egyptian agricultural investments.

McQuail (1990) emphasized the importance of mass media as the following: (1) they form a growing and changing industry which provides employment opportunities, produces goods and services, and feeds related industries; (2) they are viewed as means of control, or a power resource; (3) they are considered as the arena where national and international aspects of public life are blended; (4) they represent different aspects of cultural development; and (5) they are considered as a dominant source of definition and image of social reality related to individuals, groups, and society. In addition, they express values, norms, regulations, laws, and entertainment in different forms and features. Brown (1967:12) claimed that mass media have the capability of imposing an immediate direct impact on farmer's behavior only when the content is locally or functionally relevant. The usefulness of information depends on the way it addressed itself to the existing situation. Infra-structural factors set the parameters in which an individual can make decisions and act. Relevant information may become use-

less if it does not fall within these situational parameters or is not accompanied by changes in the situation. The essential communication activity of mass media is to attract and keep attention rather than to transmit meaning or provide a platform, or increase expressive capacity, or promote shared rituals. The primary purposes of mass media are to interest and entertain the audience, and advance skills and knowledge of the targeted audience members (McQuail, 1990).

Power of mass media have become more intense by the world aggressive steps in entering the world arena of globalization where the world became as an international village communicated with satellites, internet, television dishes, computers, and faxes. Mass media affect all aspects of daily life including trade, cultural identity, crime, wars, industry, and scientific researches. Mass media have become, to some extent, an uncontrollable tool in a life dominated by globalization and economic power. They represented an intense terror for those undemocratic regimes and for those who do not know how to use them effectively.

Radio is considered as one of the most common effective mass media. It has the capability of penetrating different geographical borders and illiteracy and provides an opportunity for the audience to receive the broadcasting anywhere and at anytime. Radio, in addition to other mass media, has been used to support agricultural activities in many places of the world. About fifty percent of agricultural projects implemented in the less developed countries incorporated mass media blended with extension efforts. In those projects, radio was listed as the most important teaching method used (Axinn and Throat, 1972). Radio is the most dynamic channel in the whole field of extension education in the decades of 1960s. It received the highest attention among the known mass media for some reasons: (1) its big audience potential including those illiterate, handicapped, young, youth, and old individuals, (2) radio stations are increasing in number everywhere, and (3) It is easy for the poor to have small transistor radio receivers. Many countries, including Egypt, have obtained fair results with radio broadcasting in raising literacy levels and teaching different curricula.

Radio broadcasting have been used worldwide in creating awareness regarding different national and international issues. It is the quickest means of getting out news. Rogers and Shoemaker (1971) found that mass media (radio and printed materials) represented first sources of knowledge about innovations for 30% of farmers in developing countries. Effective use of mass media in agriculture is sharply conditioned by the availability of relevant agricultural content. Radio, as mass media, is the best minor source of agricultural information and is effective in the first stages of adoption pro-

cess (Rogers and Shoemaker, 1971). It is used by agricultural change-agents as newspapers are used for disseminating stories, only in a briefer form. Its uses took different forms, including success stories, announcing meetings, field days, and tours; follow-up stories; timely information on crop and livestock operations; occasional surveys; documentaries and interview and talk shows on current subjects. The interviews and talk shows enable some audience participation, and some appeal to local interest (Lionberger and Gwin, 1982).

Radio impact is minor if it was not blended with an extension service. Farmers may listen but they won't follow (Benor and Harrison, 1984). Omar (1992) warned against using more entertainment doses in agricultural extension drama disseminated by radio. Agricultural radio programmers should be aware of the way of blending agricultural and entertainment properly. The big problem in trying to use radio beyond the awareness and interest stages of adoption is in getting enough two-way communication with the audience. Radio impact is limited to the awareness and interest stages in the change process. A few cases were succeeded to a limited degree in changing attitude and behavior. A major obstacle in stimulating people accept change by listening to radio alone is considered the one way nature of broadcasting. Two-way discussion is almost required before many people will go to the whole way in changing attitude or practices. Another part of the problem in using radio to influence change is that it tries to appeal to mass audience. Radio programs should stick with entertainment, news, and subjects having broad interest instead of the problems of individual communities (Lionberger and Gwin, 1982).

Radio agricultural extension broadcasting can take the forms of dialogues, drama, and songs. Omar (1992) pointed out that radio broadcasting provides also different agricultural information and news to non-agricultural audience. It also (according to Omar, 1992) creates an interest in agricultural extension methods and extension service. Hornik (1988) argued that feedback mechanisms with farmers should include formal and informal data gathering, farmers' advisory councils, feedback from field staff, and letters directly from clients. Farmers' viewpoints, complaints, and questions from rural audience should be taken seriously in consideration. Hot phone calls can be also taken in consideration. Radio broadcasting may provide farmers with accurate and recent market information. Omar (1992) emphasized the importance of involving community leaders and farmers' comments in providing enough feedback necessary for the success of agricultural extension programs.

Grunig (1969) claimed that radio efforts fail mostly because programs do not re-

spond enough to special local needs, values, attitudes, and interests. In order to enrich effectiveness of radio broadcasting strategy, there are two definite procedures: (1) broadcast content should deal with local needs. This may achieve production decentralization and strengthening links between each of the agricultural extension triangle encompasses farmers, extension agents, and researchers; and (2) organizing radio listening clubs to support and localize the radio broadcasting and create a proper link with agricultural extension agents. It is also possible to form organized radio farm forums.

Omar (1992) recognized listening forums as a necessary element in benefiting from agricultural extension radio programs. It may limit agricultural extension radio program effectiveness. Regardless of whether the forum technique is used or not, trained staff of farm advisors is needed in the field making local contacts and involving local people in discussion to make effective use of mass media (Lionberger and Gwin, 1982). Information in agricultural extension radio programs is not available at the audience's convenience because its broadcasting is scheduled (Burk, 1984).

Hornik (1988) claimed that radio programs based agricultural projects are ineffective because the presented information mostly is not the appropriate solution and there should be progressive rural structure as a way to support them. The disseminated information should be linked with the field through an effective feedback system, be coordinated and integrated with actions of other agricultural agencies, and be realistic about the circumstances under which important increases in production can be achieved. Radio broadcast can provide farmers with clear instructions if those programs' materials were prepared in an appropriate way. Farmers are rational with profit, risk, and opportunity costs and all those factors are considered large in decisions to adopt. Information is helpful, and open-broadcast strategies with a well-developed feedback system can affect agricultural practice change and productivity. DeFleur (1970) claimed that in order for mass media, including radio, to be effective, other conditions of modernity have also to be present including individuation, trust in bureaucracies, understanding of media authority, legitimacy, and objectivity. Different problems were mentioned in using agricultural extension radio programs. Among those problems: (1) difficulty in achieving coordination between radio broadcast and both the agricultural calendar in given regions and other ongoing activities of extension system; (2) difficulty in achieving coordination between broadcasting units and extension field agents; (3) agricultural extension radio programs are generally isolated and incompatible with needs and aspirations of farmers they serve; and (4) budget allocated for broadcasting may not cover researches for direct need assessment and concerns (Hornik, 1988).

Rogers and Svening (1969) found positive relationship between mass media exposure and adoption of innovation. Kidd (1968) found a strong correlation between media exposure, incorporated exposure to agricultural radio broadcasts, and both farmer knowledge and adoption. El-Feshawy (2000) found a significant positive relationship between farmers' knowledge related to maize crop and their listening to the Egyptian agricultural extension radio program, "Ardel-Mahrousa", and each of the variables: education, number of listening to the program per month, family size, and discussion of the obtained knowledge with others. El-Feshawy (2000) also reported a significant positive relationship between agricultural land ownership and knowledge of wheat farmers. Hornik (1988) indicated that measures of success for educational broadcasting are those of information and behavior impacts that is likely to be highly influenced by knowledge of the audience. Petel and Ekperse (1978) found that listening to agricultural radio broadcasts was related to knowledge of agricultural practices.

Ardel-Mahrousa

Ardel-Mahrousa is an Egyptian agricultural extension radio program directed to all the Egyptian farmers. It reflects a coordinated and integrated effort between the Egyptian agricultural extension system representing the Egyptian Ministry of Agriculture, and the Egyptian radio representing the Egyptian Ministry of Information. The program was inaugurated on November 4th. 1995. Its broadcasting time was selected attentively to be at 7:30 p.m. where rural family members sit together to talk and discuss different family and agricultural matters. Each episode of the program has four components (drama, my farmer brother, people of expertise, and folk music related to both the introduction and the end).

In order to evaluate the program impact, a content analysis study and an educational evaluation study were conducted by Agricultural Extension and Rural Development Research Institute (AERDRI) in the year 2000.

El-Feshawy (2000) discussed impact of the program on wheat and maize farmers in Munofia and Kalioubia Governorates. In order to identify impacts of the program on other targeted groups, it was necessary to conduct this study. This study may be considered as a trial to identify other features of this radio program and to reveal some other evaluation aspects.

The Study Objectives

The main objective of this study was to determine impact of the agricultural ex-

tension radio program, "Ardel-Mahrousa", on the knowledge acquired by farmers living in each of Upper Egypt (Fayoum and Menia Governorates), and the Delta (Kalioubia and Behira Governorates) in relation with vegetable and fruit crops. The specific objectives of the study were determined as: (1) to identify characteristics of vegetable and fruit farmers living in each of the Delta and Upper Egypt (the study respondents); (2) to determine relationship between each of the two studied dependent variables (knowledge acquired by the study respondents in relation with vegetable and fruit crops) and each of some selected independent variables; (3) to determine different independent variables that explain variances in each of the two dependent variables, (4) to determine farmers' suggestions as a way to enrich effectiveness of the studied radio program, and (5) to show applicability of the study obtained findings.

METHODS

The study data were collected during the period March-April, 2000 as a part of a project conducted by AERDRI's for evaluating the agricultural extension radio program, "Ardel-Mahrousa". The study sample encompassed 400 Fruit and vegetable farmers living in four Governorates (Kalioubia and Behira from the Delta, and Menia and Fayoum from upper Egypt). The four Governorates were selected randomly from a list of different Delta and Upper Egypt Governorates. Three preconditions were set to be met by the study respondents: (1) they work primarily in agriculture, or agriculture with additional work(s); (2) they listen regularly to the program with a minimum of an episode a month; (3) they accept to participate voluntarily in the study.

The study encompassed 400 fruit and vegetable farmers from Upper Egypt and from the Delta (200 each). The study respondents came from four Governorates (100 each). The selected 100 respondents/ Governorate came from four villages (25 respondents each) related to two districts (two villages each) as the following: (1) The Delta Kalioubia Governorate's respondents came from Bata and Marsafa villages (Benha District), El-Saphania and Kafr-Mansour villages (Tukh District); Behira Governorate's respondents came from Hamour and Bastwa villages (Damanhour District), Berkat Ghattas and Mitel-Wakil villages (Abu-Homus District); and (2) Upper Egypt Fayoum Governorate's respondents came from El-Adwa, and Zawiat El-Karadsa villages (Fayoum District), and El-Wanaisa and Abu-Gandeer villages (Etssa District); Menia Governorate's respondents came from Bradtuha, and Nipal villages (Muttay District), and El-Bihu and Etssa El-Balad villages (Samalout District).

A pre-tested written questionnaire and personal (interpersonal) interview were

used in collecting the study data. Frequency, mean, standard deviation, t-test, zero-order correlation, and step-wise multiple regression were used in analyzing the obtained study data. Statistical Package for Social Sciences (SPSS/Version 7.5) was used in analyzing the study data.

VARIABLES AND MEASUREMENT

1. Age

Each respondent was asked to report his age in years. For the respondents of the Delta (Kalioubia and Behira Governorates), age was ranged 20-61, with an average of about 47.9, and a standard deviation of about 13.9. Eighty five respondents (42.5%) were between 41-61 years of age, followed by 72 respondents (36%) in the age category between 20-40 years of age, and 43 of the respondents (21.5%) of the respondents were in the age category of 62 years and higher (Table 1).

For the respondents of upper Egypt (Fayoum and Menia Governorates), age was ranged 20-75, with an average of about 46 years, and a standard deviation of 11.8. One hundred and thirteen of the respondents (56.50%) were in the age category of 41-61 years, followed by 65 respondents (32.5%) in the category of 20-40 years, and 22 of the respondents (11%) came in the category of 62 and higher.

Table 1. Age as reported by the study respondents of the Delta and Upper Egypt.

Age/Years	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
20-40	72	36.0	65	32.5
41-61	85	42.5	113	56.5
62 and up	43	21.5	22	11.0
Total	200	100.0	200	100.0

Number of Respondents = 400.

2. Additional Work(s)

Each respondent was asked to indicate if he works in agriculture alone, and if he has an additional job besides agriculture. Working in agriculture alone was given score=1; and working in an additional work besides agriculture with a score=2. For the respondents of the Delta 143 of them (71.5%) were working in agriculture alone, and 57 of them (28.5%) were working in an additional work besides agriculture (Table 2). The responses ranged between a minimum of 1 and a maximum of 2, with an average

of about 1.3, and a standard deviation of .45.

For upper-Egypt respondents, 150 of them (75%) were working in agriculture alone, and 50 (25%) were working in an additional work besides agriculture (Table 2). The responses ranged between a minimum of 1, and a maximum of 2, with a mean of 1.25, and a standard deviation of .43. Almost 75% of the respondents in both the two sectors were working in agriculture alone.

Table 2. Other work(s), in addition to agriculture, as reported by the study respondents.

Additional Work	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
Working in Ag. Alone	143	71.5	150	75
Working in Add. Work	57	28.5	50	25
Total	200	100.0	200	100

Total Number of Respondents=400.

3. Family Size (Number of Family Members)

Each respondent was asked to report his family number (family size). For the respondents of the Delta, 100 of them (50%) had family size of 1-5 members, 96 (48%) had family size of 6-10 members, and only 4 (2%) had a big family size of 11 members and up. This variable ranged 1-18, with a mean of about 6 members, and a standard deviation of about 2.2 (Table 3).

For the respondents of upper Egypt, 105 of them (52.5%) had a small family size of 1-5 members, 93 (46.5%) had a medium family size, and only 2 (1%) had a big family size of 11 members and up. The variable ranged 1-11, with a mean of about 6 members, and a standard deviation of 1.7 (Table 3). In the two sectors, the mean of family size was the same (6 members).

Table 3. Family size as reported by the study respondents of the Delta and Upper Egypt.

Family Size	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
1-5 members	96	48	105	52.5
6-10 members	100	50	93	46.5
11 and up	4	2	2	1.0
Total	200	100	200	100.0

Total Number of Respondents=400.

4. Number of Years Spent in Education (Obtained Educational Level)

Each respondent was asked to mark in front of his educational level from a list. This list included: (1) do not know how to read or to write; (2) write and read without obtaining any formal educational degree; (3) primary and preparatory education (basic education); (4) high school degree and two years after high school degree; (5) university degree. The illiterate was given zero score; write and read was considered as equivalent to the 4^{th} year of primary school and was given a score = 4; and the rest were given the equivalent number of school years as their scores.

For the study respondents of the Delta, the educational levels ranged 0-17, with a mean of 4.5 years, and a standard deviation of 6.8. Table 4 showed that 112 of the respondents (56%) were illiterates, 32 (16%) had high school and two years after high school degrees, 31 (15.5%) had primary and preparatory school degrees, 13 (6.5%) with university degree, and 12 (6%) read and write with no formal degree. It was obvious that almost half of the respondents of the Delta (56%) were illiterates.

For the study respondents of Upper Egypt, the obtained educational level ranged 0-18, with a mean of 3.3, and a standard deviation of about 5.2. Table 4 demonstrated that 64 of them (32%) were illiterates, 50 (25%) with high school and two years after high school degree, 47 (23.5%) had primary and preparatory school degree, 20 (10%) know how to read and write with informal educational degree, and 19 (9.5%) had university degree. It was obvious that educational condition related to the study respondents of Upper Egypt was relatively better than that of the Delta.

Table 4. Number of years spent by the study respondents in education as reported by the study respondents of the Delta and Upper Egypt.

Educational Level	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
Illiterate	112	56.0	64	32.0
Read and Write	12	6.0	20	10.0
Basic Education	31	15.5	47	23.5
High School & 2 Years Above	32	16.0	50	25.0
University Degree	13	6.5	19	9.5
Total	200	100.0	200	100.0

Total Number of Respondents=400.

5. Wife's Education Measured in Years

This concept reflects the respondent wife's obtained educational level measured in number of years. This concept was coded and scored similar to number of years spent by the respondent in education (the respondent educational level). For the respondents of the Delta, Wife's educational level ranged 0-16, with a mean of about 2.1, and a standard deviation of about 4.2. From table 5, it was found that 155 of the cases (77.5%) were illiterates, 23 (11.5%) obtained high school degree, 12 (6%) preparatory and preparatory school degree (basic education), 9 (4.5%) write and read without obtaining degrees, and only 1 (0.5%) obtained university degree.

The responses of Upper Egypt ranged 0-16, with a mean of 3.3, and a standard deviation of 5.2. Table 5 indicated that 129 of the wives (64.5%) were illiterates, 24 (12%) with high school degrees and two years above, 22 (11%) with primary and preparatory school degrees (basic education), 14 (7%) know how to read and write without obtaining formal educational degrees, and 11 (5.5%) with university degrees.

Table 5. Number of years spent by the respondents' wives in education as reported by the study respondents of the Delta and Upper Egypt.

Educational Level	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
Illiterate	155	77.5	129	64.5
Read and Write	9	4.5	14	7.0
Basic Education	12	6.0	22	11.0
High School & 2 Years Above	23	11.5	24	12.0
University Degree	1	0.5	11	5.5
Total	200	100.0	200	100.0

Total Number of Respondents=400.

6. Agricultural Land Ownership

Each respondent was asked to write his agricultural land ownership in kirates (Feddan=24 kirates). In the Delta, the obtained responses ranged 3-720, with a mean of 65.4, and a standard deviation of about 80.4. Eighty two percent of the Delta respondents (82%) were in the category of less than 67 kirates, 24 (12%) own 67-134 kirates, 8 (4%) in the category of 202 kirates and up, and 4 (2%) fell in the category 135-201 kirates (Table 6). This implies that more than three quarters of the respon-

dents were with small agricultural land ownership.

The responses of Upper Egypt ranged ranged 5-264, with a mean of 57.7, and a standard deviation of about 51.4. One hundred forty four respondents (72%) were in the category of less than 67 kirates, 38 (19%) had 67-134 kirates, 12 (6%) came in the category of 67-134, 6 (3%) fell in the category of 202 kirates and more (Table 6). It is almost better than the situation in the Delta.

Table 6. Agricultural land ownership as reported by the study respondents.

Agricultural Land	The Delta		Upper Egypt	
Ownership	Frequency	Percentage	Frequency	Percentage
Less than 67 kirates	164	82	144	72
67-134 kirates	24	12	38	19
135 –201 kirates	4	2	12	6
202 kirates and above	8	4	6	3
Total	200	100	200	100

Total Number of Respondents=400.

7. Number of Times in Listening to the Program/Month

Each respondent was asked to write number of times/month he regularly listens to the program. In accordance with number of times, scores were as: 1=listens once/ month; 2=listens twice/month; 3=listens three times/month; and 4=listens four times/ month. The responses of the Delta ranged 1-4, with a mean of about 2.5, and a standard deviation of about 1.1. Sixty-seven of the Delta respondents (33.5%) reported that they listen regularly to the program three times/month, 52 respondents (26%) with regular listening of once/month, 41 respondents (20.5%) with regular listening times of twice/month, and 40 respondents (20%) with regular listening of four times/ month (Table 7).

The responses of Upper Egypt farmers ranged 1-4, with a mean of 3, and a standard deviation of about 1.2. One hundred four of the respondents (52%) reported that they listen regularly four times/month, followed by 41 respondents (20.5%) with regular listening of once/month, then 33 respondents (16.5%) with regular listening of three times/month, and 22 respondents (11%) with regular listening of twice/month (Table 7).

Table 7. Number of regular listening/month as reported by the Study respondents of the Delta and Upper Egypt.

Listening Times	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
Four Times/Month	40	20.0	104	52.5
Three Times/Month	67	33.5	33	16.5
Twice/Month	41	20.5	22	11.0
Once/Month	52	26.0	41	20.5
Total	200	100.0	200	100.0

Total Number of Respondents=400.

8. Listening Habits

Listening habits implied if the respondent listen to the radio alone or with others. The scores were 1 to listening to the program alone (by himself only), and 2 to listening to the program with others. The responses of the Delta farmers ranged 1-2, with a mean of about 1.8, and a standard deviation of about 0.45. Table 8 showed that 149 of the respondents (74.5%) reported that they listen to the program alone, and 51 of the respondents (25.5%) listen to the program with others.

The responses of Upper Egypt farmers ranged 1-2, with a mean of about 1.7, and a standard deviation of 0.5. Table 8 illustrated that 135 of the Upper Egypt respondents (67.5%) reported that they listen to the program with others, and 65 of the respondents (32.5%) reported that they listen to the radio with others.

Table 8. Regular listening habits as reported by the study respondents of the Delta and Upper Egypt.

Listening Habits	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
Listen Alone	51	25.5	65	32.5
Listen With Others	149	74.5	135	67.5
Total	200	100.0	200	100.0

Total Number of Respondents=400.

9. Knowledge Discussion with Other(s)

In order to measure this variable, each respondent was asked to report number of individuals who regularly discuss with them the knowledge accrued from the Program. The scores were as: 0=do not discuss with anyone; 1=discuss with one source

(person); 2=discuss with two sources; 3=discuss with three sources and more. The responses of the Delta farmers ranged 0-3, with a mean of 1.1, and a standard deviation of about 1. One hundred twenty six of the Delta respondents (63%) reported their regular discussion to the program knowledge, followed by 34 of the respondents (17%) without any discussion, 32 of the respondents (16%) with two persons, and 8 of the respondents (4%) with three persons and more (Table 9).

Seventy six of the Upper Egypt respondents (38%) reported that they do not discuss the program knowledge with any source (person), 72 of the respondents (36%) with two persons, and 39 of the respondents (19.5%), and 13 of the respondents (6.5%) with three sources and more (Table 9).

Table 9. The program knowledge discussion with others as reported by the study respondents of the Delta and Upper Egypt.

Knowledge Discussion	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
Do Not Discuss	34	17	76	18.5
Discuss With One Person	126	63	39	19.5
Discuss With Two Persons	32	16	72	36.0
Discuss With More Than Two Persons	8	4	13	6.5
Total	200	100	200	100.0

Total Number of Respondents=400

10. Knowledge of Fruit Crops Acquired from Listening to the Radio Program (KNOWVEGETS), the First Dependent Variable.

Each respondent was asked to mention a piece of knowledge, or a recommendation provided by the program. The scores was given as one score for each recommendation or a piece of knowledge the respondents knows; and 0 for those who do not know any piece of knowledge, or any technical recommendations. The Delta KNOWFRUITS ranged 0-2, with a mean of 0.23, and a standard deviation of about 0.5. One hundred sixty one of the respondents (80.5%) reported no knowledge, or technical recommendations, followed by 32 respondents (16%) with only one piece of knowledge, or a technical recommendation, then 7 respondents (3.5%) with acquired knowledge of two pieces (Table 10).

The Upper Egypt KNOWFRUITS ranged 0-4, with a mean of 0.22, and a standard deviation of about 0.58. One hundred sixty seven respondents showed no acquisition of fruit knowledge, followed by 26 respondents (13%) with two acquainted pieces of knowledge, then 2 of the respondents came with three pieces of knowledge, and only one of the respondent demonstrated his acquaintance with four pieces of knowledge (Table 10).

Table 10. Acquired fruit knowledge by the respondents of the Delta and Upper Egypt as reported in the obtained study data.

Acquired Knowledge	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
No Knowledge	161	80.5	167	83.5
One Piece	32	16.0	26	13.0
Two Pieces	7	3.5	4	2.0
Three Pieces	-	-	2	1.0
Four Pieces	-	-	1	0.5
Total	200	100.0	200	100.0

Total Number of Respondents=400.

Most the respondents of both the Delta (67.5%) and Upper Egypt (83.5%) did not acquire knowledge from the radio program. This may come as a consequence of different intervening variables and also those related to the audience emphasis on entertainment aspects instead of paying attention to extension aspects of the radio program. In general, it is difficult to claim that the radio program is the sole source of acquired knowledge in an uncontrolled environment.

11. Knowledge of Vegetable Crops Acquired from Listening to the Radio Program (KNOWVEGETS), the Second Dependent Variable

Each respondent was asked to mention a piece of knowledge, or a recommendation provided by the program. The scores were given as one point score for each recommendation or a piece of knowledge the respondent knew; and 0 for those who did not know any piece of knowledge, or any technical recommendations.

The Delta responses ranged 0-3, with a mean of about 0.39, and a standard deviation of about 0.62. Table 11 indicated that 135 of the Delta respondents (67.5%) with no acquired KNOWVEGETS, followed by 56 respondents (28%) with one piece of acquired knowledge, then 6 respondents (3%) with acquired two pieces of knowledge,

and 3 respondents (1.5%) with acquired three pieces of knowledge.

The obtained responses of Upper Egypt ranged 0-4, with a mean of 1.1, and a standard deviation of 1.04. Sixty-seven of the respondents (38%) knew no KNOWVEGETS, followed by 69 (34.5%) with only one piece of knowledge, 35 respondents (17.5) with two acquired pieces of knowledge, then 15 (7.5%) with three pieces of knowledge, and 5 (2.5%) with a maximum of four acquired pieces of knowledge each (Table 11).

To some extent, it may be claimed (from table 11) that the respondents of Upper Egypt were, in vegetable knowledge acquisition, better than their fellow farmers in the Delta with their 38% only with no knowledge acquisition (67.5% in the Delta).

Table 11. Acquired vegetable knowledge by the respondents of the Delta and Upper Egypt as reported in the obtained study data.

Acquired Knowledge	The Delta		Upper Egypt	
	Frequency	Percentage	Frequency	Percentage
No Knowledge	135	67.5	76	38.0
One Piece	56	28.0	69	34.5
Two Pieces	6	3.0	35	17.5
Three Pieces	3	1.5	15	7.5
Four Pieces	-	-	5	2.5
Total	200	100.0	200	100.0

Total Number of Respondents=400.

RESULTS AND DISCUSSION

Table 12 showed that the obtained correlation coefficient between fruit knowledge acquired by the study respondents of each of the Delta and Upper Egypt (KNOWFRUITS), as a dependent variable, and the previously mentioned independent variables. It was found (Table 12) that for those Delta respondents, the dependent variable (KNOWFRUITS) was: (1) significantly and negatively related to age (r= -0.20, at 0.01 significance level); (2) significantly and positively related to availability of additional work to agriculture (r=13, at 0.05 significance level); and (3) significantly and negatively related to habits of listening to the program, alone or with company (r=-0.12, at 0.05 significance level). For the Upper Egypt respondents, the dependent variable (KNOWFRUITS) was not related significantly to any of the used variables.

In order to compare means of the two groups, t-test was used. It was found that there was no significant difference between means each of KNOWFRUITS in the Delta and Upper Egypt (computed t-value=1.86; degrees of freedom = $(n_1 + n_2 - 2) = 398$; critical t-values extracted from the table: at 0.05 significance level=1.960, and at 0.01significance level=2.576. The null hypothesis was not rejected).

It was found (Table 13) that for the Upper Egypt respondents, the dependent variable (KNOWVEGETS) was related: (1) significantly and positively to additional work (r=0.21, at 0.01 significance level); (2) significantly and positively to wife's educational level (r=19, 0.01 significance level); (3) significantly and positively to listening habits (r=0.22, 0.01 significance level); (4) significantly and negatively to discussion of the obtained knowledge with others (r=-0.14, 0.05 significance level), and significantly and positively related to Fruit knowledge (r=0.13, 0.05 significance level). For the Delta respondents, the dependent variable (KNOWVEGETS) was not related significantly to any of the used independent variables including knowledge of fruit crops.

For the purpose of comparing means of the two groups, t-test was used. It was found that there was a significant difference between means of KNOWVEGETS in the Delta and Upper Egypt in favor of that of Upper Egypt (computed value of t =7.379; degrees of freedom=398; critical table values: at 0.05 significance level=1.960; and at 0.01 significance level=2.576. The Null hypothesis was rejected).

Despite the fact that farmers of Upper Egypt are well known of their excellent skills and long history in cultivating and producing fruits, they are striving to enrich their knowledge about vegetables and compete with the Delta farmers in vegetable production. This was clear from the positive significant relationship found between Knowledge of vegetables and knowledge of fruits for the Upper Egypt responses. This may come as a consequence of have motivations and incentives in the free agricultural market policy (laissez faire), and the ongoing privatization of agricultural extension. On the other hand, the Delta farmers may are satisfied with their status in producing higher production of vegetables and enjoying the close big markets of both Cairo and Alexandria. There was no significant relationship between the two concerned variables.

FARMERS' SUGGESTIONS

In relation with the radio program, "Ardel-Mahrousa", the Delta farmers suggestions were ranked, in a descending way, as: repeating the program broadcasting for more than once a week (23%); increasing broadcasting time to 30 minutes (14.5%),

Table 12. Zero-order correlation coefficients between independent variables and the acquired fruit knowledge (KNOWFRUITS) by the respondents of the Delta and Upper Egypt.

Independent Variables	The Delta (N=200)	Upper Egypt (N=200)
Age	-0.20**	-0.05
Additional Work(s)	0.13*	0.60
Number Of Family Members (Family Size)	0.01	0.29
Number Of Years Spent By The Respondents In Education	-0.34	-0.04
Number Of Years Spent By the Respondent's Wife In Education	0.04	0.34
Agricultural Land Ownership	-0.10	0.10
Number Of Listening Times To the Program/Month	-0.10	0.01
Listening Habits	-0.12*	0.02
Knowledge Discussion With Others	-0.04	-0.08
Knowledge of Vegetables	0.09	0.13*

* significant at 0.05 level; ** significant at 0.01 level.

Table 13. Zero-order correlation coefficients between independent variables and the acquired vegetable knowledge (KNOWVEGETS) by the respondents of the Delta and Upper Egypt.

Independent Variables	The Delta (N=200)	Upper Egypt (N=200)
Age	-0.11	-0.02
Additional Work(s)	-0.02	0.21**
Number Of Family Members (Family Size)	-0.04	-0.04
Number Of Years Spent By The Respondents In Education	0.05	0.07
Number Of Years Spent By the Respondent's Wife In Education	0.01	0.19**
Agricultural Land Ownership	0.06	0.08
Number Of Listening Times To the Program/Month	-0.09	-0.04
Listening Habits	0.08	0.22**
Knowledge Discussion With Others	-0.08	-0.14*
Knowledge of Fruits	0.09	0.13*

* significant at 0.05 level; ** significant at0.01 level.

changing broadcasting time to be after Isha prayers (8.5%); each episode should contain a dialogue between a farmer and an official (7%); each episode should include a competition component (6%); changing the program broadcasting to Friday (5.50); each episode should deal with one topic only (5%); disseminating enough advertisements about the program in the media (4.5%); disseminating the program in more than one local radio station (3%); and at the bottom came the four suggestions (2.5% each): each episode should encompass success stories of farmers who benefited from the program; knowledge should be presented in a very simple forms; using folk songs and drums in the program prelude; and each episode should include questions sent by farmers and their answers.

Suggestions reported by farmers of upper Egypt were ranked, in a descending way, as: increasing broadcasting time to 30 minutes (30%); repeating the program broadcasting for more than once a week (26%%); changing broadcasting time to be after Isha prayers (25%); each episode should contain a dialogue between a farmer and an official (13.5%); each episode should deal with only one topic (12.5%); each episode should include questions sent by farmers and their answers (11.5%); using folk songs and drums in the program prelude (4.5%); changing the program broadcasting to Friday (3%); and came the following six suggestion on the bottom of the list: adding a radio competition (1.5%); disseminating enough advertisements about the program in the media (1.5%); each episode should contain success stories of farmers who benefited from the program (1.5%); knowledge should be presented in a very simple forms (1.5%); strengthening dissemination to upper Egypt areas (1%); and disseminating the program in more than local radio stations (0.5%).

Tables 14, 15 showed that the studied significant independent variables explained together about 13.3% of the variance in KNOWVEGETS of Upper Egypt, and only about 10% of the variance in KNOWFRUITS of the Delta. This finding indicated that some other independent variables should be used in order to explain the variances in the two dependent variables.

LIMITATIONS OF THE STUDY

(1) it was not possible to generalize from this study because the study findings showed opinions, perceptions, and attitudes of its participants who are not representing all farmers of the Delta and Upper Egypt; the obtained findings may be changed if we change the study sample, or the timing of conducting the study, or the studied independent variables; (2) the study was not conducted, under control, in a radio forum

(or listening clubs) in order to have relatively accurate findings (Omar, 1992); and (3) it was found that the studied significant independent variables explained only about 13.3% of the variance in KNOWVEGETS of Upper Egypt, and only about 10% of the variance in KNOWFRUITS of the Delta (Tables 14, 15). The finding showed that some other independent variables should be used in order to explain the variances in the two dependent variables. In addition, there may be some other intervening variable that may have counter impacts on the studied variables.

Table 14. Multiple regression results showing significant independent variables that predict KNOWVEGETS of Upper Egypt responses.

Variables Entering Regression	Cumulative R^2	Standardiz Regression Coefficient (Beta)	F
Listening Habits	4.79	0.22	9.96**
Additional Work(s)	8.37	0.19	9.00**
Wife's Education	11.09	0.17	8.15**
Knowledge Discussion With Others	13.29	-0.15	7.47**

** Significant at 0.01 Level.

Table 15. Multiple regression results showing significant independent variables that predict KNOWVFRUITS of the Delta responses.

Variables Entering Regression	Cumulative R^2	Standardized Regression Coefficient (Beta)	F
All Significant Independent Variables Together (Age, Additional Work, and Listening Habits)	0.10	-0.15	2.05*

*Significant at 0.05 level.

APPLICABILITY OF THE STUDY FINDINGS

(1) the study drew the attention towards the importance of proper selection of different studied independent variables in order to explain the variance in the study de-

pendent variables; (2) the study emphasized the importance of conducting evaluation of different agricultural extension radio programs in a controlled experimentation of radio forums, or radio listening clubs; (3) the study indicated that Upper Egypt farmers were motivated to acquire better knowledge in vegetables that may be explained as a desire to compete with their fellow farmers of the Delta in vegetable crop production. This was obvious from the significant relationship between their variables of vegetable knowledge and fruit knowledge. There was no significant relationship between those two variables in the case of the Delta responses. This came despite the fact that the Delta farmers have longer history and experiences in vegetable crop production. This finding should be addressed and studied by other future researches; and (4) the study provided different suggestions, reported by the respondents, that may help enrich different rural radio programs and support the Egyptian agricultural extension services.

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أثر البرنامج الإرشادى الزراعى الإذاعى، "أرض المحروسة"، على المعلومات الخاصة بالخضر والفاكهة والمكتسبة من قبل مزارعى الدلتا والصعيد

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إستهدفت هذه الدراسة تحديد أثر البرنامج الإرشادى الإذاعى الزراعى، "أرض المحروسة"، على معلومات مزارعى كل من الدلتا (محافظتى القليوبية والبحيرة) والوجه القبلى(محافظتى الفيوم والمنيا) فى كل من مجالى الخضر والفاكهة. تم جمع بيانات هذه الدراسة خلال الفترة مارس-إبريل/ ٢٠٠٠ كجزء من مشروع تم تنفيذه من قبل معهد بحوث الإرشاد الزراعى والتنمية الريفية لتقييم البرنامج الإرشادى الزراعى،"أرض المحروسة". هذا وقد بلغ حجم عينة هذه الدراسة ٤٠٠ مزارع من مزارعى الفاكهة والخضر بمحافظات القليوبية، البحيرة، الفيوم، المنيا، وقد تم إختيار تلك المحافظات عشوائيا لتمثل كل من الدلتا (محافظتى القليوبية والبحيرة)، والوجه القبلى (محافظتى الفيوم والمنيا)، وتم إختيار ١٠٠ مزارع من كل محافظة بشروط ثلاثة: (١) أن تكون مهنته الأساسية الزراعة ولا مانع من إشتغاله بعمل أو أعمال إضافية بجانب الزراعة، (٢) وأن يكون المبحوث مواظبا وبصفة منتظمة على الإستماع إلى البرنامج بحد أدنى حلقة واحدة شهريا، (٣) وأن يكون المبحوث مستعدا للمساهمة التطوعية بجزء من وقته للمشاركة فى هذه الدراسة.

هذا وقد تم جمع بيانات هذه الدراسة باستخدام إستمارة إستبيان، مكتوبة ومختبرة مبدئيا عن طريق المقابلة الشخصية. هذا وقد تم تحليل هذه الدراسة باستخدام المتوسط الحسابى، والإنحراف المعيارى، وإختبار "ت"، ومعامل الإرتباط، والإنحدار المتعدد بالإضافة إلى العرض الجدولى بالتكرار والنسب المئوية. تم إستعراض نتائج هذه الدراسة، ومحدداتها، ومقترحات المزارعين من أجل زيادة فعالية هذا البرنامج الإذاعى الإرشادى الزراعى، وكذلك الأهمية التطبيقية لنتائج هذه الدراسة.