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SCIENTIFIC PRACTICES OF RICE FARMERS IN THE FIELD OF PRESERVING AGRICULTURAL ENVIRONMENT FROM POLLUTION IN SOME SOUTHERN AND CENTRAL PROVINCES OF THE IRAQ REPUBLIC

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Abstract

The research aimed to evaluate the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution, which included the following aspects: soil preservation from the pollution with chemical pesticide and chemical fertilizers, water sources preservation from pollution, safe and useful dealing of rice crop residues, preservation of the rice crop and its seeds from the biological pollution. As well as, identify some of the personal characteristics of rice farmers, and then reveal the nature of the relationship between the personal characteristics of rice farmers and between the scientific practices level in the field of preserving the agricultural environment from pollution. In order to achieve the objectives of this research, a random stratified sample of rice farmers was conducted in some central and southern provinces of the Iraq republic. Therefore, the research was conducted on (102) rice farmers distributed in the central and southern region provinces such Al- Najaf, Al- Qadisiyah and Al- Muthanna, where the data collected through the personal interview and then analyzed statistically to present the search results. The most important results indicated that most of the rice farmers described their general level in the field of preserving the agricultural environment from pollution as medium, and the results showed that there was a weakness in the scientific practices level in the field of safe and useful dealing of rice crop residues as well as in the field of using chemical fertilizers. Furthermore, the results also showed that there was a correlation between the informal social participation factor of rice farmers in the field of preserving the agricultural environment from pollution (voluntary work teams) and their level in the field of preserving the agricultural environment. Moreover, there was an inverse relationship between the participation factor in official extension activities, as well as the agricultural area factor of rice farmers and between their level in the field of preserving the agricultural environment from pollution.

Key words : Scientific practices level, Rice farmers, Preservation of agricultural environment from pollution.

Introduction

Rice crop consider as one of the most important strategic food crops in the world, which is cultivate in 144 out of 196 countries worldwide (Mohammed and Karim Dragh, 2018). It is particularly prevalent in the countries of South and East Asia that are on the top of the list of States in the production and export of rice crops (The Teaching staff of field crops. 2019). Furthermore, it represents an important grains crop in the world, where about half of the world's population feed on it and is the main economic resource to 90% of the Asia population (Shate *et al.,* 2011). Moreover, its nutritional importance comes from the high quantities of easily digestible carbohydrates, as well as its protein contains a balanced level of essential amino acids, especially (Lysine) compared to other grains crops (Shate *et al.,* 2011). Rice provides about 35-59% of the total energy to about 2,700 million people in Asia, while contributing about 8% of the energy to about 1,000 million people in Africa and Latin America (Tomas and Haki, 2010). Rice is cultivated in Iraq as a strategic crop that enters many food industries, and it was ranked secondly in Iraq in terms of importance after the wheat crop, due to its nutritional importance, as well as its economic profit for farmers (The Teaching staff of field crops, 2019). Due to its importance, the

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annual global demand for rice crop as well as wheat and maize is expected to reach about 3.3 billion tons, which is 800 million tons more than the total harvest of rice, wheat and maize in 2014 that reached a record level (FAO. 2016). Statistics showed a steady increase in cultivated areas and the quantities of rice crops production in previous years in Iraq, where the cultivated area in 2015 was 110,443 dunums, with a productivity of 109,209 tons, while the cultivated area in 2016 was 154,247 dunums, with a productivity of 181,320 tons. Additionally, it increased in 2017 to 222096 dunums and the productivity was 265852 tons of cultivated area, and in 2019 reached to 650,562 dunums and an approximate productivity of 729,280 tons, which was after increasing the water share of the rice producing provinces in Iraq (Ministry of Agriculture. 2018). Despite the steady increase in rice production for the period of 2015-2019, it did not reach self-sufficiency in rice crop, because the annual change rate in rice production could not, at best cope with the change in population growth rate which quantities of 2.56% for the period 2015-2018 (Ministry of Planning. 2018). This necessitates an increase in rice crop production through horizontal expansion of the agricultural area unit. As well as, a vertical expansion represented by increasing productivity in the same cultivated area, in accordance with the agricultural extension recommendations that ensure the highest productivity and quality with ensuring the preservation of the agricultural environment from pollution. Rice cultivation in Iraq is particularly prevalent in the central and southern provinces, where Al- Najaf and Al- Qadisiyah provinces make up most of the rice cultivated area crop at the level of Iraq (Mohammed and Karim Dragh, 2018). Rice cultivation in Iraq extends to more than 7 months, which it needs a lot of crop service operations (Humade and Kazem Ebadi, 2018). For example, rice cultivation in Iraq requires large quantities of phosphate chemical fertilizers at about 25 kg and nitrogen fertilizers 50 kg/ dunum, which are given in batches and at specific times and according to the agricultural extension recommendations to preserve the agricultural environment from pollution. (The General Directorate of Field Crops, 2012). Moreover, the long period of crop growth makes it vulnerable to agricultural pests, including the bush, as the expected crop losses due to the bush may reach 63-85% of the final crop quantity, as well as the deterioration of the remaining crop quality. Therefore, the crop needs to use suitable pesticides in terms of type, quantity and timing, and according to agricultural extension recommendations to control harmful bush and to preserve the agricultural environment from pollution (Shate *et al.,* 2011). Finally, the water requirements of rice crop reach 3006 mm during the germination period of 215 days with number of irrigations up to 23 irrigation, and the general rate of rice need for water is 6322 m^3/dunum, which varies slightly from one province to another (Humade and Kazem Ebadi, 2018; FAO. 2004). According to these large quantities of water needs, it is necessary to use water accordance with the agricultural extension recommendations to ensure no waste and wastage, as well as to preserve the agricultural environment from pollution.

Research problem and objectives

Despite the importance of the rice crop and the increasing demand on it at the level of Iraq and the world, the damage that may result from rice crop cultivate operations cannot be ignored, which may lead in one way or another to the deterioration and pollution of the agricultural environment used in its cultivation and production. As in the case of the excessive use of chemical pesticides to control the weeds and bush that accompany rice cultivation, or when excessive quantities of chemical fertilizers are used or not used according to the recommended extension methods, and when there is a significant waste in the quantities of water used to irrigate the crop. Furthermore, when rice crop residues are burning and not properly benefited and recycled, or in the absence knowledge of appropriate agricultural healthy extension for the rice grains storage and what may result from not applying this from directly biological damages to rice grains or seeds or later when consumed by humans. Thus, the factors mentioned above would increase the environmental pollution of agricultural land used for rice cultivation, as well as to the adjacent agricultural land in the region, if it was not used according to the recommended agricultural extension. Therefore the current research question about the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution in some southern and central provinces of the Iraq republic. While the Research Objectives Based on the above, the research objectives are defined as follows:- Evaluating the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution, which includes the following aspects: soil preservation from pollution with chemical pesticide, soil preservation from pollution with chemical fertilizer, water sources preservation from pollution, safe and useful dealing of rice crop residues, preservation of the rice crop and its seeds from the biological pollution. Identify some personal characteristics of rice farmers (age, educational level, family size, agricultural area size, informal social participation in the field of preserving the environment, participation in official agricultural extension activities in the field of preserving

the environment). Determine the relationship between the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution and between the personal characteristics mentioned in the second objective.

Materials and Methods

Research Methodology

The main objective of this research was to evaluate the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution. Therefore, the appropriate approach to such research is the descriptive approach using the method of surveys, where this approach describes what is in the field, and interprets it by collecting data and evidence that represents the reality of the situation, in order to compare it with the specified criteria according to the research objectives. Then, be able to reach the conclusions about the research objectives, that assist the decision-making authority in the Ministry of Agriculture and the Extension and Agriculture Cooperation Department, as well as ministries and other relevant, departments or institutions in the Iraq Republic. (Colin and Neville 2007; Olayan, Ribhi Mustafa. 2001)

Research community and its sample

The research community included the southern provinces specialized of rice cultivation in 2017 which they: (Al- Qadisiyah, Al- Muthanna, Dhi Qar and Maysan) as well as, the central provinces specialized of rice cultivation in 2017 (Diyala, Al- Najaf, Babylon) (Ministry of Agriculture. 2018; Ministry of Planning. 2012), where Table 1 shows the harvested area and production rate in dunums of the rice crop for 2017.

Table 1: Harvested area and production rate in dunum of rice crop for 2017.

Province	Harvested area/ dunum	Production rate kg/ dunum	Production /ton
Diyala	7751	714.4	5537
Babylon	4122	1245	5132
Al- Najaf	127649	1127.8	143965
Al- Qadisiyah	70439	1512.8	106562
Al- Muthanna	3363	542.7	1825
Dhi Qar	2670	787.3	2102
Maysan	1139	640	729
Total	217133	1224.4	265852

A stratified sample was taken from the southern region provinces by 50%, thus, the sample included both Al- Muthanna and Al- Qadisiyah province. In addition, a stratified sample was taken from the provinces of the central region and by 33.33%, thus, the sample included Al- Najaf province. Finally, research community also included all rice farmers in the southern and central provinces with an approximate number of 8526 farmers, where a random stratified sample of rice farmers was taken in the central and southern governorates by 1.2%, thus, the research sample of rice farmers was 102.

Research Tool

In order to build a test to achieve the research objectives, a questionnaire was prepared as a means of obtaining the information from rice farmers through personal interview, where the questionnaire was presented to a group of experts in agricultural extension and field crops. Furthermore, the face validity and content validity were then measured and conduct its initial test. Accordingly, six main research aspects were identified in order to measure the first objective of evaluating the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution, and they are as follows:

First aspect:Evaluation of the general level of rice farmers in the field of preserving the agricultural environment from pollution

This aspect was tested by (120) questions, and these questions represent a set of criteria by which the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution was evaluated. Provisions were then issued to serve the decision-making authorities; thus, the degree of this aspect was ranged between (0-120) degrees, and included of all the questions contained in the next five aspects.

Second aspect: Soil preservation from pollution with chemical pesticide

This aspect was tested by (39) questions, and thus its degree ranged between (0 - 39) degrees, and it was divided into a group of questions including: bush infection and types, procedures to reduce the bush effect and to reduce using chemical pesticides. As well as, the using chemical pesticides, type, quantity, time, number of addition times, soil condition, wind speed, watering after the addition of pesticide, mixing the pesticide with another pesticide and the field condition after using the pesticide.

Third aspect: Soil preservation from pollution with chemical fertilizers

This aspect was tested by (27) questions, and thus its degree ranged between (0-27) degrees, and it was divided into a group of questions including: perform chemical analysis of soil before adding fertilizer, using fertilizers before planting rice seeds. As well as, the using fertilizers after planting seeds, types, quantity, time and

date of addition, number of times of addition and the performing of the drainage process after fertilization.

Fourth aspect: water sources preservation from pollution

This aspect was tested by (24) questions, and thus its degree ranged between (0-24) degrees, and it was divided into a group of questions including: the method used in the rice crop cultivation, crop service operations, soil type and the handling of the drainage water. As well as, the separation of green algae in the water of drainage and irrigation, the presence of unpleasant odors or stink in the water of drainage and watering, number of watering times, quantities of watering during different growth stages. Finally, the watering depth, cutting period of the watering before harvest, method of watering with water such as rain water, wells water or brook water, extent of rainwater collecting and benefiting from.

Fifth aspect: safe and useful dealing of rice crop residues

This aspect was tested by (12) questions, and thus its degree ranged between (0-12) degrees, and it was divided into a group of questions including burning residues, using it as a direct feed for animals, using it in production of silage and the production of mushrooms. As well as, it using in the production of vegetables, production of biogas and compost, using it in production of concentrated feed by mixing it with molasses which are the remnants of dates molasses industry. Finally, using it in production of sawdust or artificial wood and in the reinforcing of the reinforced concrete.

Sixth aspect: Preservation of the rice crop and its seeds from the biological pollution

This aspect was tested by (18) questions, thus its degree ranged between (0-18) degrees, and it was divided into a group of questions including, the sources of obtaining seeds, the maturity signs of the rice crop, the followed method of harvesting, cleaning the harvesting machines. As well as, the survival period of crop in the field after harvest methods of collecting the crop in the field after harvesting, methods of protecting the crop from rain and birds, crop storage methods, storage temperature, the appearance of insects and ways of dealing with them, storage time period for rice grains. Additionally, some personal characteristics of rice farmers (age, educational level, family size, agricultural area size, informal social participation in the field of preserving the environment, participation in official agricultural extension activities in the field of preserving the environment) were measured by asking some direct or specific questions with certain options. The Data were collected using a questionnaire that distributed to the sample of rice farmers among the provinces of the research sample, during the period from 1/8/2017 to 25/5/2018. It is observed that the length of the time period for data collection process was long, because of the quest for accurate information from rice growers using the personal interview.

Statistical treatments

The statistical methods were used to achieve the research objectives, namely, arithmetic means, standard deviation, categories, numbers, percentages, Pearson Karl correlation, Spearman's Rho correlation, T.TEST equation, as well as weighted mean.

Results and discussion

1. Evaluation of the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution, which includes the following:

Evaluate the general level of scientific practices of rice farmers in the field of preserving the agricultural environment from pollution:

The research results showed that have been described the level of most farmers in the field of preserving the agricultural environment from pollution as a medium level as shown in (Table 2). This may be due to the existence of some wrong agricultural practices carried out by farmers, as well as their failure to follow the proper agricultural extension recommendations in the field of fertilization, safe dealing with rice crop residues, as well as the preservation of water sources from pollution, biological pollution as shown by the research results.

2. Level of soil preservation from pollution with chemical pesticide:

The research results showed that have been described the level of most farmers in this field as medium to high level by (20.45) and (31.85) degrees respectively, as shown in (Table 3). This may be due to the commitment of farmers by a good proportion to agricultural extension recommendations for the safe use of agricultural pesticides, where the farmer seeks to use pesticides in a limited way to obtain a high-quality product and at the same time seeking to reduce the production costs for pesticides due to their high domestic prices.

The results showed that three quarters of the farmers have been described their level in this field as low level by (7.39) degrees, while the level of about one quarter of the farmers was described as medium level by (11.78) degrees as shown in (Table 4). This was due to the lack commitment of farmers to the fertilizer quantities recommended by agricultural extension agents, as well

Table 2: Distribution of rice farmers according to the general level to preserve the agricultural environment from pollution.

Seq.	General level to preserve the agricultural environment from pollution	Categories	Number	%	Average	Standard deviation
1	Low level	1-40	7	6.86	37.43	3.207
2	Medium level	41-80	93	91.17	55.20	9.524
3	high level	81-120	2	1.96	82.50	2.121
Total			102	100%	54.52	10.930

Table 3: Distribution of rice farmers according to the level of soil preservation from pollution with chemical pesticides.

Seq.	Soil Preservation from pollution with chemical pesticides	Categories	Number	%	Average	Standard deviation
1	Low level	1-13	4	3.92	10.50	3.317
2	Medium level	14-26	58	56.86	20.45	2.590
3	high level	27-39	40	39.21	31.85	3.199
Total			102	100%	24.53	6.830

Table 4: Distribution of rice farmers according to the level of soil conservation from pollution with chemical fertilizer.

Seq.	Soil Preservation from pollution with chemical fertilizer	Categories	Number	%	Average	Standard deviation
1	Low level	1-9	76	74.5	7.39	1.488
2	Medium level	10-18	23	22.5	11.78	2.373
3	high level	19-27	3	2.94	22.33	1.528
Total			102	100%	8.82	3.445

Table 5: Distribution of rice farmers according to the preservation level of water sources from pollution.

Seq.	Preservation of water sources from pollution	Categories	Number	%	Average	Standard deviation
1	Low level	1-8	28	27.4	6.43	1.643
2	Medium level	9-16	73	71.5	10.18	1.206
3	high level	17-24	1	0.98	17.00	0
Total			102	100%	9.22	2.276

as to their non-compliance with the timing and dates of the addition, and not doing the chemical analysis of soil to determine the real need for rice crop of chemical fertilizers. It has been observed that some farmers are adding large quantities of chemical fertilizers to rice crops, believing that this addition contributes to increasing the quantity of production. But the fact that such action is a major cause of the agricultural environment pollution, increased soil salinity, and reduced rice-grain productivity.

Preservation of water sources from pollution

The research results showed that nearly three quarters of the farmers have been described their level in this field as a medium level by (10.18) degrees, while the level of nearly a quarter of the farmers was described as low level by (6.43) as shown in Table 5. This is due to farmers' profligacy in using watering and their limited commitment to the extension recommendations of rice crop irrigation, such as the watering depth, the periods and dates of the irrigation and the actual need for rice crop from water. As well as, the failure of rice farmers to collect rain water and dig artesian wells to benefit from it in watering the rice crop, which resulted in a low level of water in irrigation canals, and the spread of green algae and unpleasant odors in some region, which are major indicators of water pollution.

Safe and useful dealing of rice crop residues

The research results showed that most of the farmers have been described their level in this field as a low level by (2.27) degrees, while the level of some farmers was described as medium level by (5.06) as shown in Table 6. This was due to the lack commitment of farmers to the agricultural extension recommendations in this field, these include the burning of rice crop residues by farmers, and limited use of rice crop residue as animal feed, or in the production of organic fertilizer or natural gas (biogas) or in some wood industries. Furthermore, It has been observed that most farmers are planting wheat crop seeds in agricultural land planted with rice, before harvesting rice crop (due to the overlap between the date of planting wheat seeds and the date of harvesting the rice crop, which is known as the cascade system). This procedure was carried out without the disposal of rice crop residues, which leads to agricultural land stress, and all these wrong practices are

Table 6: Distribution of rice farmers according to the level of safe and useful dealing of rice crop residues.

Seq.	Safe and useful dealing of rice crop residues	Categories	Number	%	Average	Standard deviation
1	Low level	1-4	83	81.37	2.27	0.951
2	Medium level	5-8	18	17.64	5.06	0.236
3	high level	9-12	1	0.98	11.00	0
Total			102	100%	2.84	1.597

Table 7: Distribution of rice farmers according to the level of preservation the rice crop and its seeds from biological pollution.

Seq.	Preservation of the rice crop and its seeds from biological pollution	Categories	Number	%	Average	Standard deviation
4	Low level	1-6	12	11.76	4.58	1.564
5	Medium level	7-12	84	82.35	9.44	1.467
6	high level	13-18	6	5.88	13.50	0.548
Total			102	100%	9.11	2.392

Table 8: Distribution of rice farmers according to the age and its relation with the general rate to preserve the agricultural environment from pollution.

Seq.	Categories	Number	%	Average	Standard deviation
1	25-39	21	20.58	56.52	12.730
2	40-54	53	51.96	55.21	10.966
3	55-69	28	27.45	51.71	9.112
Total		102	100%	54.52	10.930

* the general rate to preserve the agricultural environment from pollution.

Table 9: Distribution of rice farmers according to the educational level and its relation with the general rate to preserve the agricultural environment from pollution.

Seq.	Educational level	Number	%	Average	Standard deviation
1	Primary	46	45.1	53.43	10.275
2	Preparatory	45	44.1	54.40	11.825
3	College	11	10.8	59.55	9.103
Total		102	100%	54.52	10.930

* The general rate to preserve the agricultural environment from pollution.

one of the main indicators that cause pollution of the agricultural environment.

Preservation of rice crop and its seeds from biological pollution

The research results showed that most of the farmers have been described their level in this field as medium level by (9.44) degrees, while the level of some farmers was described as low level by (4.58) as shown in Table 7. This was due to the farmers' proper implementation of some agricultural extension recommendations and their failures to implement other recommendations. One of the good agricultural practice for farmers is to know the maturity signs of grain and clean the harvester before each use, and to collect and dry the crop and separating the grain from the spikes and then stored at properly and safe away from birds, insects and moisture. On the other hand, it has been observed that some farmers have the wrong agricultural practices that would expose the rice crop to damage or biological pollution, including buying poor quality rice seeds loaded with bush seeds (which are allocated for agriculture) from local agricultural offices, in addition to bringing low-quality seed varieties from outside the country such as Rasht seeds and mixing them with the seeds of state approved varieties, which leads to pollution of the seeds of the final crop as well as its poor quality.

2. Identify some personal characteristics of rice farmers and include the following :

Age:

The research results showed that there were a small differences between the farmers ages and the general level of their scientific practices in the field of preserving the agricultural environment from pollution, where the highest level was recorded in the first age category which represents the youth category, as shown in (Table 8).

Educational level

The research results showed that there were small differences between the educational level of farmers and their levels in the field of preserving the agricultural environment from pollution, where the highest level was recorded at the educational level (college), as shown in (Table 9).

Family size

The research results showed that there were small differences between the family size of the farmers and their levels in the field of preserving the agricultural environment from pollution, where the highest level was recorded at the small families (the first category), as shown in (Table 10).

Agricultural area size

The research results in table 11 showed that there were a fundamental differences between the agricultural

area size of the farmers and their levels in the field of preserving the agricultural environment from pollution, as it was observed that whenever the agricultural area increased on the other hand the farmer level in preserving the agricultural environment from pollution was reduce, this is due to the fact that farmers with a large agricultural area use large amounts of fertilizers, pesticides and water, contrary to the extension recommendations given to them. They seek to increase the quantities of rice crop production, albeit at the expense of damage to the agricultural environment, it is observed that these wrong agricultural practices may be intentional by some in order to achieve high financial profits, and it may be unintended by others because of ignorance of the environmental damage resulting from that.

Table 10: Distribution of rice farmers according to the family size and its relationship with the general rate to preserve the agricultural environment from pollution.

Seq.	Family size Categories	Number	%	Average	Standard deviation
1	3-6	29	28.43	55.79	11.512
2	7-10	52	50.98	54.54	10.571
3	11-14	21	20.58	52.71	11.270
Total		102	100%	54.52	10.930

* The general rate to preserve the agricultural environment from pollution.

Table 11: Distribution of rice farmers according to the agricultural area in dunums and its relation with the general rate to preserve the agricultural environment from pollution.

Seq.	Agricultural area in dunums	Number	%	Average	Standard deviation
1	3-21	80	78.43	56.36	11.189
2	22-40	11	10.78	47.91	6.395
3	41-60	11	10.78	42.73	7.115
Total		102	100%	54.52	10.930

* The general rate to preserve the agricultural environment from pollution.

Table 12: Distribution of rice farmers according to the Informal social participation and its relation with the general rate to preserve the agricultural environment from pollution.

Seq.	Social participation	Number	%	Average	Standard deviation
1	Do not participation	91	89.22	53.65	10.669
2	Participation	11	10.78	61.73	10.864
Total		102	100%	54.52	10.930

* The general rate to preserve the agricultural environment from pollution.

Informal social participation in the field of preserving the agricultural environment

The research results in table 12 showed that there were a fundamental differences between the informal social participation in the field of preserving the environment by farmers and between their levels in the field of preserving the agricultural environment from pollution, it is observed that the social participation has contributed to increasing the farmer level in preserving the agricultural environment from pollution. This is because these social activities are developing farmers' knowledge and correcting the wrong ones as well as conducting field practical practices in the field of preserving the agricultural environment from pollution. These volunteer social activities included cleaning up rivers water from weeds and bushes, and digging artesian wells to rationalize the use of water and determine the damage caused by chemical pesticides on crops and agricultural environment.

Participation in agricultural extension activities in the field of preserving the agricultural environment

The research results in table 13 showed that there were a fundamental differences between the participation in agricultural extension activities in the field of preserving the environment by farmers and between their levels in the field of preserving the agricultural environment from pollution, where observed that farmers participating in agricultural extension activities it was reduced their level in the field of preserving the agricultural environment from pollution. This may be due to the lack of effectiveness and efficiency of most of these activities and its focus on the development of the knowledge aspects of farmers and neglected skills in the field of preserving the agricultural environment from pollution. These extension activities included field clarification, seminars, field days and training courses.

Table 13: Distribution of rice farmers according to the official extension participation and its relation with the general rate to preserve the agricultural environment from pollution.

Seq.	Extension participation	Number	%	Average	Standard deviation
1	Non-participation	35	34.31	59.54	11.136
2	Participation	67	65.68	51.90	9.927
Total		102	100%	54.52	10.930

* The general rate to preserve the agricultural environment from pollution.

3. Determine the relation between the scientific practices level of rice farmers in the field of preserving the agricultural environment from pollution and the personal characteristics mentioned in the second objective

The results showed that there was no significant relationship between the level of scientific practices of rice farmers in the field of preserving the agricultural environment from pollution and between age, family size and educational level. And showed that there was an inverse (negative) relationship between the level of scientific practices of rice farmers in the field of preserving the agricultural environment from pollution and between the agricultural area size and the participation in agricultural extension activities, and this result reinforces the findings and conclusions which reached in the previous objectives mentioned above. The results also that there was a positive correlation between the level of scientific practices of rice farmers in the field of preserving the agricultural environment from pollution and between informal social participation in the field of preserving the agricultural environment from pollution. This result, in turn, reinforces the findings and conclusion which reached in the previous objective mentioned above. As shown in Table 14.

Table 14: The relation between the total degree of the general level to preserve the agricultural environment from pollution and between the personal characteristics of rice farmers.

Seq.	Personal characteristics	Correlation coefficient value	(T.TEST)
1	Age	0.180 -	1.83
2	Educational level	0.150	1.51
3	family size	0.097 -	0.974
4	agricultural area size	0.326 - **	3.44
5	Informal social participation in the field of preserving the environment	0.230 *	2.36
6	Participation in agricultural extension activities in the field of preserving the environment)	0.334 - **	3.54

_ (T. Table) at the significance level 0.05 and 0.01 are 1.98 and 2.63, respectively._ * Significant at the level of 0.05 and ** significant at the level of 0.01._ Use correlation coefficient (Pearson) with quantitative variables, and correlation coefficient (Spearman's) with qualitative variables.

Conclusions

1. The results of the assessment process showed that most rice farmers have been described their level in the field of preserving the agricultural environment from pollution as medium level.
2. There is a commitment by rice farmers with a good proportion to agricultural extension recommendations for safe use of agricultural pesticides, as the level of most farmers in this field has been described as medium to high.
3. Failure of rice farmers to commitment to the quantities, timing and dates of adding fertilizers recommended by the agricultural extension agents as well as of not doing the chemical analysis of soil to determine the real need for rice crop of chemical fertilizers.
4. Clear wasteful use of irrigation water and limited commitment to the extension recommendations in this field.
5. Weakness in the scientific practices level in the field of safe and useful dealing with the rice crop residues.
6. Whenever the agricultural area increased on the other hand the farmer level in preserving the agricultural environment from pollution was reduce, and a significant inverse relation was found between these two factors.
7. The informal social participation of rice farmers in the field of preserving the agricultural environment from pollution (voluntary work teams) has contributed to increasing the level of farmer in preserving the agricultural environment from pollution, and a positive correlation was found between these two factors.
8. Farmers participating in agricultural extension activities have reduced their level of preserving of the agricultural environment from pollution, and a significant inverse relationship was found between these two factors.

Recommendations

Based on the research results, the following can be recommended:

1. Field extension services and agricultural extension agent should develop the knowledge and skills of rice farmers in the field of soil preservation from chemical fertilizer contamination and urge them to follow regular agricultural cycles (planting legume crops before rice planting) to reduce the use of chemical fertilizers, as well as obligate rice farmers to commitment by agricultural extension recommendations and follow them during implementation in the field.
2. It is necessary that the field extension services urge and oblige rice farmers to reduce or rationalize the use of water for irrigation, impose fees or fines on who wasteful the water ration allocated to each farmer, and the planting more rice varieties that use small quantities of water and should also provide training to them in the field of rainwater harvesting methods for irrigation.

3. It is very necessary to provide infrastructure such as organic fertilizer production plants, concentrated feed production plants, wood industries plants that will serve the rice farmers in the process of dealing safely with the residues of rice crop and working to provide the material and financial means to provide the necessary training for rice farmers in this field.
4. Supporting and promoting the informal social participation of rice farmers in the field of preserving the agricultural environment from pollution (volunteer work teams), by providing some agricultural machinery, expertise, agricultural technical advice or financial contribution with them in volunteer work.
5. Field extension agencies and agricultural extension agent should increase their field activities in the field of preserving the agricultural environment from pollution and focusing on the field practical aspect (without neglecting the correction of knowledge aspects), which contributes to increase the skills of rice farmers in the field of preserving the agricultural environment from pollution while increasing the effectiveness and efficiency of agricultural activities provided to them.

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