

Rural Awareness of Environmental Issues: the Case of Turkey

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Abstract

The main aim of this study was to determine the relationship between environmental consciousness and socio-economic characteristics of rural inhabitants and to reflect on the ideas of rural people about the solution of environmental problems. Paying attention to not destroying the environment while using agro-chemicals, and attending environmental works were taken as possible indicators of environmental attitudes and behavior among rural dwellers. Data were obtained from 159 rural dwellers living in 11 villages of Afyonkarahisar and 14 villages of Eskisehir provinces of Turkey via survey. Chi-square test (χ^2) was used while analyzing the relationship between socio-economic characteristics of rural people and environmental consciousness. No statistically significant relationship was found between determining the amount and type of fertilizer and education, or between determining the amount and type of agro-chemicals and education, or between determining the amount and type of fertilizer and age. Only when determining the amount of fertilizer was age a statistically significant factor.

Keywords: rural inhabitants, environment, rural attitudes and behaviours, agrochemicals

Introduction

During the last three decades, environmental issues have become increasingly important for human beings throughout the world [1]. Environmental problems affect everyone, every sector, and every country depending on living conditions, structure of the sector, and the geographic and socio-economic situation of the country.

Environment protection is an important challenge for every community, whether small or large, rural or urban because its long-term consequences affect people's life significantly [2]. Environmental degradation is a major stress on community life in both rural and urban settings. In rural areas, ecological problems such as deforestation can wreak havoc on a community in many ways. Urban dwellers do

not have the same direct link with the natural environment as rural people. The major environmental issues in urban settings revolve around land use and transportation, the quality and availability of water and sanitation services, air quality, solid and liquid waste management, as well as noise and the aesthetic role of the environment [3]. For the peasant household the environment is about resources contributing directly to family livelihoods (water, forests, meadows, wild plant and animals, soils, etc). This distinction is not meant to deny rural dwellers the possibility of being conscious of worldwide ecological issues. Nor does it intend to give a false impression of uniformity in the role of particular resources in peasant livelihoods [4]. Moreover, farmers seem more environmentally oriented than urban residents when their interests are threatened by economic development. Farmers tend to believe in stewardship of the land and conservation [5].

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Environmental policies first concentrated on point-source industrial pollution. Attention later shifted to non-point source surface and groundwater pollution where the agricultural sector was pinpointed as the main polluter of water [6]. Agriculture is the dominant sector in rural areas of Turkey. Therefore, the interaction between agricultural activity and the environment is unavoidable. The agricultural impact on the environment can be positive as well as negative. Farming may, for example, improve as well as destroy the fertility of soils or the diversity of biotopes and species. Agriculture, therefore, determines not only the ecological quality but also the aesthetic appeal of the rural countryside [7].

The number of studies dealing with sociological aspects of environmental problems and explaining the behaviour and attitude of rural people is limited, although many studies have been conducted on nature and environmental problems from technical and economic points of view. In terms of urban and rural residency, the literature is not clear on whether urban or rural residents are more environmentally conscious. In light of the above information, the aim of this study is to determine the relationship between environmental consciousness and socio-economics characteristics of rural dwellers, and to reflect the opinions of rural dwellers about solutions to environmental problems.

Materials and Methods

Material

A survey of 159 rural dwellers living in the provinces of Afyonkarahisar and Eskisehir allowed the researchers to achieve a 95% confidence level with a 5% error rate. The questionnaire was carried out in 3-month periods, from March to May 2005. Sampling was conducted on both weekdays and weekends. In order to ensure a representative sample, 11 villages of Afyonkarahisar and 14 villages of Eskisehir province were selected as research areas. To understand the positive or negative effects of rural industry, the area of residence where the factory was established was taken into account while choosing rural milieu (village, town or county) and respondents. Many marble processing factories have been established in rural areas of Afyonkarahisar province. Some people say that they pollute the soil and water. In addition, the results of this study were compared with the findings of other studies carried out in different parts of Turkey.

Methods

Chi-square test (χ^2) was used while analyzing the relationship between socio-economic characteristics of rural people and environmental consciousness. A 0.05 level of significance was employed for all tests in the study. The algebraic χ^2 test statistic is given in formula (1):

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i} \quad (1)$$

where O_i is the observed frequency in class or interval i and E_i is the frequency expected in class i on the basis of the hypothesised distribution, or the normal. If the null hypothesis is correct, χ^2 has a chi-square distribution with $(r-1)(c-1)$ degrees of freedom (df), where r is the number of rows and c is the number of columns in the main body of the contingency table [8, 9].

To compare two or more groups on the basis of a categorical variable, an **expected cell count** (E_i) for each cell by selecting the corresponding row and column marginal totals. Then computing is calculated via formula (2). These quantities represent what would be expected when there is no difference between the groups under study [10]:

$$\text{Expected cell count} = \left[(\text{column marginal total}) * (\text{row marginal total}) \right] / (\text{grand total}) \quad (2)$$

If the observed frequencies equal the predicted frequencies (i.e., if $O_i = E_i$ for all i), then χ^2 equals zero. If the O_i are very different from the E_i , χ^2 is large. Hence large values of test statistic are used to reject the null hypothesis that the observed frequency distribution arises from a process that leads to the distribution of predicted frequencies. When ($\chi^2_{\text{calculated}}$) is not greater than (χ^2_{critical}), we do not reject the null hypothesis. On the contrary, when ($\chi^2_{\text{calculated}}$) is greater than (χ^2_{critical}), we reject the null hypothesis [8, 9].

Age and education were taken into consideration as socio-economic characteristics of the respondents. Age of the respondents was categorised as: young (under 35), middle (between 36 and 55) and old (56 and more).

According to educational level, rural dwellers were grouped as: no formal education, primary school (5 years), secondary school (3 years), and high school (3 years). None of respondents in the sample had any university degree (undergraduate or postgraduate).

Results and Discussion

Results derived from the questionnaire can be summarized as follows:

The majority of respondents (98.11%) were male. This reflects the dominance of the male-headed family in traditional Turkish society.

As far as marital status is concerned, 94.96% were married, 2.52% were single, and 2.52% were divorced.

The proportion of respondents who were less than 35 years old was 13.21%, and the proportion between 36 and 55 years old was 56.60%. The remaining respondents were above 55 years old. The average age of the sample was 48.93 years old.

In terms of education, 12.58% of the respondents had no formal education, 61.64% had graduated from primary school, 18.86% had completed secondary school, and 6.92% had graduated from high school. Nobody had a bachelor's, master's or Ph.D. degree.

According to area of residents, 17.61% have been lived in county or town. The remainder (82.39%) were from the village.

Rural dwellers were asked to determine the basic problems of Turkey. The highest proportion of the respondents chose unemployment (37.74%). Those choosing health, education, political problems, pilfering, and inflation were 15.72, 12.58, 11.32, 8.81, and 6.29%, respectively. The proportion choosing environmental problems (i.e. devastation, unsuitable use of agricultural lands, erosion, water-air-soil pollution, and deforestation) was only 7.56%. Results of the studies carried out in different regions of Turkey support the result of this study. For example, rural youth living in six villages of Kusadasi County, one of the famous tourism centres in Turkey, reported industrialization as the most important problem [11]. Another study shows that environmental problem was ranked as 6th among unemployment, education, health, industrialisation, social security, credit, deforestation, lack of cooperation or organization, agricultural reform, and others [12]. In global base, environmental problems can be summarized as deforestation, loss of biodiversity, ozone depletion, global climate change, pollution and over-consumption of natural resources [13-15].

When asked if there were any environmental problems in their residence, nearly one-fifth of the respondents said that they had no idea. Remaining respondents identified the following environmental problems in their villages: domestic waste (45.91%), water pollution (18.87%), industrial waste (6.29%), erosion (5.66%), air pollution (1.26%), destruction of forests (1.26%), and noise pollution (0.63%).

Respondents were asked, "What do you do with domestic wastes?" Their answers were: burning (0.63%), storing at a rubbish-heap (19.49%), throwing wastes out of village (12.58%), discarding them to a stream (5.04%), and throwing the wastes away randomly (62.26%).

Respondents were asked about who should shoulder responsibilities in the solution of environmental problems. More than half (54.72%) of the respondents stated that local administrations should take responsibility for solving environmental problems. Other answers were central government (38.99%), local people (29.56%), media (23.30%), political parties (19.50%), youth (15.72%), universities (7.55%), private sector (5.03%), farmer unions (5.59%), trade unions (1.89%), and women (1.89%).

This result shows that there is a difference in the ideas of farmers about "Who should be the agency in society taking responsibility for solving environmental problems?" between regions of Turkey. Because research carried out in Tokat province of Turkey reflects that the great majority of the farmers in the sample choose the government as the agent able to solve envi-

ronmental problems [15]. In contrast, in western Turkey non-governmental or non-profit organizations shoulder some responsibilities of governmental organizations in environmental conservation.

A series of questions related to saving or destroying the environment was asked of the rural people. The first of these asked respondents whether there was destruction in forests. Only 12.58% of the respondents stated that there was. Nearly three-fourths of the respondents answered the question as "no". The remaining (13.84%) had no idea. The second question was whether they had ever planted a tree in a forest. Only 13.84 stated that they had. The third question was related to whether there was destruction or reduction in the amount of grazing area in their villages. Nearly 15% had no idea. According to 27.04% of the respondents, grazing areas were destroyed by people. The remainder disagreed. When asked if agricultural land is used for different aims (for establishment of factory, residence area, road, etc.), an overwhelming majority (91.82%) said this type problem did not exist in their area. Only 6.29% answered this question as "yes." 1.89% of the respondents had no idea.

The great majority of the respondents had detailed knowledge about organic farming (81.13%), and desertification (63.52%). However, it has been determined that most of the rural dwellers had insufficient knowledge of global warming (23.27%), ozone layer depletion (16.35%), sustainable development (8.18%), and integrated pest management (4.40%). Rural people use different information resources to learn/hear the meaning of these words. More than two-third of the respondents in this sample heard/learned these words from television, followed by radio (32.08%), journal/magazine (11.32%), newspaper (10.69%), books (9.44%), farm leaders (8.81%), school (7.55%), and seminar-meeting-courses (0.63%). Nearly the same result was obtained by researchers in Kemalpaşa county of Izmir province. Respondents explained that newspaper and television were the main tools in getting information about the environment [16].

A question that tends to indicate environmental consciousness concerns joining environmental organizations. Only 2 respondents (1.26%) were members of an environmental organisation named TEMA (The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats). In addition, only 2 respondents had attended a course related to environmental issues. This result shows that rural dwellers are not aware of environmental organisation membership and the importance of attending scientific courses organized by governmental and non-governmental organisations in the field of environmental conservation. Indeed, the simple answer to this problem can be found in the results of a study carried out in the Agricultural Faculty of Cukurova University – Turkey. Researchers explained that, unfortunately, only 12.9% of students were members of environmental organizations although being members of any environmental organisations. [17].

Table 1. Age – type and amount of fertilizer contingency.

Age	Decision-making type and amount of fertilizer								Total
	A		B		C		D		
	No	%	No	%	No	%	No	%	
Less than 35	6 (11.09)	7.14	4 (3.43)	15.38	8 (3.30)	32.00	3 (3.17)	12.50	21
Between 36 and 55	52 (47.55)	61.91	14 (14.72)	53.85	14 (14.15)	56.00	10 (13.58)	41.67	90
56 and more	26 (25.36)	30.95	8 (7.85)	30.77	3 (7.55)	12.00	11 (7.25)	45.83	48
Total	84	100.00	26	100.00	25	100.00	24	100.00	159
Result	$\chi^2_{\text{calculated}} = 15.25, \chi^2_{\text{critical}} = 12.60, df = 6, P = 0.05$								

A: own experience, B: advice of seller, C: advice of Ministry of Agriculture, D: price of fertilizer

Note: Figures in parentheses are expected frequencies.

Table 2. Education – type and amount of fertilizer contingency.

Education	Decision-making type and amount of fertilizer								Total
	A		B		C		D		
	No	%	No	%	No	%	No	%	
No formal education	9 (40.75)	12.50	5 (3.90)	16.13	1 (3.90)	3.23	5 (3.14)	20.00	20
Primary School	49 (44.38)	68.06	17 (19.11)	54.84	16 (19.11)	51.61	16 (15.41)	64.00	98
Secondary School	11 (13.58)	15.28	6 (5.85)	19.35	10 (5.85)	32.26	3 (4.72)	12.00	30
High School	3 (4.98)	4.16	3 (2.14)	9.68	4 (2.14)	12.90	1 (1.73)	4.00	11
Total	72	100.00	31	100.00	31	100.00	25	100.00	159
Result	$\chi^2_{\text{calculated}} = 11.96, \chi^2_{\text{critical}} = 16.92, df = 9, P = 0.05$								

A: own experience, B: advice of seller, C: advice of Ministry of Agriculture, D: price of fertiliser

Note: Figures in parentheses are expected frequencies.

Table 3. Age – type and amount of agro-chemicals contingency.

Age	Decision-making type and amount of agro-chemicals								Total
	A		B		C		D		
	No	%	No	%	No	%	No	%	
Less than 35	5 (5.42)	12.20	9 (10.17)	11.69	5 (3.30)	20.00	2 (2.11)	12.50	21
Between 36 and 55	22 (23.21)	53.66	44 (43.58)	57.14	17 (14.15)	68.00	7 (9.06)	43.75	90
56 and more	14 (12.38)	34.14	24 (23.25)	31.17	3 (7.55)	12.00	7 (4.83)	43.75	48
Total	41	100.00	77	100.00	25	100.00	16	100.00	159
Result	$\chi^2_{\text{calculated}} = 6.11, \chi^2_{\text{critical}} = 12.60, df = 6, P = 0.05$								

A: own experience, B: advice of seller, C: advice of Ministry of Agriculture, D: price of agro-chemicals

Note: Figures in parentheses are expected frequencies.

Table 4. Education – type and amount of agro-chemicals contingency.

Education	Decision-making type and amount of agro-chemicals								Total
	A		B		C		D		
	No	%	No	%	No	%	No	%	
No formal education	6 (5.16)	14.63	11 (9.94)	13.92	1 (2.78)	4.55	2 (2.14)	11.76	20
Primary School	28 (25.27)	68.29	48 (48.69)	60.76	10 (13.56)	45.45	12 (10.48)	70.59	98
Secondary School	3 (7.74)	7.32	18 (14.91)	22.79	7 (4.15)	31.82	2 (3.21)	11.76	30
High School	4 (2.84)	9.76	2 (5.47)	2.53	4 (1.52)	18.18	1 (1.18)	5.89	11
Total	41	100.00	79	100.00	22	100.00	17	100.00	159
Result	$\chi^2_{\text{calculated}} = 15.56, \chi^2_{\text{critical}} = 16.92, df = 9, P = 0.05$								

A: own experience, B: advice of seller, C: advice of Ministry of Agriculture, D: price of agro-chemicals

Note: Figures in parenthesis are expected frequencies.

Results show that huge numbers of rural people (98.11%) were using wood as fuel for heating. Other fuel materials were coal (77.36%), and dried dung (52.20%). The rural dwellers supply wood from their orchards (48.43%), private wood sellers (42.14%), and forests (24.53%).

As far as hunting is concerned, 70.08% of the respondents said people obey hunting laws during the restricted periods in their residence area. The remaining (29.92%) had no idea.

It has determined that there are some factories processing marble, coal, and milk in the research area. 76.92% of the respondents stated that the factory established in their village had no negative effect on the environment. The remainder said it leads to water pollution. The farmers' idea about industrialization was as follows: All the respondents are willing to establish an industrial plan in their village or outside of the villages to create new job opportunities and process agricultural products. But only 24.53% would like to establish a factory in their residence area when such a factory would pollute the environment.

91.20% of the respondents were engaged in animal production. The great majority of respondents (84.66%) store animal waste in an uncovered pit. The remainder left the animal manure in a covered pit. This situation leads to negative externality (bad smell, unwanted view, and water pollution, etc.). Animal manure was used for two things: fuel (56.55%) during the winter and fertilizer (100.00%) for crop production.

The common crops in the research area are cereals due to hard ecological conditions. Only 1.89% of the respondents burned the stubble after harvesting wheat.

Generally farmers choose the type of fertilizer to be used according to their own experience. In addition, some farmers apply fertilizer by asking their relatives, neighbours, and leader farmers. After gaining experience, they can decide on the type and amount of fertil-

izer to be applied in agricultural production [18]. The same factors are valid for agro-chemicals (i.e. pesticides and herbicides). Therefore, in this study experience, advice from private agents (fertilizers, pesticides, herbicides seller), advice of extension staff (Ministry of Agriculture), and price of fertilizers or other agro-chemicals were accepted as important factors while deciding on the type and amount of chemicals in agricultural activity. The results of this study are parallel or contrary to the finding of other studies carried out in other provinces of Turkey. For example, Kurtaslan et al. [19] reported that there were statistically significant relationships between the educational level of farmers and hormone usage in agricultural activity. Another study carried out by Akca et al. [20] noted that a statistically significant relationship was found between the education and dosage, and active ingredients of herbicides. However, Tables 1, 2, 3, and 4 show that no statistically significant relationship was found between deciding on the amount and type of agro-chemicals and education or between deciding on the amount and type of fertilizer and education, between decision making the amount and type of fertilizer and age. Only when determining the amount of fertilizer was age a statistically significant factor.

Conclusion

It is difficult to leave a liveable world to future generations if governmental organizations; non-governmental organizations established at local, regional, national and the international levels; the private sector, and people do not pay enough attention to environmental issues. Therefore, the ideas of rural inhabitants on environmental issues should be taken into consideration when deciding agro-environmental policies. Survey results show that rural dwellers need more information about technical

terms. Therefore, government organizations, the private sector and NGOs should organize conferences, seminars or meetings about environmental issues. In addition, the idea of rural people joining environmental organizations should be supported.

In summary, there was only a statistically significant relationship between age and decision-making on the amount of fertilizers used in agricultural activity. No statistically significant relationship was found between determining the amount and type of fertilizer and education, or between determining the amount and type of agro-chemicals and education, or between determining the amount and type of fertilizer and age.

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