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A research on environmental attitudes in Northern Cyprus

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Undoubtedly, pro-environmental attitude is an indispensable element of environmental sustainability and hence sustainable development. Therefore, counties should make sure that their society has positive sensitivity to environment. Otherwise, necessary measures should be taken accordingly. In this study, environmental attitude of Turkish Cypriots was researched. Research findings reveal that respondents have pro-environmental attitude although the level of environmental education and the participation in environmental groups and organizations are not sufficient. Futhermore, the results of factor analysis indicate that the most important pro-environmental elements in order of relative importance are protection of ecological balance; international fight against increasing population density; institutional restructuring against environmental problems; understanding of environmental problems and air pollution; the necessity of international organizations for fighting against environment problems; and the necessity of the civil initiative in environmental problems.

Key words: Northern Cyprus, environment, environmental attitudes, environmental attitudes scale.

INTRODUCTION

The human population is currently growing at a rate that makes sustaining our resources impossible. The world simply cannot continue consuming at a rising rate while resources begin to fall, because at some point, there will be no resources left to consume. If that were to happen, the human race would be in a huge amount of trouble. Left without resources such as food, water, shelter, and oxygen, the human race would die out. Our existence on earth cannot have a continued negative impact on the environment which we depend on for food and resources. Needing to explain the concept of environment, our environment is our surrounding consisting of physical and biological factors and their interactions. Hence, environment includes living and non-living things around us. The non-living components of environment are land, water and air. The living components are germs, plants, animals and people[1] (Ertürk, 1996; Doğan and Akaydin, 2000; Başal, 2005; Erer, 1992). Environmental studies provide an approach towards understanding the environment of our planet and the impact of human life

upon the environment. Thus, environment is actually global in nature, it is a multidisciplinary subject including physics, geology, geography, history, economics, physiology, biotechnology, remote sensing, geophysics, soil science and hydrology etc. (Tont, 2001; Yücel, 2006). Realizing the need of sustainability seeking to use fewer resources or restore those that we have used, environmental sustainability was started to be discussed during a United Nations conference in 1987[2]. Close to the present day in history, United Nations Summit organized between 20 to 22 September 2010 declared the target of integrating the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources[3].

As a reality of global world, environment is understood as an inseparable element of sustainable development. Sustainable development can be defined as the "ability to make development sustainable-to ensure that it meets the needs of the present without compromising the ability

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[1]http://jharenvis.nic.in/files/Protect%20our%20environment.pdf, December 25, 2011

[2]http://www.molletphoto.com/2011/10/26/hello-world/, December 25, 2011
[3]http://www.un.org/millenniumgoals/pdf/MDG_FS_7_EN.pdf, December 25, 2011

of future generations to meet their own needs (Kates et al., 2005: 10). The concept of sustainable development does imply limits-not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities (Kates et al., 2005: 11). This shows that sustainable development can not be achieved without solving environmental problems. In this respect, USAID (U.S. Agency for International Development) has identified five major environmental problems that most directly affect the developing world and the Agency's developmental objectives: 1) loss of tropical forests and other habitats crucial for biological diversity; 2) unsustainable agricultural practices; 3) environmentally unsound energy production and use; 4) urban and industrial pollution; and 5) degradation and depletion of water and coastal resources. Each of these threatens economic progress, biological and other natural resources, and the health and quality of human life. Each also has impacts well beyond national boundaries, often with global consequences[4] (Erten, 2003; Mert, 2006).

Solving environmental problems is closely related to environmental attitudes. In order to motivate desirable environmental attitudes we should first of all concentrate on the environmental attitudes. Behavioural change is seen as a function of change in behavioural intentions. Changes in behavioural intentions are related to changes in attitudes (Loudon and Della, 1993: 422). Environmental attitudes are recognized as an indicator and component of environmentalism. Environmental attitudes are generally accepted as responses from respondents for given environmental issues. Environmental issues might be environmental degradation, environmental pollution, the relationship between society and environment, environmental politics, etc. Positive or pro-environmentalist attitudes of respondents might be called environmentalism.

The aim of environmentalism as an ideology is to change environmental attitudes to more pro environmentalist structure (Harper, 1996). It should be pointed out that environmental attitudes are largely shaped by education among which the level of university plays the major role (Kaya et al., 2009). Increased knowledge about the environment is assumed to change environmental attitudes, and both environmental knowledge and attitudes are assumed to influence environmental policy. Environmental knowledge is found to be consistently and positively related to environmental attitudes, although the relationship is not especially strong. With the correlation of knowledge and attitudes, the low level of environmental knowledge has disturbing implications for environmental policy (Arcury, 1990). Academic sources show that a large number of environmental attitude scales exist (Kahyaoğlu et al., 2008). Among the tools used for assessing attitudes, the

most common are those that are based on the use of closed response questionnaires such as summated rating scales or Likert-type questionnaires. Likert-type surveys are the most common when it comes to obtaining quick information, they are easy to assess and, if they are made with the established requisites, they can faithfully fulfill the role for which they are designed (DeVellis, 1991; Morales, 2000; Morales et al., 2003; Spector, 1992; Stahlberg and Frey, 1988). In this study, scale developed by Berberoğlu (1995) being a Likert-type survey was applied in order to determine environmental attitudes in Northern Cyprus (Ek et al., 2009).

In the light of the aforementioned, the main body of the study were organized and sorted as follows:

a) Research will be conducted on the pre-selected organizations in North Cyprus to determine the followings:

i) Demographic characteristics of respondents,
ii) Environmental attitude of rerspondents for each 21 item in the scale,
iii) Generating smaller and therefore more manageable dimensions called factors from the 21 items of the scale by conducting factor analysis.
iv) Statistical significant relationships between demographic characteristics and the factors.

b) Conclusive remarks will be made for the environmental attitudes in Northern Cyprus.

RESEARCH METHODOLOGY

As cited earlier, the main aim of this study is to determine the environmental attitudes of Turkish Cypriots. For this purpose, four organizations operating in Northern Cyprus were taken as a case study namely, employees working with Cooperative Central Bank, near East College, Kyrenia Akçiçek Hospital, and near East University Faculty of Health Sciences during the month of June 2011 were chosen as the respondents of the research. 256 valid questionnaires were obtained from these face to face interviews. The questionnaire used in the study is comprised of three parts. The first part contains demographic profile of respondents including gender, age group, education, profession, place of settlement, economic status and residential environment. The second part is devoted to life style of respondents that is directly or indirectly related to environment such as smoking status, environmental training, interest in environmental issues, participation in the activities of environmental organizations and discussion of environmental issues in the family. Finally, third part contains 21 items of "environmental attitude scale" developed by Berberoğlu and Tosunoğlu (1995) and adapted according to unique conditions of the country. These 21 items can be grouped into four dimensions that are population growth, energy saving, environmental issues and nuclear energy. The 'environmental attitudes' scale is a 21-item scale that was constructed to measure attitudes towards environmentalism. The item responses consist of a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Positively and negatively worded items are counterbalanced and were chosen to represent both extreme opinions. Items 1, 2, 5, 7, 8, 9, 10, 15, 16, 18 and 19 are reversed scored. Respondents are asked to "Indicate the extent to which you agree or disagree with

[4]http://www.usaid.gov/policy/ads/200/environ/environ.pdf, Sept. 2, 2011

Table 1. Demographic findings.

Factor	Category	Percentage (%)
Gender	Male	39.1
	Female	60.9
Age group	25 and below	34.8
	26-35	30.5
	36-45	21.9
	46 and above	12.9
Education	Literate	2.0
	Primary education	3.5
	High school	32.0
	Higher education	62.5
Profession	Public employees	57.0
	Private sector employees	14.5
	Retired	0.8
	Student	27.7
Place of longest period of settlement	Metropolitan	7.0
	City	44.1
	Town	24.2
	Village	24.6
Economic status	Good	35.9
	Medium	56.3
	Bad	7.8
Residential environment	Family	69.1
	Relatives	2.3
	Friends	5.9
	Dormitory	22.7

each of the statements." Although, the authors do not explain how they score the scale, we would suggest creating both a total score and scores for each of the subscales (with reverse scored items coded accordingly). To create a total scale score, take the average response of all items.

Scores range from 1 to 5 with a high score indicating a higher pro-environmental attitude. Naturally, average that is statistically greater than 3 will show positive environmental attitude. Because of the environmental scale consisting of 21 items with a five category response scale, the possible minimum score that someone would get from the scale is 21 (lowest attitudes) and the maximum score is 105 (highest attitudes), then the average score is around 63 points. Average score greater than 63 will mean positive environmental attitude. The reliability of scale was tested by using Cronbach alfa coefficient calculated as 0.641. According to George and Mallery (2003), this value is within acceptable limits. In addition to reliability analysis, percentage analysis, "one-sample t test", "independent-samples t tests", "factor analysis" and "One-Way ANOVA test" were applied in the study.

FINDINGS AND DISCUSSION

The basic findings related to demographic characteristics of respondents are given in Table 1. Table 1 lists the demographic structure of the interviewed as 60.9% female, 87.5% 45 years old and under, 62.5% with an undergraduate and graduate degree and 57% public employees. Most of them have the longest period of settlement in other residential areas except metropolitan (93%). Majority of respondents (56.3%) have medium economic status. Furthermore, 69.1% of respondents live with their families. Table 2 shows the life style of respondents concerning environmental issues. Accordingly, 57.5% of respondents are non-smoker. Unfortunately, while the majority of respondents (52%) have not received training on environmental issues during their formal education, only 3% of them have received training on environmental issues that are irrelevant with thier formal education. The ratio of respondents not participating in the activities of any environmental organization is 73%. Moreover, the ratio of respondents in whose family environmental issues are discussed in any way is 67.4%. "One-sample t test" was conducted to determine environmental attitudes of

Table 2. Life style of respondents.

Factor	Category	Percentage (%)
Smoking status	Every day (at least 6 months) at least 1 a day	19.9
	Occasionally	22.7
	Quit smoking	10.2
	Never smoked	47.3
Have you received training on environmental issues during your formal education?	Yes	48.0
	No	52.0
Have you received training on environmental issues that is irrelevant with your formal education?	Yes	3.0
	No	97.0
Are you interested in the subject of environment?	Yes	35.2
	No	39.5
	Sometimes	11.3
	It differs according to subject	14.1
Have you participated in the activities of any environmental organization?	Yes	27.0
	No	73.0
Are environmental issues discussed in your family?	Yes	34.0
	No	33.6
	Sometimes	17.6
	It differs according to subject	14.8

Turkish Cypriot residents by testing 21-items of the scale mentioned earlier. Scores of these items range from 1 to 5 with a high score indicating a higher pro-environmental attitude. Thus, average score that is statistically greater than 3 will show positive environmental attitude.

The results of "one-sample t test" are shown in Table 3. According to this test, respondents have positive environmental attitude for 17 items while their attitude for 3 items is negative. Only one item which is "nutritional deficiency of underdeveloped countries is a result of environmental problems" proved to be statically indifferent from 3 (p > 0.05 », 158 > 0.05). In other words, respondents are undecided regarding this issue. According to 'environmental attitude scale' reported by respondents, the most environmentally-sensitive variables that have scores equal to 4 or above are "thinning of the ozone layer threatens everyone (4.79)"; "we should intervene in the behaviors of those individuals who are used to littering and/or spiting on street (4.15)"; "some works dealing with protecting turtles in the beaches are futile efforts (4.090)"; and "Turkey and the Northern Cyprus do not have the problem of desertification (4.00)" respectively. On the other hand, the least environmentally-sensitive variables that have scores statistically less than 3 are "squatter settlements are not environmental problem (2.35)"; "any institution or organization including the United Nations should not interfere countries as they wish to use their natural resources (2.54)"; and "since there are more important projects, supporting projects of measuring air pollution is not necessary (2.63)" respectively. Given the fact that 'general average' of 3.58 and 'total score value' of 75.08 are statistically greater than 3 and 63 respectively; it can be concluded that respondents have pro-environmental attitudes. The total score values from similar studies in the literature can be given. The total score values of 85.3, 83.18 and 60.44 belong to studies made by Kiliç et al. (2009), Çinar et al. (2010) and Akbaş (2007) respectively. 21-items in the scale can be reduced to small number of factors in order to determine relative importance of each factor and make it possible to detect if there are statistical significant relationships between these factors and demographic characteristics by applying the statistical technique called "factor analysis".

The purpose of factor analysis is to reduce the initial number of variables smaller and therefore more manageable (easier to analyze and interpret) set of underlying dimensions called factors. Thus, factor analysis can be viewed as a way of summarizing or reducing data often called in a questionnaire to a few underlying dimensions. It also examines the relationship between variables based on the correlations between them to see if there are underlying factors. With factor analysis, relative importance of each factor enlightening

Table 3. One-sample statistics and test for environmental attitude items in Northern Cyprus.

Row No	Variable	Mean	Std. deviation	Sig. (2-tailed) test value = 3 (*p*)
1	Thinning of the ozone layer threatens every one.	4.27	0.67563	0.000
2	We should intervene in the behaviors of those individuals who are used to littering and/or spiting on street.	4.15	0.87304	0.000
3	Some works dealing with protecting turtles in the beaches are futile efforts.	4.09	1.03077	0.000
4	Turkey and the Northern Cyprus do not have the problem of desertification.	4.00	0.94349	0.000
5	People should be encouraged to make small houses near the forest areas of cities in order to meet their needs of clean air.	3.90	0.97127	0.000
6	Programs about the environment in newspapers, magazines and television should be increased.	3.88	0.89277	0.000
7	Emergence of environmental groups is the result of belonging needs rather than the mission of protecting environment.	3.83	0.89539	0.000
8	The idea of environmental protection was put forward by West countries in order to prevent the development of developing countries.	3.81	1.09118	0.000
9	The news about the contamination of streams and lakes are exaggerated.	3.76	1.13238	0.000
10	Utilization of natural gas by residential and work places does not contribute to the solution of air pollution problem.	3.75	0.97718	0.000
11	The presence of Ministry of Energy is required to solve environmental problems of every country.	3.75	0.94037	0.000
12	Rapid population growth is a serious environmental problem.	3.71	1.03474	0.000
13	Drinking water in large cities is contaminated so as to necessitate the use of filters.	3.68	1.19373	0.000
14	Air, land and water are inexhaustible sources.	3.55	1.16052	0.000
15	Environmental sensitivity does not prevent the development of the country.	3.50	1.13067	0.000
16	Systematic meetings of protest should be organized against ozone-depleting technology products.	3.46	1.19398	0.000
17	Regardless its economic or political status, every country undertaking nuclear testing activities should be protested.	3.38	1.32251	0.000
18	Nutritional deficiency of underdeveloped countries is a result of environmental problems.	3.10	1.14679	0.158

Table 3. Contd.

19	Since there are more important projects, supporting projects of measuring air pollution is not necessary.	2.63	0.99804	0.000
20	Any institution or organization including the United Nations should not interfere countries as they wish to use their natural resources.	2.54	0.95697	0.000
21	Squatter settlements are not environmental problem.	2.35	0.88641	0.000
	General average	3.58		
	Total score value	75.08		

environmental attitude can be determined by looking at the variance explained by each factor. The most commonly used rule for deciding if a factor is important is to only take factors with an eigenvalue of 1 or greater (Hinton et al., 2005: 340-341; Pallant, 2005: 172-173). After the "one-sample t test" for environmental attitude items, a factor analysis was conducted using varimax rotation (Table 4). Regarding the pre-analysis testing for the suitability of the entire sample for factor analysis, the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.704 and the Bartlet tests of sphericity (483,968) was significant at $p<0.01$, thus, indicating that sample was suitable for factor analytic procedures. According to analysis, factors with eigenvalues greater than 1.0 and factor loadings that are all equal or greater than 0.50 were retained (Saruhan and Özdemirci, 2005: 151-156). Therefore, 17 variables (from total 21), loading under 6 dimensions were extracted from the analysis and these 6 factors explained 54.36% of the overall variance. The reached value of each 'factor' explains the comparative significance of the given factor.

The mentioned 6 'environmental attitude factors' are lined in Table 4 according to the specifications of variables in descending order as: 1) the need for the protection of ecological balance; 2) the need for international fight against increasing population density leading to potential environmental problems; 3) the need for institutional restructuring against environmental problems; 4) the necessity of understanding of environmental problems and air pollution; 5) the necessity of international organizations for fighting against environment problems; and 6) necessity of the civil initiative in environmental problems. Accordingly, highest variance explained reflecting the relative importance of factor belongs to first factor (12.742%) while the lowest one is possessed by sixth factor (8.886%). Referring to demographic characteristics of respondents in Northern Cyprus at Table 1, "independent-samples t test" and "one-way ANOVA test" were used to determine if environmental attitudes vary according to demographic characteristics in terms of factor score values (Table 5).

Accordingly, environmental attitude factors statistically differentiating in terms of demographic characteristics are summarized as follows:

a) The only factor differentiating in terms of gender is "the necessity of international organizations for fighting against environment problems". Females proved to be more sensitive to this factor relative to males.
b) The only factor differentiating in terms of age group is determined as "the need for international fight against increasing population density leading to potential environmental problems". The age group of "25 and under" are more sensitive to this factor relative to age group of "26 to 35".
c) Two factors revealed different scores according to the level of education. These are "the need for the protection of ecological balance" and "the need for international fight against increasing population density leading to potential environmental problems". Statistical difference observed between "literate and higher education" and between "high school and higher education" indicates that there is a positive relationship between the level of education and sensitivity towards protecting ecological balance. Furthermore, statistical difference is observed between "primary education and high school" and between "high school and higher education" regarding the factor of "the need for international fight against increasing population density leading to potential environmental problems". Probably, the demand of those with primary education for the improvement of living conditions made them more sensitive to the necessity of an international struggle towards environmental protection relative to those with high school education. However, positive impact of education is witnessed in this regard; such that, the sensitivity of those with higher education to this factor is more than those with high school education.
d) Finally, three factors revealed different scores according to profession. These factors are "the need for international fight against increasing population density leading to potential environmental problems", "the need for institutional restructuring against environmental problems" and "the necessity of international organizations

Table 4. Results of factor analysis on 17 variables and its 6 dimensions.

Factors and variables	Eigen value	Factor loadings	Variance (%)
Factor 1: The need for the protection of ecological balance	**2.668**		**12.742**
People should be encouraged to make small houses near the forest areas of cities in order to meet their needs of clean air.		0.635	
The news about the contamination of streams and lakes are exaggerated.		0.623	
Air, land and water are inexhaustible sources.		0.604	
Some works dealing with protecting turtles in the beaches are futile efforts.		0.603	
Turkey and the Northern Cyprus do not have the problem of desertification.		0.505	
Factor 2: The need for international fight against increasing population density leading to potential environmental problems	**2.111**		**11.186**
Rapid population growth is a serious environmental problem.		0.725	
Drinking water in large cities is contaminated so as to necessitate the use of filters.		0.646	
Systematic meetings of protest should be organized against ozone-depleting technology products.		0.622	
Regardless of its economic or political status, every country undertaking nuclear testing activities should be protested.		0.616	
Factor 3: The need for institutional restructuring against environmental problems	**1.238**		**8.886**
The presence of Ministry of Energy is required to solve environmental problems of every country.		0.737	
We should intervene in the behaviors of those individuals who are used to littering and/or spiting on street.		0.668	
Factor 4: The necessity of understanding of environmental problems and air pollution	**1.121**		**7.234**
Utilization of natural gas by residential and work places does not contribute to the solution of air pollution problem.		0.840	
Thinning of the ozone layer threatens all people.		0.600	
Factor 5: The necessity of international organizations for fighting against environment problems	**1.061**		**7.214**
Any institution or organization including the United Nations should not interfere countries as they wish to use their natural resources.		0.732	
Since there are more important projects, supporting projects of measuring air pollution is not necessary.		0.590	
Factor 6: Necessity of the civil initiative in environmental problems	**1.042**		**7.099**
Squatter settlements are not environmental problem.		0.706	
Emergence of environmental groups is the result of belonging needs rather than the mission of protecting environment.		0.572	

Table 5. The ımpact of demographic variables on the environmental attitude factors using analysis of variance.

Variable	F1	F2	F3	F4	F5	F6
Gender						
Male	3.8040	3.3825	3.9050	4.1100	2.4500	3.1000
Female	3.8936	3.6667	3.9808	3.9487	2.6699	3.0833
(F)	0.291	0.270	1.397	0.072	5.315*	1.326
Age group						
25 and below	3.8517	3.7472	4.1236	3.9719	2.5899	3.1124
Between 26-35	3.9103	3.3141	3.8846	4.0385	2.5641	3.1154
Between 36-45	3.7786	3.5491	3.8750	4.0089	2.5893	3.1071
46 and above	3.8909	3.6212	3.7727	4.0606	2.6061	2.9394
(F)	0.477	4.211*	2.753	0.315	0.031	0.772
Education						
Literate	3.0800	3.7000	4.1000	3.8000	3.1000	3.2000
Primary education	3.4667	4.1111	4.1667	3.8333	2.3333	3.0556
High school	3.7049	3.2683	3.8780	4.0671	2.5976	2.9817
Higher education	3.9838	3.6672	3.9719	4.0000	2.5750	3.1438
(F)	7.569*	6.304*	0.637	0.900	1.184	1.351
Profession						
Public employees	3.8753	3.3699	3.7671	4.0753	2.4110	3.0103
Private sector employees	3.7568	3.8176	4.2297	3.8919	3.1486	3.2027
Retired	3.7000	3.3750	4.0000	4.0000	3.5000	3.5000
Student	3.8817	3.8063	4.1831	3.9437	2.6197	3.1831
(F)	0.404	6.574*	7.760*	1.681	12.503*	2.143

** $p < 0.01$ and * $p < 0.05$.

for fighting against environment problems". Among these, public employees expressed less willingness for "international fight against increasing population density leading to potential environmental problems" relative to students and private sector employees. Similarly, public employees expressed less willingness for "the institutional restructuring against environmental problems" relative to students and private sector employees. Moreover, private sector employees have more sensitivity to "the necessity of international organizations for fighting against environment problems" relative to public employees and students.

Conclusion

Pro-environmental attitude is considered as a visionary approach of today's global world. Parallel to this, internationally honorable organizations/institutions are pioneering the issues of protecting and improving environment. The resultant interrelationship between these organizations/institutions and stakeholders combined with governmental objectives have generated binding rules/regulations and norms especially for global

firms. In addition to this, people that are called customers started to be environmentally sensitive. Naturally, these created a new dimension of competitiveness forcing and motivating businesses to behave in a socially responsible manner and to provide environmentally friendly products and services. Obviously, all of these efforts will not be enough to achieve environmental sustainability if democratic demand of people for this is insufficient. Therefore, the key of success is to observe a pro-environmental attitude. In this study, environmental attitudes of Turkish Cypriots were researched. It can be concluded that Turkish Cypriots have pro-environmental attitude evidenced by total score value of 75.08. The forthcoming items reflecting pro-environmental attitude of respondents are "thinning of the ozone layer"; "littering and/or spiting on street"; "protecting turtles in the beaches are futile efforts"; and "desertification problem of Turkey and the Northern Cyprus". On the other hand, items to which respondents do not have enough sensitivity are "squatter settlements"; "institutional or organizational intervention in countries dealing with the use of their natural resources" and "importance of projects for measuring air pollution".

When environmental items are grouped into factors, the

most important pro-environmental elements are reported as protection of ecological balance; international fight against increasing population density; institutional restructuring against environmental problems; understanding of environmental problems and air pollution; the necessity of international organizations for fighting against environment problems and the necessity of the civil initiative in environmental problems. Conclusively, based on the importance of environmental education, this research findings show that formal or informal environmental education is not sufficient in Northern Cyprus. Furthermore, participation of people in environmental groups and organizations is not satisfactory.

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