

A SURVEY OF RELATIONSHIP BETWEEN THE ENVIRONMENTAL ATTITUDES AND ENVIRONMENTAL KNOWLEDGE AND ENERGY CONSUMPTION BEHAVIOR AMONG CITIZENS OF URMIA, WEST AZERBAIJAN, IRAN

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Abstract

Nowadays, the environmental issues and challenges, particularly "energy consumption behavior" has been the focus of attention for policy makers and scholars in the fields of sociology, environment study, management and so on. The change in the people's behavior towards the naturalist dimensions can be considered as one of the ways to avoid the damage to the environment and destruction of nature (Quimbita, 2005:1). Based on the theory of Reasoned Action of Fishbin and Ajzen (1975), it is assumed that there is a systematic model between the people's approach towards a certain issue and the related behavior towards that issue. On the other hand, scholars in the field of environment study such as Borden and Schettino (1979), Schahn and Holzer (1990), Kaiser et al (1999), and Bayard and Jolly (2006) believe that there is a relationship between environmental knowledge and significant environmental behavior. Considering the significance of the issues stated above, the present article attempts to shed light on energy consumption behavior and its possible correlation with environmental attitudes and environmental knowledge among the citizens of Urmia, West Azerbaijan, Iran. The research method is survey and the main tool for collecting data was questionnaire. Dunlop's NEP scale was used for measuring environmental attitudes and Salehi's Items was employed for measuring environmental knowledge. Statistical sample was consisting of 383 citizens who were selected using cluster sampling method. The results show: 1) the participants owned positive environmental attitude, 2) there was a statistically significant relationship between the environmental attitude and environmental behavior

(energy consumption) of the participants, and 3) there was not any statistically significant relationships between environmental knowledge – either systematic knowledge or behavioral knowledge – and environmental behavior of the participants.

Key words: *Environmental attitudes, Energy consumption Behavior, Environmental behavior (energy consumption), New Environmental Paradigm, Systematic environmental knowledge, Action related knowledge*

JEL Classification: Q5

1. INTRODUCTION

From the beginning of the twentieth century the environmental issues, problems and challenges have been at the center of people's daily life (salehi 2009 a), in such a way that in mid 1920's worrying consequences of environmental pollution attracted more attention every day (Lorey, Kemp, 2007:17). This pollution was considered as a cost that should be paid for a successful economy. At the same time, the attitude and the approach towards the environment were changing and many of the environmental groups were working hard to begin raising public awareness and knowledge (Ibid: 19). According to Quimbata (2005) one of the ways to avoid harming the environment and prevent its destruction is the change in human behavior towards and in the direction of the naturalist dimensions (2005:1). According to the social psychology theories, the change in the behavior will not happen on its own, but requires changes in knowledge and attitude. Hence, Bar (2003) believes this notion is at the heart of government policy making that proper knowledge would have tangible affect on behavior (salehi, 2009 b). Rubin (1974) is also one of the researchers who, maintains a prominent role for environmental knowledge and believes there is a kind of universal and comprehensive knowledge about biological and ecological concepts in the center of the definition of revival and preservation of environmental quality (Ibid).

On the other hand, Eawert and Galloway (2004) believe that one of the more noteworthy areas of interaction between human and the natural environment is environmental attitudes (2004:1). To achieve behavioral changes associated with a particular issue, at first, it requires changing in individual's attitude towards the same issue. For this reason, achieving human attitudes (e.g. environmental attitudes) and exploring individual cognition is essential in the research of environmental behavior. It should be noted that the energy issue is a priority and of importance for this study because the statistical population for this research are the residence of the cold region of Iran and because of the climate and ecological

conditions inevitably have high level of energy consumption. Therefore, knowing about citizens' energy consumption pattern and factors affecting it, and also attempting to generalize results of the research to a wider areas of Iran where in terms of climate and demographic characteristics have more similarity to the present region, have an important and central role in macro- policy making.

2. THEORETICAL FRAMEWORK

According to Hines and et al (1986), the prediction of environmental behavior is not an easy job. Apparently, this includes many different variables which none of them does not act without correlation to each others. Therefore, in an empirical study, researchers should focus on only one or more variables in order to explain the environmental behaviors. In this direction, the present article by focusing environmental knowledge and attitudes, seek to share in explaining the energy consumption behaviors of people in home. Theoretically, Lions & Breakwell (1994) believe” scientific knowledge and notions about changes resulted from scientific developments, are considered important factors in the formation of environmental attitude” (Quoted from salehi, 2009). Based on Grob model (1995), the more people know about environment, the more pro-environmental behavior they will show. Grob’s reasons for claiming this, is the extensive empirical backgrounds, based on environmental data surveys of Borden & Schettino (1979), Hines and et al (1987), Schahn & Holzer (1990)and also based upon experimental evidences of Arbuthnet and et al (1976), Becker(1978), katzer & Johnson(1984) (Grob, 1995:3). Here, it is important to explain how the environmental behavior of people can be influenced by the environmental knowledge. We should acknowledge that people’s knowledge in relation to any subject, is a multilayered science: systematic knowledge and action-related knowledge.

In this direction, work of Frick and et al in introducing three forms of environmental knowledge, that are, systematic knowledge, action-related knowledge and effectiveness knowledge (Frick & et al 2004), opened new doors in the study of the impact of the environmental knowledge on effective environmental behavior. Therefore, to examine the relationship between environmental knowledge and environmental behavior, it is necessary to examine the impact of kinds of knowledge on environmental behavior simultaneously (at the same time),because in the environmental studies ,on one hand, we are faced with views of such researchers like Hines & et al (1987) in which they argue that the abstract knowledge is the most important kind of knowledge for predicting the environmental action, and on the other hand, researchers like Schahn and Holzer

(1990) who believe abstract knowledge do not lead to environmental behavior. (Ibid)

In relation to environmental attitudes, also, Dunlap and Van Liere in the mid of 1970s, influenced by Pirages and Ohrlich (1970) who they took dominant social paradigm center as anti-environment in USA, concluded that because of environmentalism, challenges in our views towards nature and relationship of human with nature has been created. Their conceptualizations about what is called New Environmental Paradigm (NEP), goes around ideas about human ability to disassemble the balance of nature, and limits for human populations growth and human rights to govern the nature. To their beliefs, despite the dominance of anti-social ecological paradigm in western societies, in recent years, some thoughts have emerged that challenge the dominant western social paradigm in relation to Human Exceptionalism. (Dunlap, Van Liere,1978).

In this regard, Catton and Dunlap(2002) adopted an approach that they called it New Ecological Paradigm, and insisted that concern about the growing environmental crisis not only has consequences for the world of nature, but also it will bring significant results for human society (Quoted from salehi, 2010). This approach introduces a new field in sociology that take environment as necessary as the political and economical processes for understanding of the social condition. In 1976, they found that a 12 Items in Likert scale that measured three dimensions of the new social paradigm, has a good internal consistency (alpha coefficient = 81%) and show the obvious difference between environment experts and ordinary people. Therefore, they said that these items can be considered as an indicator for new environmental paradigm. Based on this scale, the present study on one hand, examines environmental attitudes in general (NEP) and also examines individuals attitudes towards particular issue in relation to environmental, which is energy consumption in this study. This means that purposes of the research are: 1- the examination of the relationship between "overall environmental attitude and people attitude towards a particular issue, i.e. energy, with the energy consumption behavior, and 2- the examination of the relationships between both "systematic environmental knowledge and the knowledge related to the action" and environmental behavior. So, according to previous studies and the presented theoretical perspectives, we can hypothesize as following:

1-It seems that there is a relationship between environmental knowledge and energy consumption behavior.

2 -It seems that there is a relationship between energy consumption knowledge and energy consumption behavior.

3- It seems that there is a relationship between environmental attitude and energy consumption behavior.

4- It seems that there is a relationship between energy consumption attitude and energy consumption behavior.

3. METHODOLOGY

The research method is survey and statistical population are citizens of Urmia (West Azerbaijan, Iran) which corresponding to the latest censuses in 2006 (Statistical Center Of Iran,2006) is equal to 596117. Sample size was calculated by Cochran formula and is consisting of 383 persons. Statistical sample was selected using cluster sampling method. Research data were collected in summer of 2010 and the main tool for collecting data was questionnaire. Dunlop's NEP scale was used for measuring environmental attitudes and Salehi's Items was employed for measuring environmental knowledge.

4. RESULTS AND FINDINGS

1-Demographic characteristics of sample: from the total of 383 people being examined in this study, consisted of 34.7% female and 65.3% male. In terms of education, 4.4% illiterate, 3.1% under diploma, 29.2% with diploma, 17.2% higher diploma, 41% science degree and 4.7% with Master and higher Degrees. Considering class features, 2.9% belong to a very high class, 12% to a high class, 73.8% to middle class, 9.9% low-class and 1.3% to a very low-class.

2-Environmental culture of sample: Distribution of respondent's environmental attitudes on the NEP scale shows that 0.3% of the respondent have negative attitude to the environment, 73.9% of them have moderate attitude, and 21.4% of them are having a positive attitude to the environment. Energy consumption attitude also has a similar distribution. Distribution of energy consumption behavior shows that 86.9% of the households were low energy consumption, 11.2% moderate and 0.5% of households have high energy consumption. From the total of 383 respondents, 6.8% of persons have a little knowledge of environmental science, 72.8% of them have average knowledge about it and 18.8% have high level of environmental knowledge, but about the specific energy consumption knowledge figures suggest, 15.9% of people have little knowledge,

77.3% have average knowledge and 5.2% have obtained high level of energy consumption knowledge.

3-Testing hypothesis: The relationships between independent variables and energy consumption behavior have been tested in the form of four regression equations in table 1.

3-1. Environmental attitude and energy consumption behavior: The correlation coefficient (R) between these two variables is 0.177 which is significant at $P=0.001$. This means that as the people attitudes get more positive towards environment, their responsible energy consumption behavior also increases. Coefficient of determination is 3% ($= R^2 0.031$), in other words, 3% of the variance of respondents environmental behavior can be explain by their environmental attitude. Considering the equation 1 in the table 1, we can adjust the following regression equations for the energy consumption behavior in terms of environmental attitude:

$$\text{Energy consumption behavior} = 40.07 + (0.132) \text{ Environmental attitude}$$

3-2. Energy consumption attitude and energy consumption behavior: The correlation coefficient between these two variables is equal to 0.169, which is significant at $P=0.001$, in such a way that as the score of energy consumption attitude of people go up, their score of their responsible energy consumption behavior will also increases. Totally about 3% of respondents' energy consumption behavior changes are explainable by their energy consumption attitudes. The following regression equation can be set for prediction of energy consumption behavior in terms of energy consumption attitude:

$$\text{Energy consumption behavior} = 40.728 + (0.183) \text{ Energy consumption attitude}$$

According to the above regression equation it can be said that by controlling the energy consumption attitude variables, people's energy consumption behavior scores (on a scale ranging from 11 to 55) will be 40.728. Also, for one unit increase in people's energy consumption attitude, 0.183 unit increase is obtained in their energy consumption behavior.

3-3 Systematic environmental knowledge and energy consumption behavior: The results from the third regression equation implies that ,unlike the research hypothesis a significant relationship between systematic environmental knowledge and energy consumption behavior have not been seen in this study ($R=0.097$, $F=3.501$, $P=0.072$).Thus, the research hypothesis is not confirmed.

Nevertheless, these findings with the result obtained by Salehi (2008) and Kitzmuller (2009) are consistent.

3-4 Environmental action-related knowledge and energy consumption behavior: As it can be seen from forth equation of the table, in the examined samples in this study, there is no significant relationship between environmental action-related knowledge and energy consumption behavior. ($p=0.76$, $F=0.09$, $R=0.016$), therefore, the research hypothesis is not confirmed.

5. DISCUSSION

Results show that the level of responsible energy consumption behavior in the examined area (i.e. Urmia, West Azerbaijan Province in Iran) is high (average score of the environmental behavior is 46.77 out of 55). As it can be seen, as well as general environmental attitude and energy consumption attitude have a positive significant relationship with energy consumption behavior. These finding are compatible to the results obtained by Dunlap et al (1978), Schultz and Zelezny (1999), Watson (2005), Salehi (2010).

For explaining the relationship between attitude and behavior, we can get help from work of Dunlap et al (1994) which have examined 24 country's environmental attitude. The results of this study show that interests in environmental issues are growing in developing countries. Considering study location is in Iran , as a developing country, and proximity to the world's second largest saltwater lake (Urmia Lake) and dependency of people on agriculture and the nature in this region, all together have clarified importance of environment and its protection for the locals. It can be said that climate and geographical features of the region regarding the weather, that is, located in a cold region of the country, and facing the problem of obtaining energy in cold seasons of the year, has lead to the concern that energy consumption and its management and environmental attitude of people have play a significant role for preparing necessary energy.

Table 1- the regression equations and coefficients of independent variables on Energy consumption behavior

Dependent variable : Energy consumption behavior																Independent variables
Equation 4 Independent variable : energy consumption knowledge				Equation 3 Independent variable : environmental knowledge				Equation 2 Independent variable : energy consumption attitude				Equation 1 Independent variable: environmental attitude				
Sig	Beta	s.e	B	Sig	Beta	s.e	B	sig	Beta	s.e	B	Sig	Beta	s.e	B	
--	--	--	---	--	--	--	--	---	--	---	--	0.001	0.177	0.039	0.132	Environmental attitudes
--	--	--	--	---	---	--	--	0.001	0.169	0.056	0.18	---	--	--	--	Energy consumption attitudes
--	--	--	--	0.072	0.097	0.156	0.293	---	--	--	--	--	--	--	--	environmental knowledge
0.76	0.016	0.130	0.039	--	--	--	--	----	--	--	--	--	--	--	--	Energy consumption knowledge
0.00	---	0.694	46.5	0.00	--	0.828	45.3	0.00	--	1.860	40.7	0.00	--	2.004	40.07	constant
0.016				0.097				0.169				0.177				R
0.000				0.009				0.028				0.031				R-square
0.764				0.072				0.001				0.001				Sig

This means that the experienced problems in the past when by starting of the rainy seasons in cold regions and the lack of required energy supply (especially gas) by the government and gas flow interruptions, have involved the people of the region in trouble and made them to doubt their attitudes towards energy resources being available all the time and easy access to that energy and, in the result, they consider limiting methods for their way of consumption. Creating such limitations in relation to the energy problem and understanding of un-sustainability of natural resources lead to change people attitudes towards energy and their behaviors.

It has been believed that individual knowledge of any subject influences his/her behavior and performance towards that issue. Many studies, also, with the aim of confirming or refuting this hypothesis have been carried out. Kaiser et al (1999) and Schahn and Holzer (1990) are some examples. In the present study, based on the results of some previous studies (e.g. Borden & Schettino, 1979, Schahn and Holzer 1990, Kaiser et al 1999, Bayard & jolly 2006), was hypothesized that there is a positive and significant relationship between environmental knowledge and energy consumption behavior but the hypothesis of the study was not confirmed experimentally. Nevertheless, these findings are consistent with results obtained by Salehi (2009 a) and Kitzmuller (2009). Frick et al (2004) also believe that the knowledge related to action, is a good predictor for protective behavior. On this base, in this study it was assumed that there is a positive relationship between these two variables. Results show that, contrary to the claim of Kaiser et al, research hypothesis was not confirmed. One possible reason for this finding is the low level of environmental knowledge among the people under consideration. As it was mentioned, in the study the average consumption is 3.99 out of 9 .

Perhaps, due to the fact that citizens tend to consider the energy issue as a specialized subject, their energy knowledge is at a very low level. Another probable reason for the gap between environmental knowledge and behavior in this study is the nature of the knowledge under consideration. Although there are not a relationship between systematic knowledge and behavior knowledge and environmental behavior, but if the effectiveness knowledge was being studied, a positive relationship with environmental behavior could be found. Since the effectiveness knowledge, helps individual in choosing different behavior solution (Rezvani 2005:14), it is better that, instead of systematic knowledge and action-related knowledge and assess their relation to behavior, we chose the effective knowledge and assess its relationship with environmental behavior.

In effectiveness knowledge, action-related knowledge is extended from just knowing how to protect environment to know how of getting the maximum

environmental benefits (Frick et al, 2004:3). As it was mentioned previously, the kind of knowledge, always affect the quality of human behavior and also the kind of the behavior. For example Barr (2003) in explaining the unexpected results in his study expresses that " although knowledge plays an important role in explaining environmental behavior, but this knowledge, is concrete and real and not an abstract knowledge"(Salehi , 2009).

Undoubtedly, results and findings of the study provide further evidence that imply, in addition to environmental knowledge; some other factors must be taken into accounting of energy consumption behavior. Therefore, if the purpose of a research is understand of the affecting factors on environmental behavior, other factors besides environmental knowledge must be considered.

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