

Investigating the Relationship between Environmental Culture and Water Consumption Pattern (Case Study: Residents in the South of Urmia Lake)

Afshar Kabiri

Associate Professor, Department of Sociology, Faculty of Literature and Humanities, Urmia University

(Received: 22.01.2022

Accepted: 12.06.2022)

بررسی رابطه فرهنگ محیط‌زیستی با الگوی مصرف آب روستائیان (مورد مطالعه: ساکنین جنوب دریاچه ارومیه)

افشار کبیری

دانشیار، گروه جامعه‌شناسی، دانشکده ادبیات و علوم انسانی، دانشگاه ارومیه

پذیرش: ۱۴۰۱/۰۳/۲۲

(دریافت: ۱۴۰۰/۱۱/۰۲)

Abstract

Environmental culture can reduce environmental issues by increasing environmental awareness and lead to responsible behavior towards environment and protection of water resources. This study aimed to investigate the relationship between rural environmental culture and water consumption pattern. It is applied in terms of purpose and descriptive-analytical in terms of nature and method. The statistical population of this study includes rural households in the south of Lake Urmia catchment located in the cultivation project "Cooperation in the revitalization of Lake Urmia through the participation of local communities in the establishment of sustainable agriculture." Using multi-stage cluster sampling method 372 households were selected as a sample. The analysis and observation unit of this research is the head of rural households who used a questionnaire tool and technique to collect data. The results showed that there is a positive and significant relationship between environmental attitudes and beliefs, environmental knowledge and awareness, social trust and environmental Concern with water consumption pattern and 35% of the variance of water consumption pattern is explained by environmental culture components. In terms of impact among environmental culture variables, people's trust in responsible institutions with a beta of 50% has the most impact, so based on the results of the research can be said that the most important component to improve water consumption pattern, reform water governance and efforts to build and Restoring the social trust of the villagers to the environmental authorities and the local water governancy.

Keywords: Environmental Culture; Water Consumption Pattern; Urmia Lake; Villages; Social Trust.

چکیده

فرهنگ محیط‌زیستی با افزایش آگاهی زیست‌محیطی می‌تواند مسائل و مشکلات زیست‌محیطی را کاهش داده و منجر به رفتارهای مسئولانه در برابر محیط‌زیست و حفاظت از منابع آبی گردد. هدف از تحقیق حاضر بررسی رابطه فرهنگ محیط‌زیستی روستائیان با الگوی مصرف آب بود. این تحقیق از لحاظ هدف کاربردی و از نظر ماهیت و روش توصیفی - تحلیلی است. جامعه آماری این پژوهش شامل خانوارهای روستایی جنوب حوضه آبریز دریاچه ارومیه واقع در طرح بهکاشت «همکاری در احیای دریاچه ارومیه از طریق مشارکت جوامع محلی در استقرار کشاورزی پایدار» می‌باشد که با استفاده از روش نمونه‌گیری خوشه‌ای چندمرحله‌ای تعداد ۳۷۲ خانوار به‌عنوان نمونه انتخاب شدند. واحد تحلیل و مشاهده این تحقیق سرپرست خانوارهای روستایی است که برای جمع‌آوری داده‌ها از ابزار و تکنیک پرسشنامه استفاده شد. نتایج نشان داد بین شاخص‌های نگرش و باور محیط‌زیستی، دانش و آگاهی محیط‌زیستی، اعتماد اجتماعی و دغدغه‌های محیط‌زیستی با الگوی مصرف آب رابطه مثبت و معناداری وجود دارد ولی ۳۵ درصد از واریانس الگوی مصرف آب توسط مؤلفه‌های فرهنگ محیط‌زیستی تبیین می‌شود. به لحاظ تأثیرگذاری در میان متغیرهای فرهنگ محیط‌زیستی نیز اعتماد مردم به نهادهای مسئول با بتای ۵۰ درصد دارای بیشترین تأثیر هست؛ لذا بر اساس نتایج تحقیق می‌توان گفت مهم‌ترین مؤلفه برای اصلاح الگوی مصرف آب، اصلاح حکمرانی آب و تلاش برای بر ساخت و ترمیم اعتماد اجتماعی روستائیان به مسئولین محیط‌زیست و حکمرانان محلی آب است.

واژه‌های کلیدی: فرهنگ محیط‌زیستی، الگوی مصرف آب، دریاچه ارومیه، روستا، اعتماد اجتماعی.

Introduction

Undoubtedly, environmental issues are one of the most important epistemological and empirical problems that human society has ever faced in recent times and has been working out sustainable solutions to them. In this regard, sociology undoubtedly plays the most important role in analyzing these issues and providing answers to them. Although environmental issues are interdisciplinary in nature and can be dealt with in various sciences, it is mostly expected from sociology to show us how to deal with these problems because they are basically social and deeply rooted in the behavior of the social man and the processes that govern his social life. These issues not only are rooted in human social behavior and the order of their social life, but also have the greatest impact on human social life, although the lives of other animal and plant species are also endangered. Therefore, from the last decades of the twentieth century sociology has focused on environmental issues and has been trying to analyze the causes and processes governing the formation of these issues and show their negative impacts on human social life. This event has paved the way for the formation of knowledge that is aptly termed as sociology of environment.

Based on this introduction, it can be claimed that the biggest and most important factor in preserving environment and especially conserving water resources is cultural and social factors. Abnormal behaviors towards environment arise from cultural beliefs, including unfamiliarity with environmental culture and misunderstanding of environmental situation prevailing in society and the state of cultural attitudes and beliefs. The reason for such mis-behavior is that people have neither learned it nor properly institutionalized the culture of using natural resources, ecological facilities and co-existence with nature. Authorities' and planners' negligence of this issue has been so gross that it has penetrated into all social layers and a misconception of development has been formed, which is considered human encroachment on nature and environment (Zahed Zahedani et al., 2018: 442).

Researchers have come up with a variety of solutions to these problems, most of which are

technological and structural, but today due to high costs and double social and environmental impact of such projects on environment, they have become more interested in changing people's lifestyle and suggested sociocultural solutions (Sajasi Gheidari & Jalali Faal, 2018: 30).

One of the sociocultural solutions to these problems is the development of environmental culture among people. As a result, in our country, Iran, human environmental culture, as one of the most important and influential factors on environment, has been considered by many sociologists, geographers, environmental researchers and thinkers (Salehi & Imam Qoli, 2012: 124). They believe that developing environmental culture can reduce environmental issues and problems and lead to responsible behaviors towards environment (Schumacher, 2015: 201). They also believe that developing environmental culture is a key to solving many environmental problems (Salehi & Imam Qoli, 2012: 125). Excessive domestic energy consumption, use of disposable products, unnecessary use of non-standard public transportation, overuse of chemical pesticides in the agricultural sector, improper waste disposal, non-segregation collection of waste for recycling, damage to tree trunks, historical sites, urban and rural sites and facilities, improper use of water resources for domestic and agricultural use, destruction of groundwater resources (such as wells, springs, aqueducts) and surface resources (rivers, wetlands, lakes, seas, etc.), dumping of waste in cities and villages, forests, rivers, and many destructive behaviors are all examples that occur due to human culture and environmental behaviors (Hajizadeh Meymandi et al., 2014:84).

One of the important aspects of environmental culture is the optimal use of water resources in nature and the optimization of water consumption patterns in various economic sectors, especially agriculture. Thus, water is a common human resource that should be saved for the future generations and a very valuable resource for human life preservation, production processes, and ecosystem (Qian, 2016: 23). It is also a vital factor in intensifying sustainable agriculture that directly affects various dimensions of sustainability, including

social, economic, health, and environmental aspects (WWAP¹, 2015). However, today, water resources are severely threatened by the spread of urbanization, industrialization, climate diversity, agricultural needs, inappropriate use of land and water resources, and human activities, all of which lead to the destruction of the neighboring environment (FAO² 2011). In this regard, in the northwest of Iran, Urmia Lake has faced such a critical situation and brought irreparable effects on its environment. This lake plays an important role in social, economic and environmental dimensions of northwestern Iran (Farajzadeh et al., 2014: 39). But during the last few decades, it has faced critical conditions and water reduction levels (Asghari Zamani, 2013: 78) Thus, its downward trend has started since 2004, and during the last two decades the depth of the lake has dropped by more than 8 meters. In fact, according to the recorded figures, on average, Urmia Lake in the last two decades has faced a annual 40-centimeter decline of depth annually (Urmia Lake Rehabilitation Headquarters, 2015).

Urmia Lake has been severely threatened and almost destroyed by two groups of factors inside and outside the system. Factors within the system include climatic characteristics, water resources, wildlife, vegetation, etc. Changes in the characteristics of these factors have caused changes in the lake system (Society of Consulting Engineers, 2011: 35) to the extent that 65% reduction in water level has been related to climatic change in this region. On the other hand, external factors imposed on the system from outside are man-made, due to human exploitation of environment, such as excessive use of surface water resources, construction of dams, etc., which have affected the natural system of Urmia Lake (Mohammadi Yeghani et al., 2013: 67). Dam construction, well digging, illegal withdrawals, and unprincipled use of water as part of human intervention in this basin, alone, have accounted for 25% of the lake destruction (GEAS, 2012: 6). To deal with the crisis, the relevant authorities have suggested various techniques, including cloud seeding, water transfer from the Caspian Sea basin, water pumping from the Aras and Zab Rivers (Urmia Lake Rehabilitation Headquarters, 2015). Promoting agricultural mechanization

and modifying traditional irrigation pattern have provided planting and non-planting plan, spreading environmental culture, etc. (Irannejad, 2015: 5). However, when one reviews the proposed solutions for the preservation and restoration of Urmia Lake, s/he realizes that one of the neglected key parameters in restoration of Urmia Lake is the role of human agency and the impact of environmental culture of people on the lake basin. The amount and pattern of water consumption in the agricultural sector and in rural and urban settlements correlates with factors such as environmental knowledge and awareness, environmental attitudes and beliefs, sense of responsibility for environmental protection, concern about environmental issues (Mokhtari et al., 2014: 6). In addition, considering that a large group of the population of the catchment area of Urmia Lake is made up of villagers (Environmental Protection Organization, 2010: 20) and their economy highly depends on agriculture, horticulture, animal husbandry, handicrafts, beekeeping, etc., all of which are highly dependent on environment (Delju et al., 2012: 441). Also, they receive their raw materials from natural environment, which is the basis for the destruction of the natural environment. Therefore, paying due attention to environmental culture of villagers and improving their water consumption patterns in the agricultural sector is one of the most important solutions that can help to revitalize Urmia Lake.

In this regard, one of the most important issues in today's world, and especially Iran, which seriously needs to be acculturized and institutionalized in the behavior of individuals and residents of local communities, is the issue of protecting water resources and reforming the water consumption pattern in these communities. Therefore, agriculture as the main sector of activity in rural communities, 92%, is estimated to be the largest and most important consumer of water in Iran. More than 80% of water resources are wasted due to the lack of advanced irrigation technologies in this sector. Experts believe that the country's water resources in the current situation are poorly managed and will lead to a progressive decrease in groundwater resources in the coming years and also a decrease in the level of

1. World Water Assessment Programme

2. Food and Agriculture Organization

agricultural cultivation in some parts of the country. Among these, the study area is the main water supply of Urmia Lake along with the Zarrinehrood and Siminehrood rivers. But on the other hand, due to the fact that a large part of the region is plain and has about 82,000 hectares of irrigated land that is cultivated for various agricultural products, it is one of the main areas where the highest percentage of people are extremely busy in agriculture. A major part of water in this region is consumed in the agricultural sector, and it is one of the areas with the greatest waste of water resources. Many lands in this region, such as the central districts and Merhamatabad, have the highest water loss due to the cultivation of crops needing high amount of water and use of the traditional irrigation system. Therefore, paying attention to the indices of environmental culture in order to use water optimally and having a standard water consumption pattern in the study area are necessary to reduce water loss. To do so, there is a need to consider lifestyle, mode of social participation, the role of local people in protecting the local ecosystem that results from their attitudes, awareness and knowledge of environment, as well as local people's level of trust in the work done by officials in the regions in the shores of Urmia Lake.

Since the main contribution of water level reduction in Urmia Lake is related to human activities in dealing with environment, the aim of this study was therefore to investigate the relationship between environmental culture and water consumption pattern in rural settlements around Urmia Lake. Therefore, this study seeks to answer the following research questions: 1. What is villagers' status of environmental culture like? 2. What is the relationship between different dimensions of environmental culture of citizens and their water consumption pattern?; and 3. How much does the size of environmental culture affect the water consumption pattern of the citizens?

Culture is the collective investment of know-ledge, experience, beliefs, values, tendencies, concepts, hierarchy, religion, temporal percep-tions, functions, spatial relations, general perceptions of the world, and acquired material objects and assets by a group of people over different generations through

individual and group effort (Richards & Munster, 2010: 279). Linton (1993: 466) defines culture as "the set of common knowledge, attitudes, and behavioral patterns shared and transmitted by members of a particular community." As a result, culture is not a static concept, rather it develops endogenously. We focus here on the type of culture that influences each society's attitude toward the economic use of environment, and call this particular type of culture "environmental culture" (Schumacher, 2015: 200). According to Clock and Clock (2008), environmental culture includes a set of environmental worldviews, environmental concerns, commitments, and environmental behaviors. This definition of environmental worldview encompasses all knowledge, beliefs, and behaviors related to environment, including issues such as the protection of environment, plants and animals, the conservation of resources, natural or environmental degradation, environmental impacts, economic growth, and the use of science and technology to solve environmental problems (Rezadoost et al., 2011: 169). Cotton sees environmental culture as a set of behaviors and characteristics of individuals in dealing with environment that reflect their environmental values. According to Dunlap (1992), environmental culture is the set of knowledge, values, norms and behaviors that people in society hold in relation to their environment. Below, each of the indices of environmental culture is reviewed.

Environmental Concern

Environmental Concern is a set of actions of individuals in society towards environment, which in a wide variety includes feelings, tastes and special preparations for behavior towards environment (Asadi & Mehrabi, 2017: 124). These behaviors may be quite positive, environmentally friendly, and responsible; or on the contrary, they could be completely negative and against the environment. Environmental behavior refers to behavior that consciously seeks to reduce the negative impact of one's actions on the natural and man-made world (including reducing energy, waste production and resource consumption, using non-toxic substances). In other words,

environmental behaviors are a set of actions taken by individuals in society towards environment, which includes a wide range of feelings, desires and special preparations for behavior towards environment (Salehi & Imam Qoli, 2012: 98). Defined differently, environmental behavior refers to clear and observable actions performed by the individual in response to environment (Salehi & Ghaemi-Asel, 2013: 72). In addition, environmental behavior is a positive and responsible attitude towards environment in which activists do not harm it or at least they do not protect environment.

Explaining people's attitudes towards environment is one of the important issues in environmental sociology, which for many reasons, in addition to the theoretical aspects, are also of great practical importance (Hajizadeh Meymandi et al., 2017: 8). What is certain is that every human action or decision affects environment, and that human activities, whether micro or macro, are integrated into the context of the ideological system, and that maybe human micro-activities, due to their abundance, repetitions, widespread distributions and their accumulation in environment, have a decisive role in reducing the quality of environment (Ghobadi Aliabadi et al., 2015: 145) Therefore, it can be claimed that the main factor in the formation of environmental hazards is the human being and the people of each society have a different attitude towards environment according to their specific social culture and personality types and requirements (Nawah & Froutan-Kia, 2011: 82-83).

Environmental knowledge and awareness

One of the most important factors that make people indifferent to environment is their ignorance. Informing people should be purpose-ful, coherent and unified (Mokhtari Malekabadi et al., 2014:5). Environmental awareness (cogni-tion) means the amount of information a person has about environmental issues, the factors influencing its development and knowledge of how to behave in order to improve these problems (Kairser et al., 1999: 2). In addition, environmental awareness includes information that individuals have about environment, the ecology of the planet Earth, and the impact of human actions on

environ-ment/ecosystem (Arcury, 1990:1; Mostafa, 2009: 11030). Environmental awareness plays an important role in the daily activities of people in society. This awareness paves the path for the development of communities and reduces the problems and inadequacies that have arisen (Kumar sanjay, 2013: 85).

The history of paying attention to environmental awareness dates back to the late 1960s in Western countries. Initially, the study of environmental awareness and behavior and its various aspects was limited to Western countries; but its widespread use in other parts of the world dates back to the 1980s. Environmental problems after the end of the Cold War threatened the human society severely (Khoshfar et al., 2010: 141) which is one of the main reasons for paying attention to its environmental awareness. A correct understand-ing of environment contributes to the sustain-ability and protection of natural areas, and most of this environmental awareness is gained through experiences: gained either individually or by word of mouth quoted from the past (Hopping et al., 2016: 4). The study of various theories in the field of environmental awareness and behavior shows that this category has always been in the focus of attention of many thinkers and according to the existing issues, its importance has increased. Among the existing theories in this field, in Ramsey's theory, the importance of environmental awareness has been considered. Ramzi believes that the activities of social movements in general and environmental organizations in particular are based on the fact that in the conscious pressure of society, it leads to the protection of environment (Khajeh Shahkahi et al., 2014: 87). Various studies show that the Earth's environmental issues are many and various. In order to be more compatible with environment and reduce the rate of destruction, it is necessary to make fundamental changes in lifestyle and behavior of human society. It is also necessary to pay more attention to providing grounds for solving the existing problems, considering the basic role of human behaviors in preserving and destroying environment (Sajasi Gheidari & Jalali Faal, 2018: 134). In this regard, at international conferences including the Stockholm Confer-ence in 1972, the Tbilisi

Declaration in 1977, Johannesburg World Summit (2002), etc., the type of behavior based on environmental awareness as one of the factors of environmental protection was emphasized (Mahmoudi & Weisi, 2007:59).

Environmental attitudes and beliefs

Attitude is defined as a positive or negative feeling about a person, object or issue (Salehi, S. & Imam Qoli, L., 2012: 39). Also, environmental attitudes are a set of pleasant or unpleasant feelings about the characteristics of the physical environment or related issues (Manzanal et al., 2007: 1000). One of the main reasons for examining attitudes is the expectation about a person's behavior that we can predict. The assumption that personal attitudes determine one's behavior is ingrained in Western thought, and in many cases holds true. But research shows that the relationship between attitude and behavior is more complex than previously assumed (Mokhtari Malekabadi et al., 2014: 5). In general, attitudes are the best predictors of behavior if: (a) they are strong and harmonious; (b) attitudes have a special relationship with behavior; (c) attitudes arising from direct experience better predict behavior than attitudes formed by reading and hearing about a subject; and (d) awareness also shows evidence that those who are more aware of their attitudes are more likely to show

attitude-behavior alignment (Atkinson et al., 2009: 616).

In general, the attitude towards nature has been discussed according to two general perspectives, which include the dominant social paradigm and the new environmental paradigm. In the first view, man is the sole ruler of the planet who emphasizes on the exemption of man. This paradigm is negatively related to environmental attitudes. With the inefficiency of technologies that human beings consider a blessing, nature-based theories were formed, a set of which can be seen in the new environmental paradigm (Salehi & Pazokinejad, 2014: 72). New environmental paradigms have been studied in both environmental sociology and environmental psychology and are a source of knowledge about the values, beliefs and perceptions of individuals about nature and the place of man in it (Opoku, 2015: 38). The new environmental paradigm uses a set of propositions related to the beliefs of individuals, according to which the individuals' view of nature and the relationship of human beings with this religion is evaluated (Sharifi & Nouripour, 2015: 10). Therefore, after reviewing the theoretical foundations of various dimensions of environmental culture, internal and external studies related to the present study and available in the literature have been summarized in Table 1.

Table 1. The Internal and External Studies Related to the Present Study

Researcher(s) / Year	Topic	Result(s)
Salehi & Imam-Qoli (2011)	Investigating the Impact of Social Capital on Environmental Behaviors (Case: Kurdistan)	They conclude that there is a positive and direct relationship between social capital and environmental behaviors. In other words, with the increase of social capital, environmentally responsible behaviors also become more responsible.
Nawah & Froutan Kia (2011)	Investigating environmental behaviors of primary school teachers in terms of knowledge, awareness, attitude and skills	They found that more than 69% of primary school teachers had a positive or completely positive attitude towards appropriate environmental behaviors. Also, environmental knowledge of teachers was moderate.
Farahmand et al. (2013)	Investigating the social factors affecting environmental behaviors in Yazd	They have concluded that there is a significant relationship between the variables of age, environmental awareness, individualism, life satisfaction and environmental behaviors.
Salehi & Ghaemi Asl (2013)	Investigating the relationship between environmental education and environmental protection behaviors	They have concluded that the new environmental Approach has a positive effect on the development of environmental protection behaviors. But environmental education and knowledge have little effect on the

Researcher(s) / Year	Topic	Result(s)
Mokhtari Malekabadi et al. (2013)	Analysis of environmental behaviors of Isfahani citizens	occurrence of environmental behavior. The results indicated that environmental attitudes and beliefs, environmental knowledge and awareness had a positive effect on environmental behavior so that the effect of environmental attitudes was stronger than that of environmental knowledge.
Hejazi & Ishaqi (2014)	Explaining environmental behavior of villagers based on the tendency of planned behavior in the western provinces of the country	They concluded that the variables of controlling perceived behavior, mental norms and environmental attitude and environmental intention, respectively, had the greatest impact on the performance of environmental behaviors of villagers.
Kumar Sanjay (2013)	Environmental awareness among the rural people in Hamirpour region	The results showed that environmental awareness was low among the people of Homirpour, and there were many problems in providing environmental information to the villagers. In this study, people seemed to have some environmental awareness but did not show environmental behavior.
Schumacher (2015)	Endogenous formation of an environmental culture	For communities with low environmental quality, investing culture may create positive feedback loops, where culture further enhances the quality of environment and in turn enhances environmental culture.
Opoku (2015)	The role of culture in the formation of a sustainable environment	Increasing knowledge of culture is recognized as a powerful and important aspect in expanding the economic, social and environmental dimensions of sustainable development and is an important element in shaping the concept of sustainable development because the relationships and attitudes created gave people a framework for the natural environment.
Hejazi et al. (2017)	Study of factors affecting environmental behavior of environmental NGOs in Tehran Province	The results showed that the four variables of environmental knowledge and awareness, environmental concern, ecological attitude, environmental intentions and mental norms of farmers explain 33.4% of the total variance of environmental behavior among respondents.
Sajasi Gheidari Jalali Faal (2018)	Assessing the rurals' environmental awareness and behavior (Case: Zanglanlu County)	Based on the prioritization of indices and villages in the Vikor model, it was found that in Zanglanloo village, compared to other villages, the villagers were in a better situation in terms of environmental awareness and behavior, and Kalate Tut village in terms of environmental awareness and behavior of villagers placed in the last section of the vicor pattern.
Karimi & Movahedi (2019)	Analysis of environmental behavior of farmers in Qorveh and its affecting factors	The results showed that environmental knowledge and awareness, environmental concern, ecological attitude, environmental intentions and mental norms of farmers had the greatest impact on explaining environmental behavior of farmers, respectively.

Source: Author's own work based on the available resources

Examining the research background, it can be said that most of the research on environmental culture includes concepts such as awareness, sensitivity, concern, environmental beliefs and feelings, environmental perception, the ability to see,

hear and acquire environmental information through the senses. No study has ever been done in this field and due to the water shortage and the obligation of the villagers to observe the water pattern, the necessity of such research is doubled.

Research Methodology

This research is based on a quantitative approach. Accordingly, the present study is applied in terms of purpose. It describes the characteristics and features of the studied villages in human settlements objectively, realistically, and systematically, so it is descriptive-analytical. The geographical area of this research is south of Lake Urmia in Miandoab city, which according to the 2016 census has 73388 households and 260628 population and has 189 inhabited villages. (Statistics Center of Iran, 2016:12). The statistical population of this study includes rural households in the south of Lake Urmia catchment located in the cultivation project "Cooperation in the revitalization of Lake Urmia through the participation of local communities in the establishment of sustainable agriculture." Using multi-stage cluster sampling method 372 households were selected as a sample. To select the statistical sample, due to geographical dispersion and low variance between rural units, multi-stage cluster sampling method was used, so that 5 political sections in accordance with the national divisions, the central section and Merhamatabad and Barough due to location in the plan 40% reduction of water consumption

in order to rehabilitate Lake Urmia were selected as the first clusters and in the second stage 11 villages were selected as the second clusters. In the third stage based on population density and number of households in each village, 30 villages, with Using a simple probabilistic sampling method, by placing the villages located in the grouping of households, give a code in a bead and put each of them in a bag related to their group, then according to the share of each of the rural villages from the whole statistical population, the studied villages were selected according to the family group in which the villages were located. In the final stage, statistical samples were selected from the residents of selected villages using a simple probabilistic sampling method.

The study area is located between the geographical coordinates '44, °36 to '18, °37 north latitude and '36, °45 to 454, °46 east longitude, which is an intermediate area between the three provinces of East Azerbaijan, West Azerbaijan and Kurdistan. This ideal location in this area has been significantly affected by the positive consequences of this privileged location. This town, Miandoab, is a vast alluvial plain. This town is in the range of 1000 to more than 2000 meters above sea level (Figure 1).

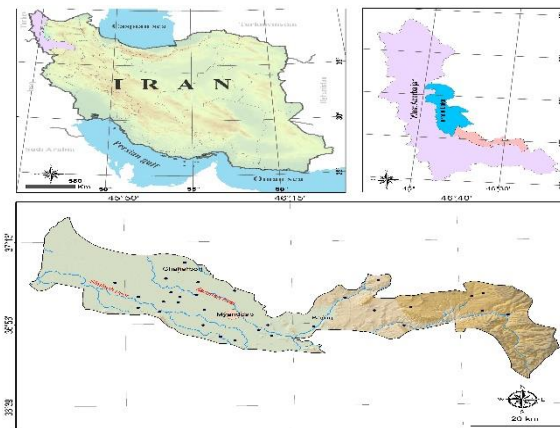


Figure 1. Location of the Study Area in the West Azerbaijan Province, Miandoab City, Iran (Source: Authors' own work)

Research Findings

Descriptive findings of the study showed that out of 374 respondents in the present study, 91.2% were men and 8.8% were women. The youngest respondent was 25 years old, the oldest 67, and the average age of the statistical

population was 39. In terms of literacy status, 1.9% were illiterate, 12.1% had primary school literacy, 24.9% junior and senior high school literacy, 34% diploma literacy, 4.4% associate degree, 19.5% a bachelor's degree, and 5.2% master degree or higher. In terms of

employment, 37.37% were busy in agriculture and horticulture, 19.35% in livestock, 2.69% in industry, 6.99% in services, 7.53% in labor occupations (plastering, construction, Tiling, agriculture, etc.), 4.84% government employees, 12.63% self-employed, and 8.60% employed in other occupations.

Considering that the main purpose of the research which is to investigate the relationship between environmental culture and water consumption pattern of villagers, in this section the type of irrigation of agricultural lands by villagers has been examined and the results show that 5.8% of respondents irrigate their lands through sprinkling and drip irrigation (72.9%), 72.9% irrigate their lands with flood irrigation method and about 21.4% used irrigation method for their lands, gardens, etc. It should be noted that the source of water consumption in the agricultural sector is also provided in such a way that the source of water consumption for 40.1% of the respondents is deep, semi-deep, shallow wells and current springs (for the Baroque sector). The source of the water consumption in agriculture is 45.4% from the Zarrinehrood, Siminehrood, Qoruchai, Ajrlichai, Leylanchai, Mordechai Malekan, etc. rivers and also 14.5% from Abiai canal and drainage, especially in Merhamatabad and central parts of the study area.

Investigating the status of environmental culture indices

Environmental culture indices in the study area were examined using a one-sample t-test. The

results showed that the average indices of environmental attitude and belief with a statistic of 26.95 and environmental behaviors with a statistic 21.93 which are considered higher than the desirability and size of the test (number 3). And the indices of environmental knowledge and awareness were evaluated with a statistic of -0.447, and the social trust of villagers in government institutions with a statistic of -11.230 which was less than the numerical desirability of the test. This shows that the villagers had relatively less knowledge and awareness about environment and its effects on water consumption and the level of social trust of villagers to government institutions due to the continuation of drought in the last decade, and the drying of Urmia Lake. Decreasing the efficiency of agricultural production, reducing employment in this sector and the emigration of villagers, and the severe administrative bureaucracy of rural work have severely reduced the villagers’ different activities. Also, their difference from the numerical mean, except for the index of environmental knowledge and awareness at the alpha level of 0.01 is significant and shows that it is important that local people in the study area are aware of environmental issues and the drying crisis of Urmia Lake. They have come out with the attitude of preserving the environment to deal with this crisis and try to save on agricultural water consumption by modifying the pattern of water consumption and spontaneous implementation of planting plans (Table 2).

Table 2. Investigation of Environmental Culture Indices

Indices of Environmental Culture	Average	Statistics T	Degree of Freedom	Meaning -fulness	Difference in Averages	95% Confidence Interval	
						Low Limit	Upper Limit
						Environmental Attitudes and Beliefs	3.97
Environmental Cognition and Awareness	2.98	-0.447	371	0.665	-0.015	-0.0822	0.0517
Social Trust	2.55	-11.233	371	0.000	-0.447	-0.526	-0.269
Environmental Concern	3.52	21.93	371	0.000	0.529	0.481	0.576

Source: Research Findings, 2020

Ranking of sample villages on the basis of environmental culture indices

In the following, the sample villages are surveyed and ranked on the basis of

environmental culture indices using Crusc-Wallis ranking test. The results in the field of environmental attitudes and beliefs showed that Khan-kandi villages with an average of 4.65 and Tappeh-chlik village with 4.46 percent are in the high rank of environmental attitudes and beliefs and the problems and crisis of Urmia Lake. Zanjir-abad villages with an average of 3.6 and Ismail-kandi villages with an average of 3.62 and Otadraq with an average of 3.45 are in the lower category in terms of environmental attitudes and beliefs. But the situation of sample villages is also different in terms of environmental knowledge and awareness. If the villages of Tappeh-rash, Delik Dash, Jafar-abad, Soghanchi and Haidar-baghi have the highest average ranks of this index and the people of these villages are in a very high situation in terms of environmental knowledge and awareness, and the villages of Ortadraq, Mansour-kandi, Ali-Bolaghi, Malhamlou and Ismail-kandi are at a very low level in terms of environmental knowledge and awareness. Therefore, it can be said that knowledge and awareness among local people in the sample villages of the study area is not at a very high level and this has led many of the first-class agricultural lands of these villages in recent years to become barren lands. And many of the water resources in these villages have been either destroyed or rendered unusable by contaminated human agents, and the rate of water loss in agriculture and domestic drinking

in these villages has been somewhat high, according to local people's reports.

Also, the situation of sample villages in terms of social trust index shows that 16 sample villages had a medium to low level of trust in the institutions responsible for the restoration of Urmia Lake and water consumption pattern, and they believe that the authorities in this regard have been lax and have not paid enough attention to their duties and responsibilities. Furthermore, the villages of Tappeh-rash, Tappeh-chlik, Qaryaghdi, Islam-abad, Qapchaq and Baktash have high trust in government institutions in relation to the rehabilitation and protection of Urmia Lake. Finally, the ranking of the studied villages in terms of environmental behavior index also showed that out of 30 sample villages, 22 villages are in average to low conditions in terms of environmental behaviors, and among them the villages of Arotadarq with an average of 81, and Zanjir-abad with an average number of 97 are in a very low rank in terms of environmental behaviors. The villages of Qiz-Qaleh, Jafar-abad and Tappeh-rash are at a very high level in terms of environmental behavior index compared to other sample villages. Also, Kruskal-Wallis statistic for this index is estimated to be 37.043 which at the alpha level of 0.05 shows a significant spatial difference between the sample villages in terms of environmental behavior index (Figure 2).

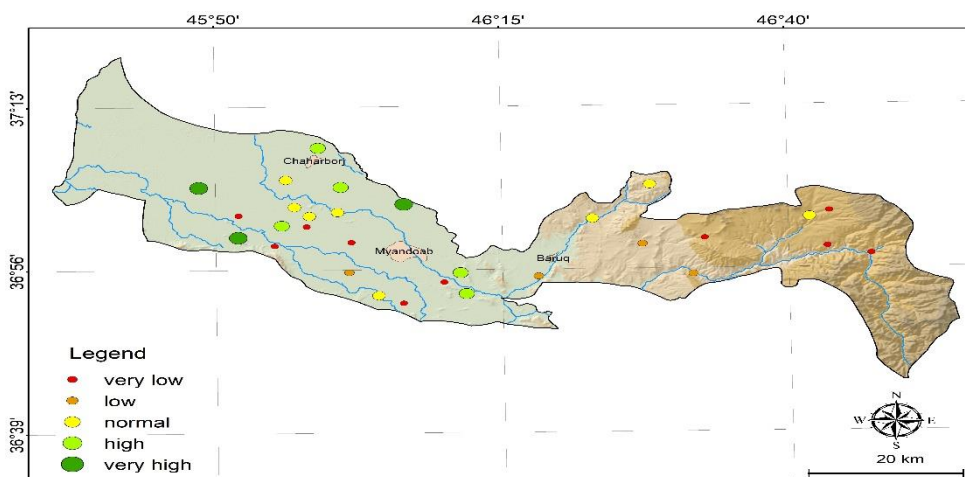


Figure 2. Environmental Attitudes and Beliefs

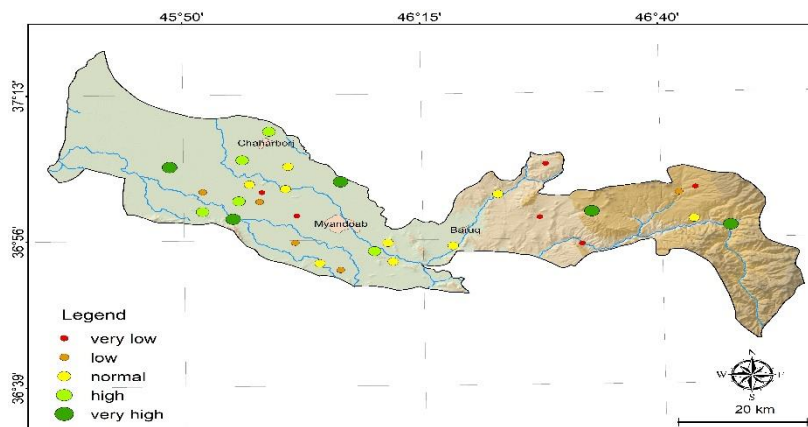


Figure 3. Environmental Awareness

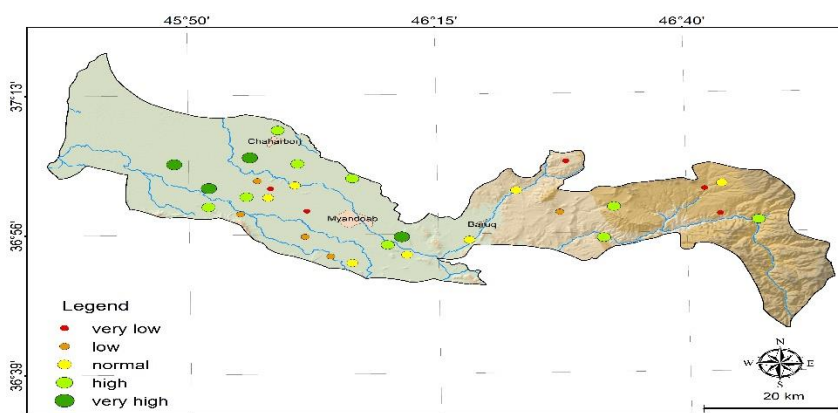


Figure 4. Social Trust

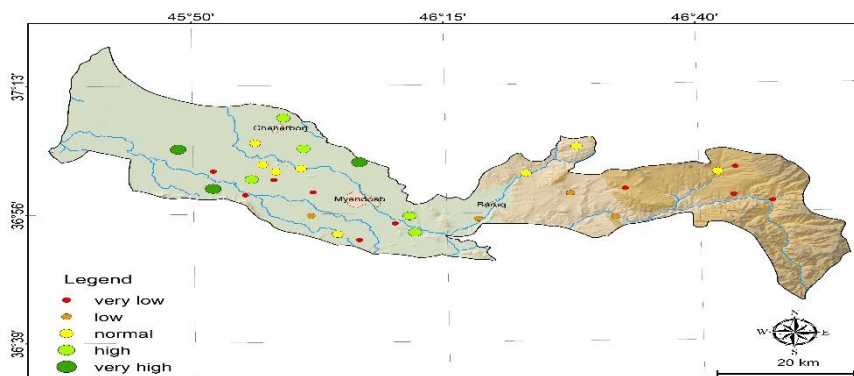


Figure 5. Environmental Concern

After examining the status of environmental culture indices and ranking of sample villages, using Spearman correlation test, the relationship between environmental culture indices (environmental attitude and belief, environmental knowledge and awareness, people's social trust, environmental behaviors) and water consumption patterns in rural areas were studied. For the relationship between the variables to be significant through Spearman correlation coefficient, if the significance level

of the test (sig) is less than 5%, the relationship between the two variables can be proved with 95% confidence. Therefore, the research findings show that there is a correlation coefficient of 0.141 between the respondents' attitude and environmental beliefs index, environmental knowledge and awareness with a correlation coefficient of 0.350, people's social trust with a correlation coefficient of 0.568 and biological behaviors index, environment with a correlation coefficient of

0.242 with a water consumption pattern index level of 0.01% alpha (Table 3). has a positive and significant relationship at the

Table 3. Measuring the Correlation among Environmental Culture Indices and the Water Consumption Pattern of Villagers

Indices	Spearman correlation	Water consumption pattern
Environmental Attitudes and Beliefs	Value of correlation	0.141**
	Significance level	0.001
Environmental Awareness	Value of correlation	0.350**
	Significance level	0.000
Social Trust	Value of correlation	0.568**
	Significance level	0.000
Environmental Concern	Value of correlation	0.242**
	Significance level	0.000

Significance of correlation at the level of 0.01 (Source: Research Findings, 2020)(**)

The effect of environmental culture indices on villager' water consumption pattern

In this section, the effects of environmental culture indices (environmental behavior, environmental attitudes and beliefs, environmental knowledge and awareness and the level of institutional social trust) in villagers' water consumption pattern in the study area using Multivariate regression test is

discussed. Analysis of variance of rural ecological culture in the study area showed that these activities had an effect of 0.592% in changing the pattern of water consumption of villagers and by correcting the coefficient of determination of 0.33% of the effect of environmental cultural indices in determining the type of water consumption pattern of the villagers (Table 4).

Table 4. Analysis of Variance of Components of Environmental Culture and the Water Consumption Pattern

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.124	4	6.531	38.870	.000 ^b
	Residual	48.222	368	.168		
	Total	74.346	372			

a. Dependent Variable: Consumption

b. Predictors: (Constant), Environmental awareness, Environmental Concern, Social trust, Environmental attitudes and beliefs

Source: Research Findings, 2020

Also, the following table shows the significance of all dimensions and components of environmental culture in the analysis of variance test, and it shows the 35% effect of regression effect in determining the pattern of water consumption in these villages. Accordingly, the regression test can be

continued. Also, the significance level is less than 0.05 according to the 95% confidence level. Therefore, the obtained correlation is confirmed, and it can be generalized to the whole statistical population and confirm the significant difference between the indices of environmental culture (Table 5).

Table 5. Analysis of Variance Based on the Linear Relationship between the Environmental Culture and Water Consumption Pattern

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.593a	.351	.342	.40990

a. Predictors: (Constant), Environmental awareness, Environmental Concern, Social trust, Environmental attitudes and beliefs

Source: Research Findings, 2020

Furthermore, the results of multivariate regression test show that environmental Concern of villagers with a beta of 0.020, the belief in environmental attitudes with a beta of 0.010, environmental knowledge and awareness with a beta of 0.117, and the trust of the villagers in the responsible institutions with a beta of 0.510 has had different effects on changing the pattern of water consumption of the villagers. But among the indices of environmental culture, the index of people's trust in responsible institutions in the field of revitalization of Urmia Lake, changing the

pattern of water consumption and environmental protection with the highest beta has a significant impact on determining the pattern of water consumption of villagers. For example, the villagers have very little cooperation with the Department of Environmental Protection, Natural Resources and Water Affairs of the city, and the amount of financial assistance (money) to provide facilities to protect groundwater resources (wells and springs) is very high. Is located at the bottom (Table 6).

Table 6. Linear Regression Function between the Environmental Culture and Water Consumption Pattern

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.643	0.205		7.996	0.000
Trust	0.321	0.042	0.510	7.710	0.000
1 Environmental Attitudes	0.011	0.086	0.010	0.123	0.902
Environmental Concern,	0.016	0.054	0.020	0.303	0.762
Environmental Awareness	0.104	0.069	0.117	1.504	0.134

a. Dependent Variable: Consumption

Source: Research Findings, 2020

According to the above table, it can be said that the pattern of water consumption in the rural settlements studied in the study area is a function of environmental Concern, environmental attitudes and beliefs, and environmental knowledge and awareness and the level of institutional social trust. Therefore, efforts to increase environmental culture by the responsible institutions can pave the way for improving the pattern of water consumption in the villages, the revitalization of Urmia Lake this year is better and ultimately provide the desire to achieve sustainable rural development.

Therefore, in general, it can be said that, given that the basis of rural economics in the limited study is dependent on agriculture, horticulture, animal husbandry, handicrafts, beekeeping and in a few cases related to services and industry, and these jobs whether they like it or not, they are highly dependent on environment in such+ a way that they receive their raw materials from the natural environment, which is the basis for human intervention in environment, and as a result the destruction of the natural environment. Therefore, in recent decades, human activities

are the most effective and important causes of environmental change, which, while creating useful and appropriate changes, has caused a lot of destruction. The main sustainable elements of the ecosystem project are local stakeholders, whose capacity and awareness should be enhanced for integrated and participatory conservation work. The participation of local communities plays a national role in the development of management capacity and the use of its resources in a sustainable manner. Local people can play a decisive role in improving environmental conditions due to the special information they have about environment and ecological features of the region and are aware of their social and economic conditions and the inhabitants of the region.

Conclusion

Today, environmental culture issues have a deep social meaning. In general, environmental issues have cultural roots, and in order to accept the cultural contexts of a society, the issue must be dealt with structurally. Today, environmental

issues have a deep social meaning. Environmental threats are at the heart of the most important questions of the 21st century human conscience. One of the concerns of the first two decades of the 21st century in most developing countries is the interaction and adaptation of "development", "environment" and "sustainability of development" in various fields.

In this regard, in the last decades of the twentieth century, the importance and necessity of methods of involving people in the planning and management of natural resources and environmental management has increased. The trend of the past decades in the industrialized countries reflects the fact that government agents and experts, as well as managers in the fields of environment and natural resources, have taken a new approach. In this new approach, special attention was paid to human beings and their behaviors as one of the main elements and factors that protect environmental interests and strengthen the quality of the environment. In recent decades, in our society, efforts have been made to promote environmental knowledge, information and awareness and to improve environmental behavior and culture in the framework of a new ecological approach, which has changed with the emergence of environmental issues such as the drought crisis of Lake Urmia. The environment has accelerated from traditional to modern, with this approach emphasizing the role of individuals and the participation of members of local communities in the preservation of natural resources and the environment. One of the important aspects of environmental culture is the optimal use of water resources in nature and the optimization of water consumption patterns in various economic sectors, especially agriculture. Environmental culture can reduce environmental issues and problems by increasing environmental awareness and lead to responsible behaviors towards the environment and protection of water resources. The purpose of this study is to investigate the relationship between rural environmental culture and water consumption pattern. Experimental findings indicate that the pattern of water consumption as an environmental behavior is a function of

environmental attitudes and environmental awareness, environmental concerns and the level of social trust of Lake Urmia residents. These variables are about 59% correlated with the water consumption pattern. The weakest relationship is related to environmental attitudes with a correlation coefficient of 0.141 and the strongest relationship is related to social trust with a correlation rate of 0.568. The variables of environmental concern with a correlation rate of 0.242 and environmental knowledge and awareness with a correlation coefficient of 0.350 have an average, positive and significant relationship with the pattern of water consumption. The variables of environmental awareness, environmental attitude, and environmental concern in combination with social trust explain about 35% of the variance of the water consumption pattern of the villagers of Urmia Lake. In terms of effectiveness, among the variables of environmental culture, people's trust in responsible institutions with a beta of 50% has the greatest impact. Therefore, based on the results of the research, it can be said that in comparing the various dimensions of environmental culture, the most effective and important component for reforming water consumption pattern is reforming water governance and trying to build and restore villagers' social trust in environmental officials and local water rulers. The results of this research confirm the results of the research of Salehi and Imam Gholi (2012) 'Schumacher (2015)' Kumar Sanjay (2013) and Mokhtari Malekabadi et al. 2014; Hejazi and Ishaqi (2014), Hejazi et al. 2017 and Karimi 2015. Finally, with regard to the research results, the following suggestions are presented: 1) It is suggested to focus on community-based management of water consumption among villagers to consider the history of traditional institutions in rural communities such as Dehbashi or Mirab took a positive step in managing water resources and improving the pattern of water consumption without the direct interventions of government organizations, taking into account the social structure and cultural context of each region; 2) Emphasis on the optimal use of modern irrigation methods in order to make optimal use of water and fertile

lands that have an impact on the livelihood of farmers and villagers; 3) Cultural and social bedrock by experts and promoters of the Natural Resources and Agriculture Organization to accept new watershed management plans in mountainous areas with rainfed planting; 4) Paying attention to the living conditions and employment of rural settlements in Miandoab city during the

implementation of cultivation or non-planting policies, along with informing the villagers that their short-term and long-term interests are in the implementation of the above policies.

Notes

This project was implemented with the approval and financial support of Urmia Lake Studies Research Institute.

REFERENCES

- Arcury, T. A. (1990). "Environmental Attitude and Environmental Knowledge". *Society for Applied Anthropology*, 49(4), 300- 304.
- Asadi, M & Mehrabi, M. (2017). "Investigating the underlying and social factors affecting environmental behaviors of Bandar Abbas citizens". *Hormozgan Cultural Research Journal*, No. 15, 134-118. [In Persian]
- Asghari Zamani, A. (2013). "Assessment of changes in the surface of Urmia Lake as a deep environmental challenge facing the northwestern region of Iran". *Journal of Geographical Space*, Year 13, No. 41, 77-91. [In Persian]
- Atkinson, R. L. & Atkinson, R.C& Smith, E. E. & Bem, D. J. & Nolen- Hoeksema, S. (2009). "Hilgard Psychology, translated by Mohammad Taghi Brahani & Behrouz Birshak& Mehrdad Bey Reza Zamani & Saeed Shamlou & Mehrnaz Shahrarai". 11th edition, *Tehran, Roshd Publications*.
- Delju. A. H. & Ceylan. A & Piguet. E & Rebetez. M (2012). "Observed climate variability and change in Urmia Lake Basin, Iran". *Theoretical and Applied Climatology*, Vol. 1.
- Dunlap, R. E. & Van Liere, K. D. (1978). "The New Environmental Paradigm: A proposed Measuring Instrument and Preliminary Results". *Journal of Environmental Education*, 9:10-19.
- Environmental Protection Organization (2010). "Comprehensive Management Program of Urmia Lake". [In Persian]
- FAO. (2011). "The state of the world's land and water resources for food and agriculture (SOLAW) Managing systems at risk, Food and Agriculture Organization of the United Nations, and London: Earthscan, Rome".
- Farahmand, M. & Shokoohifar, K. & Sayar Khalaj, H. (2013). "Study of social factors affecting the studied environmental behaviors: Citizens of Yazd". *Journal of Urban Sociological Studies (Urban Studies)*, 4(10), 109-141. [In Persian]
- Farajzadeh, J. & Fakheri Fard, A. & Lotfi, S. (2014). "Modeling of monthly rainfall and runoff of Urmia lake basin using feed-forward neural network and time series analysis model". *Water Resources and Industry* 7-8 (2014) 38-48. [In Persian]
- Ghobadi Aliabadi, S. & Chizari, M. & Siddiqi, H. (2015). "Analysis of Behavior and Environmental Attitudes of Villagers in the Face of Drought Study: Kermanshah County", *Regional Planning Quarterly* 6(21), 154-143. [In Persian]
- Global Environmental Alert Service (GEAS), UNEP (2012). "The drying of Iran's Urmia Lake and its environmental consequences".
- Hafeznia, M. R. (2010). "Introduction to Research Methodology in Humanities". 17th Edition, *Tehran: Samat Publications*. [In Persian]
- Hajizadeh Meymandi, M. & Sayarkhalaj, H. & Shokoohifar, K. (2014). "A Study of Cultural Factors Related to Environmental Behaviors: Yazd". *Bi-Quarterly Journal of Economic Sociology and Development*. 3(1), 83-107. [In Persian]
- Hopping, K, Yangzong, C, Klein, Julia. A. (2016). "Local knowledge production, transmission, and the importance of village leaders in a network of Tibetan pastoralists coping with environmental change". *Ecology and Society*. 21(1), 25, 1-19.
- Irannejad, R. (2015). "The effects of drying of Urmia Lake on sustainable rural development in eastern and western settlements". *Master Thesis in Department of Geography, Faculty of Economics*,

- Management and Social Sciences, Shiraz University*. [In Persian]
- Kairser, F.G. & Wolfing, S & Fuhrer, U. (1999). "Environmental attitude and ecological behavior". *Journal of Environmental Psychology*, 19, 1-19.
- Karimi, K. & Movahedi, R. (2019). "Analysis of environmental behavior of farmers and factors affecting it in Qorveh city", *Journal of Environmental Education and Sustainable Development*, 8, (2), 137 - 152. [In Persian]
- Karimzadeh, S. (2010). "A Study of Social Factors Affecting Environmental Behaviors (Energy Consumption)". *Master Thesis in Sociology, Payame Noor University of Tehran*. [In Persian]
- Karmi Darabkhani, R. & Hijazi, S.Y. & Hosseini, S. M. & Rezaei A. (2017). "Study of factors affecting environmental behavior of members of environmental NGOs in Tehran Province". *Quarterly Journal of Environmental Studies*, 43(1), 17-30. [In Persian]
- Khajeh Shahkoki, A. & Najafi Kani, A. & Vasal, Z. (2014) (Investigation of factors affecting the environmental awareness of villagers) (Case study: Jaghreh village in Binaloud city). *Rural research and planning*. 4(1), 85-95. [In Persian]
- Khoshfar, G. & Salehi, S. & Imam Qoli, L. (2010). "Study of people's attitudes towards environment". *Conference on Environmental Engineering*, University of Tehran, November, 2010. [In Persian]
- Kumar, S. (2013). "Environmental Awareness among Rural Folks of Hamirpur District, H.P.". *The International Journal of Engineering and Science (IJES)* 2(1), 81-84.
- Mahmoudi, H. & Veisi, H. (2007). "Environmental Promotion and Education An Approach in Principled Environmental Protection". *Quarterly Journal of Environmental Sciences*, 1(4), 57-64. [In Persian]
- Manzanal, R. F. & Barreiro L.R. & Carrasquer, J. (2007). "Evaluation of Environmental Attitudes: Analysis and Results of a Scale Applied to University Student". *Science Education*. 91(6), 988-1009.
- Mohammadi Yeghani, B. & Velaei, M. & Cheraghi, M. (2013). "The Effects of Water level Decline on Agriculture of Rural areas around Urumia Lake. Case Study: Northern Marhamatabad County, Miyandoab Township", *Journal of Geography and Environmental Hazards*. 2(1), 55-72. [In Persian].
- Mokhtari Malekabad, R. & Abdollahi, A. S. & Sadeghi, H. R. (2014). "Analysis and Recognition of Urban Environmental Behaviors (Case: Isfahan, 2012)". *Journal of Urban Research and Planning*, 5(18), 1-20. [In Persian]
- Mostafa, M. (2009). "Shades of green: A psychographic segmentation of the green consumer in Kuwait using self-organizing maps". *Journal of Expert Systems with Applications*. 36, pp 11030-11038. [In Persian]
- Nawah, A. & Froutan, S. (2011). "Investigating the Relationship between Rational Action and Environmental Behaviors: Andimeshk Urban Community". *Environmental Science and Engineering Quarterly*, No 51, 68-78. [In Persian]
- Office of Water and Environmental Studies (2012). "The effects of the ecological climate of Urmia Lake".
- Opoku, A. (2015). "The Role of Culture in a Sustainable Built Environment". *Measuring Operations Performance*, 5(3), 37-52.
- Qian, Yi, (2016). "Sustainable Management of Water Resources". *Engineering* 2, 23-25.
- Rezadost, K. & Forootan-Kia, S. & Firooz-Abadi, A. (2011). "Sociological study of environmental culture in Ahvaz, *Journal of Social Sciences, Shushtar Branch of Azad University*". 5(15), 165-188. [In Persian]
- Richards, Greg & Munster, William (2010). "Cultural Tourism Research Method", Wallingford: UK, cab international".
- Royan Frangar Sistem Consulting Engineers (2011). "Studies on Organizing Economic and Social Development of Rural Spaces in Merhamatabad District, Study Area". *Agricultural Jihad of West Azerbaijan Province*.

- Sajasi Gheidari, H. & Jalali Faal, A. (2018). "Assessing environmental awareness and behavior of villagers (Case study: Zanglanloo village, *Quarterly Journal of Spatial Planning (Geography)*". 8(1), 50-29. [In Persian]
- Salehi, S. & Ghaemi A, Z. (2013). "Investigating the relationship between environmental education and environmental protection behaviors (case study, high school girls in Babol)". *Quarterly Journal of Environmental Education and Sustainable Development*, 1(3), 67-79. [In Persian]
- Salehi, S. & Imam Qoli, L. (2012). "Investigating the Impact of Social Capital on Environmental Behaviors (Kurdistan Province)". *Iranian Journal of Sociology*, 13(4), 90-115. [In Persian]
- Salehi, S. & Pazouki Nejad, Z. (2014). "Analysis of social factors affecting students' attitudes and environmental performance". *Applied Sociology (Journal of Humanities Research, University of Isfahan)*, Vol 25, 3 (55), 71 - 88. [In Persian]
- Schumacher, I. (2015). "The endogenous formation of an environmental culture". *European Economic Review*, 76, 200–221.
- Sharifi, Z. & Nouripour, M. (2015). "Analyzing the Relationship between Social Capital and Environmental Attitudes of Rural People: A Case Study of the Central Part of Dena County". *Journal of Social Development Studies of Iran*, 8(4), 7-19. [In Persian]
- Society of Consulting Engineers (2011). "Evaluating the Sustainability of the Development Process and Its Consequences in Urmia Lake". *Quarterly Journal of Consulting Engineer*, No. 53, pp. 30-52. [In Persian]
- Statistical Center of Iran, (2016), <https://www.amar.org.ir>
- Urmia Lake Rehabilitation Headquarters, 2015) <https://www.ulrp.ir>
- WWAP (United Nations World Assessment Programme), (2015). "The United Nations World Water Development Report 2015: Water for a Sustainable World, UNESCO, Paris".
- Zahed Zahedani, S. & Hakiminia, B. & Tabi, M. & Goli, A. (2018). "Futurology of Environmental Culture by Scenario Exploration and Validation Method (case study: Isfahan city), *Quarterly Journal of Social Studies and Research in Iran*". 7(3), 468-441. [In Persian]

COPYRIGHTS



© 2022 by the authors. Licensee PNU, Tehran, Iran. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution 4.0 International (CC BY4.0) (<http://creativecommons.org/licenses/by/4.0>)