

PUBLIC AWARENESS AND PERCEPTIONS OF CLIMATE CHANGE: DIFFERENCES IN CONCERN ABOUT CLIMATE CHANGE IN THE WEST MEDITERRANEAN REGION OF TURKEY

KORKMAZ, M.

*Department of Forest Economics, Faculty of Forestry, Suleyman Demirel University
32260 Isparta, Turkey
(e-mail: korkmazmehmet32@gmail.com; phone: +90-246-211-3951, fax: +90-246-211-3948)*

(Received 7th Apr 2018; accepted 13th Jun 2018)

Abstract. This study was aimed at determining perception and awareness levels about climate change in three city centers located in the West Mediterranean Region of Turkey and identified differences in public perceptions and knowledge about regional climate change. The study utilized a questionnaire method to obtain data. The results found that approximately half of the participants had inadequate climate change knowledge. In particular, knowledge levels regarding climate change adaptation were comparatively low. Women were more concerned about climate change compared to men. Additionally, primary and high school graduates and married individuals were also more concerned. Age and income were not determining variables. There were no significant differences in terms of gender, age, income and educational status apart from marital status as to whether or not adaptation to climate change will be achieved. There are varying levels of awareness among the public regarding climate change, and thus it is especially important to organize outreach programs supported by media to increase climate change adaptation knowledge levels. Institutions need to improve their ability to promote public awareness and knowledge about climate change in order to reach a larger proportion of the public.

Keywords: *global warming, public opinion, adaptation, Turkey*

Introduction

Climate change is a key agenda item for a majority of countries due to the increased visibility of general ecological problems, developments in science and technology, and related studies by ecological economists since the 1970s. It is forecasted that important consequences, such as melting of icebergs, rising sea levels, and severe weather events may directly or indirectly impact human life and health, socioeconomic sectors and ecological systems (IPCC, 2013). It is now generally and widely agreed that global warming is accelerating in present-day conditions due to human-induced effects and that climate change is reaching a level that affects the future of society (Cook, 2013; MacCracken, 2001; IPCC, 2001). The fifth assessment report of the *Intergovernmental Panel on Climate Change* confirms changes in the frequency and intensity of some extreme events such as weather and ocean temperatures, precipitation changes, rising sea levels and drought, floods and storms (IPCC, 2014).

Policymakers face the challenge of combating climate change and determining strategies for optimal adaptation and rational policies. Strategies that focus on maintaining the healthy and effective functioning of climate-change-resistant ecosystems and managing and conserving water, land and biological resources are fundamentally important to coping with the impacts of climate change. While efforts to hinder and prevent this process continue at an international level, work aimed at implementing adaptation in societies around the world are also underway (IPCC, 1990,

1995, 2007; WB, 2008; EC, 2009). National climate legislation and strategies have been formed in most United Nations member countries (Dubash et al., 2013).

In terms of general public awareness about climate change, visible changes such as an increase in temperatures and a decrease in precipitation are effective in impacting public perceptions (Rankoana, 2016). The most striking aspect of climate change perception is personal experience with negative natural phenomena, which is a strong determinant of individual risk perception (Fronzel et al., 2017). According to many academic researchers, climate change policies have been insufficient to sensitize people in society to the meaning and importance of the problem and in particular for mobilizing people to take action (Westerhoff and Robinson, 2013; Randall, 2009; Lejano et al., 2013). The risk perception of the public regarding the possible consequences of climate change is of great importance. Apart from shaping climate policies, risk perception also plays a central role in adaptation and reduction initiatives (Lujala et al., 2015). Therefore, there is a need for more data determinants that influence people's perceptions of climate change.

Turkey is one of the countries that is most affected by climate change due to global warming. The complex climate structure in Turkey, which is surrounded by the sea on three sides, a fragmented topography, and orographic features means that different areas in Turkey will be affected to varying degrees (Ozturk, 2002). The *Turkey Climate Change Adaptation Strategy and Course of Action* policy aims to reduce the impact of climate change and adapt to global warming. Importantly, public awareness levels and institutional capacity must be increased in Turkey (MEU, 2010). Very few empirical studies have considered how the public in Turkey interprets and respond to climate change. This study investigates perceptions, concerns, and adaptation to climate change by residents of three city centers in the West Mediterranean Region of Turkey.

Materials and methods

Study area

Many of the problems caused by climate change have a tremendous effect on cities. The economic and social aspects of these problems must be tackled alongside the environmental implications (Albayrak and Atasayan, 2017). National strategies must be reorganized to a local level to improve the adaptation ability of cities against increasing risks (Warmstler et al., 2013). Over the last thirty years, the western and southern regions of Turkey have suffered from droughts due to Mediterranean precipitation patterns (Turkes, 2012). As such, this study focused on city centers (Antalya, Isparta, and Burdur) of the Western Mediterranean Region of Turkey (*Fig. 1*). The comparison of precipitation and average temperature of the study area between 1970 and 2017 was shown in *Figure 2*.

Data collection and analysis

Data were collected using a questionnaire approach. The multiple-choice questions in the questionnaire used a Likert scale. The questionnaire consists of two parts. The first part gathers profile information regarding the participants and the second part consists of questions designed to determine their level of perception and awareness about climate change. The questionnaire was conducted in face to face in the aforementioned three city centers. In order to determine the views of a group of participants with a 5%

sampling error, the sample size was calculated by the formula (Eq. 1) below (Bas, 2010):

$$n = \frac{t^2 N p q}{(N-1) d^2 + t^2 p q} \quad (\text{Eq.1})$$

where:

- n sampling size,
- t t value (1.96 for 95% confidence level),
- N population size,
- p,q probability of availability of the mass to be measured in the main mass,
- D sampling error accepted (5%).

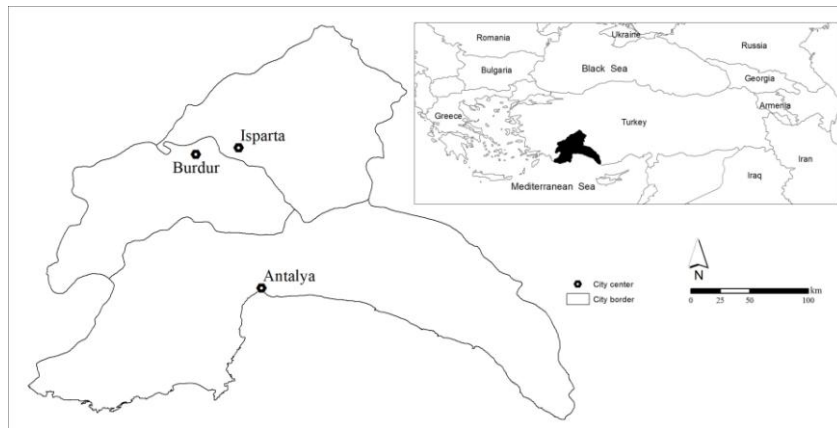


Figure 1. Study area

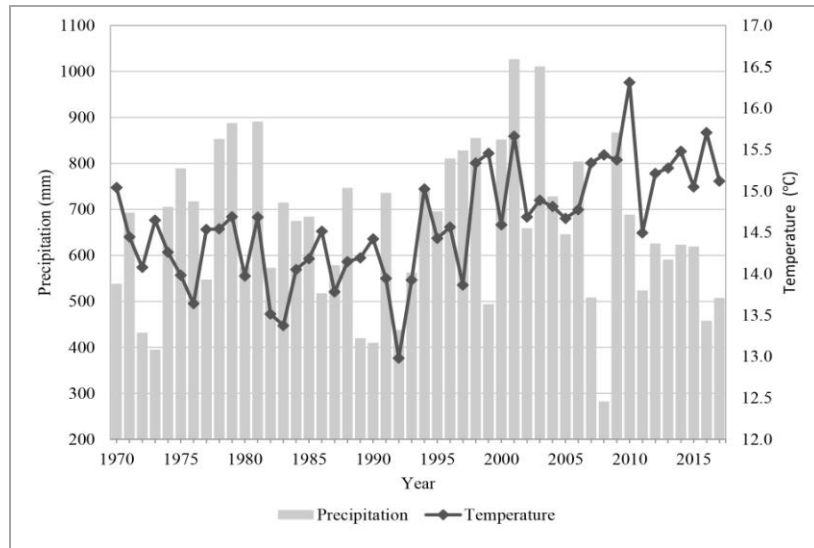


Figure 2. Temperature and precipitation change between years 1970 and 2017 in study area

Based on the above formula, the sample size needs to include 383 questionnaires. This study obtained 406 questionnaire forms in three cities (175 in Antalya, 118 in Isparta and 113 in Burdur) that were filled out and analyzed to increase the reliability of

the study. In the questionnaire applications, a systematic random sampling procedure was used. Quotas were set on age, gender, education and city population. In this context, participants were selected to represent the whole population in the study area. The internal consistency (Cronbach's alpha) coefficient of the scaled statements was determined to be 0.910. Since the internal consistency coefficient was greater than 0.8, the scale was highly reliable as a statistic.

The data obtained from the questionnaires were evaluated using statistical methods. The answers given in the first stage were analyzed using the SPSS package program to convert to percentage ratios. The Shapiro-Wilk test, the most effective method of testing the hypothesis for normality, was used to determine whether or not the questionnaire data was parametric. It was determined that 95% of the data did not have normal distribution ($p < 0.05$), meaning that it is not parametric. As such, non-parametric tests were used in the data analysis. In order to check for discrepancies among socio-demographic features (age, gender, education, etc.) while determining the views of individuals participating in the questionnaires on climate change concerns and their thoughts on climate change adaptation, several statistical methods were employed, including: for bivariate features the Mann-Whitney U test (Macfarland and Yates, 2016) and for more than two variables the Kruskal-Wallis H test (Corder and Foreman, 2014).

Results and discussion

Participant profile characteristics

Participant profile characteristics are provided in *Table 1*. A majority of the participants were young and middle-aged. Approximately one third were women. The majority were university graduates. About 60% of participants were single. The proportion with moderate and low incomes was 93.6%.

Table 1. Profile characteristic of participants

Characteristics	Number	%
Age		
18-25	158	38.9
26-45	142	35.0
46-65	98	24.1
>65	8	2.0
Gender		
Female	149	36.7
Male	257	63.3
Education		
Primary, secondary or high school	161	39.7
Graduate	245	60.3
Marital status		
Married	150	36.9
Single	256	63.1
Monthly income		
≤ 1400* TRY**	115	28.3
1401-5000 TRY	265	65.3
> 5000 TRY	26	6.4

*Minimum wage, ** Approx. 1 TRY = 0.28 US\$

Opinions regarding climate impacts and perceptions about climate change

Since climate change is an important threat, it is helpful to determine the level of knowledge and awareness in the community, in particular regarding causes, effects, how to tackle the problem, and adaptation. *Figure 3* shows that while all participants have some knowledge about climate change, about roughly half do not have enough information. The levels of knowledge in the areas of climate change and adaptation are relatively low. Ochieng and Koske (2013), Semenza (2008), Michail et al. (2007) and Papadimitriou (2004) concluded that knowledge on climate change is inadequate, which is a finding similar to our study.

Figure 3 shows that all of the people living in the cities inside the research area are aware of climate change. Although some are at low knowledge levels, almost everybody has some information on causes, impacts, how to tackle climate change, and how to adapt to it. The most important reason for this is that climate change is largely associated with changes in the air. When asked, “What is the first concept you think of when you hear the words climate change?” the most popular answers were shifting seasons (41.1%) and global warming (20.4%). Natural disasters (17.5%) and weather deterioration (7.6%) follow closely (*Fig. 4*). In studies aimed at determining perception about global warming conducted by Steentjes et al. (2017) in France, Germany, Norway and England, global warming and seasonal change were also the first concepts to come to mind. In addition, emissions, environmental pollution, and air pollution, which are the driving forces of climate change, lag behind. Such awareness supports the idea that emotional and empirical learning is more effective than intellectual-based learning to change attitudes towards climate change issues (Lujala et al., 2015).

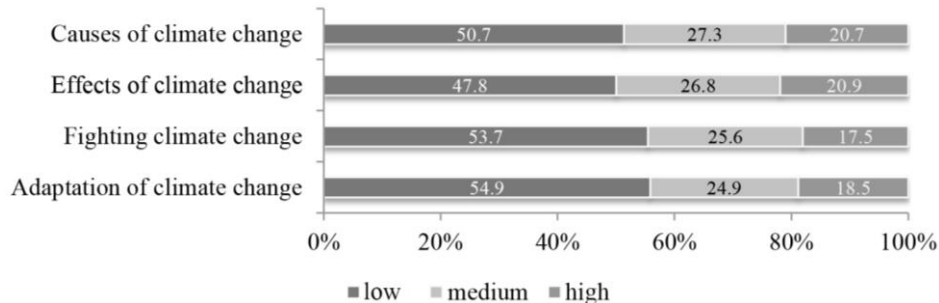


Figure 3. Knowledge level on climate change (n = 406, only values > 5%)

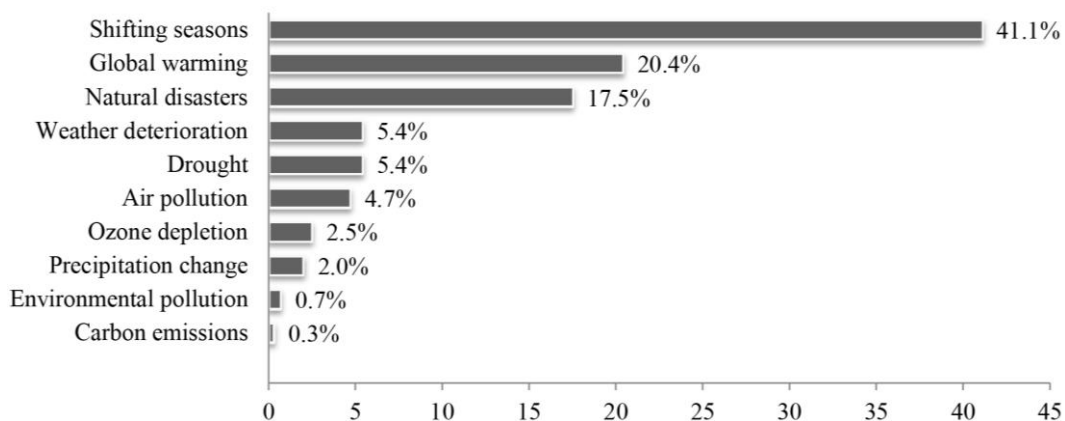


Figure 4. What first comes to mind when you hear the phrase “climate change”?

Findings on the results of climate change can be found in *Figure 5*. The vast majority of respondents indicate that climate change will cause many negative consequences, ranging from melting of glaciers to high temperatures. The level of awareness for melting of glaciers was higher (40.4%) than other impacts. Sea level rise was considered relatively important at a lower level. Unlike other concepts, about 6% of participants indicated that this is not important. The most important effect of climate change shown in *Figure 5* is the risk of extreme temperatures and drought. In our study, 75.8% of respondents in Turkey believed that heat and drought in the Mediterranean basin have increased and believe that this will continue in the future.

Schmidt et al. (2013) did a comparative analysis of 27 different countries and determined that climate change is covered in the media of countries at varying levels and that the attention of the media to carbon-dependent countries, which are committed under the Kyoto Protocol, is particularly high. The findings of this research also support this. In our study, 72% of the respondents said that they were provided information and awareness about climate change through the media. The distribution of effective media tools is internet (29%), TV (27%), and newspapers and magazines (16%). Since climate change is a global phenomenon, such platforms can affect societies around the world. Importantly, the prominence of the media is clearly evident.

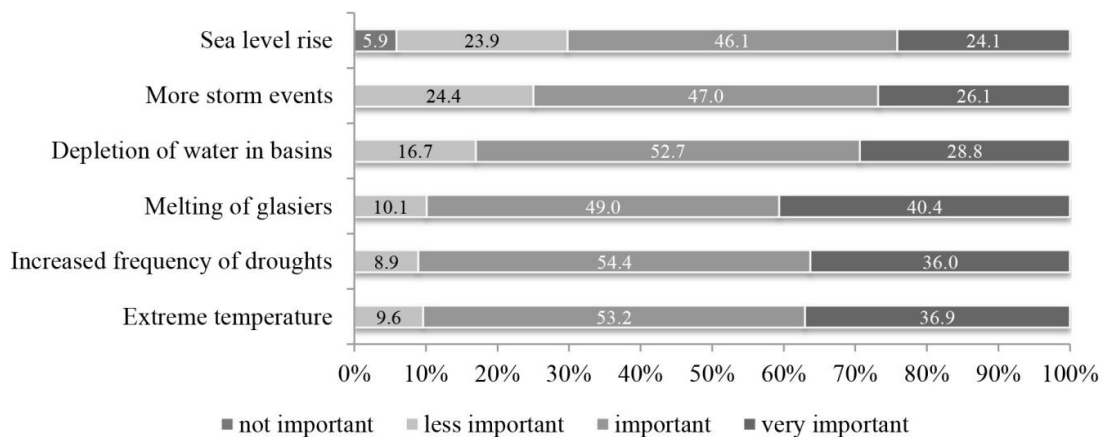


Figure 5. Climate change impacts ($n = 406$, only values > 5%)

Opinions regarding concerns about climate change

Public perceptions of climate change vary internationally. For example, people in France are more worried than those in Germany and Norway, while people in the United Kingdom are less concerned (Steentjes et al., 2017). Public perceptions also fluctuate over time. Social research shows that in the U.S., concern about climate change has fallen considerably since 2008 (Scruggs and Benegal, 2012). However, in many parts of the world in general, concerns over climate change have increased in recent years (Capstick et al., 2015).

Among the people participating in our study, women are generally more worried than men (*Table 2*). Similarly, Shi et al. (2016) also found that women in Germany and the United Kingdom were more worried than men. Recent research suggests that knowledge of climate change has limited impact on shaping climate change concerns (Malka et al., 2009; Kahan et al., 2012; Kellstedt et al., 2008). However, if measured in an area-specific and multidimensional manner, we see that knowledge is indeed an

important driving force for climate change concerns, even when we control for human values. Likewise, different information dimensions play different roles in shaping the concerns of climate change. In some studies, women were found to have more knowledge than men (McCright, 2010). For this reason, the increased levels of anxiety in women compared to men can be explained by the varying levels of knowledge.

Worldwide, educational attainment is the most powerful determinant of climate change awareness. While understanding the anthropogenic cause of climate change is the strongest determinant of climate change risk perceptions, especially in Latin America and Europe, the perception of local temperature change is the strongest determinant in many African and Asian countries. However, public awareness and other important factors related to risk perceptions underscore the need to develop specific climate communication strategies for each country (Lee et al., 2015).

Ultimately, basic education is vital for public climate literacy, local dimensions of climate change, public participation, and support for climate action. In this study, statistically significant differences were determined between university graduates and others by educational level (Table 2). This difference can be explained by the high level of awareness among university students. Similarly, Yayar et al. (2014) found that level of education has a positive effect on awareness. Additionally, married people are more worried than single people (Table 2). The main reason for this is the concern that the children of married participants will continue to live in this world. Shi et al. (2016) found that elderly adults in the UK are less concerned about climate change compared to young people. On the contrary, no difference was found according to age groups in our study ($p > 0.05$). Similarly, income was not a variable with significant differences (Table 2).

Table 2. Statistical relations on concern about climate change according to socio-economic characteristics

Characteristic		n	Test results		
Gender	Female	149	MW-U* = 17837.0	Z = -1.969	p = 0.049***
	Male	257			
Age	18-25	158	X ^{2**} = 2.777	df = 3	p = 0.427
	26-45	142			
	46-65	98			
	> 65	8			
Marital status	Married	150	MW-U = 17864.0	Z = -2.006	p = 0.045***
	Single	256			
Monthly Income	≤ 1400 TRY	115	X ² = 0.835	df = 2	p = 0.659
	1401-5000 TRY	265			
	> 5000 TRY	26			
Education	Graduate	161	MW-U = 18102.0	Z = -2.401	p = 0.016***
	Primary, secondary or high school	245			

*Mann Whitney U test, **Kruskal Wallis H test, *** $p < .05$

Perceptions of adaptation to climate change

The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (IPCC, 2007) indicated that harmonization studies are of great importance in managing climate change impacts and are the only means of counteracting climate change.

Importantly, this is the sole reason precautions were taken for climate change adaptation in the past. This emphasizes the importance of adopting a strategic approach at regional and national levels as well as at the global scale. It is vital to ensure harmony between the various sectors and levels of management to ensure that measures are taken in a timely and more effective manner to address climate change adaptation.

In recent years, creating awareness in the public about climate change in Turkey has been about lowering emission levels for compliance with the effects of climate change while adaptation to the results of climate change has been very low. The situation is similar in NGOs, which are mainly active in the management of ecosystem services (MEO, 2010).

In this study, overall, only a few demographic variables were significantly related to adaptation to climate change. Accordingly, married and unmarried people have different opinions about adaptation to climate change ($p < 0.05$). Married participants stated that more adaptation can be achieved. This can be explained by the positive perceptions that married people have developed for their concern about climate change. There were no statistically significant differences ($p > 0.05$) in terms of gender, age, income and educational status (Table 3). Although nearly half of the participants have low knowledge levels, there are positive opinions that climate change can be harmonized to a large extent. In other words, in this study there is wide participation (57.4%) in the idea that climate change is an important subject of adaptation. Meanwhile, however, the subject is characterized by different perceptions, interpretations, and evaluations contradicting each other in many respects. For individuals with high climate change awareness, adaptation capacity was also higher (Marshall et al., 2013).

Table 3. Statistical relations of ideas on adaptation to climate change according to socio-economic characteristics

Characteristic		n	Test results		
Gender	Female	149	MW-U* = 18434.0	Z = -0.730	p = 0.465
	Male	257			
Age	18-25	158	X ^{2**} = 3.254	df = 3	p = 0.354
	26-45	142			
	46-65	98			
	> 65	8			
Marital status	Married	150	MW-U = 16707.0	Z = -2.271	p = 0.023***
	Single	256			
Monthly Income	≤ 1400 TRY	115	X ² = 1.831	df = 2	p = 0.400
	1401-5000 TRY	265			
	> 5000 TRY	26			
Education	Graduate	161	MW-U = 19236.0	Z = -0.491	p = 0.623
	Primary, secondary or high school	245			

*Mann Whitney U test, **Kruskal Wallis H test, *** p < .05

Such an understanding about the different levels of awareness, knowledge and support among various demographics is important in terms of supporting policies and strategies for harmonization. Those who indicate that they can be adapted have the perception that “we will have to change our lifestyle”, “new technologies will be produced” and “we will learn to live with a warmer climate”.

One of the most important ways to adapt to the effects of climate change is to protect natural ecosystems. One of the most vulnerable sources of climate change is forest ecosystems (Detten and Faber, 2013). Withana et al. (2007) found that there is a perception that forest fires resulting from climate change will increase. In our work, there was a high perception, with 85% holding the view that forest fires will increase in the Mediterranean basin. According to public perceptions, the most important causes of climate change are air pollution (26%), deforestation (23%) and ozone depletion (15%). In this context, forests are considered as one of the most important approaches to adaptation, as forests are important resources for climate change. The survey indicated that 91.4% of respondents underline that more afforestation is needed. However, 92.6% of the respondents indicated that they would invest in alternative energy sources (wind, solar, geothermal etc.).

Conclusions

In this study, the most important determinants of concern for climate change were gender, educational status, and marital status. Age and income levels were not determinants of concern. These results are a resource for developing climate change policies and actions to increase perception and awareness regarding climate change. Governments should promote changes in perception by increasing the level of consciousness and awareness of nature, in particular about the risks of climate change and how to better manage risk factors. The greater the awareness in the community regarding the effects of climate change, the easier it will be to eliminate risks and improve adaptation.

We found that about half of the participants have little knowledge about climate change. In particular, the levels of knowledge on adaptation are relatively lower. The success of policies and actions by governments and environmental agencies to mitigate and adapt to climate change depends on support by the public. This support is closely related to public perception and awareness. In Turkey, although climate change awareness raising activities from civil society organizations have increased, the effectiveness of the NGOs working in this area is inadequate. A significant number of NGOs have focused on mitigation activities and active management of ecosystem services, but they are few in number. Importantly, many NGOs need to be aware of climate change mitigation as “mitigation” and that awareness raising is needed regarding “adaptation”. While there is considerable public awareness about climate change, it is especially important to promote programs supported by media to raise the level of knowledge regarding climate change adaptation. Increasing the capacity of institutions to address this important issue is keys. In summary, it is necessary to increase public awareness in Turkey regarding climate change.

REFERENCES

- [1] Albayrak, A. N., Atasayan, Ö. (2017): The analysis of climate change awareness at local level/Gebze case. – TUBAV Bilim 10(4): 1-10.
- [2] Bas, T. (2010): Survey (in Turkish). – Seckin Publishing, Ankara, Turkey.
- [3] Capstick, S., Whitmarsh, L., Poortinga, W., Pidgeon, N., Upham, P. (2015): International trends in public perceptions of climate change over the past quarter century. – WIREs Clim Change 6: 35-61.

- [4] Cook, J., Nuccitelli, D., Gren, S. A., Richardson, M., Winkler, B., Painting, R., Way, R., Jacobs, P., Skuce, A. (2013): Quantifying the consensus on anthropogenic global warming in the scientific literature. – *Environmental Research Letters* 8: 1-7.
- [5] Corder, G. W., Foreman, D. I. (2014): *Nonparametric Statistics: A Step-By-Step Approach*. – John Wiley & Sons, Ltd., New Jersey.
- [6] Detten, v. D., Faber, F. (2013): Organizational decision-making by German state-owned forest companies concerning climate change adaptation measures. – *Forest Policy and Economics* 35: 57-65.
- [7] Dubash, N. K., Hagemann, M., Höhne, N., Upadhyaya, P. (2013): Development in national climate change mitigation legislation and strategy. – *Climate Policy* 13(6): 649-664.
- [8] EC (2009): European Commission, White Paper Adapting to Climate Change: Towards a European Framework for Action. – <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0147:FIN:EN:PDF> (accessed on: 23.01.2017).
- [9] Frondel, M., Simora, M., Sommer, S. (2017): Risk Perception of Climate Change: Empirical Evidence for Germany. – *Ecological Economics* 137(July): 173-183.
- [10] IPCC (1990): First Assessment Report (FAR), UNEP-WMO. – https://www.ipcc.ch/publications_and_data/publications_ipcc_first_assessment_1990_wg1.shtml (accessed on: 25.02.2018).
- [11] IPCC (1995): Second Assessment: Climate Change 1995. A Report of the Intergovernmental Panel on Climate Change. – <https://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf> (accessed on: 25.02.2018).
- [12] IPCC (2001): Climate Change 2001: The Third Assessment Report of the Intergovernmental Panel on Climate Change. – https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WGI_TAR_full_report.pdf (accessed on: 15.01.2018).
- [13] IPCC (2007): Fourth Assessment Report: Climate Change 2007. – http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html (accessed on: 25.01.2018).
- [14] IPCC (2013): Climate Change: The Physical Science Basis, Frequently Asked Questions. – https://www.ipcc.ch/report/ar5/wg1/docs/WG1AR5_FAQbrochure_FINAL.pdf (accessed on: 25.01.2018).
- [15] IPCC (2014): Intergovernmental Panel on Climate Change, Climate Change 2014: Impacts, Adaptation, and Vulnerability. – <http://www.ipcc.ch/report/ar5/wg2/>.
- [16] Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Ouellette, L. L., Braman, D., Mandel, G. (2012): The polarizing impact of science literacy and numeracy on perceived climate change risks. – *Nature Climate Change* 2: 732-735.
- [17] Kellstedt, P. M., Zahran, S., Vedlitz, A. (2008): Personal efficacy, the information environment, and attitudes toward global warming and climate change in the United States. – *Risk Analysis* 28(1): 113-126.
- [18] Lee, T. M., Markowitz, E. M., Howe, P. D., Ko, C.-Y., Leiserowitz, A. A. (2015). Predictors of public climate change awareness and risk perception around the world. – *Nature Climate Change* 5: 1014-1020.
- [19] Lejano, R. P., Tavares-Reager, J., Fikret Berkes, F. (2013): Climate and narrative: environmental knowledge in everyday life. – *Environmental Science & Policy* 31: 61-70.
- [20] Lujala, P., Lein, H., Rød, J. K. (2015): Climate change, natural hazards, and risk perception: the role of proximity and personal experience. – *Local Environment* 20(4): 489-509.
- [21] MacCracken, M. C. (2001): *Global Warming: A Science Overview*. – In: Kursunogamallu, B. N., Mintz, S. L., Perlmutter, A. (eds.) *Global Warming and Energy Policy*. Kluwer Academic/Plenum Publishers, New York.

- [22] Macfarland, T. M., Yates, J. M. (2016): Introduction to Nonparametric Statistics for the Biological Sciences Using R. – Springer International Publishing, Basel, Switzerland.
- [23] Malka, A., Krosnick, J. A., Langer, G. (2009): The association of knowledge with concern about global warming: trusted information sources shape public thinking. – *Risk Analysis* 29(5): 633-647.
- [24] Marshall, N. A., Park, S., Howden, S. M., Dowd, A. B., Jakku, E. S. (2013): Climate change awareness is associated with enhanced adaptive capacity. – *Agricultural Systems* 17(May): 30-34.
- [25] McCright, A. M. (2010): The effects of gender on climate change knowledge and concern in the American public. – *Population and Environment* 32(1): 66-87.
- [26] MEU (2010): Republic of Turkey Climate Change Strategy 2010-2023. Ministry of Environment and Urbanization. – https://webdosya.csb.gov.tr/db/iklim/editordosya/iklim_degisikligi_stratejisi_EN.pdf.
- [27] Michail, S., Atamou, A. G., Stamou, G. P. (2007): Greek primary school teachers' understanding of current environmental issues: An exploration of their environmental knowledge and images of nature. – *Science Education* 91(2): 244-259.
- [28] Ochieng, M. A., Koske, J. (2013): The level of climate change awareness and perception among primary school teachers in Kisumu Municipality, Kenya. – *International Journal of Humanities and Social Science* 3(21): 174-179.
- [29] Ozturk, K. (2002): Global climatic changes and their probable effect upon Turkey. – *Gazi University Journal of Gazi Educational Faculty* 22(1): 47-65.
- [30] Papadimitriou, V. (2004): Prospective primary teachers' understanding of climate change, greenhouse effect, and ozone layer depletion. – *Journal of Science Education and Technology* 13(2): 299-307.
- [31] Randall, R. (2009): Loss and climate change: the cost of parallel narratives. – *Ecopsychology* 1(3): 118-129.
- [32] Rankoana, S. A. (2016): Perceptions of climate change and the potential for adaptation in a rural community in Limpopo Province, South Africa. – *Sustainability* 8: 672. DOI: 10.3390/su8080672.
- [33] Schmidt, A., Ivanova, A., Schafer, M. S. (2013): Media attention for climate change around the world: A comparative analysis of newspaper coverage in 27 countries. – *Global Environmental Change* 23(5): 1233-1248.
- [34] Scruggs, L., Benegal, S. (2012): Declining public concern about climate change: Can we blame the great recession? – *Global Environmental Change* 22(2): 505-515.
- [35] Semenza, J. C., Hall, D. E., Wilson, D. J., Bontempo, B. D., Sailor, D. J., George, L. A. (2008): Public perception of climate change: Voluntary mitigation and barriers to behavior change. – *American Journal of Preventive Medicine* 35(5): 479-487.
- [36] Shi, J., Visschers, V. H. M., Siegrist, M. (2016): Knowledge as a driver of public perceptions about climate change reassessed. – *Nature Climate Change* 6: 759-762.
- [37] Steentjes, K., Pidgeon, N., Poortinga, W., Corner, A., Arnold, A., Böhm, G., Mays, C., Poumadère, M., Ruddat, M., Scheer, D., Sonnberger, M., Tvinnereim, E. (2017): European Perceptions of Climate Change: Topline Findings of a Survey Conducted in Four European Countries in 2016. – Cardiff University, Cardiff.
- [38] Turkes, M. (2012): Observed and projected climate change, drought and desertification in Turkey. – *Ankara University Journal of Environmental Sciences* 4(2): 1-32.
- [39] Warmser, C., Brink, E., Rivera, C. (2013): Planning for climate change in urban areas: from theory to practice. – *Journal of Cleaner Production* 50(July): 68-81.
- [40] WB (2008): World Bank, The Global Monitoring Report 2008, Washington. – http://siteresources.worldbank.org/INTGLOMONREP2008/Resources/4737994-1207342962709/8944_Web_PDF.pdf (accessed on: 25.02.2018).
- [41] Westerhoff, L., Robinson, J. (2013): Practicing Narratives: Exploring the Meaning and Materiality of Climate Change. – *Proceedings Transformation in a Changing Climate International Conference, 19-21 June 2013, Oslo*, pp. 202-211.

- [42] Withana, N. R. P., Auch, E. (2014): Perceptions of climate change risk to forest ecosystems: a case study of Patale community forestry user group, Nepal. – International Journal of Environmental, Chemical, Ecological, Geological and Geophysical Engineering 8(8): 599-606.
- [43] Yayar, R., Kaplan, C., Simsek, U. (2014): Awareness on economic, social, and environmental effects of the global warming: Experimental findings from Turkey. – Business & Economics Research Journal 5(3): 81-95.