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Social Perceptions and Attitudes Towards Climate Change in Poland and in Turkey

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Abstract: Climate change is perceived as a threat to future human well-being and a challenge to sustainable development of local communities and economies world-wide. While some countries and regions are expected to experience slight gains from the climatic changes the other are exposed to major losses. Ever more frequent natural disasters come as warning symptoms of the changes. However, for the sake of effective and efficient adaptation in various world regions answers to the following questions are important: do people notice this changes, do they experience their negative effects, are they satisfied with the climate change mitigation and adaptation actions taken by the governments, are they willing to participate to contribute to these actions. The perceptions and attitudes towards these issues are important factors in effective and efficient implementation of climate policies. In order to contribute to this important goal a research was designed to elicit people's perceptions of and attitudes towards climate change as well as related mitigation and adaptation policies in Poland and in Turkey. These two countries were chosen to cover the variety of climate conditions. The aim of the paper is to present and analyse the outcomes collected from the conducted national Internet surveys (N=156) on perceptions of climate change as well as social expectations regarding climate change solutions in both countries. Analysis of the survey results help to understand the problems and social needs related to climate change. The results were confronted with the state-of-the-art scientific literature as well as strategic policy documents and their evaluations' reports to discuss the policy relevance of the findings and conclusions.

Keywords: issues, needs, climate change, Poland, Turkey

JEL codes: D71, D78, Q54

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1. Introduction

Climate change is manifesting itself in more frequent extreme events, higher average temperature and higher extreme temperatures. These phenomena can be observed in various parts of the world, also in Europe. Review of climate studies (IPCC, 2014) reveals that considerable changes in global temperature, precipitation patterns and occurrence of extreme

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weather events worldwide are observed. Worldwide the International Disaster Database (EM-DAT) confirms that climate and weather related risk add to the 90% of natural disaster losses. Moreover, according to the most recent climate projections, global climate change is expected to have considerable impacts on natural and human systems. (Schaeffer et al. 2012) At the same time some research (Bayer at al., 2012) and many interviews that author conducted with lay people and local level authorities in Poland in recent years reveal that climate change is not seriously taken into account in the decision making processes by some stakeholders mostly due to some doubts in the existence of this phenomenon. These inclined the author to conduct systematic research on the topic of social perceptions and attitudes towards climate change. For that the two European countries of different climatic conditions were chosen as case studies, namely Poland and Turkey. These two countries were compared to research the similarities and differences in climate change perceptions and attitudes in countries diverse in culture and climate conditions. In both countries climate change negative effects are visible and policies as well as variety of actions are applied in response.

2. Climate change issue and responses in the case study countries

Turkey lies in a region that is highly vulnerable to climate change, and the indicators show that climate is changing in Turkey. The meteorological observations show that temperatures are increasing throughout the country. Summer temperatures increase more than those of the other seasons. There are significant shifts in the timing of the snow-fed river discharges, which indicates that snow melts earlier in response to the elevated temperatures. No significant coherent change has yet been detected in precipitation observations. Future climate change projections agree on an increase in temperatures throughout the country and a reduction in precipitation in the southern half of the country. There is no doubt that these changes will impact the country's water resources negatively by reducing the water potentials in the southern river basins. (Şen, Ömer Lütfi et al., 2015)

In Poland climate is characterized by high variability of weather with significant seasonal changes. The warmest area is the south-western part of Poland, while the coolest is north-eastern part of the country and mountain areas. The last two decades of the twentieth century and the first decade of the 21st century were the warmest in the history of meteorological observations in Poland and a downward trend in the number of freezing and very frosty days is observed. (Polish Ministry of Environment, 2013) While in the 1971-2000 period, the total precipitation did not change significantly, it was characterized by its

considerable variability from year to year, especially an increase in the number of days with heavy rainfall, in particular in the southern regions, and an increase of length of rain-free periods in the eastern part of Poland (from the Vistula river to the east) was observed. (Polish Ministry of Environment, 2013) Also, the intensification of extreme climatic conditions has become noticeable, especially with regard to heat waves and floods. Table 1 presents disaster frequency and consequences in years 2005-2015 in Poland and in Turkey.

Table 1. Disaster frequency and consequences in years 2005-2015 in Poland and in Turkey

Year	Country name	Disaster type	Occurrence	Total deaths	No. of injured people	No. of affected people	No. of homeless people	Total affected	Total damage [USD]
2010	Turkey	Earthquake	1	51	100	3500	n/a	3600	no data
2011	Turkey	Earthquake	3	647	4303	6786	32075	43164	1744000
2014	Turkey	Earthquake	1	n/a	324	n/a	n/a	324	no data
2007	Turkey	Extreme temp.	1	3	n/a	n/a	n/a	n/a	no data
2008	Poland	Extreme temp.	1	82	n/a	n/a	n/a	n/a	no data
2009	Poland	Extreme temp.	1	298	n/a	n/a	n/a	n/a	no data
2010	Poland	Extreme temp.	1	200	n/a	n/a	n/a	n/a	no data
2011	Poland	Extreme temp.	1	26	n/a	n/a	n/a	n/a	no data
2012	Poland	Extreme temp.	3	273	n/a	n/a	n/a	n/a	no data
2013	Poland	Extreme temp.	1	25	n/a	n/a	n/a	n/a	no data
2014	Poland	Extreme temp.	1	78	n/a	n/a	n/a	n/a	no data
2015	Poland	Extreme temp.	1	77	n/a	n/a	n/a	n/a	no data
2016	Poland	Extreme temp.	1	21	n/a	n/a	n/a	n/a	no data
2007	Turkey	Flood	3	16	n/a	3150	36	3186	no data
2009	Poland	Flood	1	1	n/a	150	n/a	150	100000
2009	Turkey	Flood	2	47	31	35100	n/a	35131	550000
2010	Poland	Flood	2	19	n/a	100700	n/a	100700	3080000
2011	Turkey	Flood	1	8	3	n/a	n/a	3	no data
2012	Turkey	Flood	1	13	n/a	n/a	n/a	n/a	no data
2015	Turkey	Flood	2	17	n/a	5000	1500	6500	no data
2016	Poland	Flood	1	2	3	n/a	n/a	3	no data
2009	Turkey	Landslide	2	15	n/a	6	n/a	6	no data
2010	Turkey	Landslide	1	13	6	n/a	200	206	no data
2013	Turkey	Landslide	1	7	n/a	n/a	n/a	n/a	no data
2007	Poland	Storm	2	19	n/a	n/a	n/a	n/a	100000
2008	Poland	Storm	1	2	10	1050	n/a	1060	50000
2009	Poland	Storm	1	8	82	n/a	n/a	82	no data
2012	Poland	Storm	1	1	10	300	n/a	310	5900
2013	Poland	Storm	1	4	53	n/a	n/a	53	no data

Year	Country name	Disaster type	Occurrence	Total deaths	No. of injured people	No. of affected people	No. of homeless people	Total affected	Total damage [USD]
2015	Poland	Storm	1	1	17	1200	n/a	1217	no data
2008	Turkey	Wildfire	1	2	n/a	n/a	300	300	no data
Total			42	1976	4942	156942	34111	195995	5629900

Source: adapted from http://www.emdat.be/advanced_search/index.html, access on 15.09.2016.

As it can be seen the disaster frequency confirms the existence of a problem. Therefore, in response to climate change there are two main approaches: mitigation and adaptation. While climate change mitigation refers to the reduction of greenhouse gases emissions, adaptation means building resilience to climate change. Analyses of flood insurance markets worldwide (Paklina, 2003) show that in Poland and in Turkey the coverage of climate related losses is low and very low, respectively. These issues are analysed in the conducted research.

3. Conducted research method

Social research on climate change in Poland and in Turkey was conducted as an online questionnaire distributed between July and December 2016 in Poland and in Turkey. The aim of the survey was to collect perceptions of climate change in Poland and in Turkey as well as social expectations regarding climate change solutions.

Total number of completed surveys is 156, among which 59 from Poland and 97 from Turkey. Although the number of respondents is not equal in both countries it captures the differences in population, being about 38 million people in Poland and about 80 million in Turkey. Thus, approximately $15{,}5 \times 10^{-6}$ % and $12{,}2 \times 10^{-5}$% of the population in Poland and in Turkey respectively was surveyed. Various regions in both countries are represented. However, countryside and hence the agricultural sector are underrepresented. In Table 2 the basic characteristics of responders are presented. The chosen categories are presented as percentage share of the total respondents.

Table 2. Characteristics of responders in the conducted research

Categories	Poland	Turkey
	percentage share of the total respondents	
female	81	43
male	19	57
21-25 years old	7	80
26-30 years old	7	14
31-40 years old	47	5
40-60 years old	24	0
above 60	15	1
countryside	14	4
town	10	18
city	76	78
higher education	91	91

Source: Own elaboration based on the conducted research questionnaire.

As we can observe in Table 2 the overbalance exists with regard to female participants in Poland, younger respondents in Turkey, older respondents in Poland as well as city inhabitants and participants with higher education in both countries. These need to be taken into account during the results interpretation.

The questionnaire consists of 35 questions related to climate change problems and needs in Poland and in Turkey. In particular experience of respondents in relation to the negative and positive effects of climate change was research as well as the actions they undertake, if any, in case of extreme events. Moreover, the questions were asked about the respondents' knowledge on adaptation and mitigation policies and strategies of the countries. Also the respondents' involvement in the adaptation and mitigation actions was inquired.

There are various kinds of questions in the survey, closed ones with single and multiple answers possible, as well as open ones, giving more insights into respondents way of thinking about the issues.

Analysis of the survey results should help to understand the problems and social needs related to climate change. In particular, the research goals were the following:

- Get to know the attitudes of Polish and Turkish citizens towards climate change.
- Compare Poland and Turkey in terms of personal attitudes towards climate change.
- Compare the problems related to climate change identified by people to the ones identified in the official documents, such as the National Climate Change Strategies for Poland and Turkey.

In relation to the above, the following research hypotheses were formulated:

- H1: Most people experience the negative effects of climate change.
- H2: Mostly frequently experienced negative effects of climate change are heat waves, floods and droughts.
- H3: People are not interested in the debate about climate change.

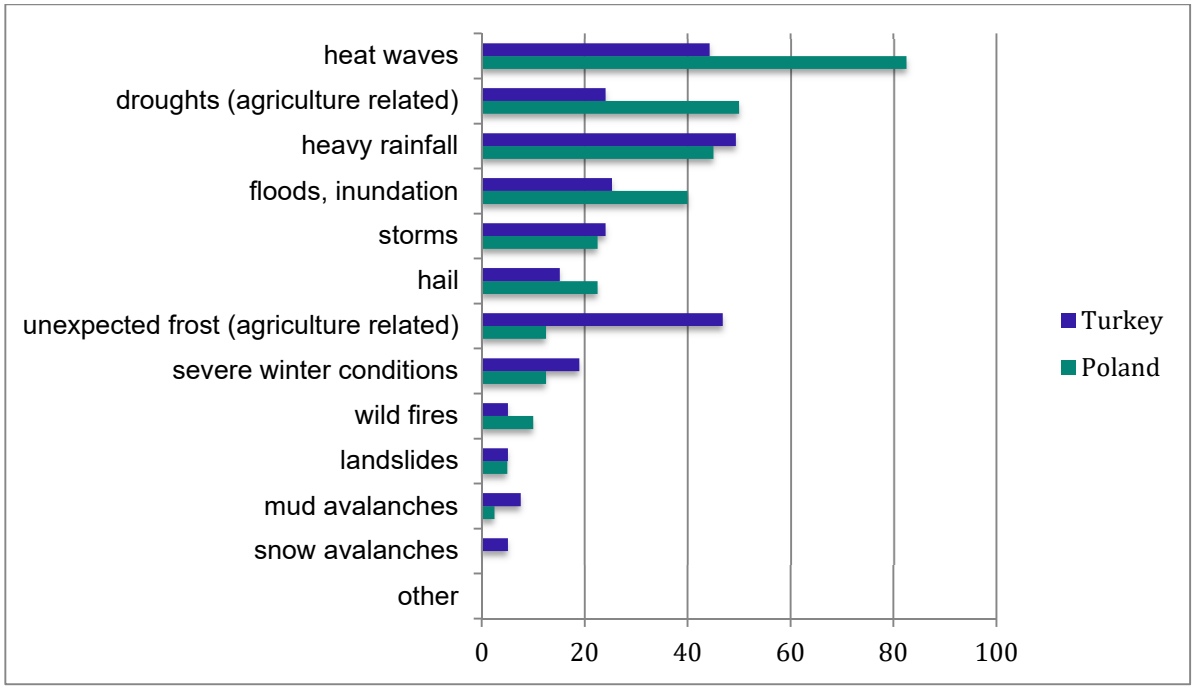
The obtained research results are presented below.

4. Research results

Experience with the negative effects of climate change declared 68% of responders in Poland and 81% of respondents in Turkey. In contrast the 36% of respondents in Poland and 12% of respondents in Turkey experiences positive effects of climate change.

Figure 1 shows which climate change negative effects have the respondents ever experienced.

Figure 1. Climate change related negative effects experienced by the respondents, in [%]



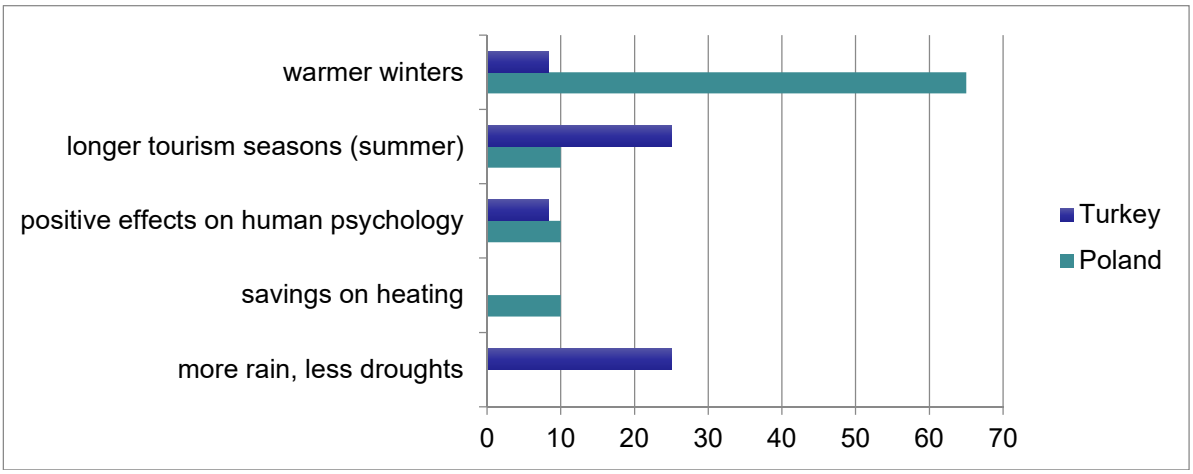
Source: Own elaboration based on the conducted research questionnaire.

There are three most frequently chosen extreme events in Turkey: heavy rainfall (almost 50%), followed by severe winter conditions and droughts related to agriculture (both above 40%). Whereas in Poland heat waves (above 80%) are highlighted by respondents as climate change

related negative effects and they are mentioned more frequently than droughts, heavy rainfall and floods (all above 40%). It can be seen that drought and heavy rainfall, being the reasons of flash floods, are the common problems. The frequently mentioned severe winter conditions in Turkey and heat waves in Poland provide visible signs of climate change.

On the other hand, the positive effects of climate change are related to warmer winters in Poland and to longer tourism season and less droughts in Turkey (see Figure 2).

Figure 2. Climate change related positive effects experienced by the respondents, in [%]

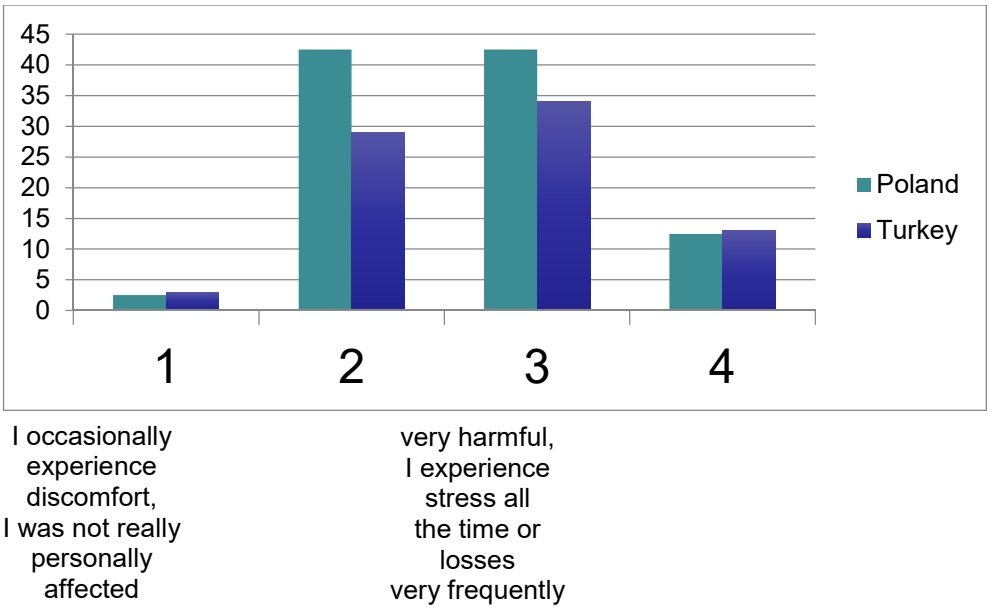


Source: Own elaboration based on the conducted research questionnaire.

The degree of harm and oppressiveness related to climate change (Figure 3) was perceived similarly in both countries and it was indicated as moderately harmful by more than 80% of respondents.

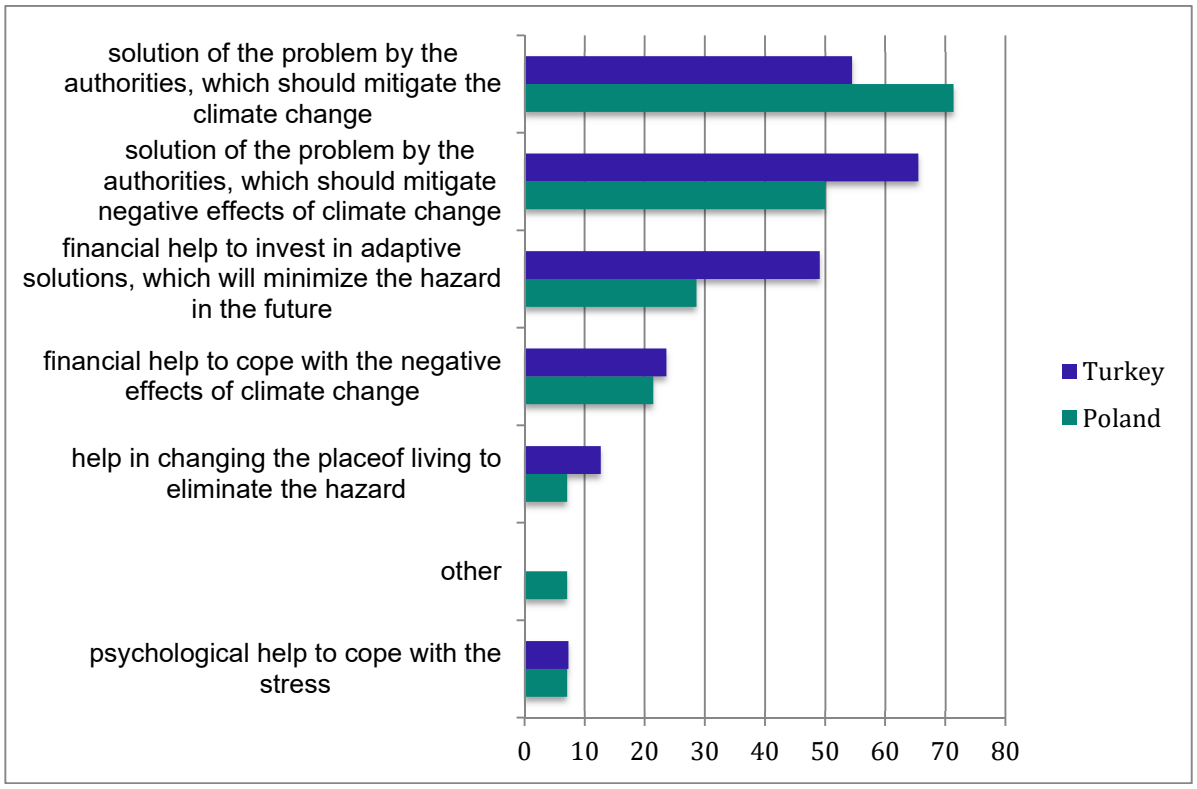
Having said that almost 70% of Turkish respondents and 35% of Polish respondents expect help related to climate change negative effects. In the subject deepening question about the kind of expected help (compare Figure 4, multiple choice question) about 65% of Turkish participants answered that they expect authorities to help in the mitigation of the climate change's negative effects and about 55% of participants also think that authorities should help to mitigate climate change itself. At the same time help in financing adaptive solutions, which could minimize the hazard in the future, is expected by almost 50% of the Turkish respondents.

Figure 3. Perceived degree of harm and oppressiveness related to climate change, in [%]



Source: Own elaboration based on the conducted research questionnaire.

Figure 4. Expected help, in [%]



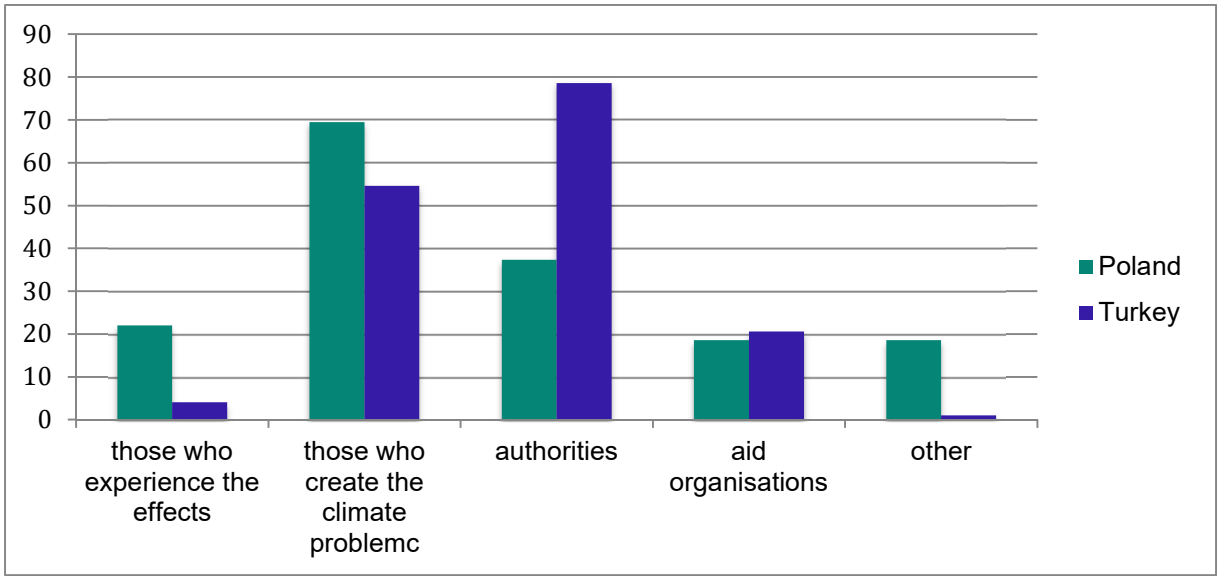
Source: Own elaboration based on the conducted research questionnaire.

Similar trends in responses are visible in Poland, with the only difference of given preference to mitigation of climate change itself by the authorities rather than the mitigation of the negative

effects of climate change. To mitigate climate change Turkey continues its efforts to increase the share of renewable energy sources (RES) and add the nuclear power into Turkish energy mix. Turkey has huge potential in renewable energy, especially geothermal, water, wind and solar energy. As stated in the National Renewable Energy Action Plan for Turkey released in December 2014 by Ministry of Energy and Natural Resources, the share of RES is planned to increase to 30% of produced energy. However, Turkey has not yet signed the Kyoto Protocol. Although polish economy is based on coal to high extend the energy policies, driven by the European Union requirements, are seeking to promote RES.

As depicted in Figure 5 in Turkey people feel that primarily the authorities should finance climate change related damages and secondly the ones who are creating emissions should finance the losses. In Poland these preferences are reverse.

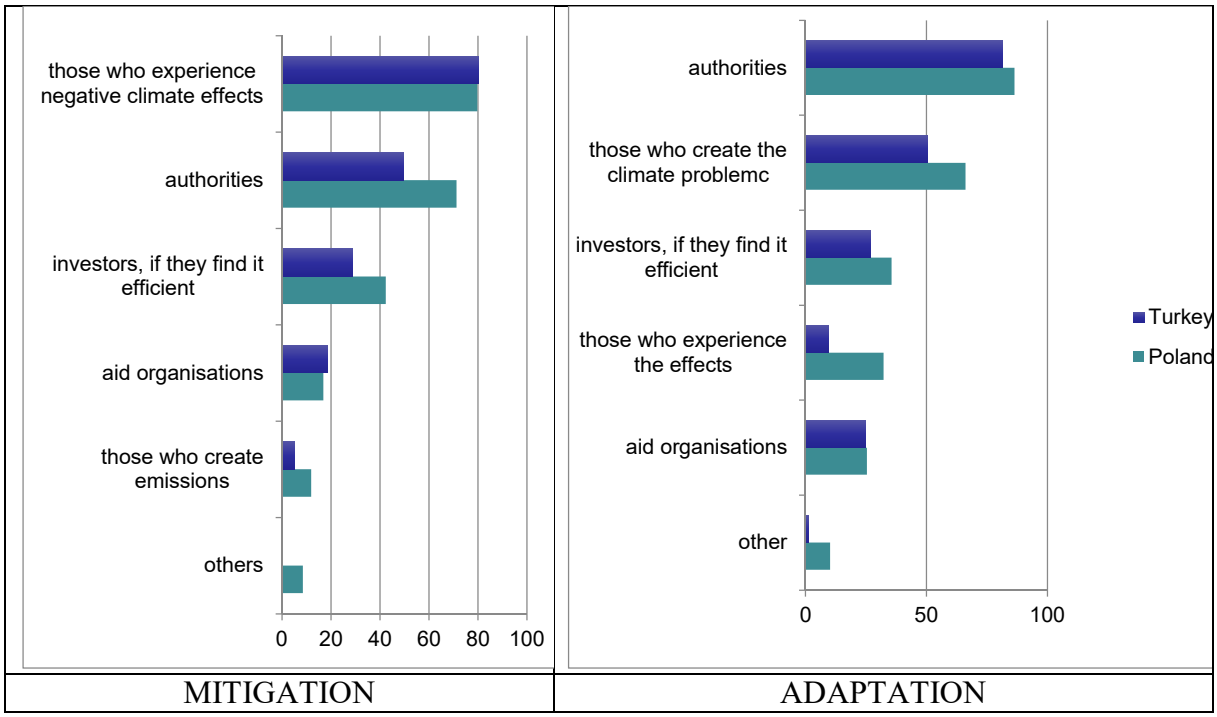
Figure 5. Sources of financing of climate change losses, in [%]



Source: Own elaboration based on the conducted research questionnaire.

When asked about the desired financing sources of mitigation and adaptation Turkish people tend to expect solution from authorities especially from public authorities, especially when it comes to adaptation (Figure 6), which is also very true for Polish respondents. Whereas when it comes to mitigation respondents in both countries pointed out as the desired financing source, quite surprisingly, those who experience negative climate effects, before the authorities and those who create emissions.

Figure 6. Desired financing sources of mitigation and adaptation respectively, in [%]



Source: Own elaboration based on the conducted research questionnaire.

Answering the question if the respondents think that the country is prepared to climate change, the 71% of Poles and 76% of Turks gave negative answer. At the same time "I don't know" answered 27% and 22% of respondents respectively. This reveal the remaining 2% of respondents in both countries convinced of adequate preparation of the country to the changing climate. In order to detail this subject the series of questions were asked concerning weather in respondents view adequate mitigation and adaptation strategies and solutions (measures) are in place or are applied in the country. The answers are summarised in Table 3.

Table 3. Implementation of climate mitigation and adaptation strategies and solutions, in [%]

Implementation of climate MITIGATION STRATEGIES			**Implementation of climate MITIGATION SOLUTIONS**		
	Poland	Turkey		Poland	Turkey
yes	10	1	yes	10	1
no	73	70	no	59	76
I don't know	17	29	I don't know	31	23
Implementation of climate ADAPTATION STRATEGIES			**Implementation of climate ADAPTATION SOLUTIONS**		
	Poland	Turkey		Poland	Turkey
yes	9	3	yes	10	1
no	59	67	no	59	67
I don't know	32	30	I don't know	34	32

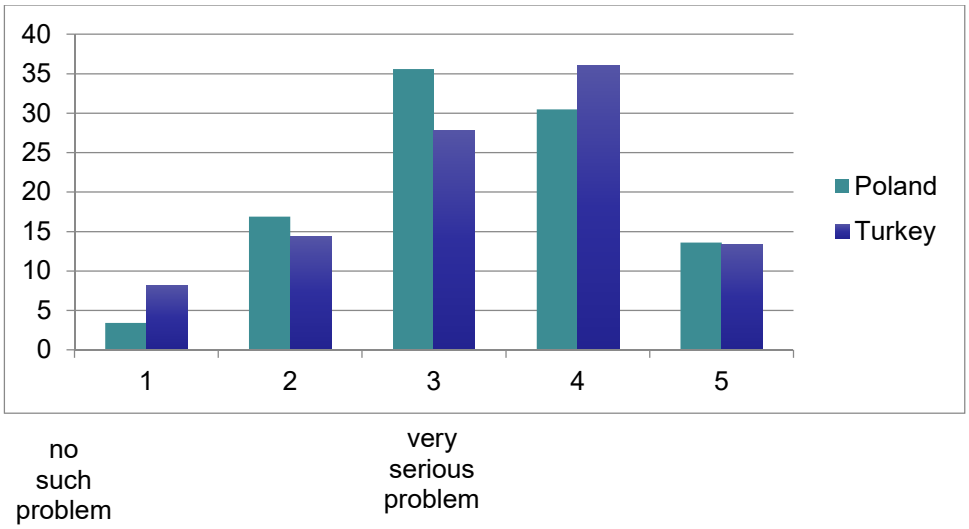
Source: Own elaboration based on the conducted research questionnaire.

When we compare the numbers in Table 3 it can be seen that there is about 9-10% of respondents in Poland and 1-3% respondents in Turkey that find both the mitigation and adaptation strategies and solutions in place. In Poland the highest number of respondents is convinced that the mitigation strategies are not applied, whereas in Turkey most respondents think so of mitigation solutions.

Perceptions on implementation of adaptation strategies and solutions in both countries are quite similar. The only difference is that a few more percent of respondents in Poland is convinced about their adequate implementation. However, most people think that the adaptation strategies and solution are not applied and about 30% declare no knowledge on that matter.

As it can be derived from Figure 7 climate change is perceived as a problem slightly more in Turkey than in Poland.

Figure 7. Perceptions on climate change as a problem, in [%]

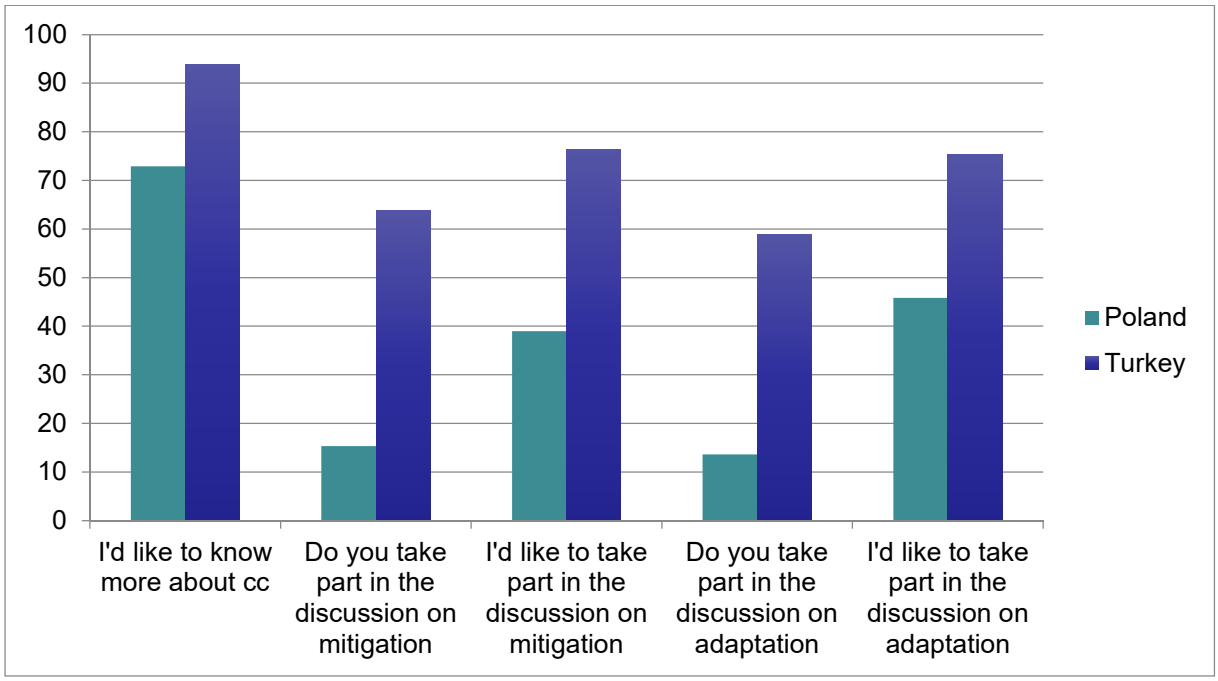


Source: Own elaboration based on the conducted research questionnaire.

Active steps to protect oneself against the negative effects of climate change declare 46% of respondents in Poland and 20% in Turkey. The most frequently mentioned actions related to adaptation and mitigation of climate change are similar in both countries and include: installing air conditioners, insulating houses, planting trees, saving water and energy, efficient use of water, resigning from individual choices, which are causing climate change, using public transport rather than private car and supporting renewable energy projects.

Knowledge and engagement related to climate change is presented in Figure 8.

Figure 8. Knowledge and engagement related to climate change, in [%]



Source: Own elaboration based on the conducted research questionnaire.

Interesting observation is that respondents in Turkey would like to be more engaged and learn about climate change than polish respondents. It can be explained by the age structure of the participants.

5. Discussion of the results

The obtained results are concise with the state-of-the-art scientific findings on climate change, summarised in the updated IPCC reports (latest one released in 2014), in that the respondents are aware of the progressing climate change. The precipitation forecasts for Turkey (UNDP, 2013) and for Poland (Polish Ministry of Environment, 2013) confirm the climate related issues mentioned by the participants of the conducted research. However, the high variability of weather with significant seasonal changes makes it difficult to recognize and distinguish climate change from the normal seasonal variations.

Moreover, strategic policy documents related to adaptation to climate change, to energy policy or to water policy in both countries are in line with the opinions expressed by the respondents with regard to the needed mitigation and adaptation strategies and measures.

Analysis of the survey results reveals the social needs, such as improved access to the knowledge about the climate change and financing of the mitigation and adaptation measures.

Although only tiny portion of the population was surveyed outcomes are representative in view of the basic characteristics of the respondents such as: regional diversity, age and sex. The only bias is related to the high amount of high education and city based respondents taking part in the survey. The countryside is underrepresented therefore the outcomes should be interpreted as representative for city inhabitants. Analysis of socio-demographic and risk perception data collected from a national online survey in Australia revealed that risk perceptions vary with age, number of years of experience, educational qualification, stakeholder group and area of work. (Dobbie & Ruth Brown, 2013) These findings are also confirmed by the study presented in this paper.

6. Conclusion

The research goals were realized and it confirmed the stated hypotheses. With regard to hypothesis H1 it can be observed that most respondents (68% in Poland and 81% in Turkey) experience the negative effects of climate change.

Concerning hypothesis H2 heat waves were mentioned as mostly frequently experienced negative effects of climate change in Poland, whereas heavy rainfall (causing floods) and droughts were the concerns in Turkey. It can be observed that respondents mentioned the phenomena that have been less known to them.

In both countries people feel that primarily the authorities should finance climate adaptation, whereas, surprisingly, those who experience negative climate effects should finance the mitigation.

Verification of hypothesis H3 that people are not interested in the debate about climate change can be derived from answers presented in Figure 8, revealing that although in both countries majority of people would like to possess more knowledge on climate change, the majority of polish respondents is neither involved in the debates on climate change nor would like to be involved. Turkish respondents, however, declared their interest. It can be explained by the different age structure of the participants.

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Postrzeganie zmian klimatycznych i nastawienie społeczne wobec nich w Polsce oraz w Turcji

Streszczenie

Zmiany klimatu są postrzegane jako zagrożenie dla przyszłego dobrobytu człowieka i wyzwanie dla zrównoważonego rozwoju lokalnych społeczności i gospodarek na całym świecie. Oczekuje się, że niektóre kraje i regiony odczują nieznaczne zyski ze zmian klimatycznych, podczas gdy inne są narażone na poważne straty. Coraz częstsze klęski żywiołowe są objawami ostrzegawczymi tych zmian. Jednak ze względu na efektywną i skuteczną adaptację do zmian klimatu w różnych regionach świata ważne są odpowiedzi na następujące pytania: Czy ludzie zauważają te zmiany? Czy odczuwają ich negatywne skutki? Czy są zadowoleni z działań łagodzących zmiany klimatyczne i działań adaptacyjnych podjętych przez rządy? Czy są chętni do udziału w tych działaniach? Postrzeganie i stosunek do tych kwestii są ważnymi czynnikami skutecznej i efektywnej realizacji polityki klimatycznej. Aby przyczynić się do realizacji tego ważnego celu, opracowano badania mające na celu poznanie percepcji i postaw ludzi wobec zmian klimatu oraz wobec polityk mających na celu łagodzenie skutków i adaptację do zmian klimatu w Polsce i Turcji. Te dwa kraje zostały wybrane ze względu na różnorodność warunków klimatycznych. Celem artykułu jest przedstawienie i przeanalizowanie wyników przeprowadzonych ankiet internetowych w obu państwach (N = 156) na temat postrzegania zmian klimatycznych, a także oczekiwań społecznych dotyczących rozwiązań w zakresie łagodzenia zmian klimatu lub/i adaptacji do nich w obu krajach. Analiza wyników badań pomaga zrozumieć problemy i potrzeby społeczne związane ze zmianami klimatu. Rezultaty zostały skonfrontowane z najnowszą literaturą naukową, a także strategicznymi dokumentami politycznymi i raportami z ich ocen, aby omówić znaczenie tych wyników i wniosków dla polityki.

***Słowa kluczowe**:* potrzeby, problemy, zmiany klimatu, Polska, Turcja.

Kody JEL: D71, D78, Q54

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