GLOBAL CHANGE AND RESILIENCE From Impacts to Responses

Edited by

Robert Stojanov Zdeněk Žalud Pavel Cudlín Aleš Farda Otmar Urban Miroslav Trnka

Global Change Research Centre AS CR, v. v. i.





GLOBAL CHANGE AND RESILIENCE From Impacts to Responses

Proceedings of the 3rd annual Global Change and Resilience Conference

Robert Stojanov Zdeněk Žalud Pavel Cudlín Aleš Farda Otmar Urban Miroslav Trnka

GLOBAL CHANGE RESEARCH CENTRE, ACADEMY OF SCIENCES OF THE CZECH REPUBLIC, v. v. i.

Brno 2013

IT'S THE WATER, STUPID! PUBLIC PERCEPTION OF CLIMATE CHANGE CONSEQUENCES IN SOUTH BOHEMIA, CZECH REPUBLIC

Jan Vávra, Miloslav Lapka, Eva Cudlínová

Faculty of Economics, University of South Bohemia in České Budějovice, Czech Republic, jvavra@ef.jcu.cz

Abstract

We focus on the public perception of possible consequences of climate change among the regional population of South Bohemia in the Czech Republic. We conducted a questionnaire survey of 500 respondents in 2010 and asked them to evaluate the potential consequences of climate change on different levels (personal, state, World). Respondents paid attention mostly to the problems with water, such as drinking water shortage, floods or droughts. Appearance of new diseases or accelerated species extinction is also perceived as an important problem, while possible economic consequences, such as climate tax or regulation of business and consumption are seen as less important. We briefly discuss some of the potential causes of the results and compare them with previous studies carried out in the Czech Republic and other countries. This comparison shows the varying importance of some consequences (especially economic) and overall agreement on the importance of water issues, mainly the shortage of drinking water resources.

Keywords

Environment, climate change, global warming, social perception, water, Czech Republic, South Bohemia, sociology

Introduction

Climate change has been an object of interest of social sciences since the early 1990s. The research has included a variety of subtopics, e.g. public understanding of climate change (Kempton 1991), its social representations (Fischer et al. 2012), comparison with other possible threats (Bord, Fischer, and O'Connor 1998), barriers to personal engagement (Lorenzoni, Nicholson-Cole, and Whithmarsh 2007) or the changes of climate change discourse (e.g. Reusswig 2010; Beck 2010). Climate change is also a topic questioned in many opinion polls. Some of them report a decrease in public interest in climate change in the last few years in the EU (European Commission [EC] 2009, 2011) after its peak around 2007. This could be probably explained by the rise in the importance of economic issues after 2008 (financial and economic problems are not only perceived as more urgent than climate change, but some of the climate change mitigation measures are portrayed as obstacles to economic growth and global competitiveness).

We focus on the public perception of possible consequences of climate change among the population of the Czech region of South Bohemia. Long term results of Czech opinion polls confirm that the importance of climate change is decreasing. In 2006 and 2007 climate change was reported as a very or fairly serious global problem by 84 % of population; this number dropped to 64 % in 2011. Even in the peak years, climate change was less important for the public than accumulation of waste or drinking water pollution or its shortage (Tuček 2011). An analysis of the perceived importance of major global threats, based on the answers of the same sample of respondents as this paper, confirmed that environmental pollution in general or economic downturn were more important in 2010 for the respondents from the Czech Republic, as well as for those from the other four surveyed EU countries (Lapka and Vávra 2011). Similar results appear in an older survey among the US population (Bord et al. 1998). The participants claim that climate change is less threatening than other environmental issues and in fact than all non-environmental threats. This research also proves that the possible impacts of climate change (like increased rate of diseases or decreased standard

of living) are perceived more seriously globally than for the respondents personally. From possible climate change impacts, US citizens stressed mostly the threat to water quality and increased droughts (Bord and O'Connor 1997).

Two previous pieces of research, which included Czech respondents, brought similar results, at least in some aspects. The survey carried out in 2008 within the local population in the Czech Republic has showed that shortage of drinking water is the possible consequence most feared by the whole population, while some of the concerns about possible impacts depend more on the occupation type. Farmers, for example, were personally more worried about floods and droughts, and entrepreneurs or the self-employed were concerned more about climate tax or other economic costs (Lapka, Cudlínová, and Marek 2011). Surveys among international students' samples confirmed a concern about water resources and the importance of droughts and floods. Some international differences occurred; students from the US and New Zealand expressed more concern about the economic costs and limitations, Czech students paid more attention to the risk of sunbathing or species extinction (Lapka and Cudlínová 2007) and Italian students stressed the economic costs and new diseases (Lapka et al. 2011).

We do not analyse the effect of socio-demographic characteristics on the perception of climate change consequences due to the limited length of this paper. Previous studies show that the effect of socio-demographics is very complex and differs according to the particular question (e.g. whether respondents are asked to assess overall perception of climate change or to express concern about its possible impacts).

Methods

The survey was conducted in spring 2010 with 500 respondents as a part of the GILDED research project, which focused on the energy consumption of European households and public perception of climate change issues. The study site consisted of the city of České Budějovice and rural areas in the South Bohemia Region. For detailed information about the area see Vávra, Lapka, Cudlínová, and Dvořáková-Líšková (2010).

The questionnaires were distributed and collected from door to door by the professional poll research company, quota sampling was used to achieve a representative sample according to age and gender; however, the accuracy is influenced by a non-representative distribution of population. As the overall project objective was to compare urban and rural households, half of the respondents were selected from urban and half from rural areas. Gender distribution was 49 % male and 51 % female; average age was 45 years (SD 15). The distribution of education is as follows (Czech terms in brackets if needed for clarification): no education or elementary school 4 %, lower secondary (SOU) 28 %, higher secondary and non-university extension (maturita+VOŠ) 51 %, and university degree 17 %. Average net month per capita income is 11 245 Kč ($433 \in$). Considering the specific sampling of urban and rural population, our sample is quite representative in all socio-demographic characteristics, except education (the sample is slightly overeducated).

The questions analysed in this paper focused on the respondents' perception of the 10 potential consequences of climate change, including these possibilities: more droughts, more floods, appearance of new diseases, climate/energy tax, considerable change of natural scenery, regulation of business and consumption, migration of people from endangered areas, accelerated species extinction, sea level rise, and decreasing of drinking water resources. The list of consequences was adapted from the 2006 survey of an international sample of students (Lapka and Cudlínová 2007) and slightly modified. The authors of the original questions based them mostly on the IPCC projections of probable consequences of climate change. We asked for the impact of each consequence on three different levels (to myself, my state and the world). Respondents had to rank the impact on a scale from 1 (no impact at all) to 5 (a major impact). They also could express the opinion that the suggested consequence was not likely to happen. We calculated the overall impact of each consequence (mean of three different levels) and we use this number in the analyses to reduce the complexity (Table 1 shows the reliability of Cronbach's alpha of the three different levels for each potential consequence). The statistical analysis was carried out in IBM SPSS Statistics software.

Results

The results in Table 1 show that respondents from South Bohemia perceive problems with water as the most serious possible impact of climate changes. The water issues include the decrease of drinking water resources, more floods and more droughts. Appearance of new diseases and accelerated species extinction has also received more attention, while migration, considerable change of natural scenery and economic impacts has a lower score. Sea level rise was ranked as the least important.

	Decrease of drinking water	More floods	New diseases	Species extinction	More droughts	Migration	Change of natural scenery	Buss. and cons. regulation	Climate tax	Sea level rise
Ranking	1 (1)	2 (2)	3 (2)	4 (2)	5 (2)	6 (3)	7 (3)	8 (3)	9 (3)	10 (4)
Mean	4.11	3.84	3.78	3.70	3.66	3.52	3.45	3.40	3.36	3.06
SD	0.87	0.76	0.85	1.02	0.79	0.90	0.99	0.86	0.87	0.96
Difference (M-O)	-0.38**	-0.71**	-0.40**	-0.43**	-0.75**	-0.71**	-0.14**	-0.45**	0.04	-0.86**
Difference (S-O)	-0.07**	0.20**	0.02	-0.06**	0.07**	0.15**	0.03	0.19**	0.03	-0.40**
Difference (W-O)	0.44**	0.51**	0.42**	0.49**	0.67**	0.56**	0.17**	0.25**	0.01	1.26**
Not likely to happen (%)	1.4	2	2.2	5	2	2	3.6	4	3.3	2.2
Missing answer (%)	11.8	10.2	10.8	16.8	9.2	18	14	20.8	19.3	13.8
Cronbach's α (M+S+W)	0.83	0.70	0.84	0.87	0.74	0.80	0.88	0.78	0.77	0.78

Tab. 1. Seriousness of potential consequences of climate change

Source: GILDED survey 2010 (N=500).

Note: Ranking shows the overall position, however the differences between the means of some consequences are not statistically significant. The number in brackets shows the groups with insignificant differences for all means (within 95 % Confident Interval). There are four significantly different groups. Nevertheless, droughts are a specific case, because the difference between droughts and floods is not within their 95 % CI, and the difference between migration and droughts is within the 95 % CI of both means. Due to the differences and similarities with other consequences in the groups, we put the treshold consequence of droughts into group 2.

SD stands for Standard Deviation of the mean.

Rows labelled Difference show the mean difference between 3 aspects of overall impact assessment (M – myself, S – state, W – World) and overall average impact (O – Overall). The statistical significance of differences was tested by one sample t test with test value 0; ** p < 0.05.

Standard deviations show that opinion on floods and droughts was the least variable, and vice versa for species extinction. This consequence also shows the highest number of "not likely to happen" answers. The high percentage of missing answers in species extinction and even more in both economic questions suggests that respondents found it hard to evaluate these consequences. The differences between impact on myself and the overall impact prove that except the possibility of a climate/energy tax, respondents find the impact on themselves less important. Contrarily they assess the global impact (World) as higher, especially in the case of consequence of sea level rise. Differences between the impact on the Czech Republic and the overall impact differ for particular consequences; a higher impact on a country level is perceived especially in floods and business and consumption regulation.

Discussion and conclusion

The global impact of the climate change is assessed as more serious in general than the personal impact on the respondent. This agrees with the older US study of Bord et al. (1998). Perceived low seriousness of the potential consequences of climate change on the personal level could be caused by the lack of direct personal experience with these phenomena or just people's belief that they will not be affected. No difference in the seriousness of climate tax at different levels suggests that respondents can imagine that the tax would influence themselves as well as the state or the World as a whole. The perception of impact on the country level seems to reflect the recent water related events in the Czech Republic, mostly the frequent floods in last 15 years (although some droughts also occurred, e.g. in 2003).

When compared to the previous survey of the local Czech population (Lapka et al. 2011), our respondents perceive a lower importance of both economic issues, but they assess new diseases and species extinction as bigger problems. The relatively high importance of species extinction and the low importance of economic impacts of our sample is in agreement with the outcomes of the survey of Czech students (Lapka and Cudlínová 2007), but students paid less attention to the new diseases.

While some of the perceptions vary probably due to the differences in samples or maybe also due to the time shift (however the period is quite short to make any definite conclusions), there is one evergreen topic: the water. The decrease of drinking water resources and problems with floods and droughts are in the top positions of all three Czech surveys and drinking water is also the main concern of respondents from other countries (e.g. Lapka and Cudlínová 2007; Lapka et al. 2011; Bord and O'Connor 1997). The opinion polls also report the high importance of water supply and quality (even if not related to climate change), which is usually perceived as the most serious environmental problem, more important than climate change itself (e.g. EC 2009; Tuček 2011).

We conclude that the perceived seriousness of floods and droughts expresses respondents' experience with these events in their country. The importance of the shortage of drinking water is probably caused rather by media coverage of these problems, not by common personal experience. We also argue that the high concern with water issues could help to better communicate the problems of climate change with the public and that it may bring more public support for climate change mitigation and adaptation measures.

Acknowledgement

The work on this paper was supported by the project Postdoc USB (reg.no. CZ.1.07/2.3.00/30.0006) realised through the EU Education for Competitiveness Operational Programme and funded by European Social Fund and the Czech state budget. Data were collected with the support from the EU Seventh Framework Programme (FP7/2007–2013) under the GILDED research project, grant agreement no. 225383. The authors would like to express many thanks to all of the respondents who participated in the survey.

References

Beck, U. (2010). Climate for change, or how to create a green modernity? Theory, Culture & Society, 27(2-3), 254-266.

Bord, R.J., & O'Connor, R.E. (1997). The gender gap in environmental attitudes: The case of perceived vulnerability to risk. *Social Science Quarterly*, 78(4), 830–840.

Bord, R.J., Fisher, & O'Connor, R.E. (1998). Public perceptions of global warming: United States and international perspectives. *Climate Research*, 11, 75–84.

European Comission (2009). *Europeans' attitudes towards climate change – Special Eurobarometer 322 – EB72.1*. Retrieved March 21, 2013 from http://ec.europa.eu/public_opinion/archives/ebs/ebs_322_en.pdf

European Comission (2011). Attitudes of European citizens towards the environment – Special Eurobarometer 365 – EB75.2 – *Presentation*. Retrieved March 21, 2013 from http://ec.europa.eu/public_opinion/archives/ebs/ebs_365_pres_en.pdf

Fischer, A., Peters, V., Neebe, M., Vávra, J., Kriel, A., Lapka, M., & Megyesi, B. (2012). Climate change? No, wise resource use is the issue: Social representations of energy, climate change and the future. *Environmental Policy and Governance*, 22(3), 161–176.

Kempton, W. (1991). Lay perspectives on global change. Global Environmental Change, 1(3), 183-208.

Lapka, M., & Cudlínová, E. (2007). Problem of global warming and emerging patterns of global consciousness. International study. *Journal of Landscape Ecology*, 0(0), 91–104.

Lapka, M., Cudlínová, E., & Marek, M.V. (2011). Vnímání globálních klimatických změn ve společnosti. In Marek, M.V. et al. *Uhlík v ekosystémech České republiky v měnícím se klimatu* (pp. 211–232). Praha: Academia.

Lapka, M., & Vávra, J. (2011). Regional perception of global challenges in five EU countries: Economic crisis, environment and technology. In *Sborník z konference INPROFORUM 2011 "Globální krize – regionální dopady*" (CD-ROM) (pp. 236–243). České Budějovice: Jihočeská univerzita v Českých Budějovicích. Retrieved March 22, 2013 from https://www.ef.jcu.cz/research-cs/ konference/archiv/konference-inproforum-2011/sbornik-z-konference-inproforum-2011/view

Lorenzoni, I., Nicholson-Cole, S., & Whitmarsh, L. (2007). Barriers perceived to engaging with climate change among the UK. *Global Environmental Change*, 17, 445–459.

Reusswig, F. (2010). The new climate change discourse: A challenge for environmental sociology. In M. Gross, & H. Heinrichs (Eds.). *Environmental sociology: European perspectives and interdisciplinary challenges* (pp. 39–58). Springer.

Tuček, M. (2011). Česká veřejnost o globálních problémech – květen 2011. Retrieved March 24, 2013 from http://cvvm.soc.cas. cz/media/com_form2content/documents/c1/a3883/f3/101161s_oe110622.pdf

Vávra, J., Lapka, M., Cudlínová, E., & Dvořáková-Líšková, Z. (2010). Energy governance in České Budějovice shire – the Czech case. In N. Gotts, & I. Kovách (Eds.). Climate change and local governance: Alternative approaches to influencing household energy consumption. A comparative study of five European regions (pp. 76–109). Budapest: Hungarian Academy of Science. Retrieved March 20, 2013 from http://mek.oszk.hu/09300/09355/09355.pdf.