



Perceived citizens' satisfaction with climate change stakeholders using a multicriteria decision analysis approach



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ABSTRACT

The current need to adjust to the climate change requires urgent action to be taken both by the stakeholders involved in addressing climate change and by citizens. However, in order for citizens to be able to take part in such actions directly or indirectly, they will need to have a positive perception of the relevant stakeholders, so that a mutual relationship of trust and understanding is established. The objective of this study is to examine citizen satisfaction with the actions of the stakeholders involved in climate change. The study was conducted in Greece using a structured questionnaire; 1536 questionnaires were collected from January 2014 to June 2015 and the relevant data were processed using the MUSA method (MULTicriteria Satisfaction Analysis). The results of the study show that the citizens are not particularly satisfied, mainly with the actions of the governmental authorities involved in addressing climate change. In order to motivate citizens to take part in such actions in future, the relevant governmental bodies will need to increase their involvement and substantially improve their actions regarding the reduction of pollutants from industry and business, the level of civil protection and information provision, as well as public awareness and education on climate change.

1. Introduction

In recent decades, the environmental problems that the global community has been tackling have been a source of great concern for the scientific community and relevant stakeholders. One of these problems is climate change (Hansen, 2011), which is one of the greatest challenges that mankind has ever faced (Manolas, 2015). Young people, in particular, will face its impact throughout their life, and will also be society's future decision-makers on issues of vital importance (Körffgen et al., 2017). Climate change, however, does not simply constitute an environmental issue, but is also inextricably linked to development, both on a personal and socio-political level, with citizens having to make great efforts as regards its future outcome (Lorenzoni and Pidgeon, 2006).

There are various restrictive factors which play a relevant role: a) the development of diverse policies and strategies, b) the various ideologies expressed by country leaders (McCright et al., 2016), c) the promotion of debates and scientific information on climate change in various contexts (Boykoff and Goodman, 2015), d) the ever-changing values and intentions which require harmonization with socio-environmental models (Piperopoulos and Tsantopoulos, 2006; Voinov et al., 2014), e) the nature of the static phenomenon of climate change

which cannot be directly perceived (Weber, 2016), and f) the failure of the mass media to portray and elaborate on issues related to climate change, in conjunction with the independent variables (gender, age, education and religion) which affect citizens' views (Clements, 2012).

The said views, which differ in each geographical region, combined with the low level of public information (Lorenzoni and Hulme, 2009), a low educational level, the ignorance of the related risks, as well as the economic decline countries are suffering, have resulted in decreased concern for climate change in recent times by the public, compared to the past.

Environmental communication, through its methods, models and policy strategies, can play a significant role in tackling this problem by mobilizing the participation of various stakeholders and citizens in actions on climate change that will also contribute to sustainable development. It has the ability to combine environmental issues with citizen communication, and is affected by several factors, such as the mass media, which can easily influence the views, attitudes and perceptions of citizens on various issues, including environmental problems (McCallum et al., 1991; Greenberg and Chess, 1992; Liebler and Bendix, 1996; Stamm et al., 2000; Williams, 2000; Bengston et al., 2005; Pollak and Zint, 2006; Skanavis and Sakellari, 2007), through their direct promotion. Another major factor is the citizens' satisfaction

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from the actions undertaken by stakeholders in dealing with this phenomenon. Citizen satisfaction is a term linked to the trust shown by citizens in stakeholders, and is required if the former are to get involved in actions related to climate change.

Therefore, the goal of this study is to define the criteria that affect global citizen satisfaction and pinpoint potential improvement actions. For this reason, a first step will be to identify the stakeholders with whom the citizens are particularly satisfied or dissatisfied, as regards their actions concerning climate change; secondly, to present any further actions and improvements that are required for citizens to be motivated to participate. In this way, an attempt will be made to identify the decision-making bodies that citizens consider to be of most importance, and to actually measure citizens' satisfaction with actions undertaken by the state, with the aim to find the optimum scope for action and action improvement that will increase the citizens' satisfaction and trust, and urge them to participate in such actions in future.

The aforementioned holistic approach is the main contribution of the present paper, given the limited efforts made by previous studies that mainly focus on a simple measurement approach. In addition, the application of a multicriteria decision analysis approach, which can effectively analyze collected ordinal data, also constitutes an important contribution of this study.

2. Background

Climate change has been at the focus of global environmental problems, mainly since the Kyoto Protocol came into effect and recently with the Paris Agreement, which has a binding obligation to achieve zero global carbon emissions at a future date (Uitto et al., 2017); it has become a major environmental issue both for the scientific community and for governments, and also for the mass media which exert a direct influence on society. Nevertheless, following the signing of the Protocol, governments have implemented various policy strategies regarding climate change, without paying particular attention to raising awareness and educating the public as regards the need to adapt to these new changes.

Thus, after the signing of the Protocol and a period of intense concern, polls now show that the citizens' concern regarding climate change has decreased; such public opinion is influenced, in general, by weather conditions, socio-economic factors and policy actions (Capstick et al., 2015), regardless of political leanings (Guber, 2013).

According to the World Bank (2010), the majority of citizens (59.0%) globally regard the climate change as an issue of primary importance, whereas a small percentage (3.0%) does not consider it important. The level of concern is highest amongst Canadian citizens, followed by Europe and South America (Bord et al., 1998). Nevertheless, most citizens consider climate change to be of secondary importance, compared to other types of problems (Lorenzoni and Pidgeon, 2006). The reduced levels of concern among citizens regarding climate change (GlobeScan, 2013), according to Scruggs and Benegal (2012), are probably related to the global economic decline, and the deficient labor market; these levels of concern are expected to rise only when the two above-mentioned parameters present some improvement. Obani and Gupta (2016) make the same observations and believe that, during an economic crisis, citizens tend to focus their attention on economic recovery, rather than on climate change, since they are convinced that by making environmental issues a priority they are hampering the recovery of the economy.

Thus, in a poll conducted in Europe in 2002, climate change was placed in the second major category of environmental problems, with a total level of concern amounting to 39.0%. The highest level of concern regarding climate change was recorded in Greece (63.0%), compared to countries such as Luxemburg (50.0%), Italy (49.0%), Portugal (47.0%), France and Germany (44.0%) and Austria (39.0%). The other European countries presented lower levels ranging between 21.0% and 29.0%

(EORG, 2002). In the same year, it was also found that most European citizens were similarly worried about future changes to the climate and presented more or less the same average rate of concern (Lorenzoni and Pidgeon, 2006). Over the next years, climate change was also viewed by European citizens as the main problem for Europe (57.0%), in contrast to 2004, when the percentage was 45%, and Europe considered water pollution to be its number one problem (47.0%) (European Commission, 2007). In 2008, climate change was deemed to be the second most important problem (62.0%) in Europe, while poverty was at the top of the list (68.0%) (European Commission, 2008). The same results were obtained during the economic crisis (2013), when climate change moved to the third place (50.0%), compared to the results of 2011 (51.0%). On the contrary, the number of citizens who considered the economic situation as the second most important problem for Europe (45.0%) and poverty as the first (64.0%) increased in 2013 to 58.0% and 76.0% respectively (European Commission, 2013).

In Greece, which is undergoing a period of economic decline, it was found that nine out of ten citizens (87.0%) consider the climate change to be a very important problem; a higher rate than the average of all European countries. When compared to other major problems, Greek people consider poverty to be the main problem of Greece, while climate change is in fourth place (48.0%) (European Commission, 2015).

In order to raise the levels of concern among citizens regarding climate change, so as to address the problem and ensure the citizens' participation in relevant actions and their adaptation to the new changes, several states have tried to carry out action plans on a national and local level, which, however, have not led to substantial results. Finland, the United Kingdom, and Italy were some of the first countries that published strategic adjustment plans regarding the impact of climate change, while other European countries also developed similar successful programmes and applied strategic adjustment policies aiming at the adoption of relevant measures. Some of the latter involved adjustments in forest management due to climate change were addressed at the forest owners of Portugal, Germany and Sweden (Blennow et al., 2012). In the USA, strategic adjustment policies were used to study the level of concern among farmers regarding the effects of climate change (Arbuckle et al., 2014) and how to minimize the irrigation of agricultural land by farmers, through programmes implemented by the Ministry of Agriculture using alternative forms of new technology irrigation systems in order to reduce soil and drought vulnerability (Carrico et al., 2015). Moreover, although certain actions were carried out in Brazil, mainly to mitigate gas emissions, the government's intervention was insufficient and there is limited capacity to adjust to the climate change (Martins and Ferreira, 2011). In addition, in California (USA), the government has extensively focused on the exchange of information, impact assessment and programming issues (Davis and Chornesky, 2014). At the same time, certain cities in Germany and the United Kingdom developed action plans involving strategies mainly related to the energy sector, but these were abandoned due to financial constraints (Bulkeley and Kern, 2004). The same situation was observed in Greece, where the national strategy for adjustment to climate change (2016) was delayed due to the economic decline.

In such cases however, according to Gillard et al., (2016), decision-makers will need to overcome any constraining factors and turn to other stakeholders offering alternative means of impact and innovation, as well as opportunities for effective action. Moreover, apart from the interaction between economic and social values, the moral question regarding the rights of future generations and the responsibilities of today's generations has not yet been resolved either (Howarth and Norgaard, 1992). On the contrary, there are disputes with regards to nature, environmental ethics and the importance of the actual needs that arise (Morrow, 2015). This is obviously due, on the one hand, to the unforeseen economic impact of the climate change and the complex issue of the inherent element of uncertainty involved (Kang and Banga, 2013) and, on the other hand, to the fact that future provisions are

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