

Article

# Climate Change and Social Perception: A Case Study in Southern Italy

Loredana Antronico <sup>1,\*</sup>, Roberto Coscarelli <sup>1</sup>, Francesco De Pascale <sup>1</sup> and Dante Di Matteo <sup>2</sup>

<sup>1</sup> Research Institute for Geo-Hydrological Protection, Italian National Research Council, 87036 Rende, CS, Italy; roberto.coscarelli@irpi.cnr.it (R.C.); francesco.depascale@irpi.cnr.it (F.D.P.)

<sup>2</sup> Department of Architecture and Urban Studies, Polytechnic of Milan, 20133 Milan, Italy; dante.dimatteo@polimi.it

\* Correspondence: loredana.antronico@irpi.cnr.it

Received: 9 July 2020; Accepted: 24 August 2020; Published: 27 August 2020

**Abstract:** The consequences of climate change can involve various ambits and be very severe. For this reason, the social perception of climate change is a fundamental issue since it can influence the decisions of the policymakers, by encouraging or discouraging political, economic and social actions. In this paper, a sample of 300 interviews, collected through a standardized questionnaire and carried out among two municipalities located in southern Italy, was exploited to investigate the perception of climate change. Specific issues, regarding perceptions about climate change, concerns about its impacts, level of information, behavior and actions, exposure to extreme natural events and trust, were addressed to give answers to the research questions: (i) Is climate change perceived by the population? (ii) What is the degree of the community resilience to extreme natural events and climate change? As the main findings, this survey highlighted that the spatio-temporal dimension affects population perception, suggesting that some issues, such as correct behavior towards the geosphere, the sustainability of anthropization processes, community resilience and disaster risk reduction policies, can be very central and useful to mitigate the effects of climate change in population and society. Moreover, climate change perception varies in relation to contextual factors, including media communication, socio-demographic characteristics of respondents, knowledge and education, economic and institutional factors, personal values and, finally, psychological factors and experience.

**Keywords:** climate change; social perception; resilience; Calabria (Italy)

---

## 1. Introduction

Climate change represents a great challenge for these times. The impacts of the climate tendencies can be severe in several aspects: health, agriculture, water availability, etc. One of the consequences of climate change is an increase in the occurrence of extreme events with several impacts. As an example, temperature, winter freezes and heat waves can affect the safety of communities, causing serious health problems to people and huge damages to various economic sectors, such as agriculture and energy (e.g., in [1,2]). The tendencies in rainfall patterns can cause an increase in the occurrence of drought events, severe storms and floods, with consequences on agriculture, water resources and exposure to geo-hydrological risk with damages to population and properties.

Climate change represents a necessarily interdisciplinary topic in which the traditional approach of the physical sciences can be usefully integrated with the contribution of the social sciences. Indeed, the main cause of climate change is the series of energy production and consumption actions implemented by humans. The conditions that led to it and with which the issue will have to be addressed in the near future are contained in the socio-economic structures and value systems of

individuals and communities [3]. Therefore, the response to climate change requires social, political and cultural, as well as scientific, approaches [4].

Starting from this framework, the social perception of climate change is fundamental for two important reasons: first, indirectly, because it constitutes a key component of the socio-political context within which policymakers exercise their decisions. Public opinion has the power to incentivize or disadvantage political, economic and social actions aimed at tackling the problem posed by climate change. This is in line with the position of those who argue that it is public opinion—and not the evidence brought by the scientific community—that ultimately pushes governments to take actions [5]. The second reason is more direct: the process of mitigation and adaptation to climate change requires the transformation of the behaviors of millions of individuals, who each day make individual and collective choices that have a huge impact on the amount of greenhouse gas emissions and, therefore, potentially on the planet's climate balance. Both dimensions arise in a circular relationship whereby greater public attention and awareness favors the activation of policies that, in turn, lead to greater awareness of the public and the encouragement of virtuous behavior. This process must, therefore, be triggered at all levels from both a top-down and a bottom-up perspective. With this aim, it is necessary to know the forms and contents of the current public perception of the phenomenon and be aware of the most effective communicative strategies [4].

Perception is a totally subjective assessment of a concept or sensation, influenced by whatever interests us: our being, the influence received during our personal growth, the environment in which our perception develops, etc. For this reason, the perception of a possible hazard varies from person to person, and this also explains why the victims of a disaster often provide different accounts of the same event [6]. Perceptions, feelings or beliefs shaped by socioeconomic, political and cultural factors can support or prevent the adoption of a specific behavior [7]. Risk awareness is the raising of understanding within the population of what risks exist, their potential impacts, and how they are managed [8]. Increased awareness can increase levels of worry, but this may then have a positive effect on the level of preparation. Improved preparation, in turn, reduces worry. Over a longer time scale, this may reduce awareness [9]. The personal level of information is fundamental because comprehensive information on all the dimensions of disaster risk, including hazards, exposure, vulnerability and capacity, related to persons, communities, organizations and countries and their assets, increases the preparedness and, consequently, the ability to face an extreme phenomenon. Trust is about the level of confidence actors have that they will get the input needed to perform their tasks from each other actor they are dependent on [10]. Trust in political institutions is, however, fundamental for planning communication strategies [6]. The effectiveness of communication lies in the trust in the communicator [11], because a passive communication system can also be ignored by citizens [12], thus becoming less effective than an active communication system.

This study investigates the perception of climate change among the populations of two municipalities located along the Tyrrhenian side of Calabria (southern Italy). The local perception analysis of climate change consequences, assessed by means of the application of a methodology based on standardized interviews, represents a novelty for Calabria. Moreover, this specific topic, generally, still occupies a marginal position, reduced to a few case studies in the literature in Italy. In particular, in this study we consider the following two general objectives to be investigated, that represent the research questions of the survey: (i) Is climate change perceived by the population? (ii) What is the degree of the community resilience to extreme natural events and climate change? These research questions receive answers by addressing the following specific issues: (1) perception and awareness about climate change; (2) concern about impacts and effects of climate change; (3) perception of the personal level of general information about climate change based on the principal sources for each citizen (television, digital media, journals, experts, etc.); (4) personal actions and behavior taken to fight climate change; (5) perception of exposure to extreme natural events; (6) behavior if an extreme event occurs; (7) trust in actions taken by local, national and global policymakers.

## 2. Climate Change Perception: The Reference Framework

The studies carried out so far on the perception of climate change present a series of paradoxes that help to explain the difficulty of the public in facing the challenge posed by climate change. Firstly, awareness of the existence of the phenomenon is growing [13]. According to a study by the European Commission [14], European respondents consider, as the most serious problems, those of “poverty, the lack of food and drinking water”, and the “global warming/climate change”. Many large-scale public surveys have shown that climate change has been consistently perceived as a “very serious” problem in the UK, France, Australia and most continental European countries (e.g., in [15–19]). Globally, climate change is generally perceived as a much greater risk in most developing countries [20–23]. The European Investment Bank [24] launched a large-scale survey across Europe, China and the USA. The goal of the survey was to explore the citizens’ perception about the extent of climate change. For Europeans (47%) and the Chinese (73%), climate change is the biggest challenge. Americans worry more about access to health services (45% against 39% who consider climate change as the biggest challenge).

Other studies indicate growing skepticism in the late 2000s in some developed countries, fueled by economic and socio-political factors. However, in many other countries worldwide, concern about climate change has been growing in recent years [25]. National surveys conducted in the Czech Republic in 2006 and 2007 showed that climate change was rated as a “very” or “fairly” serious global problem by 84% of the population; in 2011 this value had dropped to 64% and in 2013 to 61%. As regards Germany, other representative and quantitative surveys showed a relative decline in awareness of climate change, while in 2007 the 69% of German respondents defined climate change as one of the five environmental problems with which they were most concerned. In 2011 the percentage dropped significantly to 40% [26–28].

However, this is counterbalanced by a reduced understanding of its causes and possible solutions [29]. In particular, it is important for the study of public understanding of climate change [30], the integration in the social sciences between quantitative and qualitative methods [17]. American citizens, according to the GlobeScan survey [31], at a percentage of 77%, believe that human activities have contributed to recent climate change.

In research conducted by DEFRA [32] and Bostrom et al. [33], in which categories of answers were provided, most of the respondents were able to correctly identify the causes of climate change in terms of carbon dioxide emissions and deforestation. In other qualitative research with open-ended questions, Norton and Leaman [34] found that only 30% of British citizens indicated carbon dioxide emissions as the causes of climate change. In the case of the research by Read et al. [35], only 18% of respondents cite the use of fossil fuels as a determinant of climate change. Considering, therefore, the studies on the perception of climate change, it emerges—from the public opinion—that there is an absence of opposition towards initiatives whose impact on the current lifestyle is not perceived to be relevant [15]. Lorenzoni et al. [36], starting from a series of studies carried out over the years, identify barriers perceived in the face of active commitment to climate change: lack of knowledge, uncertainty and skepticism, distrust of information sources, outsourcing of responsibilities and faults, climate change understood as a distant threat, priority to other dangers, reluctance to change own lifestyle, fatalism and feeling of powerlessness for the whole scale of the problem. Moreover, at local, national and international levels, there is an absence of trust in the responsibility taken by governments and local policymakers and in the significance of their actions.

Considering the most frequent associations with climate change, as showed by Bostrom and Fischhoff [37], which will be later highlighted by our study, the main significant link is with the melting of glaciers. Even in the survey promoted by the European Investment Bank [24], European citizens consider the melting of glaciers as the first climate change sign. According to Riva [4], this relationship allows for two orders of reflection. In the first place, climate change is invisible to our eyes and everything we know about this phenomenon passes through the media rather than political or scientific communication. According to the scholar, the image of melting ice occupies an important position because, since it is not possible to see and directly understand the reality of this change, the effects are imagined by deducing and associating the presence of heat to the evidence of melting ice

[4]. The second reflection, however, concerns the geographical location of the image. In fact, the melting of the glaciers concerns a spatial dimension far from the contexts and the daily life experience of the people interviewed. Therefore, climate change could still be perceived as a phenomenon distant in time and space, far from people's direct life experience [4]. In the survey carried out by the European Investment Bank [24], Chinese citizens consider air pollution as the first climate change sign, while American citizens consider rising temperatures as the first sign associated with the climate change. As described later in our study, the rising temperatures are considered by the respondents in second place as a phenomenon associated with climate change, after the melting of glaciers.

Other recent studies highlight the relationship between climate change and resilience. Iturriza et al. [38,39] present two studies to develop climate change awareness in the urban context; in the first study, the authors proposed a framework as a result of a systematic literature review and a co-creation process with the participation of a group of stakeholders through a focus group and a Delphi study. The framework concludes with the establishment of the responsibilities of each stakeholder, by defining the policies they should implement, and the effect one policy might cause on other stakeholders and among policies. As we will see in our study, citizens and stakeholders must be involved in decision-making processes to jointly implement disaster risk reduction strategies for a community-based approach also aimed at increasing trust in political institutions and favoring incisive territorial planning and resilience processes. In the second study the authors present a triangulation approach composed by a systematic literature review, semi-structured interviews and case study results with the framework that defines the ideal process for developing awareness in urban areas. The resulting framework includes three main elements: awareness-development mechanisms (experience, attention and knowledge), awareness-development over time graphs and a learning ladder. Additionally, in our study, the development of awareness and learning also play a fundamental role in understanding a complex and problematic phenomenon, such as climate change. It requires a holistic approach, including the contribution of humanists and social scientists, which should dialogue with stakeholders, planners and policy makers to identify proposals for a sustainable, cultural and ecological regeneration of the territory. Even the experience of local communities with extreme natural phenomena influences the perception of climate change, as also emerges from our study. The same problems related to climate change knowledge and adapting arise with the study of Saxena et al. [40] which, using the case of Caribbean small island developing states, qualitatively analyzes in-depth interviews with 35 climate change donors and project implementers. The authors found that most actors were aware of the 2 and 1.5 °C targets of the 2015 Paris Climate Agreement [41], but all were pessimistic about their achievements. Project implementers do not identify the ways by which these targets should be inserted into their adaptation projects. Moreover, there is no uniform understanding of concepts of "resilience" and "transformation". Ruiz et al. [42] presented a study which quantified the relative strength of drivers of climate change perception, taking into account differences in the social, political, geographical, economic and educational identities of each considered community. The authors also analyzed the interactions among drivers, identifying, in this way, indirect influence pathways. The authors found that perception is directly influenced by the share of cultural factors and by the physical experience of weather change. Indirect influences are related to the level of community development, to its level of social interaction and to the spread of climate change information. Elshirbiny and Abrahamse [43] provided a new approach based on two mixed methods (an online survey and semi-structured interviews) to examine climate change risk perceptions in a sample of the Egyptian population. Experiential factors were identified as the strongest predictors of climate change risk perception, while socio-cultural factors the weakest predictors. In our study we also analyzed how these factors (socio-cultural, experiential, political, geographical, economic and educational), mentioned in the last two cited works, influence the perception of the interviewed population.

Lee et al. [44] proposed a narrative synthesis of the studies about youth perceptions of climate change, including research from 1993 to 2018. The analysis dealt with reported belief and concerns about climate change and perceptions of its causes and consequences, proposing viable solutions to climate change and notions of responsibility for implementing these. In our study, we also tried to

capture the differences in perceptions between young and old people to verify what the level of awareness of the phenomenon was, and by which elements it was conditioned.

In Italy there are few current studies on the perception of climate change. Marincioni [6] pays particular attention to the perception of climate hazards and adaptation processes of such communities, highlighting similarities and differences related to geographical location. The results show a significant improvement in flood resilience for those communities involved in public meetings, exercises and other participatory processes. The study constitutes a strong theoretical basis useful for extending the analysis to other territories, providing the elements for a better management of climate risk in Italy. Sabato [45] carries out a didactic experimentation on the perception of climate change in adolescents in a Sicilian school. Bonati and Tononi [46] are editing a volume on the relationship between climate change and risk in the field of geographical education. De Paula Baer et al. [47] propose a study to validate a questionnaire to measure the knowledge of Italians on climate change and its consequences. Nguyen et al. [48], through qualitative and quantitative empirical research methods, carried out on a case study based upon four Mediterranean farming systems located in Oristano, to try to understand the relationship between farmers' perceptions of climate change (i.e., increased temperature and decreased precipitation) and of present and future water availability for agriculture, as forecasted by climatic and crop models. The authors also explore asymmetries between farmers' perceptions and present and future climate change and water scenarios as well as factors influencing perceptions. Finally, in the context of water management in agriculture, another study carried out by Vollaro et al. [49] empirically analyses the social perception of climate change and the social acceptability of potential policy reforms of water management in Italy. The results show the respondents' awareness of climate change events and a common consensus on the need to improve efficiency in water management.

These studies have several aspects in common with this study, and it is worth highlighting that community resilience and social vulnerability to climate change are two concepts closely linked to the study of social perception. In fact, investigating and understanding public perception, the collective imagination and the awareness of a community are necessary steps to promote strategies useful to enhance community resilience and decrease social vulnerability. In this context, disasters are processes that arise from the intersection between nature and society. According to UNDRR [50], disasters result when a natural or human-induced hazard affects a human settlement which is not appropriately resourced or organized to withstand the impact, and whose population is vulnerable because of poverty, exclusion, or social disadvantage.

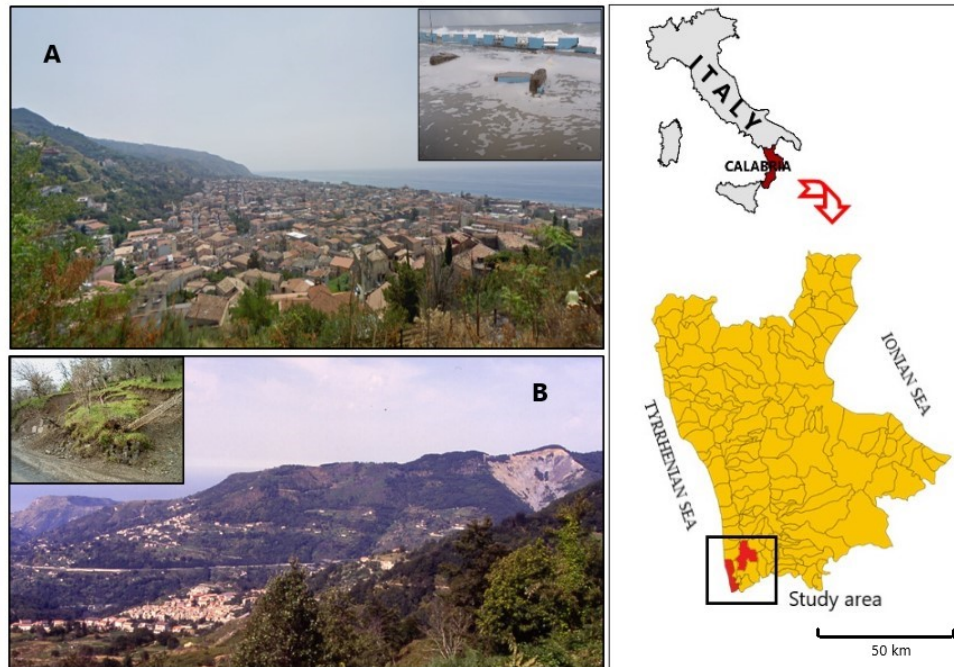
### 3. Methods

#### 3.1. The Study Area

The present survey was carried out in Calabria (southern Italy) as a part of a Research Project funded under the Agreement on Scientific Cooperation between the National Research Council of Italy (CNR) and the University of Malta (UoM)—Biennial Programme 2018/2019. The Project focused on the risk perception and social vulnerability of population living in coastal areas subject to climate change in Malta and Calabria. These two Mediterranean regions show different geomorphological and climatic settings; however, although they have different exposure levels, they are both affected by extreme physical phenomena and climate change.

In Calabria, the study area consists of the municipalities of Amantea and Lago (Cosenza province) with a total population of about 16,600 inhabitants (2019, Italian Census). The selected municipalities are located along the Tyrrhenian side of Calabria (Figure 1). The territory of the Amantea municipality, which develops from the coastline up to 420 m of elevation, is characterized by a hilly morphology. The coastal plain, as the whole Tyrrhenian side, is frequently hit by severe erosion phenomena on the beach, caused by both heavy storm surges and a decrease in the solid material carried down by the rivers [51,52]. In particular, in December 2019, following severe weather events, the Amantea coastal plain was affected by storm surges with consequent flooding and coastal erosion that threatened the population and caused damage to buildings and infrastructures (Figure

1A). The municipal area of Lago ranges from 142 m above sea level to 1155 m of elevation and it is mainly characterized by a mountain morphology and by a high frequency of both superficial and deep landslide phenomena of different types, shown in Figure 1B [53,54]. In the map of the seismic classification of Italian territory, the municipalities of Amantea and Lago fall into Zone 1—that is the most dangerous area, where major earthquakes may occur [55].



**Figure 1.** Location of the study area. (A) Amantea municipality; the photo shows coastline erosion due to the action of waves during the 2019 event. (B) Lago municipality; the photo shows a road partially obstructed by a landslide.

From a climatological point of view, Calabria is a region characterized by a typical subtropical Mediterranean climate. Given its position within the Mediterranean basin and its orography, strong contrasts are present between the two sea sides (Tyrrhenian and Ionian) of the region. The Tyrrhenian side, where the two study areas (Lago and Amantea) are located, is often subject air currents coming from the West, which cause mild winters and hot and dry summers, but also considerable orographic precipitation [56], especially in the areas at sea level, such as the territory of Amantea. The inner areas of the Tyrrhenian side, such as in the Lago territory, are characterized by colder winters, sometimes snowy, and fresher summers with some precipitation. The trend analysis carried out for the whole region [57] has shown for the territory, which includes the two study areas, a decreasing trend of rainfall on a yearly scale and opposite behaviors on monthly scale—negative in winter months and positive in summer months. Regarding temperature, regional studies on the series of Calabria did not show significant and uniform trends in maximum temperature data [58].

### 3.2. Survey Method and Statistical Analysis

This study employed a standardized questionnaire consisting of 33 close-ended questions (yes/no, multiple-choice, five-point scale), divided into three sections. The first section included socio-demographic information of the participants, their gender, age, municipality of origin, employment status and education. Because the questionnaire was part of a larger study that focused on risk perception and social vulnerability of population in coastal areas subject to climate change, this section contained additional questions about some social characteristics that may make people in general more vulnerable. The socio-demographic information comprised the presence of family members under 14 and over 65 years old, the presence of family members not functionally

independent, place of living (urban/rural), year of construction and type of dwelling, time taken to reach the work/study place and social problems present in the community where respondents live. Under the scope of this study, only the socio-demographic variables, such as respondent gender, age, education, occupation and place of living were taken into account for the analysis. The second section of the questionnaire contained thirteen questions aimed at measuring the respondents' perceptions of climate change. This section included questions about: (i) perception and awareness about climate change; (ii) level of information about this phenomenon; (iii) personal actions taken to fight climate change and opinion about actions taken by national and international governments; (iv) perceived concern about impacts and effects of climate change. Although most people today have at least heard of climate change, we found it useful to include in this second section, before the questions, a simple and clear description of the phenomenon. The third section of the questionnaire encompasses five questions probing the participants' resilience to extreme natural events. This section explores: (i) perception of exposure to extreme natural events and related damages of respondent in the territory where they live; (ii) their behavior and reaction if involved by an extreme natural event; (iii) trust in the local government's capacity. Table 1 shows an overview of the survey together with the previous studies in which the research questions have been already addressed.

**Table 1.** Overview of the survey.

Research Questions	Specific Issues	Example Studies
Is the climate change perceived by the population?	Perception and awareness about climate change	[22,37,59]
	Concern about impacts and effects of climate change	[37,59]
	Perception of the personal level of general information about climate change based on the principal sources for each citizen (television, digital media, journals, experts, etc.)	[22,36]
	Personal action and behavior taken to fight climate change	[37,59]
What is the degree of the community resilience to extreme natural events and climate change?	Perception of exposure to extreme natural events	[60,61]
	Behaviour if an extreme event occurs	[62,63]
	Trust in actions taken by local, national and global policy makers	[60,61]

In September 2019, the questionnaire was submitted to 300 citizens, of which 100 were inhabitants of Lago and 200 inhabitants of Amantea. The method for selecting participants was non-proportional quota sampling (based on gender and age). The interviews were conducted face-to-face and, as far as the data capture is concerned, the CAPI (Computer Assisted Personal Interview) technique was used. Prior to the start of the interview, participants were informed about the scientific purposes of the questionnaire and reassured that their identities were reserved. All participants gave their voluntary and informed consent before the interviews.

A statistical analysis was carried out to individuate the baseline linkages between the social and demographic features of the population (first section) and the perceived climate change (second section), as well as the relationships between the same anthropological features with the resilience capacity of individuals towards extreme natural events (third section), as comes out by the sections of the questionnaire. The method of correlation was considered as preferable to reach these goals. In particular, the principle individuated by Spearman [64], in which derivation originates from the Pearson's general correlation, as follows, was used to correlate the data:

$$r = \frac{S_{xy}}{\sqrt{S_x^2 \times S_y^2}} \quad (1)$$

where  $r$  is the required correlation between a certain pair of features for which the intensity of the linkage is to be found (levels of significance),  $x$  and  $y$  are the deviation of any pair of characteristics from their mean and  $S_{xy}$  is their sum;  $S_{x^2}$  and  $S_{y^2}$  are the sum of the squares of all the values of  $x$  and  $y$ . Given the features of the collected data, which are presented in the shape of rank (dichotomous or categorical), the (1) can be rewritten in the following form to take into account certain features that are not purely quantitatively comparable:

$$r = \frac{\frac{1}{n} \sum_{i=1}^n ((R(x_i) - \overline{R(x)}) \times (R(y_i) - \overline{R(y)}))}{\sqrt{(\frac{1}{n} \sum_{i=1}^n (R(x_i) - \overline{R(x)})^2) \times (\frac{1}{n} \sum_{i=1}^n (R(y_i) - \overline{R(y)})^2)}} \quad (2)$$

where  $R(x)$  and  $R(y)$  are the ranks and  $\overline{R(x)}$  and  $\overline{R(y)}$  are the mean values of the ranks [65]. The use of the Spearman correlation adjusted for the rank variables allowed us to control for the not directly comparable parameters (for instance, certain perceptions about natural events expressed on a Likert scale of evaluation are not directly linkable to the employment status or the age class, but they need smoothing) and this increases the goodness of fit of the coefficients. Moreover, a non-parametric and non-linear approach, such as the Spearman's rank correlation, is regarded as preferable because it is also suited for case studies that consider different administrative territories as part of the same correlation analysis [66]. The results reported in the following sections only consider those coefficients that are above the 95% of statistical significance ( $p < 0.05$ ).

## 4. Results

### 4.1. Characterization of the Sample

A total of 300 respondents took part in this study. Table 2 shows the socio-demographic characteristics of the total sample. For the results presentation, the answers, including a 5-point scale, from 1 (min) to 5 (max), were grouped into three categories (1 + 2 = low; 3 = medium; 4 + 5 = high).

**Table 2.** Socio-demographic characteristic of the respondents ( $n = 300$ ).

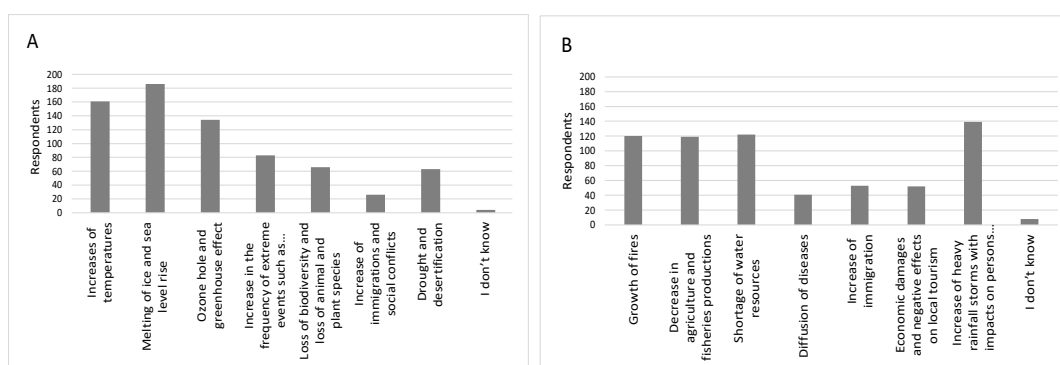
Socio-Demographic Characteristic	Percentage (%)
Gender	
Female	52
Male	48
Age class	
18–39	31
40–59	34
>60	35
Education	
No title	1
Primary school	3
Middle school	15
High school	49
Higher education	32
Occupation	
Unemployed	11
Student	7
Retired	22
Homemakers	7
Employee	40
Business owner/freelance	13



## 4.2. Social Perception of Climate Change

### 4.2.1. Perception and Awareness of Climate Change

Respondents' awareness of climate change was explored by asking "Do you believe that climate change is in effect globally?". In total, 94% of the sample answered "yes", while only 4% answered "I don't know" and 2% "no". With the aim to investigate the aspects related to knowledge about climate change, the respondents were invited to give their opinion on the main cause of this phenomenon. More than half of the respondents (59%) thought that climate change is caused by the excessive use of fossil fuels and air pollution; then they indicated deforestation (33%), I don't know (4%), none of these (3%) and livestock farming (1%). Two multiple-choice questions focused on which phenomena, in their opinion, were associated to climate change on both global and local scales (Figure 2). As regards the global phenomena, the most frequent answer was "melting of ice and sea level rise" (186 answers) followed by "increases of temperatures" (161 answers), "ozone hole and greenhouse effect" (134 answers), "increase in the frequency of extreme events such as hurricanes, tropical storms, floods, heat and cold waves" (83), "loss of biodiversity and loss of animal and plant species" (66), "drought and desertification" (63) and "increase of immigrations and social conflicts" (26). The results of the Spearman's correlation show positive linkages between the age range 18–39 years and the answers "melting of ice and sea level rise" ( $r = 0.1334$ ) and "loss of biodiversity and loss of animal and plant species" ( $r = 0.1354$ ), while for the answer "increase of immigrations and social conflicts" a positive correlation was in both the age ranges 40–49 and more than 60 ( $r = 0.1241$ , for each of the age range). Regarding the same question, it must be highlighted that the phenomena of "drought and desertification" were mostly perceived by those who lived in "rural areas" ( $r = 0.2546$ ). As concerns the local phenomena, the most frequent answer was "increase of heavy rainfall storms with impacts on persons and properties" (139 answers) followed by "shortage of water resources" (122 answers), "growth of fires" (120), "decrease in agriculture and fisheries productions" (119), "increase of immigration" (53), "economic damages and negative effects on local tourism" (52) and "diffusion of diseases" (41). Women associated the "shortage of water resources" with climate change ( $r = 0.1218$ ), while respondents aged 40–59 and over 60 years, housewives and those with low levels of education (secondary school) associated climate change with the local phenomenon of "diffusion of diseases" ( $r = 0.1588$ ;  $r = 0.1271$  and  $r = 0.1368$ , respectively).

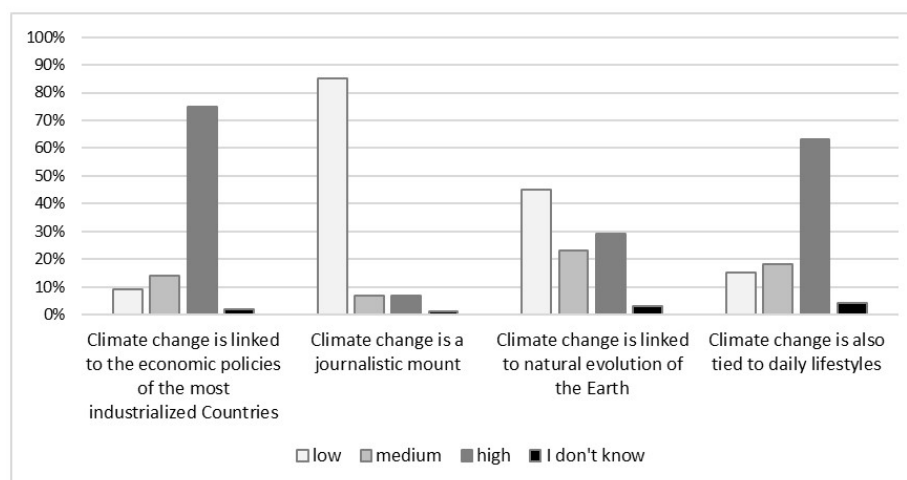


**Figure 2.** Questions focused on which phenomena, in respondents' opinions, are associated with climate change on both global (A) and local (B) scales.

### 4.2.2. Level of Information on Climate Change, Personal Actions taken to Fight Climate Change

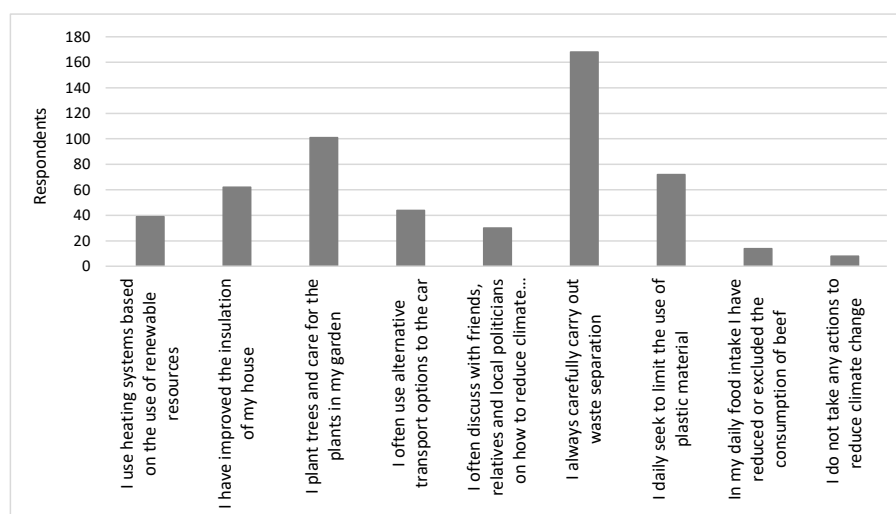
In order to analyze the level of information on climate change, we firstly asked respondents if they themselves felt informed about it. About 44% felt fairly informed about climate change, while 38% felt uninformed. Regarding the multiple-choice question concerning the sources from which they obtained climate change-related information, the most frequent answers were "TV" (232 answers) and "internet and social network" (184). Besides, the participants also found relevant information in "newspapers, books, magazines" (125 answers) followed by "relatives and friends"

(40), and “university and experts” (28). As regards the respondents’ occupational statuses, the results show a positive correlation between “student” and “the use of the internet and social network” ( $r = 0.1374$ ) as well as “university and experts” ( $r = 0.1814$ ) as sources of information on climate change. Conversely, there is a negative correlation between retirees and the sources “internet and social network” and “university and experts” ( $r = -0.2470$  and  $r = -0.1409$ , respectively) as they mostly receive information from “TV” ( $r = 0.1301$ ). Respondents with low levels of education (primary school) catch information by “relatives and friends” ( $r = 0.2003$ ), while respondents with higher education (tertiary level) are more inclined to “use internet and social networks” ( $r = 0.1391$ ), “newspapers, books, magazines” ( $r = 0.1241$ ), and to receive information from “university and experts” ( $r = 0.1457$ ). The respondents were invited to give their opinions (personal judgment) on a number of statements linked to the problem of climate change on a 5-level scale merged into three categories (low, medium, high; Figure 3). Around 75% of respondents considered the statement that “climate changes are linked to the economic policies of the most industrialized Countries” very true, while 85% considered the statement that “climate change is a journalistic mount” with low reliability. Regarding the assertion “climate change is linked to natural evolution of the Earth”, 45% of respondents considered this statement wrong, while 63% thought that “climate change is also tied to daily lifestyles”. The assertion that “climate change is linked to natural evolution of the Earth” is positively correlated with lower educated respondents (primary school) ( $r = 0.1788$ ) and negatively correlated to those with higher education (tertiary level) ( $r = -0.1485$ ). The assertion that “climate change is a journalistic mount” was negatively correlated to the youngest group of respondents (age range 18–39 years) ( $r = -0.1202$ ) and with higher educated individuals ( $r = -0.1115$ ).



**Figure 3.** Opinion (personal judgment) of the respondents on a number of statements linked to the problem of climate change.

In relation to public opinion over the activities of the national and international governments to tackle climate change [22], the majority of respondents (68%) thought that national and international political actions to face this problem are insufficient. According to 19% of respondents, political actions are taking place, while 13% had no opinion on this matter. We asked respondents to indicate at least two common actions taken by them (or by their family members) to face climate change (Figure 4).



**Figure 4.** Common actions taken by respondents or by their family members to face climate change.

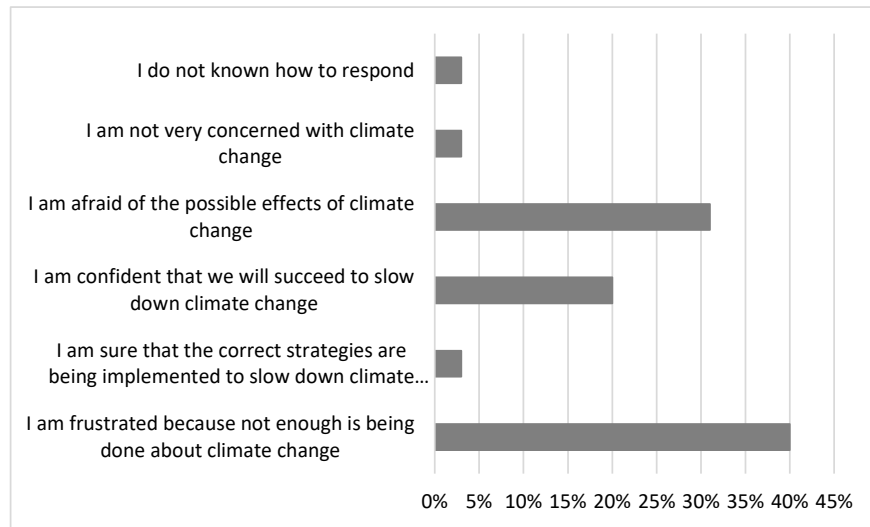
Among the most common actions made by the respondents were “I always carefully carry out waste separation” (168), “I plant trees and care for the plants in my garden” (101), “I daily seek to limit the use of plastic material” (72), followed by “I have improved the insulation of my house” (62), “I often use alternative transport options to the car” (44) and “I often discuss with friends, relatives and local politicians on how to reduce climate change” (30). Only eight people declared they were not acting to face climate change. In terms of respondents’ ages, the highest willingness to carry out waste separation was found among people aged 40–59 and more than 60 ( $r = 0.1377$ , for each range), while respondents aged 18–39 were those who most often using alternative transport options to the car ( $r = 0.1330$ ). The answer option “I daily seek to limit the use of plastic material” was (positively) correlated with respondents holding a post-secondary education ( $r = 0.1218$ ), while the statement “I often talk with friends, relatives and local politicians on how to reduce climate change” was positively correlated with the higher educated respondents ( $r = 0.1259$ ). The respondents who were “unemployed” and with “no title” were those who did not take action to face climate change ( $r = 0.1366$  and  $r = 0.1913$ , respectively).

Respondents who thought that national and international governments are not doing enough to fight climate change were generally more inclined to use heating systems based on renewable sources to face climate change ( $r = 0.1715$ ).

#### 4.2.3. Concern about Impacts and Effects of Climate Change and Psychological Attitudes towards Climate Change

The most common answers to the multiple-choice question “You are mainly concerned about the impacts of climate change on ...” were “population of all over the world” and “nature and environment”, with 171 answers for each of the two options, followed by “myself, my family and the community where I live” (103 answers) and “my nation: Italy” (35). Differences in concern about the impacts of climate change were observed over the sample. The group of respondents aged 18–39 years and the respondents living in rural areas were most concerned with the impacts of climate change on nature and environment ( $r = 0.1834$  and  $r = 0.2256$ , respectively). Individuals with higher education (tertiary) were concerned about the population of the world ( $r = 0.1254$ ). We asked respondents when, in their opinion, the effects of climate change both globally and locally will begin to become evident. A large part of respondents (70%) thought that the effects of climate change were already happening, while for 18% the effects will be evident in next 50 years. For only 5%, after the next 50 years. Individuals in the age range 18–39 ( $r = 0.1357$ ) and those with post-secondary school level ( $r = 0.1281$ ) were more inclined to think that the effects of climate change are already happening.

In order to analyze some psychological attitudes (fear, trust, frustration) towards climate change, respondents were asked to give their opinions on a series of statements (Figure 5).



**Figure 5.** Questions about psychological attitudes (fear, trust, frustration) of the respondents towards climate change.

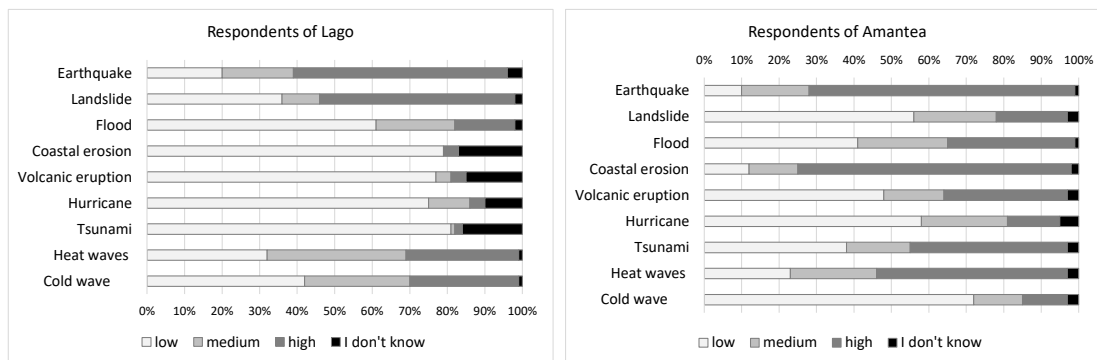
In total, 40% of respondents agreed with the statement “I am frustrated because not enough is being done about climate change” and 31% of them with the statement “I am afraid of the possible effects of climate change”. Only 20% agreed with the statement “I am confident that we will succeed to slow down climate change”. Respondents aged 18–39 ( $r = 0.1638$ ) and those with tertiary education ( $r = 0.1530$ ) were more afraid of the possible effects of climate change, unlike retirees who are less afraid of the possible effects ( $r = -0.1601$ ). Respondents with post-secondary school level were more frustrated because they thought that not enough is being done to face climate change ( $r = 0.1239$ ).

The latter are, not surprisingly, more prone to think that national and international governments are not doing enough to fight climate change ( $r = 0.1906$ ) than those who are confident that climate change will slow down ( $r = -0.1532$ ).

### 4.3. Community Resilience to Extreme Natural Events

#### 4.3.1. Perception of Exposure to Extreme Natural Events and Related Damages

Figure 6 shows the answers to the question “How do you think you are personally exposed to each of these events in the territory where you live?” on a 5-level scale merged into three categories, separately for the two sub-samples of Lago and Amantea.



**Figure 6.** Questions that examine to what extent the respondents perceive the level of exposure to natural events.

As shown in Figure 6, the answers are not uniform between the two groups, with the exception regarding the exposure to earthquakes—indeed, 71% of Amantea’s respondents and 57% of Lago’s respondents perceived the level of exposure to earthquake as “high”. Lago’s citizens perceived higher exposure to landslides and heat waves than Amantea’s citizens, while those interviewed from Amantea perceived higher exposure to floods, coastal erosion, volcanic eruptions, hurricane, tsunami, and heat waves, compared to those interviewed from Lago.

Respondents were asked (by means of a multiple-choice question) to indicate the damage they fear most for each of the extreme events, as listed in the previous question, which could occur in their territory. For this question too, there was difference between the groups (Figure 7). The majority of Amantea’s respondents feared “physical injuries to myself or my family” and “property damage” as a consequence of extreme events, such as earthquakes, landslides, floods, coastal erosion, volcanic eruptions, hurricanes and tsunami. Otherwise, the respondents of Lago feared “physical injuries to myself or my family” and “property damage” as a consequence of earthquakes, landslides, floods, heat wave and cold wave, while a relatively high number of respondents answered “I don’t know” for coastal erosion, volcanic eruption, tsunami and hurricanes.

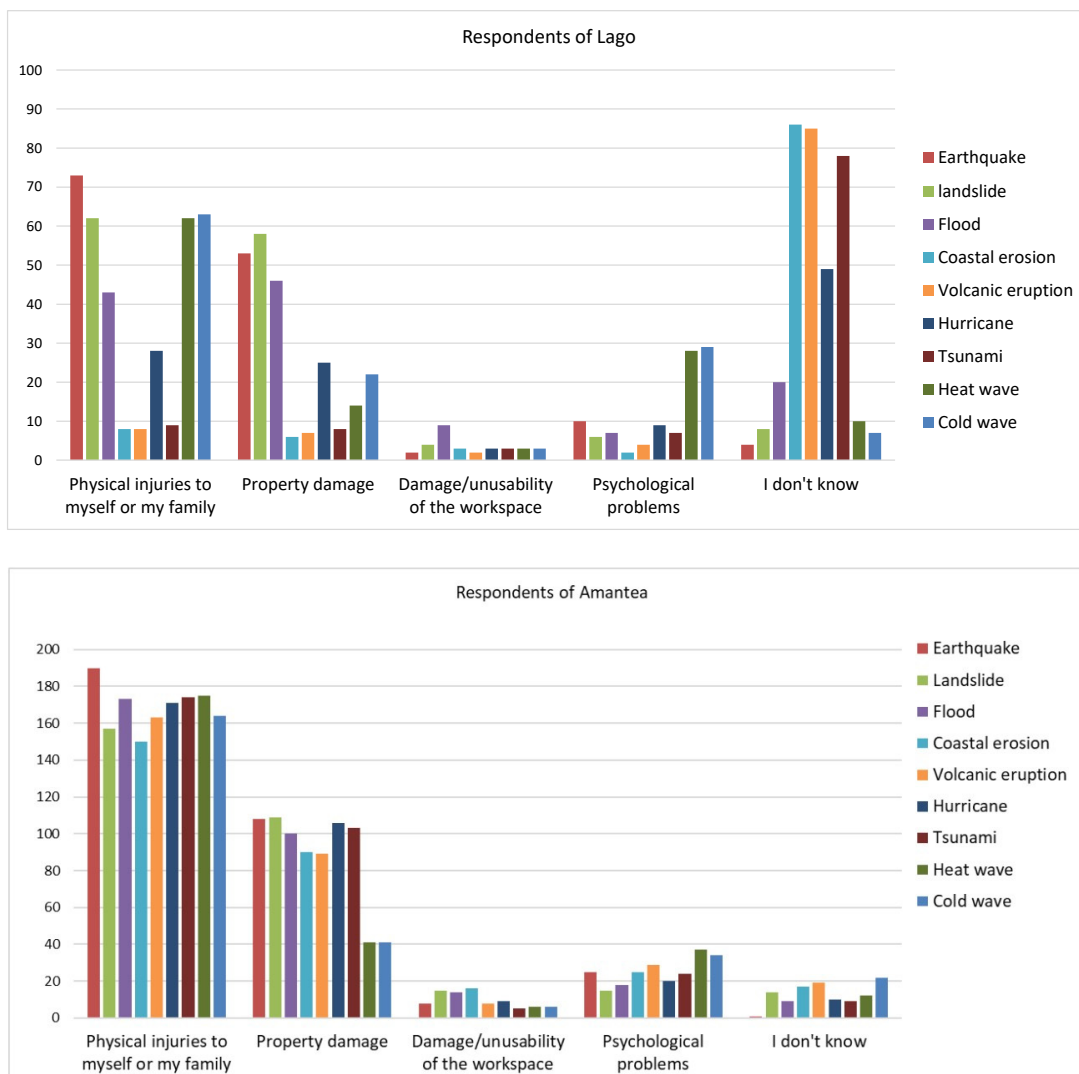


Figure 7. Damage that respondents fear most for each of the extreme events listed in Figure 6.

#### 4.3.2. Behavior if an Extreme Event Occurs

Respondents were asked to evaluate their behavior when an extreme event occurs in the territory they live in. Around 40% of respondents provided the answer “I try to get information about the situation through TV, social networks, internet, radio, neighbors, experts”, followed by “I trust in God” (19%), “I don’t know what I should do” (15%), “I know what I should do” (13%), “I do not know how to reply” (11%), and “I wait the intervention of the authorities” (3%). Women, housewives, and lower educated respondents (primary school) are more willing to rely on God if they are involved in an extreme natural event ( $r = 0.1210$ ;  $r = 0.1806$ ;  $r = 0.1157$ , respectively), while the respondents with no level of education are more inclined to not know what they should do ( $r = 0.1432$ ). As regards higher educated respondents (tertiary), coefficients show a positive correlation with the answer “I try to get information about the situation through TV, social networks, internet, radio, neighbors, experts” ( $r = 0.1242$ ) and a negative correlation with the answer “I trust in God” ( $r = -0.1666$ ).

The behavior “I don’t know what I should do”, in the case of an extreme event, is positively correlated to the answer “I do not take actions to reduce climate change” ( $r = 0.1593$ ), while for the behavior “I wait the intervention of the authorities” a positive correlation ( $r = 0.1517$ ) with the answer “I try to get information about the situation through TV, social networks, internet, radio, neighbors, experts” was detected. As for the multiple-choice question about respondents’ reactions in the case of an extreme event occurring in the territory they live in, the most frequent answer was “I help first my family and others who are in difficulty” (226 answers), followed by “I rush to find an escape route” (72), “I do not panic” (61) and “I panic” (23). As regards the respondents’ occupational statuses, there was a positive correlation between “students” that “do not panic” ( $r = 0.1241$ ) and between “retirees” that “help first their family and others who are in difficulty” ( $r = 0.1168$ ).

Respondents who “do not panic” were considerably more inclined to seek to limit the daily use of plastic material to face climate change ( $r = 0.1288$ ) and they are less willing to help family and others ( $r = -0.1433$ ). Moreover, respondents whose reactions were “I help first my family and others who are in difficulty” ( $r = 0.1692$ ) and “I do not panic” ( $r = 0.1226$ ) were more inclined “to try to get information about the situation through TV, social networks, internet, radio, neighbors and experts”. Contrariwise, those who “panic”, often also said that “they would not know what to do” ( $r = 0.1555$ ). Furthermore, there is a strong positive correlation between individuals who were unable to respond on the reaction that they might have if an extreme event should occur in their place of belonging and those who preferred to not respond about the behavior to be adopted ( $r = 0.3256$ ).

#### 4.3.3. Trust in Local Government Capacity

In order to explore the level of safety perceived by those interviewed, individuals were asked if they would trust the local government capacity to respond to a disaster caused by an extreme natural event. The data obtained show that more than a half of the respondents did not trust local government capacity (55%), while 22% trusted and 23% did not know. Women had more trust in local government capacity to face disasters caused by extreme natural events than men ( $r = 0.1525$ ).

Respondents who did not trust local government capacity if an extreme event should occur in the territory they live in were more inclined to think that national and international political actions to face climate change are insufficient ( $r = 0.1387$ ). Conversely, those who trusted local government capacity think that political actions are on track to face this problem ( $r = 0.1318$ ).

## 5. Discussion

### 5.1. Climate Change Perception

Natural and social scientists have been investigating for years how people perceive climate change, what aspects they know about this phenomenon and what they ignore, what dimensions frighten them and what the behavioral responses have to be to cope with it.

In this context, our study shows that respondents’ awareness of the existence of climate change, globally, is high. Various studies highlight how, in some countries, this climate change awareness

has not always been so high. For example, Leiserowitz [59] noted that there is a general tendency in the United States to underestimate climate change. This is because citizens, despite being aware of the problem, see it temporally distant, a long-term event and, therefore, unworthy of great concern. This type of attitude is well explored by Bubeck et al. [67] with the formulation of the “motivational hypothesis” theory— individuals implement measures to reduce their vulnerability only when they really feel exposed to a high risk [6].

As for the causes of climate change, the majority of citizens, in our study, indicated as the first cause the excessive use of fossil fuels and air pollution and, subsequently, deforestation. The population, therefore, has attributed the responsibility for the ongoing climate change to anthropic activities. This increase in the awareness of the importance of anthropogenic factors, as influential on current climate change, is probably due to the worldwide media effect of the various events promoted by Greta Thunberg in 2019, before the arrival of Covid-19. Indeed, these initiatives have raised public awareness and, above all, the awareness of young people, on the issue of climate change and have resulted in a social movement against climate change and human activity, including political decisions, the effects of which contribute to enhancing global warming.

By examining the phenomena associated with climate change on a global scale, according to the respondents, the most frequent responses were “the melting of glaciers and rising sea levels” and “temperature rise”. This is surely due, in part, to the influence of the mass media, as we have already highlighted, which often report on the withdrawal of glaciers within the framework of climate change as first news and first images. However, as we mentioned in Section 2, this specifically depends on the influence of the space–time dimension and on the geographical concepts of relational and relative distance, later discussed. In this sense, elastic and with “multiple rationalities” analytical models must be urged to be elaborated, rather than univocal and inflexible ones [68].

The rise in temperatures is the other global phenomenon most associated with climate change as the results of this survey supported. The weather, daily or seasonal meteorology, indeed, constitutes a second image to which common sense associates with climate change. In third place, as a phenomenon associated with climate change, there is the “ozone hole and the greenhouse effect”, also perceived among the first places in the study by Bostrom and Fischhoff [37]. Tracing climate change to the phenomenon of the destruction of the ozone layer means associating two phenomena that are not directly connected, but which are linked by the impact that human behavior has had on the environment on a global scale [4]. This association, as Riva [4] points out, although constituting an error from a scientific point of view, demonstrates the ability of common sense to give meaning to complex phenomena such as those under consideration, extrapolating parts of the problem, such as the anthropogenic effect on the environment, and leaving out others, such as the different characteristics related to the greenhouse effect and the ozone hole.

On the other hand, if we consider that the results of our study showed a significant correlation between the age group 18–39 years and the answers “melting of glaciers and rising sea levels” and “loss of biodiversity and disappearance of animals and plants species”, while for the response “increase in immigration and social conflicts” a significant correlation was found with groups aged 40–59 and over 60 years, the reasons for this are closely connected with what is written above. It is plausible that those individuals with higher education perceive the melting of glaciers and the loss of biodiversity more, while elderly and lower educated people perceive the increase in immigration more, a phenomenon closer to space and time rather than the “distant phenomenon” of the melting glaciers.

The rise in temperatures is the other global phenomenon most associated with climate change as the results of this survey highlighted. Those who live in rural places perceive the association with the phenomena of drought and desertification more, likewise due to a matter of greater spatio-temporal and cultural proximity to the problem.

As for the association of local phenomena with climate change, the greater perception of the increase in heavy rains with impacts on people and property shown by the interviewees is probably due to the increase in sudden storm showers that frequently hit the Calabrian territory and the study area, causing direct and indirect losses. The association with the lack of water resources which, in winter and summer, is very frequent in the Calabrian territory is significant; the statistical correlation

of this issue with the female sex is also of anthropological importance. In fact, Calabria has always been marked in its history by a “geography of thirst”, to which corresponds a “geography of waters” [69]. During the various pilgrimages, thirst was overcome by a perfect knowledge of the places and their waters. All places were marked, upon leaving or entering, by fountains where women went and where people, returning from work, stopped. The writer Corrado Alvaro repeatedly returns to his works on women who go in search of water at fountains outside their places, often in inaccessible and distant locations [70–72].

The association with the answer “increase in fires” could be due to the numerous forest fires which have hit the Calabrian territory in recent years. In particular, according to the report of the Calabrian Civil Protection, in the first nine months of 2017, in Calabria there were recorded more than 800 forest fires and the province most affected was Cosenza, with 413 square kilometers of area affected by fires.

The perception of the spread of diseases associated with climate change was an absolutely justified and proven fear from the arrival of Covid-19 which, although not directly connected to climate change, certainly has significant relationships with the protection of the environment, natural ecosystems, primary forests and biodiversity [73–75].

Data on the perception of information levels about climate change do not indicate a significant gap between people who feel informed and those who do not feel informed. The most frequently reported sources of information on climate change are television, internet and social networks. Those who are younger and have a university degree use newspapers, books and magazines and the internet as sources of information, and are also informed through school and university institutions. Retirees and those with lower education get more information via TV and family and friends. This shows how important it is to spread the correct messages of information on climate change and risk communication through TV and social media, avoiding any distortions of reality which, thus, would affect citizens’ perceptions of the phenomenon.

Furthermore, as regards the analysis of the discursive constructions associated with climate change, the majority of respondents consider the statement that “climate change is linked to the economic policies of the most industrialized countries” “very true”, and, the statement that “climate change is a journalistic mount” with low reliability. Those with lower education judge truthful discursive patterns that are, in fact, false as “climate change is considered to be totally natural phenomena” and “climate change is a journalistic mount”. In any case, it would be necessary to strengthen the teaching of geography in the Italian school system, for whom programs in which the study of the climate and its characteristics is foreseen. Instead, those who fall into the 18–39 age group and have a degree believe that the patterns “climate changes are linked to the natural evolution of the planet” and “climate changes are a journalistic mount” are false.

The perception of retirees, who believe that the pattern “climate change is linked to the economic policies of the most industrialized countries” is strictly connected, probably, to the nostalgic sentiment of elderly people towards pre-globalized society, which can also be found in other testimonies [76].

In relation to political actions to mitigate climate change, the majority of respondents believe that national and international political actions taken to tackle this problem are inadequate and insufficient. Lorenzoni et al. [36], with respect to the barriers perceived at a social level, first of all, in their research conducted in the United Kingdom, identify the perception of a low political commitment at a national and international level.

With respect to the actions taken by the population to fight climate change, the most frequently reported answer was “I always carry out waste separation with great care”. It is easy to see the willingness to implement practices, such as the recycling of household waste, even if they are not strictly linked to the problem of climate change, as Norton and Leaman [34] point out. The second-most referred answer by the respondents was “I plant trees and take care of the plants in my garden”. Additionally, also in the study of Leiserowitz [22], the latter action falls second and represents the symbol of pro-environmental action par excellence. Even “I try to limit the use of plastic in everyday life” represents an important action, since the production, incineration and disposal of plastic



contributes dramatically to the increase in CO<sub>2</sub> in the atmosphere. On this point, economic factors may have influenced the perception of respondents. Indeed, in the same period in which the interviews were carried on, the Italian government adopted the “plastic tax”, a tax on the consumption of single-use items (MACSI) made with the use of plastic materials.

The other responses given by the respondents, in order of choice, are: “I have improved the insulation of my home” and “I often use alternative transport options to the car”. In some surveys in the United Kingdom and in the United States it likewise emerges how citizens are inclined to recycle household waste more and to improve domestic energy efficiency, rather than exhibiting a willingness to change their transport habits [77]. In this respect, institutional factors, such as the absence of an efficient public transport network in Calabria, can certainly hinder the implementation of low environmental impact behaviors.

Discussing the reduction in climate change with friends, family and local politicians—which is another frequently answered option—certainly helps to sensitize local communities on this issue and to find solutions on a local scale to fight climate change. Few respondents said they do not take action to address climate change. Those who are unemployed and have no qualifications, do not perform actions to reduce climate change, probably due to the lack of sensitivity and knowledge on the matter. On the other hand, young students or those who have a degree, carry out various virtuous actions compared to elderly people, who mainly deal with separate collection.

## 5.2. Community Resilience to Extreme Natural Events and Climate Change

The majority of respondents show greater concern about the impacts of climate change on the world population and on nature and the environment than the impacts on themselves, their family, the community and the country they live in. The global dimension of the phenomenon is perceived mostly by younger and higher educated people, with greater concern for the impacts on nature and the environment by those living in rural areas. The perception of the global dimension of the phenomenon, as previously mentioned, is probably related to the representation of the spatio-temporal diffusion of its effects, the cultural background and the media communication that has recently centralized the attention to the issue of climate change.

According to the majority of respondents, the effects of climate change are already manifesting. This is due, yet again, to media communication on climate change that has been more frequent, recently, following the demonstrations organized by Greta Thunberg that have brought the theme of climate change to the attention of public opinion and politics. However, this is also due to the frequency of some extreme natural events, such as landslides and floods that have occurred locally in recent years and have affected the Calabrian territory.

In addition, people aged 18–39, and those with higher education, are more afraid of the possible effects of climate change and are frustrated that not enough is being done to mitigate the effects. Retirees, on the other hand, are less afraid of the effects. Evidently, also considering the statistical correlations identified, young people are better prepared on the problem and, consequently, they are more worried because the national and international political class is not carrying out sufficient actions to slow down climate change.

If we analyze the perception of exposure to extreme natural events, the perception of exposure to earthquakes by respondents from Lago and Amantea is high on both. These data, in the context of this geographical study area, confirm the high perception of risk exposure, also found in other studies carried out in different areas of Calabria—Pollino [63], Aiello Calabro [78], Costa degli Dei [60,79], Maierato [61,80]. As we have pointed out, the two municipalities are located in an area with high seismic hazard.

The perception of volcanic and tsunami risk of the Lago’s respondents is high because the study area, located along the Tyrrhenian coast of Calabria, not far from the Stromboli Volcano (Aeolian Islands), was involved in December 2002 in an emergency phase due to a tsunami risk for a landslide triggered by the eruption of the volcano [81]. The highest perception of Amantea’s respondents about the coastal erosion and the highest perception of landslide risk of the Lago’s respondents are correct, as they correspond to the main peculiarities of the two territories that are subject to these natural hazards.

The behavior of the population at the occurrence of extreme natural events was examined. The majority of respondents try to obtain information on the situation via TV, social networks, internet, radio, neighbors and experts. This is followed by the response "I trust in God". In particular, there is a significant statistical correlation of this response with the female sex, housewives and those with lower education. Several writers and scholars have argued about the relationship between women and religion in Calabria. The Calabrian population is historically linked to a religiosity, also due to all the various famines and disasters connected to extreme natural events or diseases, such as malaria, that have historically affected the territory. The feeling of devotion of women has always had a symbolic and resilient function that recalls the defense against all the calamities to which the Calabrian territory has been subjected over the centuries. In addition, various resilient behaviors are assumed by those who have adequate education, such as waiting for the authorities to intervene and looking for information on the event.

In addition, we can note that some responses indicating poorly resilient behavior are significantly related between them, such as, for example, "I do not know what I should do" and "I do not take action to reduce climate change". Similarly, responses indicating fairly resilient behaviors are likewise significantly related between them, such as, for instance, "I try to get information on the situation via TV, social networks, etc." and "I await the intervention of the authorities".

As for the reactions of the interviewees in the case of extreme events in the area they live in, the most frequently reported response was "I first help my family and others who are in difficulty", followed by "I rush to find a way escape". The latter reaction, particularly inadequate for some extreme events, was already found in other previous studies on the perception of seismic risk in Calabria [63]. Furthermore, the positive and significant correlation between the "students" category and the "I do not panic" response indicates resilient behavior by younger people with an adequate level of education. The positive correlation between "retirees" and the answer "in the first place I help my family and others who are in difficulty" is certainly due to the caring and protective behavior of the elderly people towards their family and loved ones.

Resilient behaviors are accompanied by a positive adaptation and by the competence that refers to the ability to function effectively in the world in relation to some expectations that are based on the behavioral rules typical of the reference context [82–84]. In this study, therefore, we note how positive adaptation and competence are associated with resilient behaviors during extreme natural events. From this we understand why different positive resilient behaviors are accompanied by other equally resilient, competent and adaptive behaviors and reactions. We also note the importance of familism and education as socio-cultural factors that influence the increase in community resilience [85,86].

Instead, the lack of trust in local administrators, emerging from this research, does not constitute a factor of community resilience [87–89]. Additionally, in another study on the perception of climate change conducted in Sweden, homeowners said their trust in local policymakers is low when it comes to managing crises [90]. However, other studies on the perception of geo-hydrological risk in Calabria have also revealed the lack of trust of citizens towards local policymakers [60,61]. In some studies, gender difference has been found to have a considerable influence on risk perception [91]; even in this study, women have greater confidence than men in local government authorities. The behavior of Calabrian women seems consistent with their greater vulnerability, so they give greater trust to local institutions, so as to hope for greater protection in case of need [92,93].

In this study, however, those who trust the ability of local policymakers to face an extreme event also trust the national and international political classes in the fight against climate change. On the contrary, those who have no faith in local authorities do not even believe in the ability of national and international political authorities to solve the problem. The lack of trust in the political institutions represents a perceived barrier closely linked to the lack of political action to mitigate climate change, which is classified, indeed, by Lorenzoni et al. [36] at a perceptual level of global dimension.

### 5.3. Practical Implications

From this study, various practical implications, directly linked to the study of geographic sciences, emerge. The space–time dimension mentioned in this paper belongs to epistemology of geography. It is not possible to do geographical research without investigating the facts in their temporal evolution, without taking into account the effect of time in spatial flows and relationships and without considering the role of some historical matrices in contemporary territorial reality [94]. For instance, the first phenomenon that citizens, in this survey, associate with climate change is the melting of glaciers. As we have already highlighted, this is probably due to the images transmitted by the mass media, but it is also linked to a very important concept in geographical studies: that of space. The absolute space, in geography, does not exist. Geographical space depends on which phenomena are observed and on which tools are used to construct a geographical “representation” or “analysis”. Therefore, space is “relative”. The “relative” distance (time, cost) and the “relational” distance (cultural, linguistic, institutional, etc.) often do not coincide with the geometric distance between two places. Relative space is perceptible, but it is not always objectively determinable, and in any case, it varies over time. In this perspective, the relative space can be seen as a social product, which reflects the activities and interrelations between them [95]. Therefore, the reasons why citizens have associated the melting of glaciers with climate change refer to the relative and relational distance with this phenomenon, not to the geometric one.

Moreover, from the disciplinary perspective of geography, the reflection around climate change epistemologically implies different issues, some of which appear to be central, such as the interaction between human beings and natural elements, the sustainability of anthropization processes, the possibilities of action that translate into social, political and economic choices and in the related (and possible) intervention policies [45,96]. As Sabato [45] points out, in Italy the contraction of the hours in geography teaching in most school curricula, has actually created a gap that students perceive. If it is true that some environmental issues, including climate change, can also be dealt with synergistically with other school subjects, geography plays a leading role thanks to the theoretical tools and research applications that characterize it [45,97].

The theme of climate change has returned to being central in geographic studies also thanks to the diffusion of the concept of the Anthropocene [98,99] in human and social sciences. The theory of the Anthropocene, indeed, brings geographers to confront themselves with human climate–community relations, to rethink how to interpret adaptation first, then interaction, and finally mutual transformation [100]. The climate is proving to be one of the most changing geographical factors, but also one of the most impacting on the territorializing process. Furthermore, as also emerges in our study, it seems to be increasingly considered and perceived as an element linked to the outcomes of human actions.

The symptoms and perceptions of the Anthropocene, therefore, invite us to reflect on this concept, understood as a social and cultural process, in particular as a concern for the future of the planet and mankind, which has become aware of the feedback from the environment with respect to human action and of the need to redefine our relationship with the planet. In the EIB Climate Survey 2019–2020 [24] more than 6 respondents out of 10, from Europe, the U.S.A. and China, think their behavior can make a difference in tackling climate change. These results, in harmony with our study, demonstrate the importance of adopting resilient and geo-ethical behaviors to take care of the territorial ecosystem in which we live, locally, and to safeguard our planet, globally.

Political institutions, therefore, must also think about responsible, ethically correct, persuasive actions, significantly impacting on a local and global scale against climate change so that they can acquire credibility and trust citizens. It is essential that nature scientists work hand in hand with social scientists and humanists as well as politicians, policymakers, and businesses to: (i) develop an integrated and multidisciplinary approach to understand a complex phenomenon, such as climate change; (ii) promote shared and sustainable actions involving the population to reduce the disaster risk.

## 6. Conclusions

The perception of climate change varies in relation to contextual factors, including media communication, socio-demographic characteristics of respondents, knowledge and education, economic, institutional factors, personal values and, finally, psychological factors and experience. On this last aspect, from a different point of view, scientists often remember how associating individual meteorological events with climate change is imprudent and scientifically incorrect, since, as is well known, climatology refers mainly to the average characteristics of the climate [4]. In fact, on the effects of climate change, the ways of building reality, influenced by exposure to the mass media and some stereotyped images, bring the attention of public opinion to exchange climate change with daily or seasonal meteorology or to associate it with the hole in the ozone and melting glaciers [37].

Furthermore, as we have highlighted several times in this paper, the spatio-temporal dimension, therefore—in one word, “geographic”—which affects the perception of the citizens interviewed, indicates a knowledge gap that can only be bridged through the enhancement of geographic sciences in school curricula. As can be seen, these are all issues that emerged during the discussion of this research. Therefore, with respect to the issues listed above, the perception of risk plays a fundamental role: it implies various cultural (re)productions and it constitutes a fundamental motivation for the formulation of what Landowski [101] calls “action programs”, both individual and collective.

Even though the results of this study could be considered valid only for the study area, the perspectives of the obtained outputs will be compared with results of other surveys, in particular those in Malta, within the Agreement on Scientific Cooperation between CNR and the University of Malta (UoM).

**Author Contributions:** Conceptualization, L.A., R.C., F.D.P.; data curation, R.C.; formal analysis, D.D.M.; investigation, F.D.P.; methodology, L.A. Specifically, F.D.P. and R.C. wrote Section 1 Introduction; L.A. and D.D.M. wrote Section 3 Methods; L.A. and R.C. wrote the Section 4 Results; F.D.P. wrote Section 2 Climate Change Perception: The Reference Framework and Section 5 Discussion; all authors contributed to Section 6. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Acknowledgments:** The authors would like to thank participants who gave their voluntary and informed consent before the interviews. The authors thank the anonymous reviewers for helpful and insightful comments which improved the paper.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Keellings, D.; Waylen, P. The stochastic properties of high daily maximum temperatures applying crossing theory to modeling high temperature event variables. *Theor. Appl. Climatol.* **2012**, *108*, 579–590.
2. Ye, L.; Xiong, W.; Li, Z.; Yang, P.; Wu, W.; Yang, G.; Fu, Y.; Zou, J.; Chen, Z.; Van Ranst, E.; et al. Climate change impact on China food security in 2050. *Agron. Sustain. Dev.* **2013**, *33*, 363–374.
3. Trumbo, C.W.; Shanahan, J. Social Research on Climate Change: Where we Have Been, Where we Are, and Where we Might Go. *Public Underst. Sci.* **2000**, *9*, 199–204.
4. Riva, P. La percezione sociale del cambiamento climatico. In *Cambiamenti Climatici: Un Approccio Interdisciplinare per Capire un Pianeta in Trasformazione*; Migliavacca, M., Rigamonti, L., Eds.; Il Mulino: Bologna, Italy, 2010; pp. 169–214.
5. McDaniels, T.; Axelrod, L.; Slovic, P. Perceived Ecological Risks of Global Change, a Psychometric Comparison of Causes and Consequences. *Glob. Environ. Chang.* **1996**, *6*, 159–171.
6. Marincioni, F. *L'emergenza Climatica in Italia: Dalla Percezione del Rischio Alle Strategie di Adattamento*; Geographies of the Anthropocene Book Series; Il Sileno Edizioni: Cosenza, Italy, 2020.
7. USAID. *Integrating Social and Behavior Change in Climate Change Adaptation: An Introductory Guide*; United States Agency for International Development: Washington, D.C., USA, 2019.
8. Jen, R. How to Increase Risk Awareness. In Proceedings of the PMI® Global Congress 2012—North America, Vancouver, BC, Canada, 23 October 2012; Project Management Institute: Newtown Square, PA, USA, 2012.

9. Raaijmakers, R.; Krywkow, J.; Veen, A. Flood risk perceptions and spatial multi-criteria analysis: An exploratory research for hazard mitigation. *Nat. Hazards* **2008**, *46*, 307–322.
10. Becker, P. Dependence, trust, and influence of external actors on municipal urban flood risk mitigation: The case of Lomma Municipality, Sweden. *Int. J. Disaster Risk Reduct.* **2018**, *31*, 1004–1012.
11. Longstaff, P.H. *Security, Resilience, and Communication in Unpredictable Environments such as Terrorism, Natural Disasters, and Complex Technology*; Center for Information Policy Research, Harvard University: Cambridge, MA, USA, 2005.
12. McIvor, D.; Paton, D. Preparing for natural hazards: Normative and attitudinal influences. *Disaster Prev. Manag. Int. J.* **2007**, *16*, 79–88.
13. Nisbet, M.C.; Myers, T. The Polls-Trends: Twenty Years of Public Opinion about Global Warming. *Public Opin. Q.* **2007**, *71*, 444–470.
14. European Commission. Europeans' attitudes towards climate change—Special Eurobarometer 300—EB69.2. Available online: [https://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs\\_300\\_full\\_en.pdf](https://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_300_full_en.pdf) (accessed on 30 June 2020).
15. Bord, R.J.; Fisher, A.; O'Connor, R.E. Public Perceptions of Global Warming: United States and International Perspectives. *Clim. Res.* **1998**, *11*, 75–84.
16. Lorenzoni, I.; Pidgeon, N.F. Public Views on Climate Change: European and USA Perspectives. *Clim. Chang.* **2006**, *77*, 73–95.
17. Pidgeon, N. Climate Change Risk Perception and Communication: Addressing a Critical Moment? *Risk Analysis* **2012**, *32*, 951–956, doi:10.1111/j.1539-6924.2012.01856.x.
18. Reser, J.P.; Bradley, G.L.; Glendon, A.I.; Ellul, M.C.; Callaghan, R. *Public Risk Perceptions, Understandings, and Responses to Climate Change and Natural Disasters in Australia and Great Britain, Gold Coast, Australia: National Climate Change Adaptation Research Facility*; Griffith University: Brisbane, Australia, 2012. Available online: [https://research-repository.griffith.edu.au/bitstream/handle/10072/49216/84369\\_1.pdf](https://research-repository.griffith.edu.au/bitstream/handle/10072/49216/84369_1.pdf) (accessed on 21 May 2020).
19. Steentjes, K.; Pidgeon, N.; Poortinga, W.; Corner, A.; Arnold, A.; Böhm, G.; Mays, C.; Poumadère, M.; Ruddat, M.; Scheer, D.; et al. *European Perceptions of Climate Change: Topline Findings of a Survey Conducted in Four European Countries in 2016*; Cardiff University: Cardiff, UK, 2017.
20. So Young, K.; Wolinsky-Nahmias, Y. Cross-National Public Opinion on Climate Change: The Effects of Affluence and Vulnerability, *Global Environmental Politics*. *Glob. Environ. Politics* **2014**, *14*, 79–106.
21. Lee, T.; Markowitz, E.; Howe, P.D.; Ko, C.-Y.; Leiserowitz, A.A. Predictors of public climate change awareness and risk perception around the world. *Nat. Clim. Chang.* **2015**, *5*, 1014–1020. Available online: <https://doi.org/10.1038/nclimate2728> (accessed on 10 May 2020).
22. Leiserowitz, A. International Public Opinion, Perception, and Understanding of Global Climate Change, Human Development Occasional Papers (1992–2007) HDOCPA-2007-31, Human Development Report Office (HDRO), United Nations Development Programme (UNDP). Available online: [http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/leiserowitz\\_anthony6.pdf](http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/leiserowitz_anthony6.pdf) (accessed on 2 July 2020).
23. Van der Linden, S. Determinants and Measurement of Climate Change Risk Perception, Worry, and Concern. *Oxford Research Encyclopedia of Climate Science*; Oxford University Press: Oxford, UK, 2017.
24. European Investment Bank (EIB). *The EIB Climate Survey 2019-2020 How Citizens are Confronting the Climate Crisis and What Actions They Expect from Policymakers and Businesses*; European Investment Bank: Luxembourg, 2020.
25. Capstick, S.; Whitmarsh, L.; Poortinga, W.; Pidgeon, N.; Upham, P. International trends in public perceptions of climate change over the past quarter century. *WIR Clim. Chang.* **2015**, *6*, 35–61, doi:10.1002/wcc.321.
26. European Commission. Attitudes of European citizens towards the environment—Special Eurobarometer 217—EB62.1. 2005. Available online: [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_217\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_217_en.pdf) (accessed on 25 September 2013).
27. European Commission. Attitudes of European citizens towards the environment—Special Eurobarometer 295—EB68.2. 2008 Available online: [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_295\\_sum\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_295_sum_en.pdf) (accessed on 25 September 2013).
28. European Commission. Attitudes of European citizens towards the environment—Special Eurobarometer 365—EB75.2. 2011 Available online: [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_365\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_365_en.pdf) (accessed on 25 September 2013).

29. Hargreaves, I.; Lewis, J.; Speers, T. *Towards a Better Map: Science, the Public and the Media*. Economic and Social Research Council: London, UK, 2003.
30. Riva, P. Climate of Opinion. Come studiamo la percezione dei cambiamenti climatici. *Equilibri* **2008**, *12*, 263–270.
31. GlobeScan. *EnviroNics International Environmental Monitor Survey Dataset*. GlobeScan: Toronto, ON, Canada, 1999.
32. DEFRA *Survey of Public Attitudes to Quality of Life and to the Environment*; Department for Environment, Food and Rural Affairs: London, UK, 2002.
33. Bostrom, A.; Morgan, M.G.; Fischhoff, B.; Read, D. What Do People Know About Global Climate Change? Part 1: Mental Models. *Risk Anal.* **1994**, *14*, 959–970.
34. Norton, A.; Leaman, J. *The Day After Tomorrow: Public Opinion on Climate Change*; Mori Social Research Institute: London, UK, 2004.
35. Read, D.; Bostrom, A.; Morgan, M.G.; Fischhoff, B.; Smuts, T. What do people know about global climate change? Part 2: Survey Studies of Educated Laypeople. *Risk Anal.* **1994**, *14*, 971–982.
36. Lorenzoni, I.; Nicholson-Cole, S.; Whitmarsh, L. Barriers Perceived to Engaging with Climate Change Among the UK Public and their Policy Implications. *Glob. Environ. Chang.* **2007**, *17*, 3–4, 445–459.
37. Bostrom, A.; Fischhoff, B. Communicating health risks of global climate change. In *Environmental Risks: Perception, Evaluation and Management (Research in Social Problems and Public Policy)*; Böm, G., Nerb, J., McDaniels, T., Spada, H., Eds.; Emerald Group Publishing Limited: Bingley, UK, 2001; pp. 31–56, doi:10.1016/S0196-1152(01)80023-5.
38. Iturriza, M.; Hernantes, J.; Abdelgawad, A.; Labaka, L. Are Cities Aware Enough? A Framework for Developing City Awareness to Climate Change. *Sustainability* **2020**, *12*, 2168, doi:10.3390/su12062168.
39. Iturriza, M.; Labaka, L.; Ormazabal, M.; Borges, M. Awareness-development in the context of climate change resilience. *Urban Clim.* **2020**, *32*, 100613.
40. Saxena, A., Qui, K.; Robinson, S.A. Knowledge, attitudes and practices of climate adaptation actors towards resilience and transformation in a 1.5 °C world. *Env. Sci Policy* **2018**, *80*, 152–159, doi:10.1016/j.envsci.2017.11.001.
41. UNFCCC, The Paris Agreement. United Nations Framework Convention on Climate Change. 2016. Available online: [http://unfccc.int/paris\\_agreement/items/9485.php](http://unfccc.int/paris_agreement/items/9485.php) (accessed on 7 August 2020).
42. Ruiz, I.; Faria, S.H.; Neumann, M.B. Climate change perception: Driving forces and their interactions. *Environ. Sci. Policy* **2020**, *108*, 112–120, doi:10.1016/j.envsci.2020.03.020.
43. Elshirbiny, H.; Abrahamse, W. Public risk perception of climate change in Egypt: A mixed methods study of predictors and implications. *J Env. Stud Sci* **2020**, doi:10.1007/s13412-020-00617-6.
44. Lee, K.; Gjersoe, N.; O'Neill, S.; Barnett, J. Youth perceptions of climate change: A narrative synthesis. *Wir Clim Chang.* **2020**, *11*, e641, doi:10.1002/wcc.641.
45. Sabato, G. Il cambiamento climatico nella percezione degli adolescenti: Una prospettiva geografica. In *The Climate Crisis in Mediterranean Europe: Cross-Border and Multidisciplinary Issues on Climate Change*; Gómez Cantero, J., Morán Martínez, C., Losada Gómez, J., Carnelli, F., Eds.; Geographies of the Anthropocene Book Series; Il Sileno Edizioni: Cosenza, Italy, 2020; pp. 147–162.
46. Bonati, S.; Tononi, M. (Eds.) *Cambiamento Climatico e Rischio. Proposte per Una Didattica Geografica*; Franco Angeli: Milan, Italy, 2020.
47. De Paula Baer, A.; Sestili, C.; Cocchiara, R.A.; Barbato, D.; Del Cimmuto, A.; La Torre, G. Perception of Climate Change: Validation of a questionnaire in Italy. *Clin Ter.* **2019**, *170*, e184–e191, doi:10.7417/CT.2019.2131.
48. Nguyen, T.P.L.; Mula, L.; Cortignani, R.; Seddaiu, G.; Dono, G.; Viridis, S.G.; Pasqui, M.; Roggero, P.P. Perceptions of Present and Future Climate Change Impacts on Water Availability for Agricultural Systems in the Western Mediterranean Region. *Water* **2016**, *8*, 523.
49. Vollaro, M.; Zavalloni, M.; Raggi, M.; Viaggi, D. Adapting to climate change: The social perception of voluntary water transfers in the Italian context. *Int. J. Sustain. Agric. Manag. Inform.* **2015**, *1*, 26–48.
50. Mizutori, M. Time to say goodbye to “natural” disasters. PreventionWeb, 2020. Available online: <https://www.preventionweb.net/experts/oped/view/72768> (accessed on 18 August 2020).
51. Barbato, G. Master Plan of solutions to mitigate the risk of coastal erosion in Calabria (Italy), a case study. *Ocean Coast. Manag.* **2016**, *132*, 24–35.
52. Ietto, F.; Cantasano, N.; Pellicone, G. A New Coastal Erosion Risk Assessment Indicator: Application to the Calabria Tyrrhenian Littoral (Southern Italy). *Environ. Process.* **2018**, *5*, 201–223.

53. Antronico, L.; Ferrari, E.; Gullà, G.; Sorriso-Valvo, M.; Tansi, C.; Terranova, O.; Aceto, L.; Niceforo, D. *Il Sackung di Lago (CS). CNR-IRPI, POP 1994/99, Misura 4.4 "Ricerca Scientifica e Tecnologica"*; Rubbettino Editore: Catanzaro, Italy, 2004.
54. Borrelli, L.; Muto, F. Geology and mass movements of the Licetto River catchment (Calabrian Coastal Range, Southern Italy). *J. Maps* **2017**, *13*, 588–599, doi:10.1080/17445647.2017.1342283.
55. Dipartimento della Protezione Civile Nazionale, Classificazione Sismica. 2017. Available online: [http://www.protezionecivile.gov.it/resources/cms/documents/class2012\\_02prov.pdf](http://www.protezionecivile.gov.it/resources/cms/documents/class2012_02prov.pdf) (accessed on 10 September 2019).
56. Coscarelli, R.; Caloiero, T. Analysis of daily and monthly rainfall concentration in Southern Italy (Calabria region). *J. Hydrol.* **2012**, *416*, 145–156.
57. Brunetti, M.; Caloiero, T.; Coscarelli, R.; Gulla', G.; Nanni, T.; Simolo, C. Precipitation variability and change in the Calabria region (Italy) from a high resolution daily dataset. *Int. J. Climatol.* **2012**, *32*, 57–73.
58. Caloiero, T.; Buttafuoco, G.; Coscarelli, R.; Ferrari, E. Spatial and temporal characterization of climate at regional scale using homogeneous monthly precipitation and air temperature data: An application in Calabria (southern Italy). *Hydrol. Res.* **2015**, *46*, 629–646.
59. Leiserowitz, A. American Risk Perceptions: Is Climate Change Dangerous? *Risk Anal.* **2005**, *25*, 1433–1442.
60. Antronico, L.; Coscarelli, R.; De Pascale, F.; Condino, F. Social Perception of Geo-Hydrological Risk in the Context of Urban Disaster Risk Reduction: A Comparison between Experts and Population in an Area of Southern Italy. *Sustainability* **2019**, *11*, 1–23, doi:10.3390/su11072061.
61. Antronico, L.; De Pascale, F.; Coscarelli, R.; Gullà, G. Landslide risk perception, social vulnerability and community resilience: The case study of Maierato (Calabria, southern Italy). *Int. J. Disaster Risk Reduct.* **2020**, *46*, 101529, doi:10.1016/j.ijdrr.2020.101529.
62. Dwyer, A.; Zoppou, C.; Mielsen, O.; Day, S.; Roberts, S. *Quantifying Social Vulnerability: A Methodology for Identifying Those at Risk to Natural Hazards*; Geoscience Australia: Canberra, Australia, 2004.
63. De Pascale, F.; Bernardo, M.; Muto, F.; Tripodi, V. Geoethics and seismic risk perception: The case of the Pollino area, Calabria, southern Italy and comparison with communities of the past. In *Geoethics: The Role and Responsibility of Geoscientists*; Peppoloni, S., Di Capua, G., Eds.; Geological Society, Special Publications: London, UK, 2015; Volume 419, pp. 87–102, doi:10.1144/SP419.16.
64. Spearman, C. The Proof and Measurement of Association Between Two Things. *Am. J. Psychol.* **1904**, *15*, 72–101.
65. Cleff, T. *Exploratory Data Analysis in Business and Economics: An Introduction Using SPSS, Stata, and Excel*; Springer: Cham, Switzerland, 2013.
66. Hauke, J.; Kossowski, T. Comparison of Values of Pearson's and Spearman's Correlation Coefficients on the Same Sets of Data. *Quaestiones Geographicae* **2011**, *30*, 87–93.
67. Bubeck, P.; Botzen, W.J.W.; Aerts, J.C.J.H. A Review of Risk Perception and Other Factors that Influence Flood Mitigation Behaviour. *Risk Anal.* **2012**, *32*, 1481–1495.
68. Gugg, G. Beyond the volcanic risk. To defuse the announced disaster of Vesuvius. In *Socio-Natural Disasters and Vulnerability Reduction in the Territorial Ecosystems*; Cannizzaro, S., De Pascale, F., Farabollini, P., Muto, F., Eds.; AIMS Geosciences: Springfield, MO, USA, 2019; Volume 5.
69. Teti, V. Storia dell'acqua. In *Mondi Materiali e Universi Simbolici*; Donzelli Editore: Rome, Italy, 2013.
70. Teti, V. Acque, paesi, uomini in viaggio: Appunti per un'antropologia dell'acqua in Calabria in epoca moderna e contemporanea. In *Miscellanea di Studi Storici*; Dipartimento di Filologia, Università della Calabria: Cosenza, Italy, 1986; Volume 5; pp. 75–118.
71. Teti, V. Fame, digiuno, dieta nella storia e nella cultura folklorica della Calabria. In *Salute e Malattia nella Cultura delle Classi Subalterne del Mezzogiorno*; Di Rosa, M., Ed.; Guida: Naples, Italy, 1990; pp. 89–134.
72. Alvaro, C. *Gente in Aspromonte*; Pomilio Garzanti: Milan, Italy, 1982; Garzanti: Milan, Italy, 1930.
73. Andersen, K.G.; Rambaut, A.; Lipkin, W.I.; Holmes, E.C.; Garry, R.F. The proximal origin of SARS-CoV-2. *Nat. Med.* **2020**, *26*, 450–452, doi:10.1038/s41591-020-0820-9.
74. Pievani, T. *L'editoriale. Coronavirus: Uno Sguardo Evoluzionistico, Il Bo Live*; University of Padua: Padua, Italy 2020.
75. De Pascale, F.; Roger, J.C. Coronavirus: An Anthropocene's hybrid? The need for a geoethic perspective for the future of the Earth. *Aims Geosci.* **2020**, *6*, 131–134, doi:10.3934/geosci.2020008.
76. Bernardo, M.; De Pascale, F. *Le Vie della Transumanza in Calabria: Un Itinerario Culturale Percepito tra Geostoria, Economia e Letteratura*; La Dea Editori: Camigliatello Silano, Italy, 2017.
77. Bord, R.J.; O'Connor, R.E.; Fisher, A. In What Sense Does the Public Need to Understand Global Climate Change? *Public Underst. Sci.* **2000**, *9*, 3, 205–218.

78. De Pascale, F.; Bernardo, M.; Muto, F.; Di Matteo, D.; Dattilo, V. Resilience and seismic risk perception at school: A geoethical experiment, Aiello Calabro, southern Italy. *Nat. Hazards* **2017**, *86*, 569–586, doi:10.1007/s11069-016-2696-z.
79. Antronico, L.; Coscarelli, R.; De Pascale, F.; Muto, F. Geo-hydrological risk perception: A case study in Calabria (Southern Italy). *Int. J. Disaster Risk Reduct.* **2017**, *25*, 301–311, doi:10.1016/j.ijdrr.2017.09.022.
80. Antronico, L.; Coscarelli, R.; De Pascale, F.; Gullà, G. *La Comunicazione del Rischio e la Percezione Pubblica dei Disastri: Il Caso Studio della Frana di Maierato (Calabria, Italia)*; Prisma—Economia, Società, Lavoro; Franco Angeli: Milan, Italy, 2018; Volume 3; pp. 9–29, doi:10.3280/PRI2018-003002.
81. Chiocci, F.L.; Romagnoli, C.; Tommasi, P.; Bosman, A. The Stromboli 2002 tsunamigenic submarine slide: Characteristics and possible failure mechanisms. *J. Geophys. Res.* **2008**, *113*, doi:10.1029/2007JB005172.
82. Masten, A.S.; Coatsworth, J.D. The development of competence in favorable and unfavorable environments. Lessons from research on successful children. *Am. Psychol.* **1998**, *53*, 205–220.
83. Masten, A.S.; Cutuli, J.J.; Herbers, J.; Reed, M. Resilience in development. In *Oxford Handbook of Positive Psychology*; Snyder, C.R., Lopez, S., Eds.; Oxford University Press: New York, NY, USA, 2009; pp. 117–131.
84. Inguglia, C.; Lo Coco, A. *Resilienza e Vulnerabilità Psicologica nel Corso dello Sviluppo*; Il Mulino: Bologna, Italy, 2013.
85. Prati, G.; Pietrantoni, L. Resilienza di comunità: Definizioni, concezioni ed applicazioni. *Psychofenia* **2009**, *12*, 9–26.
86. Clauss-Ehlers, C.S.; Lopez Levi, L. Violence and Community, Terms in Conflict: An Ecological Approach to Resilience. *J. Soc. Distress Homelessness* **2002**, *11*, 265–278, doi:10.1023/A:1016804930977.
87. Farinella, D.; Saitta, P. *The Endless Reconstruction and Modern Disasters. The Management of Urban Space Through an Earthquake—Messina, 1908–2018*; Palgrave MacMillian: London, UK, 2019.
88. Moe, N. *The View from Vesuvius. Italian Culture and the Southern Question*; University of California Press: Berkeley and Los Angeles, CA, USA, 2002.
89. Schneider, J. (Ed.) *Italy's 'Southern Question'. Orientalism in One Country*; Berg: New York, NY, USA, 1998.
90. Kolmodin, S.; Lundgren, M.; Andersson, C. Preparing for climate change and hazards: Individual homeowners trust in local authorities and private entrepreneurs. *Int. J. Disaster Risk Reduct.* **2019**, *41*, 101277, doi:10.1016/j.ijdrr.2019.101277.
91. Sundblad, E.L.; Biel, A.; Gärling, T. Cognitive and affective risk judgements related to climate change. *J. Environ. Psychol.* **2007**, *27*, 97–106.
92. Finucane, M.L.; Slovic, P.; Mertz, C.K.; Flynn, J.; Satterfield, T.A. Gender, Race and Perceived Risk: The 'White Male' Effect". In *The Earthscan Reader on Risk*; Löfstedt, R.E., Boholm, Å., Eds.; Earthscan: London, UK, 2009.
93. Olofsson, A.; Rashid, S. The white (male) effect and risk perception: Can equality make a difference? *Risk Anal.* **2011**, *31*, 1016–1032.
94. Giorda, C. Il mio spazio nel mondo. In *Geografia per la Scuola dell'Infanzia e Primaria*. Carocci: Rome, Italy, 2014.
95. Lussault, M. L'homme spatial. In *La Construction Sociale de l'Espace Humain*; Éd. du Seuil: Paris, France, 2007.
96. Pepe, P. Insegnare geografia a distanza: Educazione alla cittadinanza e formazione, Ambiente Società Territorio. *Geogr. Nelle Scuole* **2020**, *65*, 37–42.
97. Gómez Trigueros, I.M. El cambio climático y la enseñanza interdisciplinar: Una propuesta didáctica al reto educativo del siglo XXI. In *The Climate Crisis in Mediterranean Europe: Cross-Border and Multidisciplinary Issues on Climate Change*; Gómez Cantero, J., Morán Martínez, C., Losada Gómez, J., Carnelli, F., Eds.; Geographies of the Anthropocene Book Series; Il Sileno Edizioni: Cosenza, Italy, 2020, pp. 163–181.
98. Crutzen, P.J. Geology of mankind. *Nature* **2002**, *415*, 23.
99. Crutzen, P.J.; Stoermer, E.F. The Anthropocene. *IGBP Newsl.* **2000**, *41*, 17–18.
100. Giorda, C. (Ed.) *Geografia e Antropocene*. In *Uomo, Ambiente, Educazione*; Carocci: Rome, Italy, 2019.
101. Landowski, E. *Avoir Prise, Donner Prise*; Nouveaux Actes Sémiotiques: Limoges, France, 2009; p. 112 Available online: <https://www.unilim.fr/actessemiotiques/2852> (accessed on 23 June 2020).

