REGILIENCE

Regional Pathways to Climate Resilience

Citizen Survey Report – Central Macedonia

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About

REGILIENCE is committed to supporting the European Green Deal and the EU Mission "Adaptation to Climate Change" by fostering the adoption of regional climate resilience development pathways.

The project develops, compiles, shares, and promotes tools and scientific knowledge to support European regions in identifying and addressing their climate-related risks. We work closely with sister projects, such as ARSINOE, IMPETUS, and TransformAr to enhance the capacity of 7 focus regions to tackle the unavoidable impacts of climate change.

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Project partners

Executive Summary

The REGILIENCE project, dedicated to supporting European regions in developing climate resilience pathways, emphasizes the importance of involving citizens in climate adaptation and mitigation processes. Despite existing European and national initiatives, a critical gap persists in citizen awareness and engagement regarding climate change impacts. Recognising this, the REGILIENCE project conducted a citizen survey in Central Macedonia, Greece, to evaluate public awareness, perceptions, and personal engagement in climate resilience.

The survey was conducted online, gathering valid 218 responses over two months. It employed a non-probabilistic convenience sampling method and ensured participant confidentiality.

Key Findings:

Demographic Insights: The survey revealed diverse demographic profiles in terms of gender, age, education, and occupation. Social networks and the internet emerged as primary sources of environmental knowledge, with significant reliance on television.

Awareness and Perceptions: Overall awareness levels varied, with 'Sustainability' and 'Regional development' being the most recognized concepts, while 'Climate resilience' was less known. Women and younger individuals exhibited higher concern for climate change impacts. Educational attainment correlated with greater awareness and concern.

Regional Priorities: Respondents prioritized effective water management, sustainable consumption, urban planning integration, and renewable energy promotion. Conversely, coastal protection, transportation infrastructure, and public health systems were seen as lower priorities, highlighting a need for targeted awareness campaigns.

Personal Engagement: Women and certain age groups (18-24, 35-54) were more proactive in climate adaptation measures. Actions predominantly focused on mitigation, such as energy efficiency and waste management, rather than direct adaptation.

Challenges and Recommendations: The survey identified significant gender and age disparities in climate perception and action. To address these, increased public education and engagement are essential. Additionally, future surveys should aim for better demographic representation and refine data collection methodologies to enhance robustness and inclusivity.

The REGILIENCE survey underscores the necessity of involving citizens in climate resilience efforts and highlights the varying levels of awareness and engagement across demographics. These insights are crucial for shaping effective, inclusive public policies and fostering sustainable practices within European regions.

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1 Introduction

The REGILIENCE project develops, compiles, shares, and promotes tools and scientific knowledge to support European regions in identifying and addressing their climate-related risks. The impacts of climate change are already being felt globally whether through the increase in extreme weather-related events such as droughts, or by a gradual change in environmental conditions and ecosystems. While several European and national initiatives are underway to develop solutions to adapt and mitigate these effects, there remains a critical need to involve citizens in this process. This is particularly crucial given the potential inadequacy of citizens' awareness, knowledge, and implementation of measures to address climate change impacts.

Recognising the importance of citizen perspectives in shaping effective actions, it is imperative to consider their visions in the co-development and implementation of measures.
This study focuses on the Central Macedonia region in Greece, with a population of 1.8 million people, which has experienced persistent flooding over the last five years, alongside challenges in transport infrastructure and energy consumption of public buildings.

The citizen survey conducted in Central Macedonia is part of the work performed under WP1 "Engagement, communication, and dissemination," which aims to design and implement various communication and dissemination activities targeting identified stakeholders and the broader community.
The scope of the citizen survey is to assess citizen awareness of climate risks, including hazards, exposure, and vulnerability, and to gauge the need for climate resilience in Central Macedonia. Moreover, the survey aims to collect data to monitor citizens' perceptions throughout the project. In addition to assessing citizen perspectives on climate change, it is crucial to uphold ethical standards throughout the survey process. Participants were informed of their rights and the purpose of the survey, ensuring anonymity and confidentiality.

The present report is structured in three distinct parts: Methodology, Results, and Conclusion. The Methodology section provides a detailed overview of the survey structure, including the types of questions asked and how they were formulated. It also describes the data collection process, including participant recruitment and survey administration methods. Furthermore, it explains the sampling method used, detailing the rationale behind the non-probabilistic convenience sample, and discusses any limitations of the methodology that may impact the generalizability of the results.

The Results and Data Analysis section presents the findings of the survey and discusses their implications. It covers various aspects of the data, including sociodemographic characterisation, which analyses the respondents' demographic profiles, such as gender, age, educational levels, scientific areas, professional occupation, and economic condition assessment. This section also provides insights into the sources from which respondents obtain their environmental knowledge and their awareness of key environmental concepts. It examines the respondents' perceptions regarding the severity of climate change, their agreement levels with climate change impact statements, their regional perceptions of climate change hazards, and their views on priority actions for addressing regional climate change challenges. Furthermore, it assesses the personal engagements respondents have taken to adapt to climate change, including an analysis of the types of activities taken and their prevalence across different demographic groups.

Last but not least, the Conclusion summarises the main findings of the survey and provides final remarks. It highlights key insights, such as significant gender differences in hazard perception, variation in concern levels across age groups, the correlation between education levels and awareness, and the impact of occupational status and socio-economic factors on environmental perceptions. Additionally, it discusses the need for increased public education and engagement to foster sustainable practices and resilience across all segments of society. This section also addresses the limitations of the survey, including sample representation issues, and suggests improvements for future research methodologies to enhance the robustness and inclusivity of subsequent studies.

2 Methodology

The Citizens' Survey was developed and implemented online by F6S using EUSurvey under the prerequisites of the REGILIENCE project. The questionnaire was translated into Greek by the same platform and validated afterwards by an outside contractor.

The survey aimed to describe and analyse people's awareness, practices, and perceptions about climate change in Central Macedonia, Greece. The survey was devised also to enable indicators to be drawn up that would encourage future studies to be carried out to compare and analyse the evolution of perceptions and representations observed at different times. The collected information also aimed to reveal the need to maintain climate resilience actions/good practices throughout the project's lifespan. Consequently, questions were developed to encompass the following topics:

- Sociodemographic characterisation.
- Sources of information and knowledge about climate change.
- Perceptions about climate change.
- Personal actions on climate change focusing on adaptation.

At the same time, the instrument was developed taking into consideration its length and time of responses so as not to deter individuals from answering the study. The final version of the questionnaire comprised 15 questions, further broken down into 53 variables, and was designed to be completed within a timeframe not exceeding 10 minutes, available in both English and Greek (see Annex I).

Data collection began in January 2024 and was extended until April 2024. As mentioned, the survey was implemented online using EUSurvey, an open-source surveying tool developed by the European Union.

The target audience (universe) comprises individuals aged 18 or over who live in Central Macedonia, Greece proficient in either Greek or English, and with internet access. Regarding sampling, a non-probabilistic sample by convenience was sought to be the best practical approach based on the network of associations established in the area/region. Several partners within the region were contacted to circulate and publicise the survey.

Additionally, efforts were made to disseminate the survey through email, social media platforms and local community networks to ensure broad participation and representation.

Moreover, to encourage participation and ensure inclusivity, the survey was designed to be user-friendly and accessible across various devices. Clear instructions were provided, and assistance was made available for individuals who required support in completing the survey.

The online survey collected 241 responses, and yielded 218 valid responses; however, it is important to note the limitations inherent in a non-probabilistic sampling method. The results may not fully represent the entire population of interest.

Ethical considerations were paramount throughout the survey process. Participants were informed of the purpose of the survey and their rights as participants prior to participation, ensuring informed consent. The survey was conducted anonymously to safeguard participant confidentiality. Participants were given the option to provide their email addresses for project updates, but this information was not stored in any database for analysis or treatment of the results, preserving participant anonymity.

Overall, the survey methodology aimed to gather diverse perspectives from the target population while minimising barriers to participation and ensuring the reliability and validity of the data collected.

The data underwent meticulous treatment using Excel and SPSS, primarily focusing on descriptive statistics and cross-tabulations. Excel facilitated initial data management and organisation, while SPSS enabled in-depth analyses, including the generation of descriptive statistics and cross-tabulations. To explore the results in greater depth, the data were disaggregated by specific variables, comprising gender, age groups, level of education, areas of higher education study, employment status, and socio-economic situation. This disaggregation was essential for analysing the survey responses across different segments of the population.

In the gender analysis, individuals who 'preferred not to answer' were excluded due to their statistical insignificance.

Age groups were maintained as originally designed in the survey to preserve the granularity of the data. Levels of education were consolidated from seven categories into three broader groups to enhance statistical relevance. This recoding process aimed to provide clearer insights while maintaining the validity of the data.

Areas of education were categorised from an open question into five main areas of study. This categorisation helped streamline the analysis while preserving the diversity of educational backgrounds. Professional occupation was simplified into two categories: 'working' and 'not working'. This recoding was necessary to address the lack of representativeness among other occupational groups. Regarding economic condition, a question concerning the difficulty of paying bills, adapted from the Special Eurobarometer 513, was included. This question served as a proxy for income level, offering a comparable measure without directly inquiring about respondents' income, which may be perceived as intrusive.

This methodical approach ensured that the survey results were comprehensively analysed and that the findings reflect the diverse perspectives of the respondents. The independent variables selected for disaggregation allowed for meaningful comparisons across different groups, thereby enriching the understanding of public perceptions of climate change.

3 Results and Data Analysis

During the dissemination period of the survey in Central Macedonia, Greece, 218 valid responses were collected.

3.1 Sociodemographic Characterisation

3.1.1 Gender

In terms of gender distribution, the majority of respondents are female (138), comprising 63.3% of the total. Males account for 35.8% (78), while a small fraction (2), 0.9%, chose not to disclose their gender. This slight imbalance between female and male respondents is likely due to the online dissemination method, which limits control over who participates in the survey. The data indicate a higher participation rate among women, which may suggest greater interest in the survey topic among females or a higher likelihood of their participation in online surveys.

3.1.2 Age Groups

Age groups were divided into six ranges: '18-24'; '25-34'; '35-44'; '45-54'; '55-64'; '65+' (as seen in question 3 in Annex I). The group with the highest percentage of responses is 45-54 years old at 31.7%, and the age group with the lowest percentage of responses is 65+ at 7.3%. The sample does not appear to be fully representative of the population of Central Macedonia, particularly due to the under-representation of older adults (65+) and the over-representation of middle-aged adults (45-54), as shown in Table 1. Percentages were normalised considering the total number of individuals aged 18 and over (1,539,33). Individuals under 18 (342,275) were not taken into consideration for these calculations. The data regarding the total number of residents in the region by age was obtained from Eurostat on May 29, 2024, and subsequent estimations were conducted thereafter.

Table 1 Age Group Distribution

Age Group:	Survey	Population
18-24	11,0%	9,8%
25-34	12,8%	16,6%
35-44	19,3%	18,5%
45-54	31,7%	16,8%
55-64	17,9%	14,2%
65+	7,3%	24,2%
Total (N)	218	1 539 833

Source: Eurostat

In terms of distribution by Age and Gender the following Figure illustrates the distribution of respondents' ages segmented by gender. This visual representation helps in understanding how age demographics vary between male and female respondents within the sample.
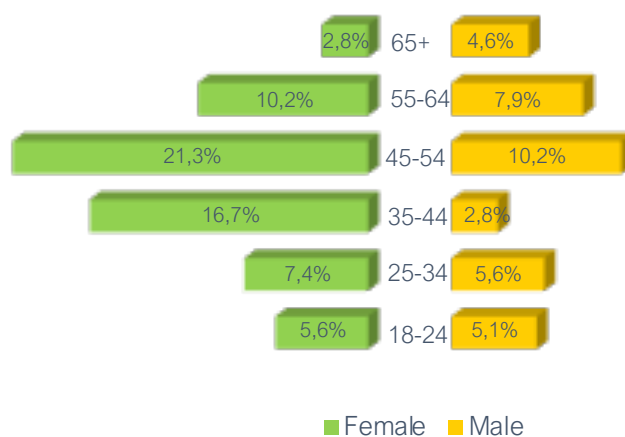

Figure 1 Age groups by Gender

3.1.3 Levels of Education

The survey included a question about the highest level of education completed by respondents. Initially, the question offered seven categories: 'Primary education', 'Lower secondary education', 'Upper secondary education', 'Post-secondary non-tertiary education', 'Short-cycle tertiary education', 'Bachelor's degree or equivalent tertiary education level', 'Master's degree or equivalent tertiary education level', and 'Doctoral degree or equivalent tertiary education level'. Due to sub-representation in some groups, these categories were recoded into three broader groups for analysis: Pre-Tertiary Education, Bachelor's Degree or Equivalent Tertiary Education Level, and Master's and Doctoral Degrees.
The distribution of respondents' educational attainment is summarised in the following Figure:

- Pre-Tertiary Education
- Bachelor's Degree or Equivalent Tertiary Education Level
- Master's and Doctoral Degrees
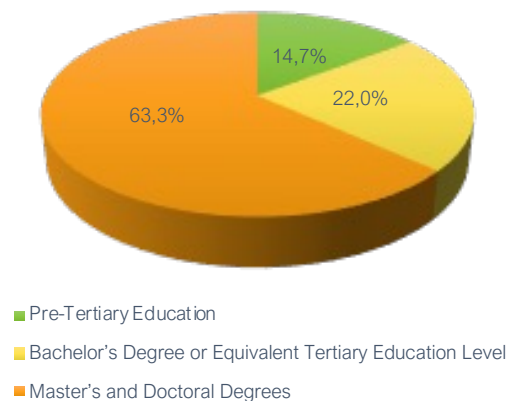
Figure 2 Levels of Education

The largest group of respondents, 63.3%, have completed Master's and Doctoral Degrees. This indicates a highly educated sample population, with a significant portion having attained advanced levels of education.

22.0% of respondents have completed a Bachelor's Degree or an equivalent tertiary education level, showing that a substantial segment of the sample has attained at least a basic tertiary education.
The smallest group, comprising 14.7% of respondents, has completed Pre-Tertiary Education. This group includes those who have not pursued education beyond secondary or post-secondary non-tertiary levels.
This distribution suggests that the survey sample is predominantly composed of individuals with higher education qualifications, which may influence the perspectives and insights provided in their responses.
The recoding of the educational categories was necessary to ensure more meaningful and representative analysis, given the original sub-representation in some groups.

3.1.4 Scientific Areas

Categories were established and standardised based on responses to an open-ended query regarding the respondents' fields of study, as delineated in the methodology section. This methodological approach fosters a nuanced comprehension of the diverse academic and professional backgrounds of the survey participants. The relatively equitable dissemination of responses across scientific domains suggests a multifaceted spectrum of expertise and interests within the survey cohort.

Considering the significant number of respondents whose primary focus lies within the realm of 'Business, Economics, and Management', it was deemed prudent to delineate this category distinctively from the broader grouping encompassing 'Social Sciences and Humanities'. This strategic segmentation ensures a more granular depiction of the respondents' areas of specialisation, thereby accentuating the distinctive viewpoints inherent in 'Business, Economics, and Management'.

Concerning the primary scientific area, out of the 218 respondents, 184 responses were validated. The distribution of these authenticated responses is as follows:

Table 2 Main Scientific Areas

Main Scientific Area	Responses	Percentage
Engineering & Technology	49	26,6%
Business, Economics and Management	35	19,0%
Natural Sciences	38	20,7%
Social Sciences and Humanities	49	26,6%
Health Sciences	13	7,1%
Total valid responses	**184**	**100%**

- Engineering & Technology and Social Sciences and Humanities emerge as the most prominent scientific areas among respondents, each comprising 26.6% of the validated responses. This observation underscores the substantial representation from both technical and societal spheres.
- Natural Sciences constitute 20.7% of responses, indicative of a diverse array of disciplines encompassing biology, chemistry, and physics.
- Business, Economics, and Management accounts for 19.0% of respondents. Delving into this category separately from Social Sciences and Humanities ensures the faithful representation of the distinct professional and academic perspectives intrinsic to these domains.
- Health Sciences exhibit the lowest representation, comprising a mere 7.1% of responses. This category encompasses medical and health-related fields, indicating a smaller proportion of respondents with expertise in these areas.

3.1.5 Professional Occupation

The refinement of professional occupation categorisation has led to the establishment of two distinct groups: 'Working' and 'Not Working'. This process aimed to simplify the analysis while ensuring clarity and coherence in the classification.

The 'Working' category encompasses individuals actively engaged in employment, specifically those categorised as 'Paid Worker'. On the other hand, the 'not working' category comprises individuals presently not employed, including respondents identified as 'Unemployed', 'Student', 'Pensioner', 'Looking for First Job', 'Student-Worker', and 'Without Any Activity'.
The categorisation of student-workers as "Not Working" allows for a focused analysis of individuals not part of the full-time workforce, facilitating insights into the dynamics of student employment alongside other non-working statuses. This approach streamlines data interpretation while preserving meaningful distinctions based on employment status.

By ensuring a clear differentiation between those actively working and those not, this strategy accommodates the majority representation of 'Paid Worker' responses (80.3%) within the 'Working' category, while consolidating the remaining categories under 'Not Working' (19.7%).

3.1.6 Economic Condition Assessment

As previously noted, an inquiry concerning the challenge of paying bills, adapted from the Special Eurobarometer 513, was integrated into the survey. This question serves as an indirect measure of respondents' income level, providing insight into their financial well-being without directly soliciting details about their income.
The analysis of responses is summarised in the following table:

Table 3 Difficulty Paying Bills

Difficulties paying bills	Responses	Percentage
Always	18	8,3%
Sometimes	121	55,5%
Never	79	36,2%
Total	**218**	**100%**

The table illustrates that most respondents (55.5%) acknowledge encountering difficulties paying bills on an occasional basis, underscoring the presence of financial challenges within a considerable portion of the surveyed population. Additionally, a smaller percentage of respondents (8.3%) consistently report experiencing such difficulties, indicating a notable minority confronting ongoing financial strain.

Conversely, a significant segment of respondents (36.2%) affirms never experiencing difficulties paying bills, suggesting a relatively stable financial standing among this cohort.

In summary, the findings regarding challenges in bill payment underscore the prevalence of financial obstacles among a notable portion of the surveyed population. These insights shed light on the diverse range of financial strains experienced by respondents.

3.2 Sources of Environmental Knowledge and Concept Awareness

Understanding the primary sources of information about the environment and climate change is essential for assessing public awareness and perceptions regarding these critical issues. This section presents an analysis of respondents' main sources of information as well key concept insight about the environment and climate change, exploring variations across different demographic and socio-economic factors. The analysis provides insights into how individuals access and engage with environmental information, shedding light on patterns and preferences that can inform targeted communication strategies and educational initiatives.

3.2.1 Sources of Information

Q7. From the following list, which are your three main sources of information about the environment and climate change?

Table 4 Main Sources of Information about Environment and Climate Change

From the following list, which are your three main sources of information about the environment and climate change?

Main sources of information	Television	Social media networks and the internet	Newspapers	Radio	Films and documentaries	Family, friends, neighbours or colleagues	Magazines	Books or scientific publications	Brochures or information materials	Events	Museums, national parks
Region											
Kentriki Makedonia	46,3%	80,3%	10,6%	10,6%	31,2%	14,2%	0,9%	30,7%	10,1%	34,9%	1,8%
Gender											
Female	43,5%	81,9%	9,4%	9,4%	29,0%	15,2%	0,7%	29,0%	13,0%	37,0%	1,4%
Male	52,6%	78,2%	12,8%	12,8%	33,3%	12,8%	1,3%	33,3%	5,1%	29,5%	2,6%
Age											
18-24	33,3%	95,8%	4,2%	8,3%	33,3%	37,5%	4,2%	12,5%	8,3%	33,3%	0,0%
25-34	35,7%	92,9%	7,1%	7,1%	21,4%	39,3%	0,0%	42,9%	3,6%	39,3%	3,6%
35-44	33,3%	92,9%	9,5%	7,1%	23,8%	2,4%	0,0%	42,9%	11,9%	42,9%	0,0%
45-54	47,8%	79,7%	11,6%	11,6%	42,0%	11,6%	1,4%	24,6%	15,9%	31,9%	0,0%
55-64	61,5%	71,8%	10,3%	5,1%	28,2%	5,1%	0,0%	38,5%	7,7%	38,5%	2,6%
65+	75,0%	25,0%	25,0%	37,5%	25,0%	0,0%	0,0%	12,5%	0,0%	12,5%	12,5%
Educational Categories											
Pre-Tertiary Education	65,6%	62,5%	15,6%	18,8%	25,0%	12,5%	3,1%	12,5%	3,1%	12,5%	3,1%
Bachelor's Degree or Equivalent Tertiary	58,3%	87,5%	12,5%	10,4%	35,4%	20,8%	0,0%	12,5%	6,3%	25,0%	2,1%
Master's and Doctoral Degrees	37,7%	81,9%	8,7%	8,7%	31,2%	12,3%	0,7%	41,3%	13,0%	43,5%	1,4%
Main Scientific Area											
Engineering & Technology	40,8%	83,7%	14,3%	6,1%	34,7%	10,2%	2,0%	40,8%	6,1%	40,8%	2,0%
Business, Economics and Management	54,3%	80,0%	14,3%	11,4%	31,4%	11,4%	0,0%	22,9%	8,6%	37,1%	2,9%
Natural Sciences	39,5%	76,3%	2,6%	13,2%	28,9%	13,2%	0,0%	47,4%	13,2%	47,4%	2,6%
Social Sciences and Humanities	42,9%	91,8%	6,1%	8,2%	36,7%	18,4%	0,0%	20,4%	14,3%	32,7%	0,0%
Health Sciences	30,8%	76,9%	7,7%	0,0%	15,4%	30,8%	0,0%	53,8%	23,1%	38,5%	0,0%
Professional occupation											
Working	46,9%	81,7%	10,9%	9,7%	32,0%	13,1%	0,6%	32,0%	12,0%	36,0%	1,1%
Not Working	44,2%	74,4%	9,3%	14,0%	27,9%	18,6%	2,3%	25,6%	2,3%	30,2%	4,7%
Difficulties paying bills											
Always	61,1%	94,4%	11,1%	22,2%	44,4%	22,2%	0,0%	16,7%	11,1%	0,0%	0,0%
Sometimes	43,0%	75,2%	8,3%	12,4%	30,6%	14,0%	0,0%	34,7%	12,4%	37,2%	1,7%
Never	48,1%	84,8%	13,9%	5,1%	29,1%	12,7%	2,5%	27,8%	6,3%	39,2%	2,5%

Gender:
- Both genders rely heavily on social media networks and the internet as their primary sources of information about the environment and climate change, with 81.9% of females and 78.2% of males citing it as one of their top three sources.
- Television is also a significant source for both genders, though it is slightly more popular among males (52.6%) compared to females (43.5%).

Age Group:

- Respondents aged 18-24 heavily rely on social media networks and the internet (95.8%) as their primary source of information about the environment and climate change, followed by family, friends, neighbours, or colleagues (37.5%).
- The 25-44 age group shows a higher preference for books or scientific publications (42.9%) compared to other age groups.
- Older age groups (55-64 and 65+) show a higher reliance on television as a source of environmental information, with 61.5% and 75.0%, respectively, citing it as one of their top three sources.
- In the 45-54 age group, television maintains its significance, with 47.8% of respondents relying on it, while social media networks and the internet also play a prominent role (79.7%).

Educational Level:

- Respondents with Bachelor's degree (87.5%) and Doctoral Degrees (81.9%) show a higher preference for social media networks and the internet and compared to those with Pre-Tertiary Education (62.5%).
- Those with Master's and Doctoral Degrees show the highest preference for books or scientific publications (41.3%) compared to other educational categories.
- Television emerges as the primary source of information about the environment and climate change among individuals with Pre-Tertiary Education, with 65.6% of respondents considering it one of their main sources.

Main Scientific Area:

- Respondents in the field of Engineering & Technology rely heavily on social media networks and the internet (83.7%) and books or scientific publications (40.8%) as their main sources of environmental information.
- Those in Business, Economics and Management show a higher preference for television (54.3%) compared to other scientific areas.
- The Natural Sciences category exhibits a strong preference for books or scientific publications (47.4%) and events (conferences, fairs, exhibitions, festivals, etc.) (47.4%) as sources of environmental information.
- Social Sciences and Humanities rely heavily on social media networks and the internet, with 91.8% citing it as a top source of information about the environment and climate change.
- Individuals in the Health Sciences field primarily depend on social media networks and the internet, with 76.9% citing it as their main source of information. Moreover, they also show a considerable reliance on books or scientific publications, with 53.8% considering it a vital source.

Professional Occupation:

- Both working and not working respondents heavily rely on social media networks and the internet as their main sources of information about the environment and climate change.

Difficulties Paying Bills:

- Respondents who always experience difficulties paying bills show a higher preference for television (61.1%) compared to those who sometimes (43.0%) or never (48.1%) experience difficulties, indicating a potential correlation between financial stress and reliance on traditional media for environmental information.

3.2.2   Concept Awareness

This section also investigates respondents' familiarity with fundamental environmental and developmental concepts. Specifically, participants were queried regarding their awareness of key terms such as 'Climate resilience', 'Climate change adaptation', 'Sustainability', 'Regional development', and 'Green transition'. The responses were then converted into percentages, reflecting the proportion of cases in which individuals

indicated familiarity with each concept. The data presented in the subsequent table encapsulates these percentages, offering insights into respondents' awareness levels.

Q8. Have you ever heard about the following concepts?

Table 5 Concepts on Environment and Climate Change

Have you ever heard about the following concepts?

Concepts:	Climate resilience	Climate change adaptation	Sustainability	Regional development	Green transition
Region					
Kentriki Makedonia	66,5%	87,6%	97,2%	93,1%	88,5%
Gender					
Female	65,9%	89,9%	97,1%	93,5%	88,4%
Male	66,7%	84,6%	97,4%	93,6%	88,5%
Age					
18-24	75,0%	79,2%	100,0%	87,5%	75,0%
25-34	67,9%	85,7%	96,4%	89,3%	92,9%
35-44	78,6%	90,5%	100,0%	92,9%	90,5%
45-54	69,6%	97,1%	95,7%	97,1%	97,1%
55-64	59,0%	94,9%	94,9%	92,3%	94,9%
65+	25,0%	37,5%	100,0%	93,8%	43,8%
Educational Categories					
Pre-Tertiary Education	59,4%	56,3%	100,0%	93,8%	50,0%
Bachelor's Degree or Equivalent Tertiary	52,1%	91,7%	95,8%	87,5%	93,8%
Master's and Doctoral Degrees	73,2%	93,5%	97,1%	94,9%	95,7%
Main Scientific Area					
Engineering & Technology	75,5%	98,0%	95,9%	98,0%	98,0%
Business, Economics and Management	65,7%	91,4%	97,1%	85,7%	97,1%
Natural Sciences	65,8%	94,7%	100,0%	94,7%	94,7%
Social Sciences and Humanities	71,4%	87,8%	98,0%	93,9%	93,9%
Health Sciences	46,2%	92,3%	92,3%	92,3%	100,0%
Professional occupation					
Working	69,1%	93,7%	97,7%	93,7%	95,4%
Not Working	55,8%	62,8%	95,3%	90,7%	60,5%
Difficulties paying bills					
Always	27,8%	94,4%	77,8%	83,3%	88,9%
Sometimes	62,0%	87,6%	98,3%	93,4%	88,4%
Never	82,3%	86,1%	100,0%	94,9%	88,6%

Climate Resilience:

- Across all demographic segments, 'Climate resilience' registers relatively lower levels of recognition compared to other concepts, with awareness rates ranging from 25.0% to 82.3%.
- Particularly noteworthy is the observation that individuals facing challenges in bill payment and those aged 65 and above exhibit notably lower levels of awareness, with only 27.8% and 25.0% respectively, indicating familiarity with the concept.

Climate Change Adaptation:

- Awareness of 'Climate change adaptation' demonstrates consistent prevalence across demographic strata, with recognition rates ranging from 37.5% to 98.0%.
- Notably, those with Pre-Tertiary Education exhibit comparatively lower levels of awareness, with only 56.3% indicating familiarity with the concept.

Sustainability:

- 'Sustainability' emerges as one of the most universally acknowledged concepts, with awareness levels consistently exceeding 90% across all demographic categories.
- Among respondents experiencing financial challenges, awareness of 'Sustainability' experiences a marginal dip, with 77.8% indicating familiarity.

Regional Development:

- Analogous to 'Sustainability', 'Regional development' garners widespread recognition across demographic segments, with awareness rates spanning from 83.3% to 98,0%.
- Within the realm of 'Business, Economics and Management', there is relatively lower recognition compared to other main scientific areas, with this sector reporting the lowest level of awareness of 'Regional development' among respondents (85.7%).

Green Transition:

- Awareness of the 'Green transition' concept is relatively strong, with recognition levels ranging from 43.8% to 100%. Notably, the lowest awareness is observed among the 65+ age group (43.8%) and those with 'Pre-Tertiary education' (50.0%).
- Individuals not actively engaged in employment display diminished awareness compared to their working counterparts, with only 60.5% demonstrating familiarity with the concept.

In summary, while awareness levels fluctuate across diverse demographic profiles, 'Sustainability' and 'Regional development' emerge as the most universally recognized concepts, whereas 'Climate resilience' appears to register as the least known among respondents.

3.3 Perceptions about Climate Change

3.3.1 Perception of Climate Change Severity

The objective of this section is to assess respondents' perceptions of the seriousness of climate change issues, including hazards and impacts in their region.

The initial inquiry aimed to measure respondents' perception of climate change as a current problem, applying a scale from 0 to 10. The analysis involved computing means of said responses. 'I don't know' responses were excluded from the analysis since they cannot bear weight in assessing perceptual numeric values.

Q9. How serious of a problem do you think climate change is at this moment?
Please use a scale from 0 to 10, where '0' means "not a serious problem, and '10' means "an extremely serious problem.
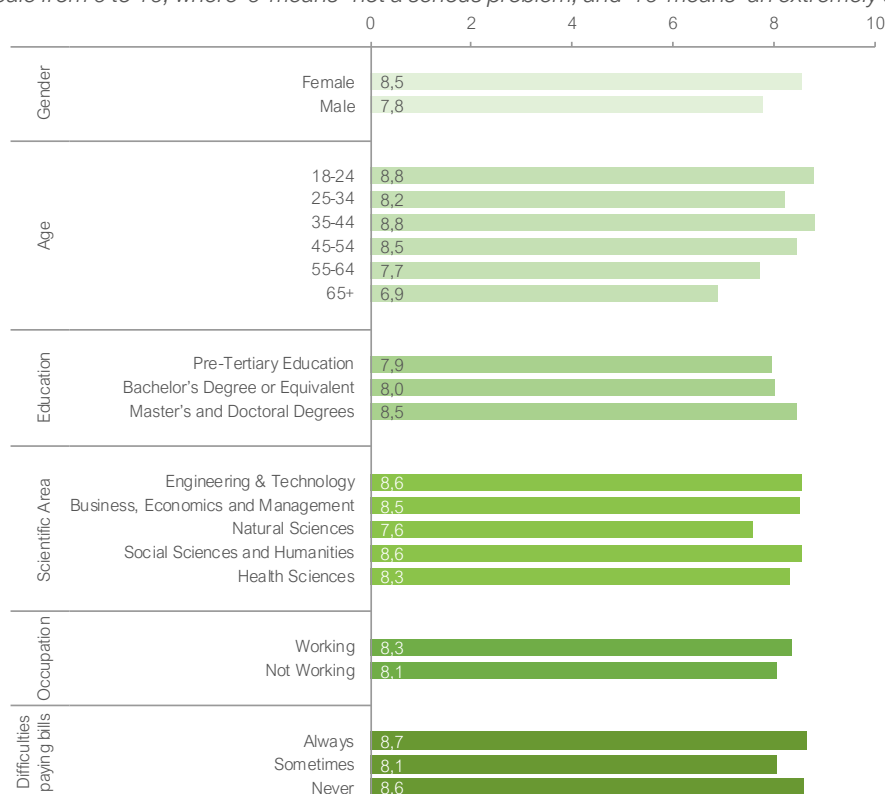

Figure 3 Respondents Perception of Climate Change Severity

The survey in Central Macedonia reveals an overall high concern about climate change, with an average rating of 8.3.

Gender:
- Females rate the seriousness higher (8.5) than males (7.8).

Age Groups:
- The highest concern is among the 18-24 and 35-44 age group (8.8), while the 65+ group shows the lowest (6.9).

Educational Level:
- Educationally, those with 'Master's and Doctoral degrees' have a higher mean rating (8.5), whereas pre-tertiary educated individuals rate it lower (7.9)

Scientific Area:
- Among scientific disciplines, Engineering & Technology and Social Sciences and Humanities both have the highest concern (8.6), while Natural Sciences is lower (7.6).

Professional Occupation:
- Occupation shows similar levels of variance in response

Difficulties Paying Bills:
- People who 'sometimes' have difficulties paying bills have less concern about climate change than individuals in opposite spectra.

3.3.2   Agreement Levels with Climate Change Impact Statements

This field evaluates respondents' agreement with various statements regarding climate change. Responses were converted to a numerical scale from 1 to 5, where '1' signifies 'Strongly disagree'; '2' 'Disagree'; '3' 'Neither agree nor disagree'; '4' 'Agree'; and '5' indicates 'Strongly agree'. Once again, 'I don't know' responses were excluded from the analysis as they do not contribute to the numeric assessment of perception. Additionally, some negatively phrased statements were included to test the coherence of respondents' views on climate change.

Q10 Please tell us to what extent you agree or disagree with each of the following statements: Please select from the options: 'Strongly disagree', 'Disagree', 'Neither agree nor disagree', 'Agree', 'Strongly agree' or 'I don't know'.

Figure 4 Agreement Levels with Climate Change Impact Statements

Respondents were clear with their evaluations. Negative statements such as 'Climate change is a natural phenomenon, and I cannot do anything about it' had the lowest score among its counterparts (2.0), followed by 'There are more important matters than climate change' (2.8). The highest level of agreement was with the statement, 'The government should increase incentives for people who try to slow down climate change,' which had a mean score of 4.4. Respondents generally agree that 'Environmental issues directly affect their daily life and health' and that 'Climate change is caused by human activities (4.0)'. There is moderate agreement that climate change negatively impacts jobs and income sources, with a mean score of 3.4.

Following the same logic, the analysis now examines respondents' agreement individually with the same set of statements regarding climate change. This exploration aims to understand how different demographic and socio-economic factors influence their perceptions. By scrutinising data across various groups, valuable insights are gained into the nuances of attitudes towards climate change within diverse segments of the sample.

Q10a. Environmental issues have a direct effect on my daily life and health.
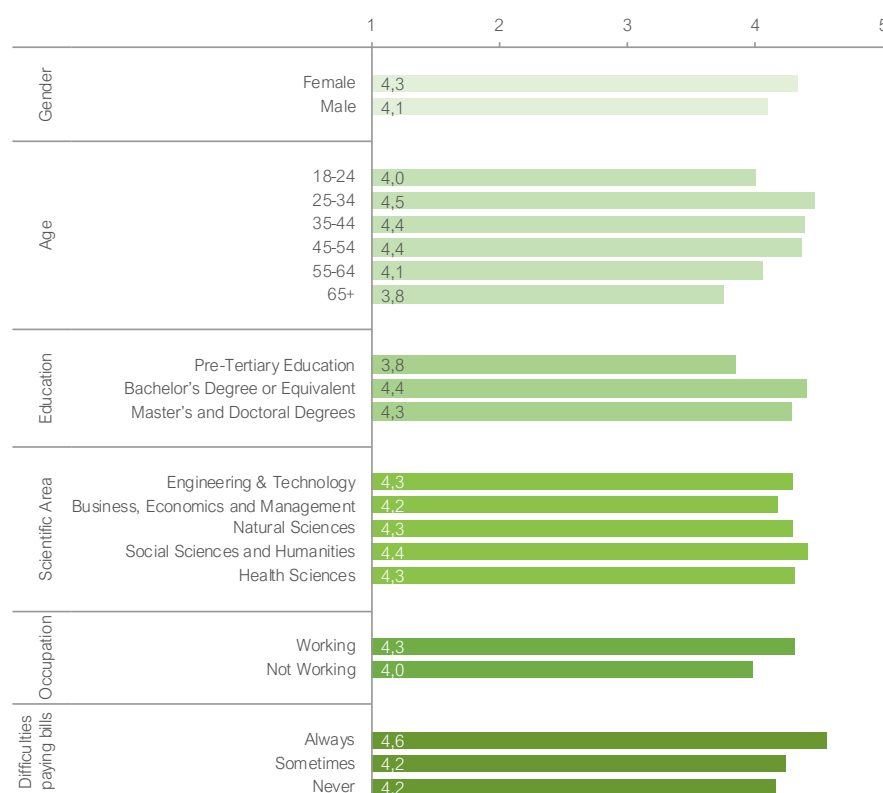
Figure 5 'Environmental issues have a direct effect on my daily life and health'

Gender:

- Females tend to exhibit a slightly higher agreement (4.3) compared to males (4.1).

Age Groups:

- Notably, individuals aged 25-34 demonstrate the uppermost agreement (4.5), while those in the 65+ group display the bottommost (3.8).

Educational Level:

- Among respondents, those with a 'Bachelor's Degree or Equivalent' show the highest average agreement (4.4), contrasting with the lowest among those with 'Pre-Tertiary Education' (3.8).

Scientific Area:

- Scientific areas show similar levels of variance in response.

Professional Occupation:

- Individuals who are 'Not Working' display slightly lower mean agreement (4.0) compared to their 'Working' counterparts (4.3).

Difficulties Paying Bills:

- Interestingly, respondents who 'Always' face difficulties paying bills demonstrate the highest mean agreement (4.6), followed by those who face difficulties 'Sometimes' (4.2), and those who never experience difficulties (4.2).

Q10b. Climate change has a negative impact on my job and income sources.
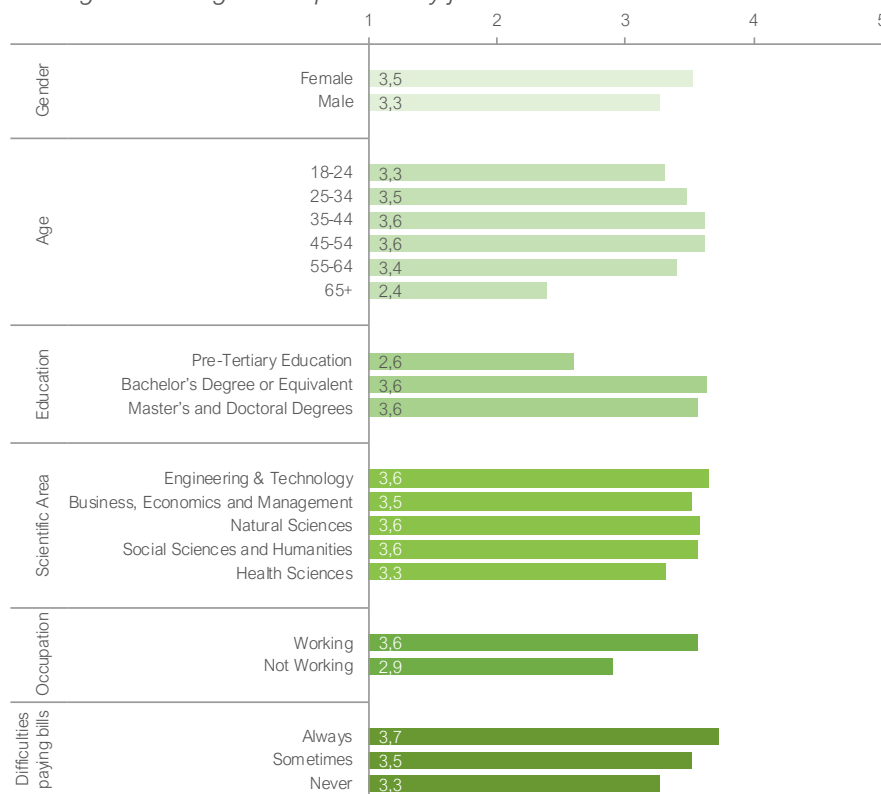
Figure 6 'Climate change has a negative impact on my job and income sources'

Gender:

- Females generally agree more (3.5) than males (3.3) that climate change impacts their job and income.

Age Groups:

- The highest agreement is among individuals aged 35-44 and 45-54 (3.6), and the lowest among those 65+ (2.4).

Educational Level:

- Respondents with a 'Bachelor's and Master's/Doctoral Degrees show the highest agreement (3.6), while those with 'Pre-Tertiary Education' have the lowest (2.6).

Scientific Area:

- Scientific areas show similar levels of variance in response.

Professional Occupation:

- In the professional realm, those 'Working' tend to agree more (3.6) than those 'Not Working' (2.9).

Difficulties Paying Bills:

- Individuals who 'Always' face difficulties paying bills demonstrate the highest agreement (3.7).

Q10c. I already experienced the impact of climate hazards (e.g., floods, droughts, heatwaves, wildfires, etc…)
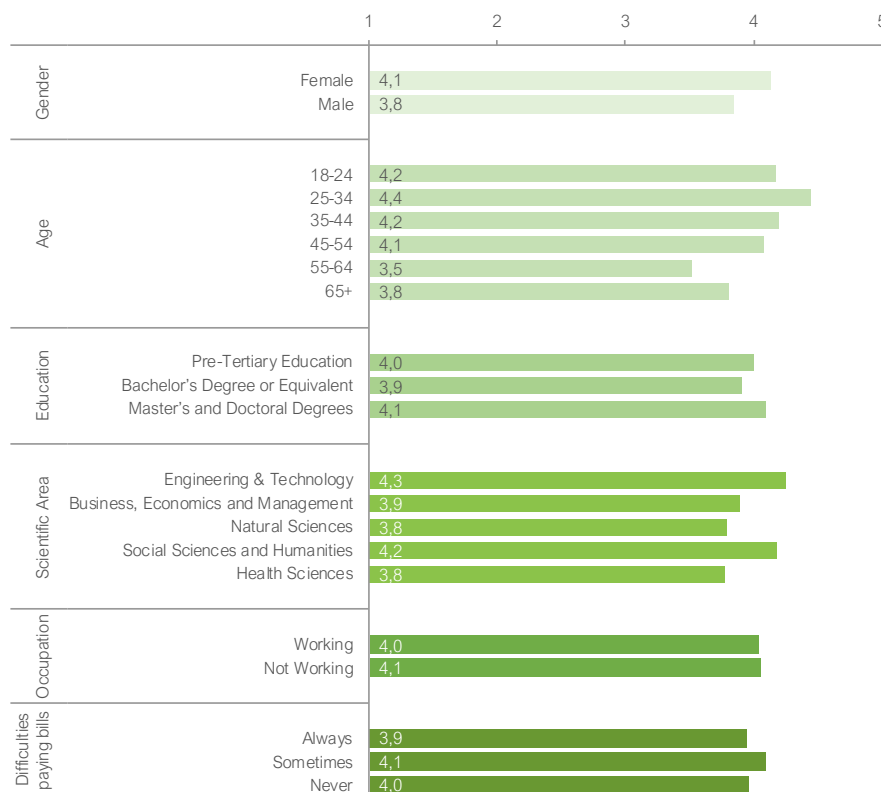
Figure 7 'I already experienced the impact of climate hazards'

Gender:

- Females tend to agree slightly more (4.1) than males (3.8).

Age Groups:

- The highest agreement is seen among individuals aged 25-34 (4.4) and the lowest among those aged 55-64 (3.5).

Educational Level:

- 'Bachelor's Degree or Equivalent' (3.9), 'Pre-tertiary Education' (4.0) and 'Master's and Doctoral Degrees' (4.1) show similar levels of variance in response.

Scientific Area:

- 'Engineering & Technology' (4.3) and 'Social Sciences and Humanities' (4.2) show the highest levels of agreement. The remaining areas appear with a slightly below agreement, ranging from 3.8 to 3.9.

Professional Occupation:

- Professional occupation doesn't significantly influence agreement, with both 'Working' and 'Not Working' individuals averaging 4.0.

Difficulties Paying Bills:

- The difficulties concerning the payment of bills show similar levels of variance in response.

Q10d. My consumption habits affect the environment.
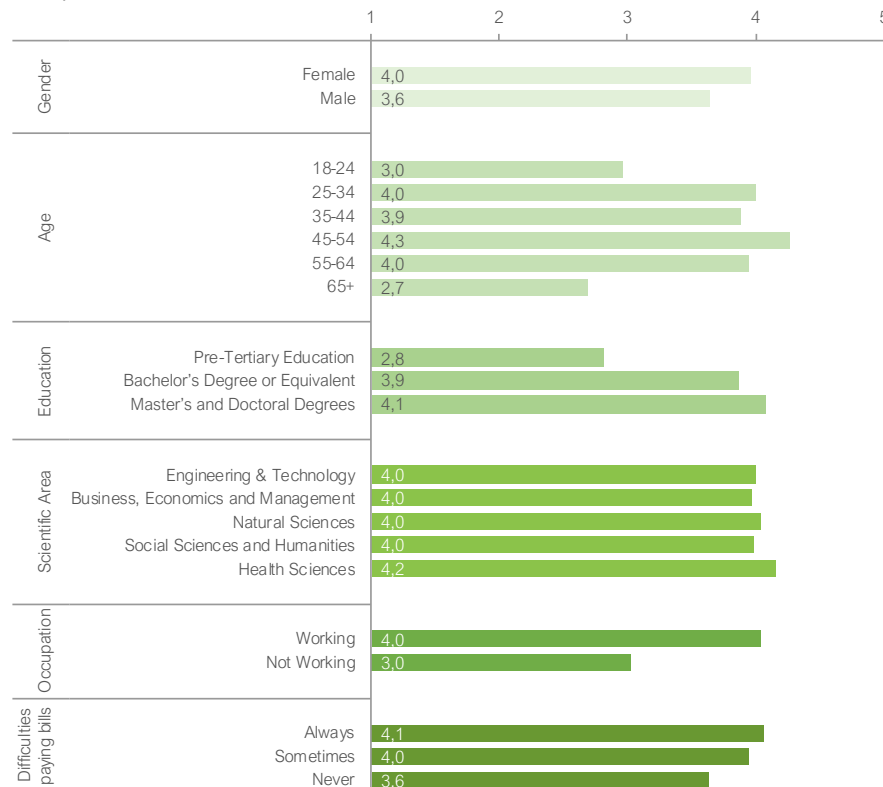
Figure 8 'My consumption habits affect the environment'

Gender:
- Females tend to agree more (4.0) than males (3.6).

Age Groups:
- The highest agreement is among those aged 45-54 (4.3), while the lowest is among the 65+ group (2.7).

Educational Level:
- Respondents with 'Master's and Doctoral Degrees' show the highest agreement (4.1), while those with 'Pre-Tertiary Education' have the lowest (2.8).

Scientific Area:
- Among scientific disciplines, Health Sciences has the highest agreement (4.2), while the remaining areas show a slightly lower level of agreement (4.0)."

Professional Occupation:
- In the professional occupation category, 'Working' individuals have higher agreement (4.0) compared to 'Not Working' individuals (3.0).

Difficulties Paying Bills:
- Individuals who 'Never' face difficulties paying bills demonstrate the lowest agreement (3.7).

Q10e. Climate change is caused by human activities.
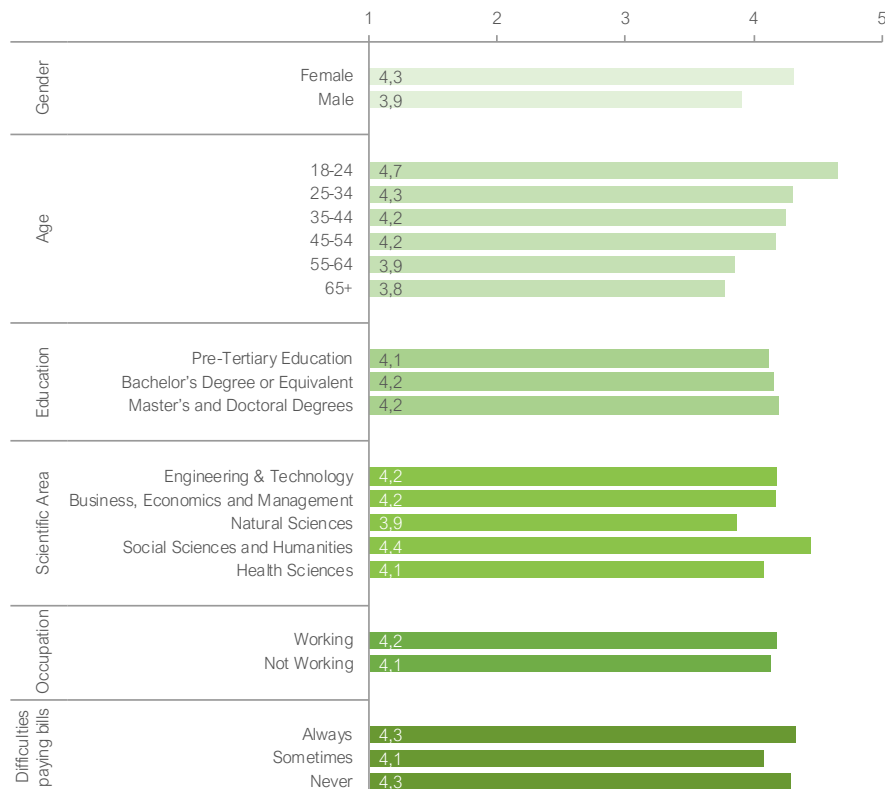
Figure 9 'Climate change is caused by human activities'

Gender:
- Females tend to agree more (4.3) than males (3.9).

Age Groups:
- The highest concern is among the 18-24 age group (4.7), while the 65+ group shows the lowest (3.8).

Educational Level:
- Education has similar levels of variance in response.

Scientific Area:
- 'Social Sciences and Humanities' demonstrated the highest level of agreement at 4.4.

Professional Occupation:
- Occupation shows similar levels of variance in response

Difficulties Paying Bills:
- Factors within economic conditions have similar levels of variance in response.

Q10f. Climate change is a natural phenomenon, and I cannot do anything about it.
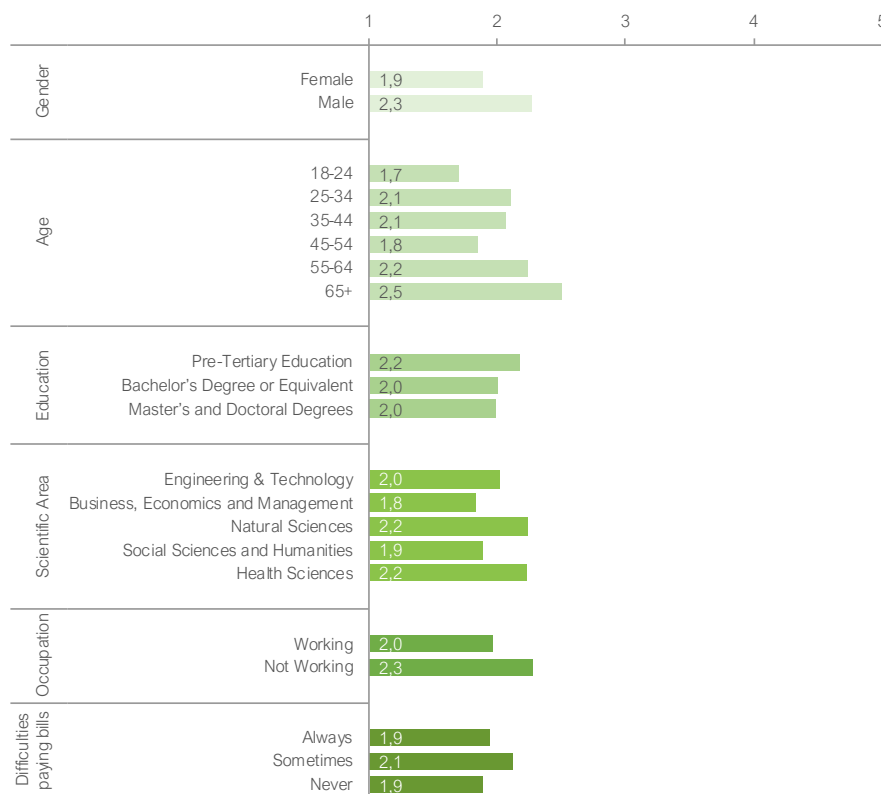
Figure 10 'Climate change is a natural phenomenon, and I cannot do anything about it'

This statement collected the highest level of disagreement compared to every other sentence.

Gender:

- Males tend to express more agreement (2.3) than females (1.9).

Age Groups:

- Interestingly, individuals aged 18-24 demonstrate higher disagreement (1.7) compared to older respondents.

Educational Level:

- Individuals with a 'Bachelor's Degree or Equivalent' and 'Master's and Doctoral Degrees' demonstrate a slightly higher disagreement (2.0) compared to "Pre-Tertiary Education" (2.2).

Scientific Area:

- Among scientific areas, 'Business, Economics and Management' indicated the lowest agreement level (1.8).

Professional Occupation:

- 'Not Working' individuals displayed higher agreement (2.3) than their 'Working' counterparts (2.0).

Difficulties Paying Bills:

- People who 'sometimes' have difficulties paying bills do agree slightly more (2.1) about 'Climate change is a natural phenomenon" than individuals that 'never' or 'always' have difficulties paying bills (1.9).

Q10g. Climate change is having a significant impact in my region.
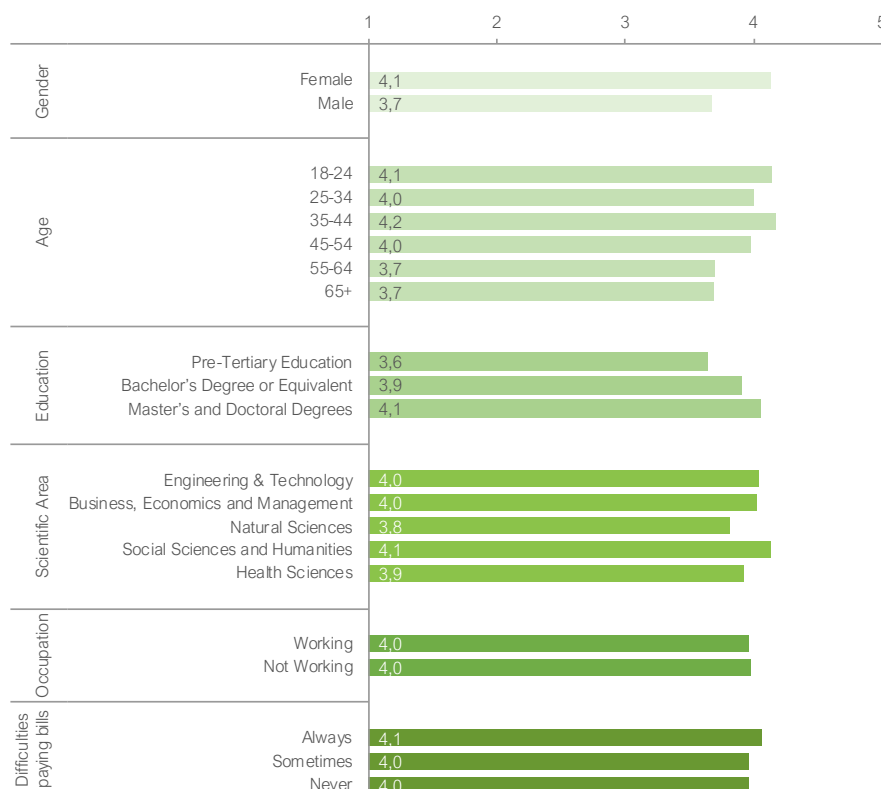
Figure 11 'Climate change is having a significant impact in my region'

Gender:

- Females (4.1) expressed higher agreement than males (3.7) on the statement 'Climate change is having a significant impact in my region'.

Age Groups:

- Among age groups, the highest agreement levels were seen in the 35-44 (4.2) and lowest between 55-64 and 65+ (3.7).

Educational Level:

- Education-wise, individuals with 'Master's and Doctoral Degrees' reported the highest agreement (4.1) in contrast with respondents with less formal education.

Scientific Area:

- In scientific areas, 'Social Sciences and Humanities' showed the highest mean agreement (4.1).

Professional Occupation:

- There are no significant differences among 'Working' and 'Not Working' individuals.

Difficulties Paying Bills:

- There are no significant differences among the group of the individuals that have 'Always', 'Sometimes' or 'Never' 'Difficulties Paying Bills'.

Q10h. My region is exposed to climate risks.
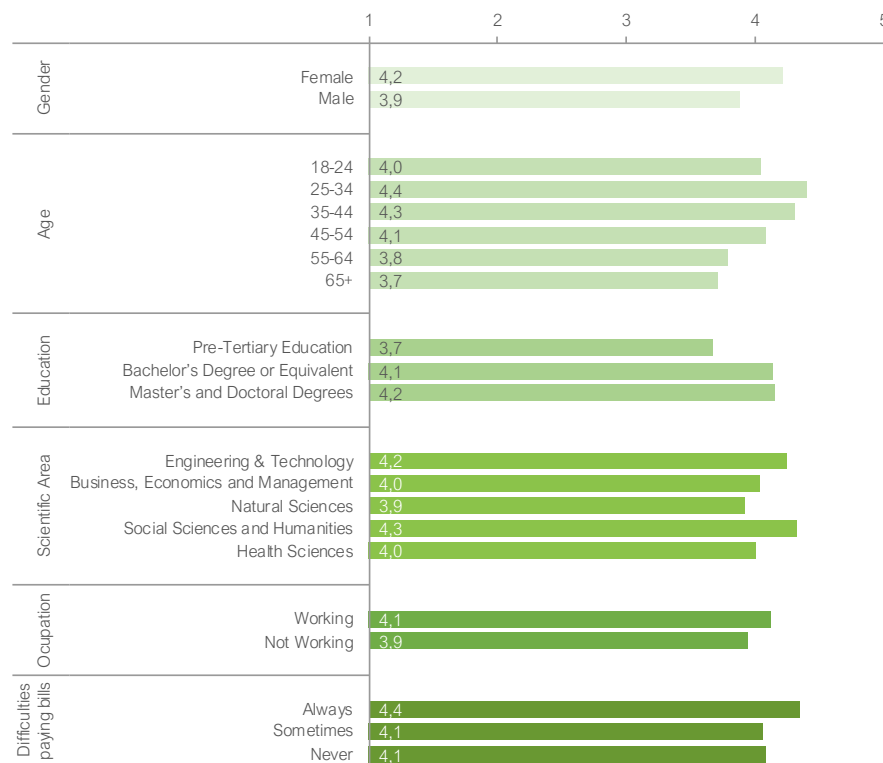
Figure 12 'My region is exposed to climate risks'

Gender:
- Females (4.2) expressed higher agreement than males (3.9).

Age Groups:
- The highest level of agreement was observed among respondents aged 25-34 (4.4). Conversely, respondents aged 65+ rated the statement among the lowest (3.7).

Educational Level:
- Individuals with 'Master's and Doctoral Degrees' reported the highest agreement (4.2) education-wise.

Scientific Area:
- 'Social Sciences and Humanities' showed the highest mean agreement (4.3) in scientific areas.

Professional Occupation:
- Occupation shows similar levels of variance in response

Difficulties Paying Bills:
- The highest level of agreement was observed among those who "Always" face difficulties paying bills (4.4).

Q10i. The government should increase incentives for people who try to slow down climate change.
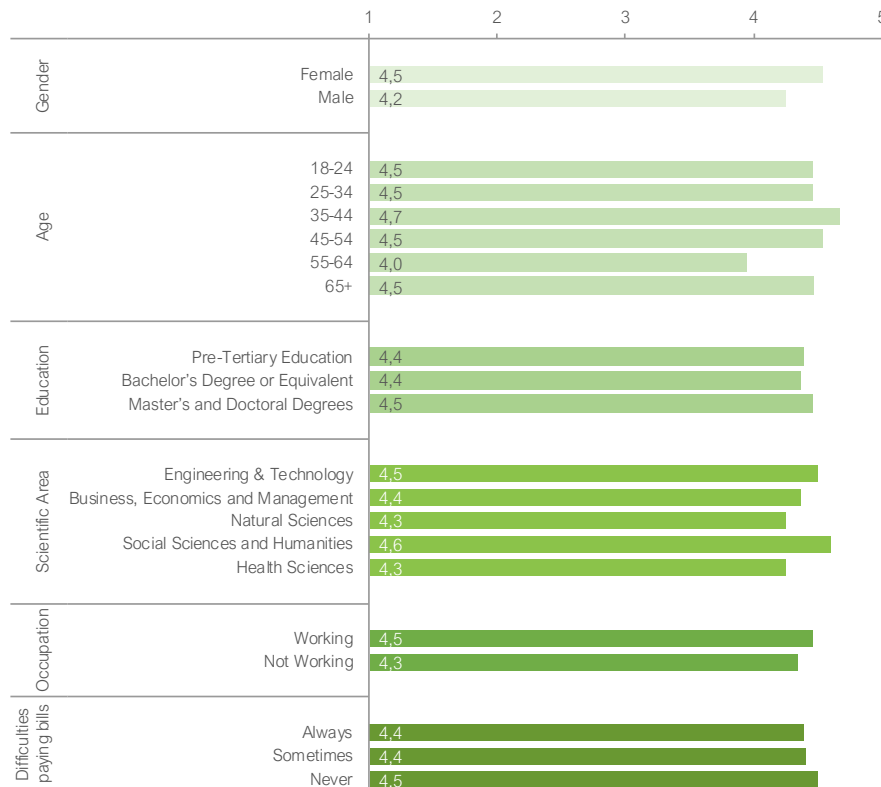
Figure 13 'The government should increase incentives for people who try to slow down climate change'

This statement received the highest level of agreement compared to every other sentence.

Gender:

- Females (4.5) agreed more than males (4.2).

Age Groups:

- The age group 35-44 had the highest agreement (4.7), while those aged 55-64 had the lowest (4.0).

Educational Level:

- The scores within the various educational levels are consistently high, indicating a widespread understanding and support for the statement.

Scientific Area:

- Among all scientific disciplines, the scores remain uniformly elevated.

Professional Occupation:

- Both 'Working' and 'Not Working' individuals show high scores implying a broad understanding and endorsement of the statement

Difficulties Paying Bills:

- In the three categories of 'Difficulties Paying Bills', the high scores indicate a broad comprehension and agreement with the statement

Q10j. There are more important matters than climate change.
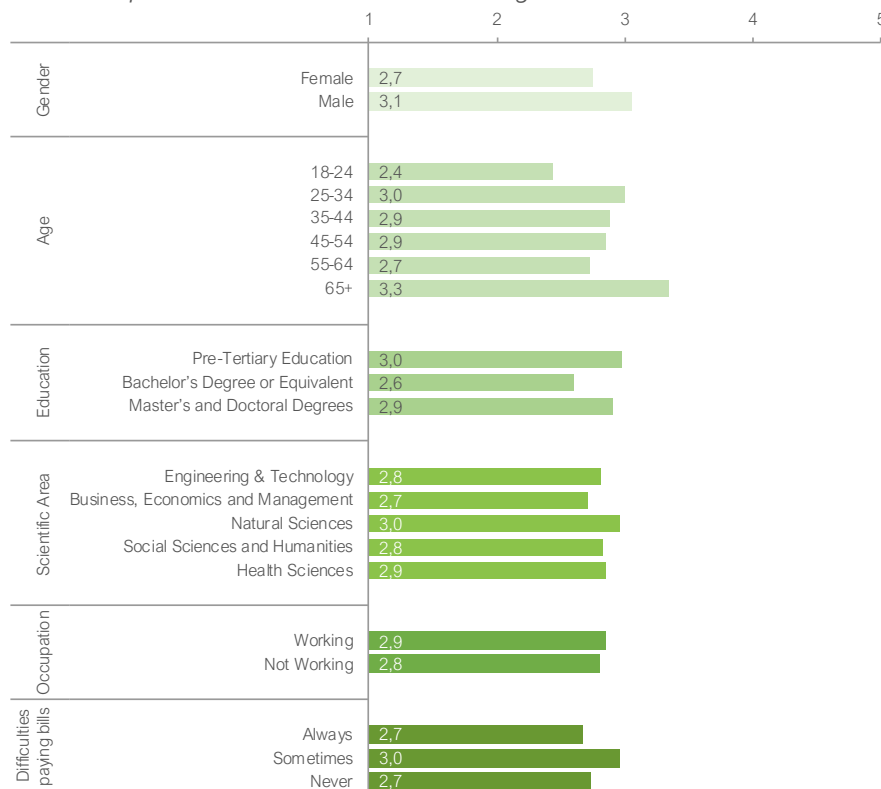
Figure 14 'There are more important matters than climate change'

Gender:

- Males (3.1) generally agreed more than females (2.7) that there are more important matters than climate change.

Age Groups:

- Among age groups, those 65+ (3.3) showed the highest agreement, while those 18-24 (2.4) had the lowest.

Educational Level:

- Respondents with a 'Bachelor's Degree or Equivalent' expressed lower agreement (2.6), compared to those with 'Pre-Tertiary Education' (3.0) and 'Master's and Doctoral Degrees' (2.9).

Scientific Area:

- Among scientific areas, 'Natural Sciences' had the highest agreement (3.0), while 'Business, Economics and Management' had the lowest (2.7).

Professional Occupation:

- Occupation shows similar levels of variance in response.

Difficulties Paying Bills:

- As already mentioned, people who 'sometimes' have difficulties paying bills have less concern about climate change than individuals in opposite spectra.

Overall, the most significant averages across all figures are:

- Females (3.8) always rate every assertion higher than males (3.6), except in statements perceiving more negative attitudes towards climate change.
- Age group 25-34 (3.9) compared to age group 65+ (3.4) shows the largest delta difference between age groups (0.5).

- Individuals with Master's and Doctoral Degrees (3.8) compared to those with Pre-Tertiary Education (3.4) have the largest delta difference between education levels (0.4).

3.3.3 Regional Perception of Climate Change Hazards

The present section analyses respondents' perceptions and representations of how various hazards and climate change impacts are affecting their region. In Figure 15, two representations are provided side by side:

- The left-side representation displays the mean assessment for each hazard or climate change impact on a scale of 1 to 3 ["Not affecting the region" (1), "Affecting in some ways" (2), "Strongly affecting the region" (3)]. For this calculation, "I don't know" answers were excluded, as they do not contribute to the numeric assessment of perception.
- The right-side representation shows the distribution of responses in percentages. Contrary to other questions, this figure has been included with percentages of 'I don't know' responses due to some hazards/climate change impact(s) raising a significant amount of doubt/uncertainty among respondents.

Q11. How the following hazards/climate change impact(s) are affecting your region at this moment: Please select from "Not affecting the region", "Affecting in some ways", "Strongly affecting the region" or "I don't know".
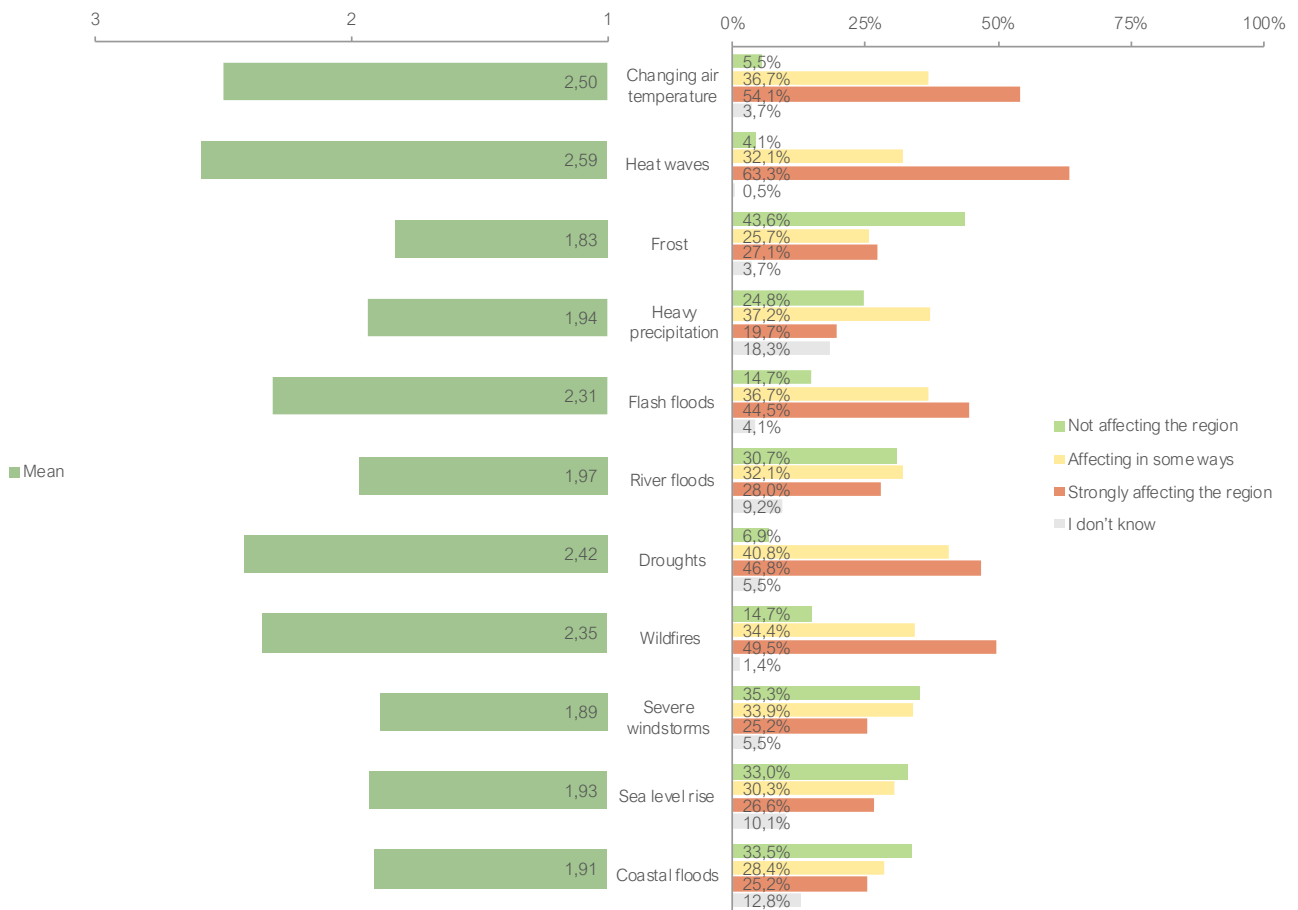
Figure 15 Regional Perception of Climate Change Hazards

The analysis of respondents' perceptions regarding various hazards and climate change impacts in Central Macedonia, Greece, reveals several key findings. Foremost among these is the significant concern expressed regarding heat waves, with an overwhelming 63.3% of respondents indicating they strongly affect the region. Following closely, changing air temperature garnered strong concern from 54.1% of participants, while wildfires were noted by 49.5%. However, heavy precipitation (18.3%) and coastal floods (12.8%) exhibited considerable uncertainty, as evidenced by a notable increase in "I don't know" responses

compared to other segments of the survey. Conversely, frost was deemed to have the least impact, with 43.6% of respondents reporting it does not affect the region.

Examining the calculated averages, the top three means, reflecting the highest perceived impacts, were observed for heat waves (2.59), changing air temperature (2.50), and droughts (2.42). Conversely, the bottom three perceived impacts were found for frost (1.83), severe windstorms (1.89), and coastal floods (1.91). This analysis underscores the prevalence of uncertainties across several hazards and climate change impacts.

As before, the analysis now focuses on respondents' perceptions regarding various hazards and climate change impacts, examining how these perceptions vary across different demographic and socio-economic factors. This section aims to provide a detailed understanding of how specific groups within the population view the risks and impacts associated with climate change, shedding light on the nuances and diversity of opinions among different segments of society. By analysing these differences, we can better comprehend the factors that influence public perception and identify areas where targeted information and intervention may be necessary.

Q11a. Changing air temperature
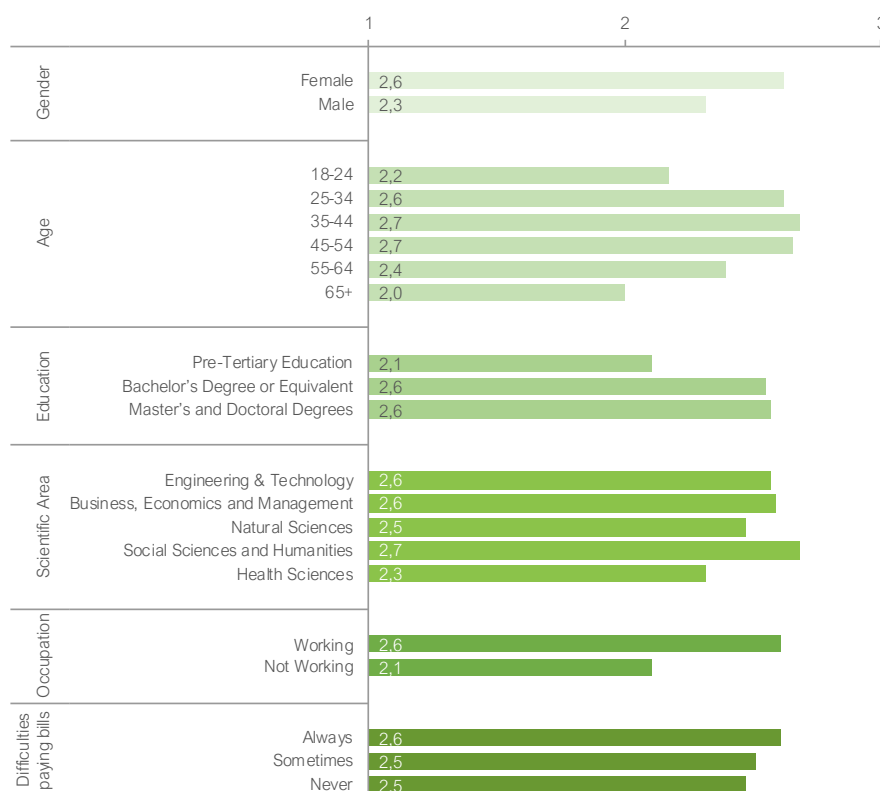
Figure 16 Changing air temperature

Gender:

- Concerning changing air temperature, females rate it higher (2.6) than males (2.3).

Age Groups:

- The middle age groups, 35-44 and 45-54, have the highest scores (2.7), while those 65+ score lowest (2.0).

Educational Level:

- Respondents with 'Pre-tertiary education' rank it lowest (2.0), while Bachelor's and Master's/Doctoral degrees score highest (2.6).

Scientific Area:

- Social Sciences and Humanities rate it highest (2.7), and Health Sciences lowest (2.3).

Professional Occupation:

- Those working score 2.6, in contrast, those not working score 2.1.

Difficulties Paying Bills:

- Difficulties paying bills scores vary between 2.5 and 2.6.

Q11b. Heat waves
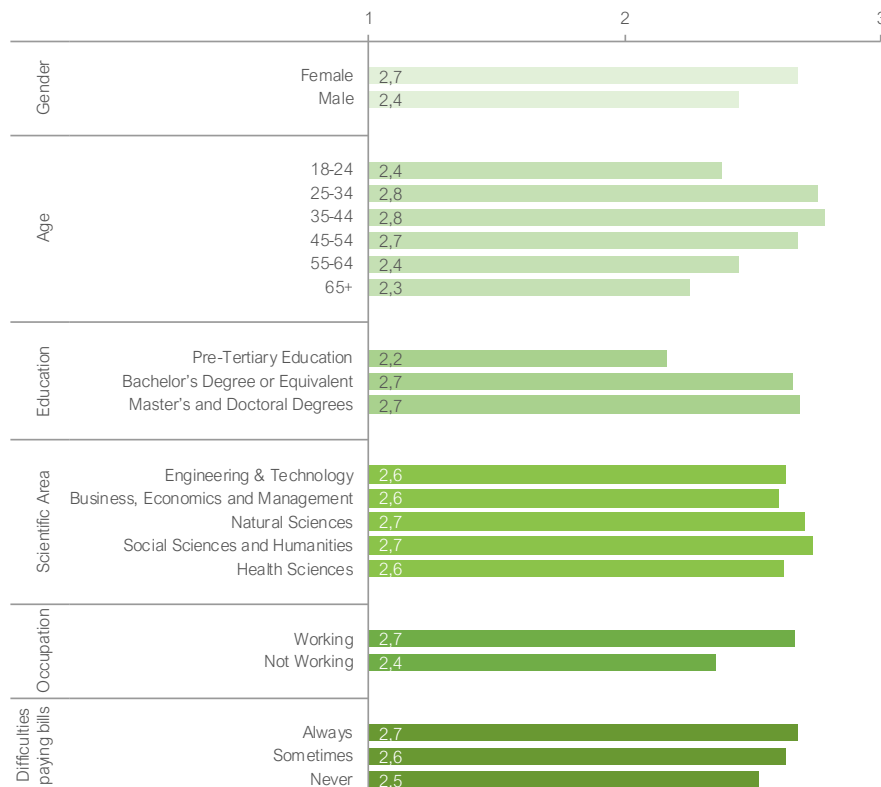
Figure 17 Heat waves

Gender:

- Regarding heat waves, females rate it higher (2.7) than males (2.4).

Age Groups:

- The 35-44 age group has the highest score (2.8), while those 65+ score it lowest (2.3).

Educational Level:

- Pre-tertiary education respondents score at 2.2, Bachelor's at 2.7, and Master's/Doctoral at 2.7.

Scientific Area:

- Scientific Areas varies between 2.6 and 2.7.

Professional Occupation:

- Those working score at 2.7, and those not working at 2.4.

Difficulties Paying Bills:

- Respondents Always struggling with bills rate it highest at 2.7.

Q11c. Frost
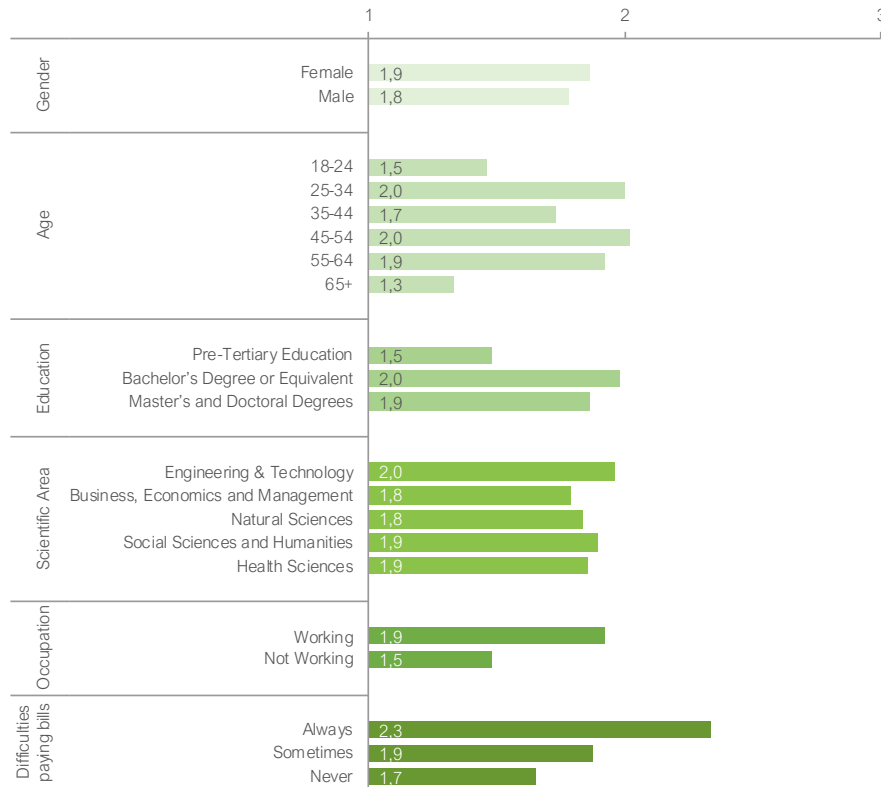
Figure 18 Frost

Gender:

- Females rate it slightly higher (1.9) than males (1.8).

Age Groups:

- Among age groups, those aged 65+ score it lowest (1.3), while those 25-34 and 45-54 scores it highest (2.0).

Educational Level:

- Pre-tertiary education respondents rate it at 1.5, Bachelor's at 2.0, and Master's/Doctoral at 1.9.

Scientific Area:

- Engineering & Technology have the highest apprehension about frost (2.0).

Professional Occupation:

- Among occupation, those Not Working score it at 1.5, and those Working at 1.9.

Difficulties Paying Bills:

- Respondents who Always struggle with bills rate it highest at 2.3, while those who Never struggle rate it lowest at 1.7.

Q11d. Heavy precipitation

Figure 19 Heavy precipitation

Gender:

- Females rate it slightly higher (2.0) than males (1.9).

Age Groups:

- Among age groups, those aged 65+ score it lowest (1.5), while those aged 25-34 and 45-54 score it highest (2.1).

Educational Level:

- Pre-Tertiary education respondents rate it at 1.5, Bachelor's and Master's/Doctoral at 2.0.

Scientific Area:

- Engineers and technologists have the highest perception score (2.2), while those in Health Sciences have the lowest (1.6).

Professional Occupation:

- Among occupations, those Not Working score it at 1.6, and those Working at 2.0.

Difficulties Paying Bills:

- Respondents who Always struggle with bills rate it highest at 2.4 and who Never struggle with bills rate it highest at 1.9.

Q11e. Flash floods
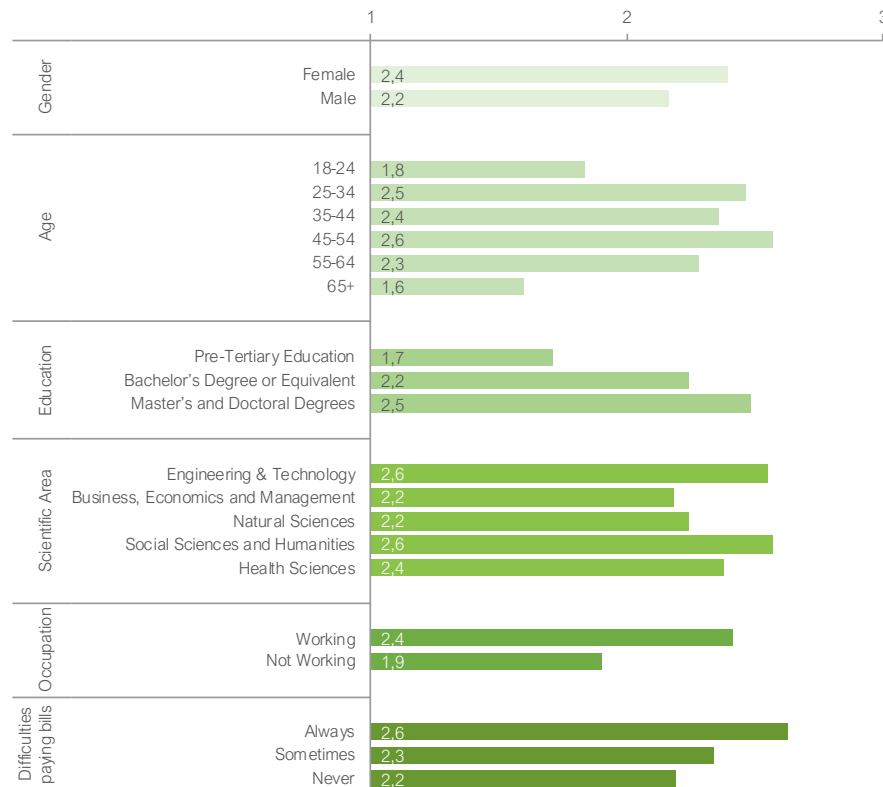
Figure 20 Flash floods

Gender:

- Females rate it slightly higher (2.4) than males (2.2).

Age Groups:

- Among age groups, those aged 65 and above scored the lowest (1.6), while those aged 45-54 scored the highest (2.6).

Educational Level:

- Pre-tertiary education respondents rate it at 1.7, Bachelor's at 2.2, and Master's/Doctoral at 2.5.

Scientific Area:

- Social Sciences and Humanities respondents report the highest score (2.6), while those in Business, Economics and Management and Natural Sciences have the lowest (2.2).

Professional Occupation:

- Among occupations, those Not Working score it at 1.9, and those Working at 2.4.

Difficulties Paying Bills:

- Respondents who Always struggle with bills rate it highest at 2.6 and who Never struggle with bills rate it lowest at 2.2.

Q11f. River floods
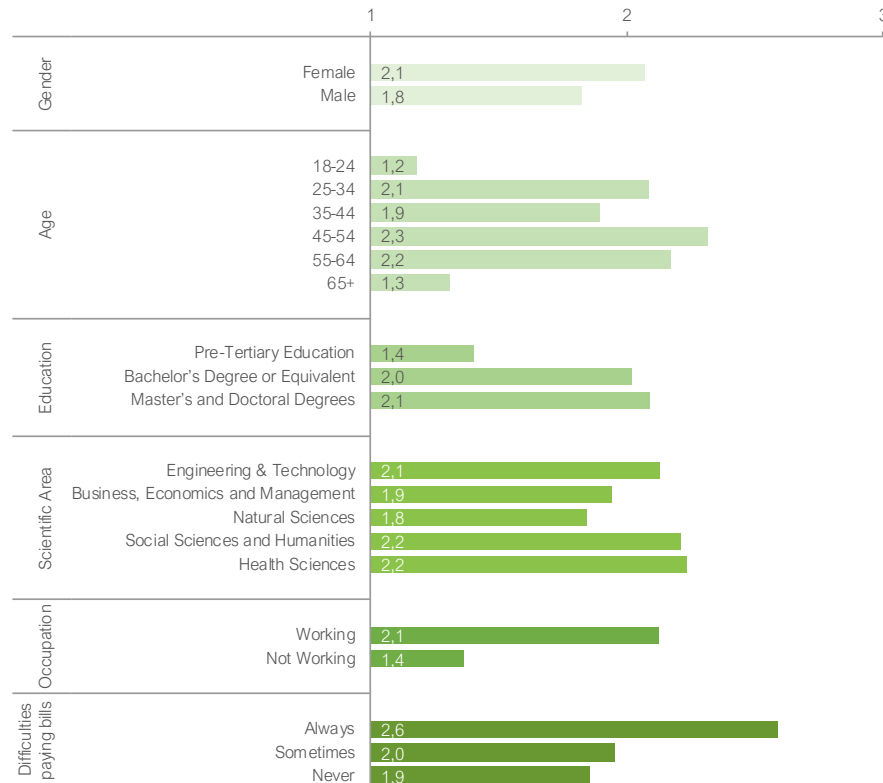
Figure 21 River floods

Gender:

- Females rate it slightly higher (2.1) than males (1.8).

Age Groups:

- Among age groups, those aged 18-24 and above scored the lowest (1.2), while those aged 45-54 scored the highest (2.3).

Educational Level:

- Pre-tertiary education respondents rate it at 1.4, Bachelor's at 2.0, and Master's/Doctoral at 2.1.

Scientific Area:

- Respondents from Social Sciences Humanities; and Health Sciences have the highest score (2.2), while those in Natural Sciences report the lowest (1.8).

Professional Occupation:

- Among occupations, those Not Working score it at 1.4, and those Working at 2.1.

Difficulties Paying Bills:

- Respondents who Never struggle with bills rate it lowest at 1.9 and who Always struggle with bills rate it highest at 2.6.

Q11g. Droughts

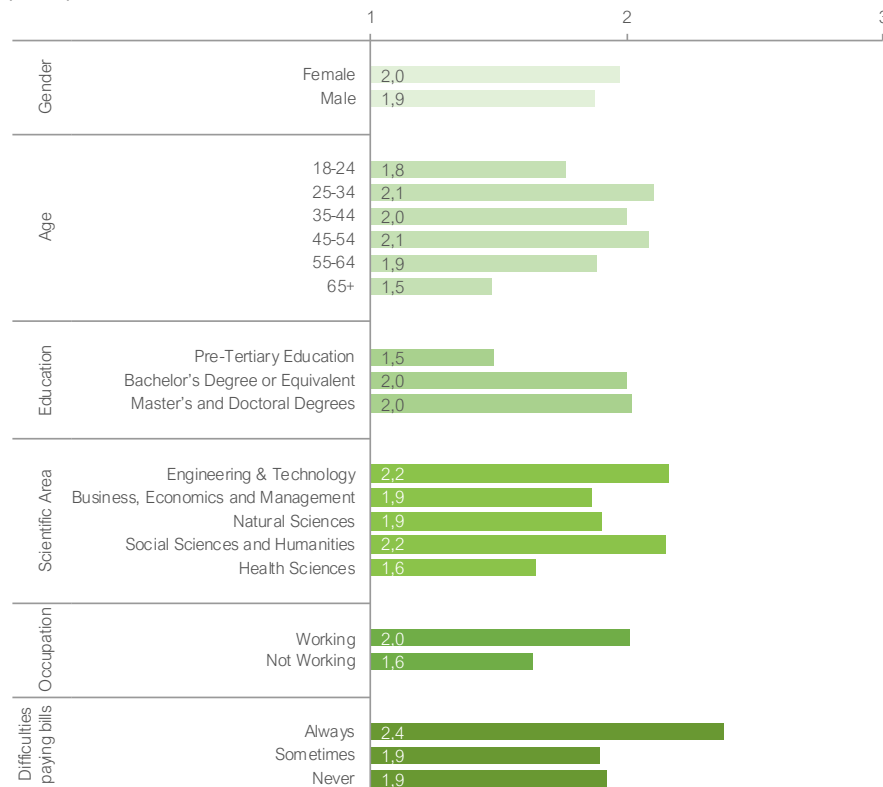*Figure 22 Droughts*

Gender:

- Females rate it slightly higher (2.5) than males (2.4).

Age Groups:

- Among age groups, those aged 65 and above score it lowest (2.1).

Educational Level:

- Pre-tertiary education respondents rate it at 2.3, Bachelor's at 2.4, and Master's/Doctoral at 2.5.

Scientific Area:

- Those in Natural Sciences have the highest mean score (2.6), while those in Business, Economics and Management have the lowest (2.2).

Professional Occupation:

- Among occupation, those Not Working score it at 2.2, and those Working at 2.5.

Difficulties Paying Bills:

- Difficulties paying bills scores vary between 2.4 and 2.5.

Q11h. Wildfires
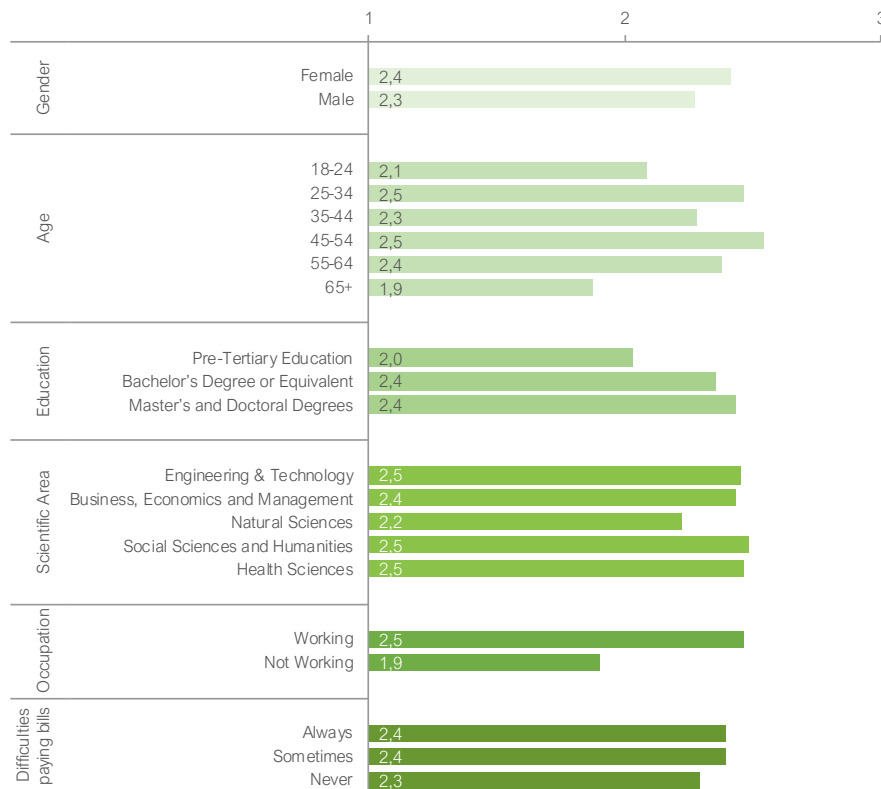
Figure 23 Wildfires

Gender:

• Females tend to rate it slightly higher (2.4) than males (2.3).

Age Groups:

• Among age groups, those aged 25-34 and 45-54 give the highest rating (2.5), while the 65+ group gives the lowest (1.9).

Educational Level:

• Bachelor's and Master's/Doctoral holders score at 2.4, whilst respondents with Pre-tertiary education rank it at 2.0.

Scientific Area:

• Respondents from the Engineering & Technology fields report the highest score (2.4), while those in Natural Sciences have the lowest (2.2)

Professional Occupation:

• Respondents Working rate it at 2.5, while those Not Working rate it lower at 1.9.

Difficulties Paying Bills:

• Difficulties paying bills scores vary between 2.3 and 2.4.

Q11i. Severe windstorms
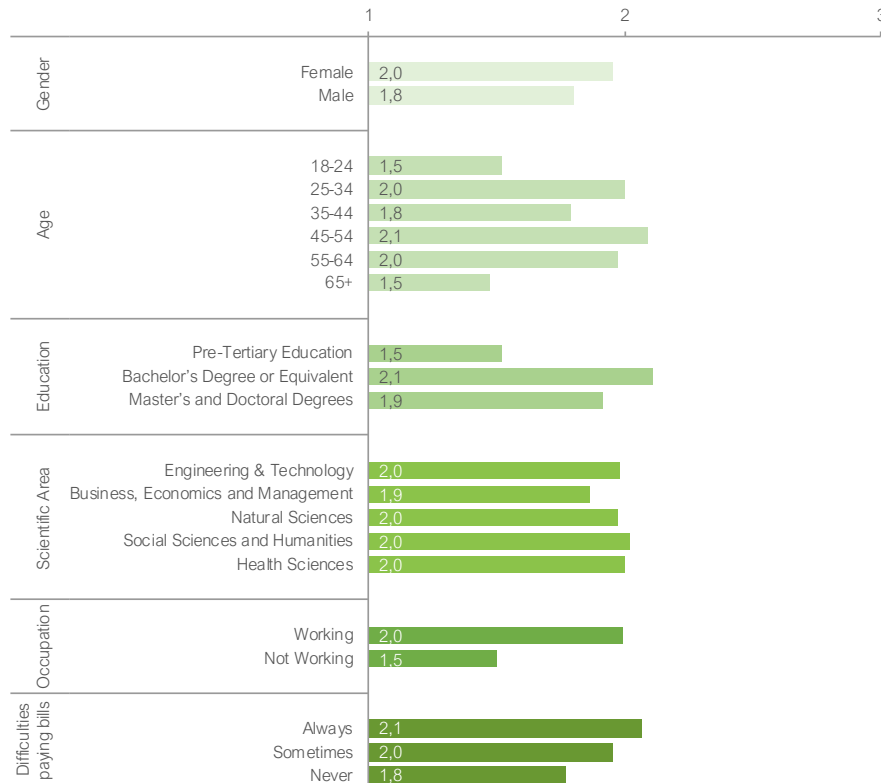
Figure 24 Severe windstorms

Gender:

- Females rate it slightly higher (2.0) compared to males (1.8).

Age Groups:

- Among age groups, those aged 45-54 give the highest rating (2.0), while the 18-24 and 65+ groups give the lowest (1.5).

Educational Level:

- Pre-Tertiary Education scores at 1.5 and Bachelor's degree or equivalent holders score at 2.1.

Scientific Area:

- Scientific Areas scores vary between 1.9 and 2.0.

Professional Occupation:

- Respondents Working rate it at 2.0, while those Not Working rate it lower at 1.5.

Difficulties Paying Bills:

- Respondents who Always struggle with bills rate it highest at 2.1, while those who Never struggle rate it lowest at 1.8

Q11j. Sea level rise
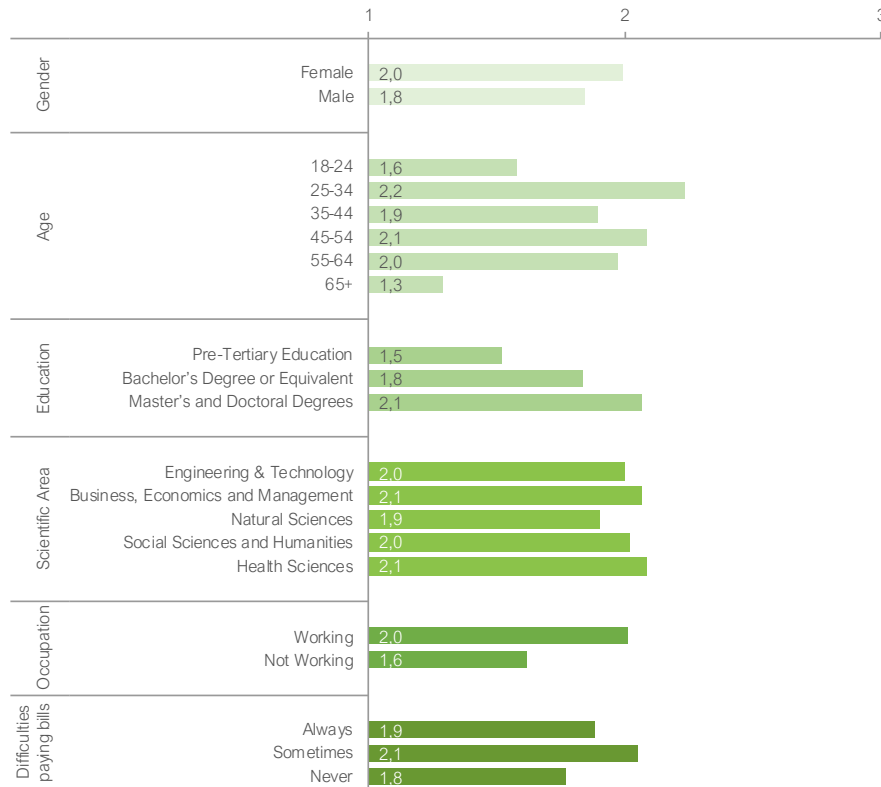
Figure 25 Sea level rise

Gender:

- Females rate it slightly higher (2.0) compared to males (1.8).

Age Groups:

- Among age groups, those aged 25-34 give the highest rating (2.2), while the 65+ group gives the lowest (1.3).

Educational Level:

- Bachelor's degree or equivalent holders score at 1.8, and Master's/Doctoral degree holders at 2.1.

Scientific Area:

- Scientific Areas scores vary between 1.9 and 2.1.

Professional Occupation:

- Respondents Working rate it at 2.0, while those Not Working rate it lower at 1.6.

Difficulties Paying Bills:

- Respondents who Sometimes struggle with bills rate it highest at 2.1, whereas those who Never struggle rate it lowest at 1.8.

Q11k. Coastal floods
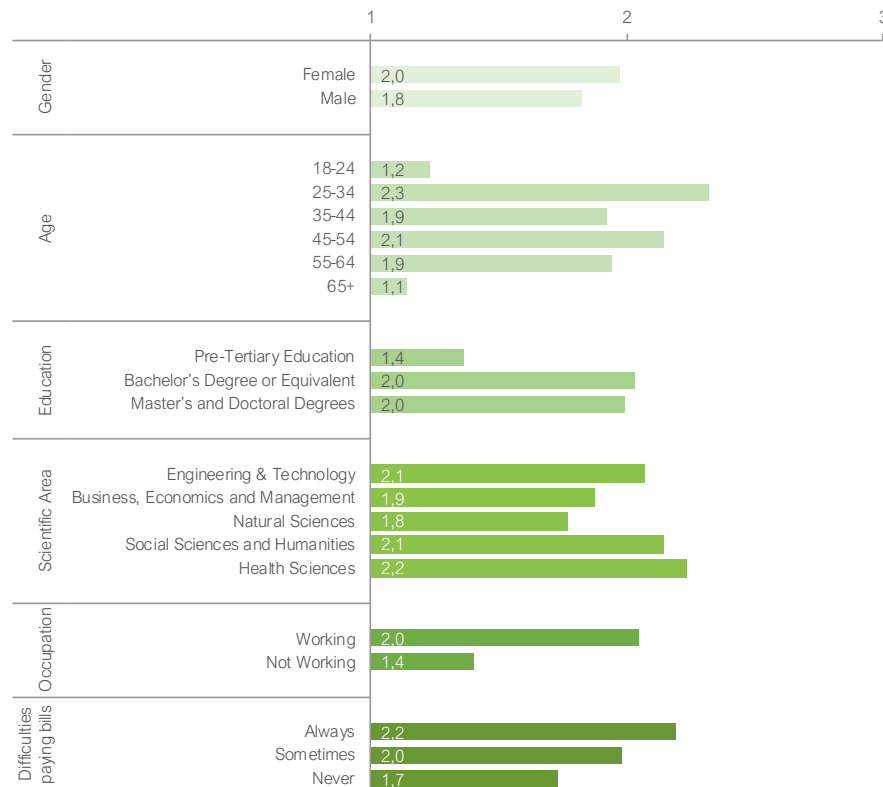
Figure 26 Coastal floods

Gender:

- Females slightly rate it higher (2.0) than males (1.8).

Age Groups:

- Among age groups, those aged 25-34 give the highest rating (2.3), while the 65+ group gives the lowest (1.1).

Educational Level:

- Pre-Tertiary degree holders score it at 1.4, while Bachelor's and Master's/Doctoral degree holders score it higher at 2.0.

Scientific Area:

- Those in Health Sciences (2.2), while those in Natural Sciences (1.8).

Professional Occupation:

- Respondents who are Working rate it at 2.0, while those Not Working rate it lower at 1.4.

Difficulties Paying Bills:

- Respondents who Always' struggle with bills rate it highest at 2.2, whereas those who Never struggle rate it lowest at 1.7

Overall, the most significant averages across all figures are:

- Females (2.2) always rate every hazard higher than males (2.0).
- Ages 25-34 and 45-54 (2.3) compared to 65+ (1.6) show the largest delta difference between age groups (0.7).
- Bachelor's, Master's, and Doctoral Degrees (2.2) compared to Pre-Tertiary Education (1.7) have the largest delta difference between education levels (0.5).
- Working (2.2) compared to Not working (1.8) within occupational category shows a significant difference between them (0.4).

3.3.4 Regional Actions for Addressing Climate Change Challenges

As before, the analysis now focuses on respondents' perceptions regarding the most important actions to address the impacts of climate change in their region. This section of the survey explores various actions that respondents believe are critical to mitigate and adapt to climate change, considering different demographic and socio-economic factors.

Respondents were asked to identify the most important actions from a list, which includes:

- Improved agricultural practices and technologies
- Effective water management and conservation
- Protection of coastal areas vulnerable to sea-level rise
- Promotion of renewable energy sources and reducing fossil fuel dependence
- Strengthening public health systems for climate-related risks
- Enhancing transportation infrastructure for extreme weather events
- Conservation and restoration of ecosystems
- Integration of climate considerations into urban planning
- Encouragement of sustainable consumption and production
- Implementation of waste management and recycling initiatives

The results were broken down by region, gender, age, education level, main scientific area, professional occupation, and difficulties in paying bills.

Q12. Considering the impacts of climate change in our region, which actions do you believe are the most important to address these challenges?

Table 6 Priority Actions for Addressing Regional Climate Change Challenges

Considering the impacts of climate change in our region, which actions do you believe are the most important to address these challenges?

Most important actions to address the impacts of climate change	Improved agricultural practices and technologies.	Effective water management and conservation.	Protection of coastal areas vulnerable to sea-level rise.	Promotion of renewable energy sources and reducing fossil fuel dependence.	Strengthening public health systems for climate-related risks.	Enhancing transportation infrastructure for extreme weather events.	Conservation and restoration of ecosystems.	Integration of climate considerations into urban planning.	Encouragement of sustainable consumption and production.	Implementation of waste management and recycling initiatives.	Other adaptation measure(s)
Region											
Kentriki Makedonia	52,8%	68,8%	34,4%	56,9%	41,3%	38,5%	56,4%	57,8%	61,9%	50,5%	2,3%
Gender											
Female	55,8%	71,7%	38,4%	60,9%	42,0%	42,0%	60,1%	63,0%	65,9%	56,5%	2,2%
Male	48,7%	65,4%	29,5%	51,3%	41,0%	33,3%	50,0%	50,0%	53,8%	41,0%	2,6%
Age											
18-24	20,8%	83,3%	20,8%	54,2%	50,0%	16,7%	25,0%	37,5%	83,3%	29,2%	0,0%
25-34	60,7%	64,3%	53,6%	64,3%	53,6%	57,1%	64,3%	57,1%	46,4%	57,1%	0,0%
35-44	35,7%	52,4%	31,0%	61,9%	33,3%	35,7%	47,6%	61,9%	69,0%	52,4%	4,8%
45-54	63,8%	71,0%	39,1%	63,8%	31,9%	46,4%	72,5%	69,6%	58,0%	53,6%	0,0%
55-64	66,7%	79,5%	35,9%	53,8%	38,5%	35,9%	64,1%	61,5%	74,4%	64,1%	5,1%
65+	56,3%	68,8%	12,5%	18,8%	81,3%	18,8%	25,0%	18,8%	25,0%	18,8%	6,3%
Educational Categories											
Pre-Tertiary Education	43,8%	65,6%	21,9%	37,5%	59,4%	25,0%	31,3%	31,3%	46,9%	34,4%	0,0%
Bachelor's Degree or Equivalent Tertiary	62,5%	70,8%	33,3%	60,4%	47,9%	29,2%	54,2%	52,1%	60,4%	52,1%	2,1%
Master's and Doctoral Degrees	52,2%	69,6%	38,4%	60,9%	35,5%	44,9%	63,0%	65,9%	65,9%	53,6%	2,9%
Main Scientific Area											
Engineering & Technology	36,7%	65,3%	38,8%	57,1%	30,6%	34,7%	63,3%	63,3%	63,3%	49,0%	4,1%
Business, Economics and Management	54,3%	65,7%	45,7%	68,6%	31,4%	54,3%	62,9%	60,0%	74,3%	48,6%	0,0%
Natural Sciences	68,4%	81,6%	28,9%	50,0%	44,7%	39,5%	63,2%	63,2%	60,5%	52,6%	2,6%
Social Sciences and Humanities	57,1%	59,2%	32,7%	61,2%	36,7%	36,7%	49,0%	59,2%	55,1%	51,0%	2,0%
Health Sciences	69,2%	100,0%	53,8%	76,9%	76,9%	53,8%	76,9%	69,2%	84,6%	84,6%	0,0%
Professional occupation											
Working	57,1%	67,4%	38,3%	61,7%	37,7%	41,1%	62,3%	64,0%	62,3%	56,0%	2,9%
Not Working	37,2%	76,7%	20,9%	39,5%	58,1%	27,9%	32,6%	32,6%	60,5%	27,9%	0,0%
Difficulties paying bills											
Always	66,7%	55,6%	27,8%	61,1%	38,9%	50,0%	61,1%	55,6%	50,0%	50,0%	5,6%
Sometimes	52,9%	70,2%	35,5%	55,4%	44,6%	39,7%	57,9%	56,2%	58,7%	53,7%	2,5%
Never	50,6%	70,9%	35,4%	59,5%	38,0%	34,2%	53,2%	60,8%	69,6%	45,6%	1,3%

According to respondents living in Central Macedonia, the highest priorities for the region are 'Effective water management and conservation' (68.8%), 'Encouragement of sustainable consumption and production' (61.9%), and 'Integration of climate considerations into urban planning' (57.8%). The lowest priorities in this region include 'Protection of coastal areas vulnerable to sea-level rise' (34.4%), 'Enhancing transportation infrastructure for extreme weather events' (38.5%), and 'Strengthening public health systems for climate-related risks' (41.3%).

The detailed breakdown of each measure by demographic and socio-economic groups, including gender, age, education level, main scientific area, professional occupation, and difficulties in paying bills, is as follows:

1. **Improved Agricultural Practices and Technologies**

   Highest Support:
   - Scientific Areas, Health Sciences: 69.2% and Natural Sciences: 68.4%
   - Age, 55-64: 66.7%
   - Difficult paying bills, Always: 66.7%

   Lowest Support:
   - Age, 18-24: 20.8% and 35-44: 35,7%
   - Scientific Areas, Engineering & Technology: 36.7%
   - Occupation, Not Working: 37.2%

2. **Effective Water Management and Conservation**

   Highest Support:
   - Scientific Areas, Health Sciences: 100% and Natural Sciences: 81.6%
   - Age, 18-24: 83.3% and 55-64: 79,5%
   - Occupation, Not Working: 76.7%

   Lowest Support:
   - Age, 35-44: 52.4%
   - Difficult paying bills, Always: 55.6%
   - Scientific Areas, Social Sciences and Humanities: 59,2%

3. **Protection of Coastal Areas Vulnerable to Sea-Level Rise**

   Highest Support:
   - Scientific Areas, Health Sciences: 53.8% and Business, Economics and Management: 45.7%
   - Age, 25-34: 53.6% and 45-54: 39.1%
   - Gender, Female: 38.4%

   Lowest Support:
   - Age, 65+: 12.5% and 18-24: 20.8%
   - Occupation, Not Working: 20.9%
   - Education Levels, Pre-Tertiary Education: 21,9%

4. **Promotion of Renewable Energy Sources and Reducing Fossil Fuel Dependence**

   Highest Support:
   - Scientific Areas, Health Sciences: 76.9% and Business, Economics and Management: 68.6%
   - Age, 25-34: 64.3% and 45-54: 63.8%
   - Occupation, Working: 61.7%

   Lowest Support:
   - Age, 65+: 18.8%
   - Educational levels, Pre-Tertiary Education: 37.5%
   - Occupation, Not Working: 39.5%

5. Strengthening Public Health Systems for Climate-Related Risks

Highest Support:

- Age, 65+: 81.3%
- Scientific Areas, Health Sciences: 76.9%
- Educational levels, Pre-Tertiary Education: 59.4%

Lowest Support:

- Scientific Areas, Engineering & Technology: 30.6% and Business, Economics and Management: 31.4%
- Age, 45-54: 31.9% and 35-44: 33.3%
- Educational levels, Master's and Doctoral Degrees: 35.5%

6. Enhancing Transportation Infrastructure for Extreme Weather Events

Highest Support:

- Age, 25-34: 57.1%
- Scientific Areas, Business, Economics and Management: 54.3% and Health Sciences: 53,8%
- Difficulties Paying Bills, Always: 50.0%

Lowest Support:

- Age, 18-24: 16.7% and 65+: 18.8%
- Educational Levels, Pre-Tertiary Education: 25.0%
- Occupation, Not Working: 27.9%

7. Conservation and Restoration of Ecosystems

Highest Support:

- Scientific Areas, Health Sciences: 76.9% and Engineering & Technology: 63.3%
- Age, 45-54: 72.5% and 25-34: 64.3% and 55-64: 64.1%
- Educational Levels, Master's and Doctoral Degrees: 63.0%

Lowest Support:

- Age, 18-24: 25.0% and 65+: 25.0%
- Educational Levels, Pre-Tertiary Education: 31.3%
- Occupation, Not Working: 32.6%

8. Integration of Climate Considerations into Urban Planning

Highest Support:

- Age, 45-54: 69.6%
- Scientific Areas, Health Sciences: 69.2%
- Educational Levels, Master's and Doctoral Degrees: 65.9%

Lowest Support:

- Age, 65+: 18.8%
- Educational Levels, Pre-Tertiary Education: 31.3%
- Occupation, Not Working: 32.6%

9. Encouragement of Sustainable Consumption and Production

Highest Support:

- Scientific Areas, Health Sciences: 84.6% and Business, Economics and Management: 74.3%
- Age, 18-24: 83.3% and 55-64: 74.4%
- Difficulties Paying Bills, Never: 69.6%

Lowest Support:

- Age, 65+: 25.0% and 25-34: 46.4%
- Educational Levels, Pre-Tertiary Education: 46.9%
- Difficulties Paying Bills, Always: 50.0%

10. Implementation of Waste Management and Recycling Initiatives

Highest Support:

- Scientific Areas, Health Sciences: 84.6%
- Age, 55-64: 64.1% and 25-34: 57.1%
- Gender, Female: 56.5%

Lowest Support:

- Age, 65+: 18.8% and 18-24: 29.2%
- Occupation, Not Working: 27.9%
- Educational Levels, Pre-Tertiary Education: 34.4%

3.4 Personal Actions on Climate Change

3.4.1 Climate Change Adaptation

An inquiry was formulated to address the subject matter concerning personal actions related to climate change adaptation. Subsequently, participants were questioned regarding their individual endeavours towards adapting to climate change. Their responses have been methodically collated and categorised across several demographic parameters. The ensuing table delineates the proportional distribution of responses across 'Gender', 'Age Groups', 'Educational Levels', 'Scientific Area', 'Professional Occupation', and 'Economic Conditions'. With this context in mind, the analysis proceeds to examine the findings in detail.

Q13. Have you personally taken some action to adapt to climate change?

Table 7 Climate Change Adaptation

Have you personally taken some action to adapt to climate change?

Actions to adapt to climate change	Yes	No	I don't know
Region			
Kentriki Makedonia	28,0%	56,0%	16,1%
Gender			
Female	29,7%	54,3%	15,9%
Male	24,4%	60,3%	15,4%
Age			
18-24	33,3%	29,2%	37,5%
25-34	14,3%	64,3%	21,4%
35-44	35,7%	50,0%	14,3%
45-54	34,8%	55,1%	10,1%
55-64	17,9%	69,2%	12,8%
65+	18,8%	68,8%	12,5%
Educational Categories			
Pre-Tertiary Education	15,6%	59,4%	25,0%
Bachelor's Degree or Equivalent	27,1%	58,3%	14,6%
Master's and Doctoral Degrees	31,2%	54,3%	14,5%
Main Scientific Area			
Engineering & Technology	28,6%	59,2%	12,2%
Business, Economics and Management	40,0%	45,7%	14,3%
Natural Sciences	26,3%	55,3%	18,4%
Social Sciences and Humanities	26,5%	55,1%	18,4%
Health Sciences	38,5%	61,5%	0,0%
Professional occupation			
Working	30,3%	57,1%	12,6%
Not Working	18,6%	51,2%	30,2%
Difficulties paying bills			
Always	16,7%	77,8%	5,6%
Sometimes	28,9%	56,2%	14,9%
Never	29,1%	50,6%	20,3%

The results of the survey on personal actions to adapt to climate change reveal intriguing insights across various demographic segments.

Gender:

- Females demonstrate a higher propensity for taking personal actions to adapt to climate change compared to males, with 29.7% of females responding affirmatively compared to 24.4% of males.

Age Groups:

- The age groups 35-44, 45-54, and 18-24 demonstrate the highest levels of proactive engagement in climate change adaptation, with 35.7%, 34.8%, and 33.3% respectively, reporting affirmative actions. Conversely, the 25-34, 55-64 and 65+ age brackets exhibit comparatively lower rates of involvement, with only 14.3%, 17.9% and 18.8% respectively, indicating their proactive engagement in climate change adaptation measures.

Educational Levels:

- Respondents with 'Master's and Doctoral Degrees' exhibit the highest level of proactive engagement in climate change adaptation, with 31.2% reporting affirmative actions. 'Pre-Tertiary Education' respondents display the lowest level of engagement, with only 15.6% reporting affirmative actions.

Scientific Area:

- Individuals in the field of 'Business, Economics, and Management' demonstrate the highest level of proactive engagement in climate change adaptation, with 40.0% reporting affirmative actions. Conversely, respondents in the 'Natural Sciences' field exhibit the lowest level of engagement, with only 26.3% reporting affirmative actions.

Professional Occupation:

- Individuals who are working exhibit a slightly higher level of proactive engagement in climate change adaptation compared to those who are not working, with 30.3% and 18.6% respectively reporting affirmative actions.

Economic Conditions:

Respondents who report 'Always' experiencing difficulties paying bills exhibit the lowest level of proactive engagement in climate change adaptation, with only 16.7% reporting affirmative actions. Conversely, those who report 'Never' experiencing difficulties display a higher level of engagement, with 29.1% reporting affirmative actions.

These findings emphasise the necessity of considering demographic variables when devising strategies to promote and facilitate personal initiatives toward climate change adaptation. Contrariwise, a notable proportion of respondents indicate a lack of personal involvement in adapting to climate change. For instance, within the 'No' category, a significant portion of respondents across various age groups, educational levels, and professional occupations report no action taken, with percentages ranging from 29.2% to 69.2%. Similarly, uncertainty persists among certain segments of the population regarding their engagement in climate change adaptation. Within the 'I don't know' category, respondents' express ambiguity about their involvement, with percentages ranging from 5.6% to 37.5%. This vagueness is particularly noteworthy among individuals aged 18-24 (37.2%) and those without a professional occupation (30.2%).

A subsequent inquiry was developed to ascertain the specific adaptation measures respondents have undertaken. From 61 valid responses, categories were created based on those same answers, including:

- 'Energy Efficiency and Renewable Energy'.
- 'Waste Management and Recycling',
- 'Sustainable Transportation',
- 'Sustainable Consumption Practices',
- 'Carbon Footprint Reduction',
- 'Lifestyle Changes',
- 'Water Conservation',

- 'Education and Advocacy',
- 'Innovative Solutions and Professional Efforts'.

Interestingly, most responses indicate actions that may not directly address climate change adaptation but rather pertain more to mitigation measures. It's noteworthy that 27 out of 61 respondents mentioned more than one different action, reflecting a polygonal approach to addressing climate-related challenges.

3.4.2 Climate Change Adaptation Actions

Table 8 Actions to Climate Change Adaptation

Which adaptation action(s)?

Action(s) Categories	Energy Efficiency and Renewable Energy	Waste Management and Recycling	Sustainable Transportation	Sustainable Consumption Practices	Carbon Footprint Reduction	Lifestyle Changes	Water Conservation	Education and Advocacy	Innovative Solutions and Professional Efforts
Region									
Kentriki Makedonia	21,3%	49,2%	18,0%	31,1%	11,5%	9,8%	8,2%	14,8%	13,1%
Gender									
Female	22,0%	51,2%	17,1%	31,7%	14,6%	12,2%	4,9%	14,6%	9,8%
Male	21,1%	47,4%	15,8%	26,3%	5,3%	5,3%	15,8%	15,8%	21,1%
Age									
18-24	37,5%	50,0%	12,5%	12,5%	12,5%	0,0%	25,0%	0,0%	0,0%
25-34	0,0%	25,0%	0,0%	0,0%	0,0%	0,0%	0,0%	50,0%	50,0%
35-44	13,3%	46,7%	26,7%	53,3%	13,3%	20,0%	6,7%	20,0%	6,7%
45-54	25,0%	50,0%	20,8%	33,3%	12,5%	8,3%	4,2%	8,3%	20,8%
55-64	28,6%	57,1%	14,3%	14,3%	14,3%	0,0%	0,0%	14,3%	0,0%
65+	0,0%	66,7%	0,0%	33,3%	0,0%	33,3%	33,3%	33,3%	0,0%
Educational Categories									
Pre-Tertiary Education	40,0%	100,0%	20,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Bachelor's Degree or Equivalent Tertiary	7,7%	76,9%	7,7%	30,8%	7,7%	7,7%	15,4%	7,7%	0,0%
Master's and Doctoral Degrees	23,3%	34,9%	20,9%	34,9%	14,0%	11,6%	7,0%	18,6%	18,6%
Main Scientific Area									
Engineering & Technology	28,6%	35,7%	28,6%	35,7%	7,1%	7,1%	14,3%	28,6%	28,6%
Business, Economics and Management	28,6%	50,0%	21,4%	42,9%	14,3%	14,3%	7,1%	14,3%	7,1%
Natural Sciences	10,0%	50,0%	0,0%	40,0%	10,0%	20,0%	10,0%	20,0%	20,0%
Social Sciences and Humanities	0,0%	46,2%	23,1%	30,8%	15,4%	7,7%	7,7%	7,7%	7,7%
Health Sciences	40,0%	40,0%	0,0%	0,0%	20,0%	0,0%	0,0%	0,0%	0,0%
Professional occupation									
Working	22,6%	50,9%	20,8%	34,0%	9,4%	11,3%	5,7%	13,2%	15,1%
Not Working	12,5%	37,5%	0,0%	12,5%	25,0%	0,0%	25,0%	25,0%	0,0%
Difficulties paying bills									
Always	0,0%	33,3%	0,0%	33,3%	33,3%	33,3%	0,0%	0,0%	0,0%
Sometimes	17,1%	57,1%	22,9%	31,4%	8,6%	11,4%	11,4%	17,1%	14,3%
Never	30,4%	39,1%	13,0%	30,4%	13,0%	4,3%	4,3%	13,0%	13,0%

The analysis reveals several notable actions taken by respondents in reference to climate change challenges. Among the most frequently mentioned measures are 'Energy Efficiency and Renewable Energy', 'Waste Management and Recycling', 'Sustainable Transportation', and 'Sustainable Consumption Practices'.

The predominance of actions related to energy efficiency, waste management, and sustainable consumption practices suggests that respondents may be more inclined towards mitigating the effects of climate change rather than directly adapting to its impacts.
The variety of actions mentioned, with many respondents citing multiple measures, underscores the need for a diversified approach to climate change adaptation. This highlights the complexity of the issue and the importance of addressing it through multiple channels.

The inclusion of 'Education and Advocacy' as a category indicates a recognition of the role of awareness-raising and advocacy in climate change adaptation. This stresses the importance of public education and engagement in fostering sustainable practices and resilience.

The mention of 'Innovative Solutions and Professional Efforts' suggests that some respondents may be engaged in developing or implementing innovative solutions to address climate challenges. This indicates a potential role for professionals and innovators in driving climate change adaptation efforts.

Overall, the findings emphasise the importance of holistic and inclusive approaches to climate change adaptation, addressing both mitigation and adaptation measures while considering socioeconomic factors and fostering public engagement and innovation.

4 Conclusions

Align with the EU's Green Deal and its mission to support development pathways for regional climate change adaptation actions, REGILIENCE is committed to developing and promoting tools and scientific knowledge to support European regions in identifying and addressing their climate-related risks. At the same time, engaging citizens is crucial to shaping public policy on a global scale due to their potential lack of awareness and understanding of climate change impacts.

The epistemologies of these premises led to the systematic planning, creation, development and execution of a citizen survey in Central Macedonia, Greece. The survey aimed to evaluate citizens' perspectives, perceptions, representations, and knowledge about climate risks, hazards, vulnerability and the need to measure climate adaptation and resilience in the area. Methodological instruments were deployed to pursue these ambitions. The survey was spread online in English and Greek to be answered in a reasonable amount of time of ten minutes or less to gather the most respectful number of answers available.

A total of **218 valid responses** were collected across two months of data collection. Data measuring respondents' knowledge, perceptions, and actions about climate change was fragmented per socio-demographic indicators to accumulate a broad spectrum understanding of the object of study and its subjects. Regarding **sources of knowledge about climate change**, it was made clear that respondents rely heavily on social networks and the internet to gather their insights about the subject. Television is also a durable foundation across all demographics. Overall awareness levels fluctuate across diverse demographic profiles, 'Sustainability' and 'Regional development' emerge as the most universally acknowledged concepts, whereas 'Climate resilience' appears to register as the least known among respondents.

Analysing **respondents' perceptions of the seriousness of climate change issues**, women and younger people tend to vehemently recognise more urgency on the substance than men and older individuals. Exploring levels of agreement in statements to inference on values and perceptions, became evident the worriedness around the focus in question. Respondents understand the importance of each battling climate change and have experienced already some impacts in their daily lives and health. Parallel to that fact, respondents overwhelmingly contemplate that **Governments should increase incentives for people who actively seek to mitigate and adapt to climate change**. It is essential for local governmental bodies to enhance their engagement and awareness of climate initiatives to build community resilience and develop effective hazard mitigation strategies. The conducted survey also clarifies the prevailing **perceptions surrounding environmental hazards**, particularly emphasising heat waves, changing air temperature, droughts, wildfires and flash floods, within the Central Macedonia region of Greece. The discerned insights spotlight several salient observations.

Firstly, a distinct gender dichotomy is evident, with **women consistently attributing higher levels of concern to environmental statements and/or hazards compared to their male counterparts**. This discrepancy suggests a potential variance in awareness or apprehension levels across gender lines. Moreover, discernible age-related disparities surface, with **individuals aged 25-34 and 45-54 exhibiting heightened levels of concern regarding environmental hazards**, juxtaposed against a more tempered perception among the elderly demographic, notably those over 65 years old. Furthermore, an intriguing correlation emerges between educational attainment levels and hazard perception, delineating a discernible trend wherein **respondents with Bachelor's and Master's/Doctoral degrees express greater apprehension** vis-à-vis those with Pre-Tertiary Education backgrounds.

As this analysis reaches its conclusion, it is evident that residents of Central Macedonia place significant importance on certain regional priorities. The **highest urgencies identified by respondents include 'Effective water management and conservation', 'Encouragement of sustainable consumption and production', 'Integration of climate considerations into urban planning' and 'Promotion of renewable energy sources and reducing fossil fuel dependence'**. These priorities reflect a strong concern for sustainable resource management and energy transition, underscoring the community's recognition of the importance of long-term environmental sustainability.

Conversely, the lowest priorities for the region, as indicated by the respondents, are 'Protection of coastal areas vulnerable to sea-level rise', 'Enhancing transportation infrastructure for extreme weather events' and

'Strengthening public health systems for climate-related risks'. These lower orderings suggest that while these areas are acknowledged, they may not be perceived as immediate concerns compared to other pressing environmental issues. This discrepancy in prioritising highlights the need for targeted awareness campaigns and policy interventions to address these less-selected, yet crucial areas to ensure a comprehensive approach to regional climate resilience.

At last, the analysis of the survey data concerning **personal actions related to climate change adaptation** reveals critical insights into the behavioural tendencies of different demographic groups. The data show that females exhibit a higher propensity for engaging in climate change adaptation measures compared to males. Additionally, specific age groups, notably 35-44, 45-54, and 18-24 demonstrate higher levels of proactive engagement in adaptation efforts, whereas older age groups, particularly those aged 55-64 and 65+, show lower involvement. Educational attainment also plays a significant role in shaping individuals' engagement with climate change adaptation. Despite the proactive measures taken by some respondents, **a considerable portion of the population indicates a lack of personal involvement or uncertainty regarding their engagement in climate change adaptation**.

This is particularly evident among younger individuals and those not currently employed. Furthermore, the types of actions reported by **respondents predominantly focus on mitigation rather than direct adaptation**, with energy efficiency, waste management, and sustainable consumption practices being the most cited measures. The diverse range of actions, including education, advocacy, and innovative solutions, underscores the multifaceted nature of addressing climate change. These categories were created based on respondents' open answers. These findings highlight the necessity of considering demographic variables when promoting climate change adaptation strategies and emphasise the importance of inclusive, holistic approaches that integrate both mitigation and adaptation measures.

The data also point to the need for **increased public education and engagement to foster sustainable practices and resilience across all segments of society**. Nonetheless, it is important to denote that this survey, as a quantitative instrument, unveils several limitations warranting attention and rectification. Foremost among these is the need to address sample representation limitations, particularly the underrepresentation of demographic cohorts such as individuals over 65 and those from less affluent socio-economic strata. A critical review of data collection methodologies and partnership efficacy is also warranted to enhance the robustness and inclusivity of future surveys.

Additionally, refinements in question design, especially concerning queries about financial difficulties, are imperative to glean more nuanced insights. In conclusion, while the survey engenders valuable insights into public perceptions of environmental hazards in the Central Macedonia region, continuous refinement of methodologies and concerted efforts to enhance sample representativeness are requisite for bolstering the comprehensiveness and accuracy of future studies.

Annex

Annex I Questionnaire

[Section] CITIZEN SURVEY

We would like to invite you to participate in a research study as part of the European project REGILIENCE, funded by the European Union's Horizon 2020 program with the support of the Regional Development Fund of Central Macedonia. This project aims to promote the adoption and widespread dissemination of regional actions for climate change resilience.

What are the study objectives?

To gather baseline information reflecting:

i) Awareness and citizen involvement regarding resilience to the impact of climate change in their regions;

ii) The geographic, economic, social, and cultural differences among citizens.

This information will be collected before (current phase) and after implementing climate resilience actions/good practices from the REGILIENCE project to assess its usefulness/impact.
The collected information also aims to reveal the need to maintain climate resilience actions/good practices throughout the project's lifespan.

What are the benefits of taking part in the study?
By completing this survey, you have the opportunity to share your level of understanding regarding awareness and involvement in climate resilience actions in your region.
With the results of this survey, we intend to develop infographics and informational sessions, and widely disseminate them, including some results in a document that will be published on https://regilience.eu/ and distributed on LinkedIn, Twitter, and Facebook.

Why were you invited to participate?
Because the area where you live, work, or travel is vulnerable to the impacts of climate change, we aim to support actions to improve resilience and adaptation.

What will happen if you take part in the study?

You will respond to a questionnaire that will take about 10 minutes. It will include questions to understand your perception and experience in the area of climate change resilience. Your anonymized information will be treated confidentially and will not be shared outside the project consortium, in accordance with the EU General Data Protection Regulation (GDPR). All collected data will be deleted upon project completion.

What will happen to the research study results?

The results will contribute to the creation of a report, infographics, and briefings, which will be widely disseminated through social media and the project website. The personal information of respondents will not be shared.

More information and contacts

If you have any questions about any aspect of this study, you can contact info@regilience.eu. You can submit your responses until the survey closes on February 29, 2024.

Thank you very much for supporting us,

The REGILIENCE project team

Consent to data use

Please give us your consent to process the information you provide with this survey:

> I voluntarily agree to participate in this research. I also allow the organisers to analyse, publish and distribute the given information royalty-free, in all forms and in all media. The consent is given without a temporal or spatial limit and can only be withdrawn on solid ground.
> I confirm that I read and accept the REGILIENCE Privacy Policy available here below.

[Section] Personal information

1.1 Please select your region:

> Greece: Kentriki Makedonia
> Other

1.2 Gender:
> Male
> Female
> Other
> Prefer not to answer

1.3 Age:

18-24

25-34

35-44

45-54

55-64

65+

1.4 Highest level of education you have completed:

I have not completed any formal education

Primary education

Lower secondary education

Upper secondary education

Post-secondary non-tertiary education

Short-cycle tertiary education

Bachelor's degree or equivalent tertiary education level

Master's degree or equivalent tertiary education level

Doctoral degree or equivalent tertiary education level

1.4.1 (if Bachelor, Master or Doctoral) **Which area?**
[free answser]

1.5 Main occupation:

Paid worker

Unemployed

Looking for a first job

Retired or a pensioner

Studying

Student worker

Without any activity

Other situation

1.5.1 (if other situation) **Which?**
[free answser]

1.6 Do you have any difficulties paying bills:

Always

Sometimes

Never

[Section 2] Me and Climate Change

2.1 From the following list, which are your three main sources of information about the environment and climate change?

Television

Social media networks and the internet

Newspapers

Radio

Films and documentaries

Family, friends, neighbours or colleagues

Magazines

Books or scientific publications

Brochures or information materials

Events (conferences, fairs, exhibitions, festivals, etc)

Museums, national parks

2.2 Have you ever heard about the following concepts:

Concept	Yes	No	I don't remember
Climate resilience *Ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate*			
Climate change adaptation *Actions that reduce the negative impact of climate change*			
Sustainability *Meeting our own needs without compromising the ability of future generations to meet their own needs*			
Regional development *About the geography of welfare and its evolution*			
Green transition *A shift towards economically sustainable growth and an economy that is not based on fossil fuels and overconsumption of natural resources*			

2.3 How serious of a problem do you think climate change is at this moment? Please use a scale from 0 to 10, where '0' means "not a serious problem, and '10' means "an extremely serious problem"

0	1	2	3	4	5	6	7	8	9	10	I don't know

2.4 Please tell us to what extent you agree or disagree with each of the following statements. Please select from the options: «Strongly disagree», «Disagree», «Neither agree nor disagree», «Agree», «Strongly agree» or «I don't know».

Statements	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	I don't know
Environmental issues have a direct effect on my daily life and health.						
Climate change has a negative impact on my job and income sources.						
I already experienced the impact of climate hazards (e.g., floods, droughts, heatwaves, wildfires, etc…)						
My consumption habits affect the environment.						
Climate change is caused by human activities.						
Climate change is a natural phenomenon, and I cannot do anything about it.						
Climate change is having a significant impact in my region.						
My region is exposed to climate risks.						
The government should increase incentives for people who try to slow down climate change.						
There are more important matters than climate change.						

2.5 How the following hazards/climate change impact(s) are affecting your region at this moment? Please select from "Not affecting the region", "Affecting in some ways", "Strongly affecting the region" or "I don't know".

Hazard/Climate change impact	Not affecting the region	Affecting in some ways	Strongly affecting the region	I don't know
Changing air temperature				
Heat waves				
Frost				
Heavy precipitation				
Flash floods				
River floods				
Droughts				
Wildfires				
Severe windstorms				
Sea level rise				
Coastal floods				

2.6 Considering the impacts of climate change in our region, which actions do you believe are the most important to address these challenges? Instructions: Please select actions that you consider crucial for adapting to climate change in our region. You may choose multiple options.

        Improved agricultural practices and technologies.
        Effective water management and conservation.
        Protection of coastal areas vulnerable to sea-level rise.
        Promotion of renewable energy sources and reducing fossil fuel dependence.
        Strengthening public health systems for climate-related risks.
        Enhancing transportation infrastructure for extreme weather events.
        Conservation and restoration of ecosystems.
        Integration of climate considerations into urban planning.
        Encouragement of sustainable consumption and production.
        Implementation of waste management and recycling initiatives.
        Other adaptation measure(s)

2.6.1 (if other adaptation measures) **Which other(s)?**

2.7 Have you personally taken some action to adapt to climate change?
        Yes
        No
        I don't know

2.7.1 (If yes) **Which adaptation action(s)?**

[free answser]

Thank you!

Thank you for your answer, however, since you are not from one of the focus regions, we invite you to share it with someone living at Kentriki Makedonia.

[Section] Final considerations

If you would like to be contacted for future activities related to the project, please leave your email address below:

Thank you for your answer.

Please share the survey with your family and/or colleagues.