

CLIMATEQ&A : BRIDGING THE GAP BETWEEN CLIMATE SCIENTISTS AND THE GENERAL PUBLIC



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Full paper

Abstract

We investigate public views on climate change and biodiversity loss by analyzing questions asked to the ClimateQ&A platform. Utilizing NLP clustering on a sample of 3,425 questions (around 10% of total gathered as of Jan. 2024), we find that **25.8% express a personal interrogation**, like consumption habits or living areas. Our findings suggest traditional survey methods aimed at gauging climate awareness and literacy may miss knowledge gaps and that reliance solely on IPCC and IPBES reports may not fully address individual concerns, potentially hindering public understanding and action on these critical issues.

Introduction: understanding climate awareness and literacy

Numerous studies have sought to measure climate change awareness and literacy through **closed-ended questionnaires**. Notable examples include the Sulitest and the People's Climate Vote, among many others. These studies seek to understand the socio-demographic factors influencing varying levels of awareness and literacy, and a **respondent's level of knowledge** of nature and sustainability science. However, they often overlook a critical aspect for driving action: **understanding what matters to individuals personally**. While capturing this deeply personal aspect proves challenging through closed-ended questionnaires, our tool offers a solution by allowing users to **freely express their concerns** through a conversational chatbot interface. This approach can offer **complementary insights** to nature scientists and communicators striving to garner broader public engagement.

Methods

We extracted a sample of 7,000 questions posed to the platform in April 2023, and excluded repeated questions (exact matches) and unclassifiable questions (e.g., short follow-up questions by the user). This left a sample of 3,425 questions. We then conducted **clustering** based on dense embeddings of the questions (bge-base-en-v1.5). Initial cluster naming was automated using **BERTopic**. Using this NLP approach, we obtained a categorization of questions across 130 different clusters representing salient topics. We manually reviewed each cluster to identify recurring categories and sub-categories. Finally, we annotated each cluster based on whether the user had expressed a general or personal inquiry.

Results (topic analysis)

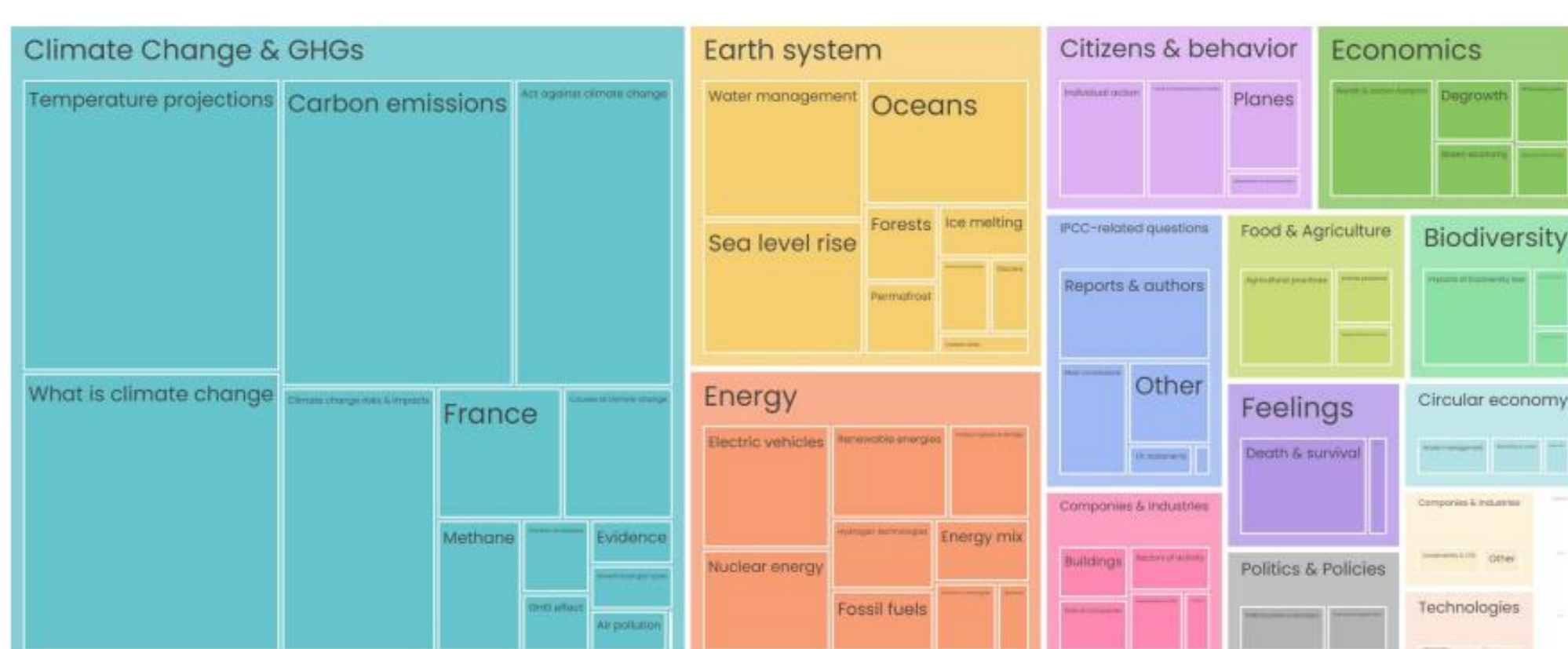


Chart: breakdown of the number of questions by topic and subtopic

Results (intent analysis)

Climate change impact projections in specific areas	8,80%
Impacts of specific consumption patterns on climate change	6,70%
Personal concerns about the physical and economic consequences of climate change	5,10%
Skepticism regarding scientific consensus or the ramifications of climate change	0,30%
Efficiency of individual actions in mitigating climate change impacts	2,10%
Other	2,80%
Personal interrogations regarding nature phenomena	25,80%

Table: detail of questions with a personal intent

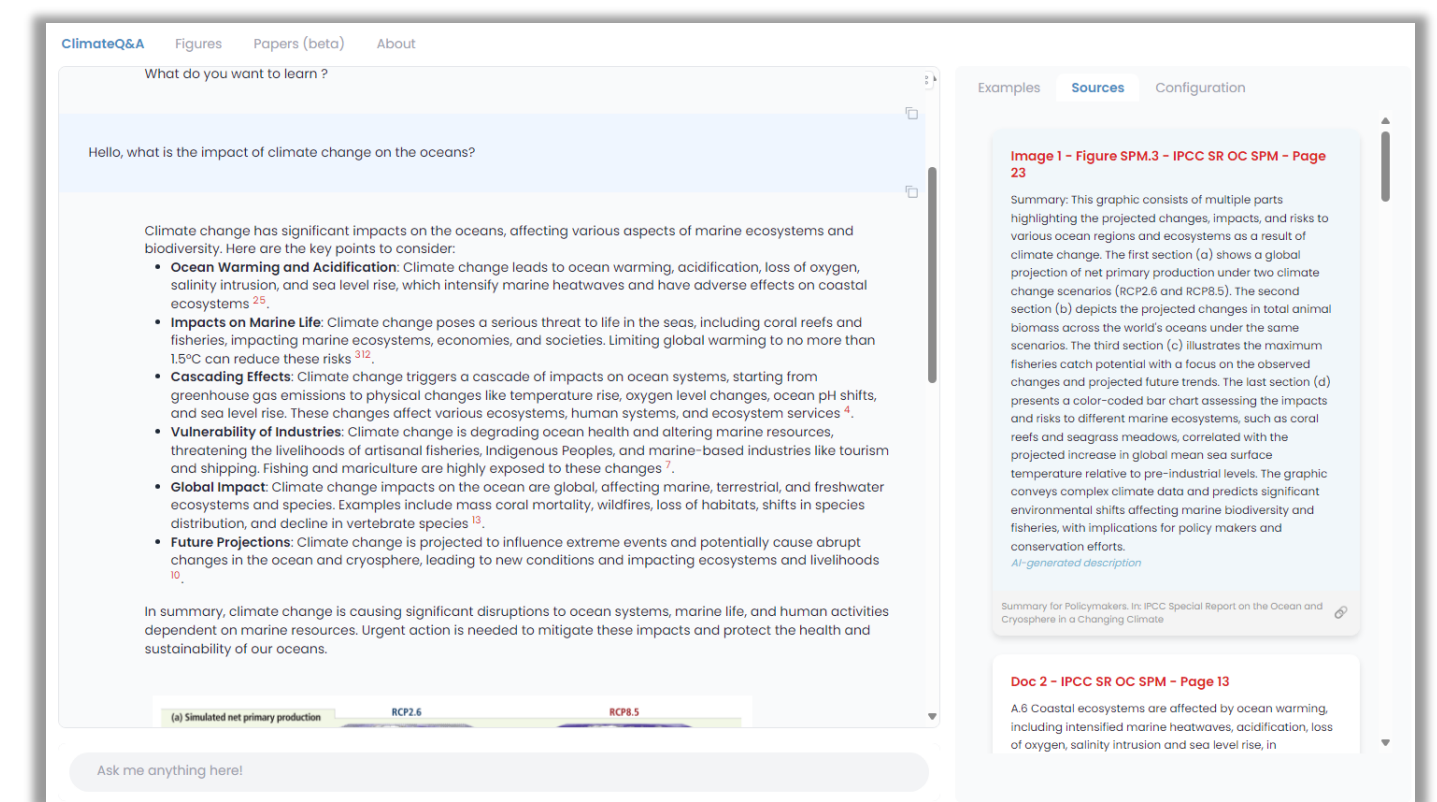


Image: sample of the ClimateQ&A console, allowing for the free formulation of questions by users

Traditional methods of surveying (close-ended questionnaires):

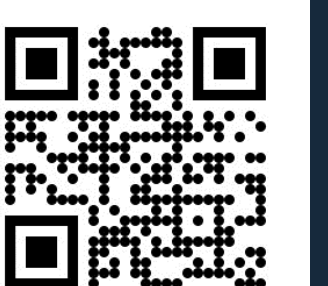
How is climate change perceived as a global threat by individuals? What understanding do people have about the root causes of climate change? How and why have individuals acquired this knowledge?

Conversational agent (free formulation):

What do people actually care about regarding climate change and biodiversity loss?

What is ClimateQ&A?

ClimateQ&A is a conversational agent that leverages LLMs to make IPCC and IPBES reports more accessible, addressing critical concerns: hindering their use: length, language, and complexity. The tool is available for free, it is open-source and it systematically provides the source of the answers provided.



Tool