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MEMBER OF  
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EUROPEAN UNIVERSITY  
OF TECHNOLOGY

## **ADDRESSING THE SOCIAL DIMENSION OF CLIMATE CHANGE: A TRANSDISCIPLINARY APPROACH FOR INSTITUTIONAL POLICIES**

A Thesis Submitted in Partial Fulfilment of the Requirements  
for the Degree of Doctor of Philosophy in

### **Sustainable Development and Climate Change**

*Doctoral Programme of National Interest*



**PhD SDC**  
SUSTAINABLE DEVELOPMENT  
AND CLIMATE CHANGE

In the Curriculum  
**THEORIES, INSTITUTIONS AND CULTURE**

**Licina Pascucci**

June, 2025









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by

**Licinia Pascucci**

Supervisor: Prof. Alessandra Sannella

Co-Supervisor(s): Prof. Roberto Buizza



## ABSTRACT

The research addresses the theoretical debate regarding the sociogenesis of the 'acceleration' of climate change, which identifies the interaction among economic processes, primarily patterns of production and consumption, and socio-political framework as the primary cause of the environmental and climate crisis (Harvey, 2021; Padovan & Sannella, 2023). The structure-oriented sociological perspective (Dunlap et al., 1994; Crenshaw & Jenkins, 1996) emphasises how social structure and socio-structural processes are key determinants of accelerating anthropogenic climate change. Furthermore, a highly stratified social structure leads to climate vulnerabilities (Mearns & Norton, 2009; Beck, 2013) and health inequalities (Marmot, 2010; Sannella, 2019).

The social dimension of climate change, viewed through the structural-functional perspective, focused the analysis on public institutions, particularly governmental ones, which, according to the AGIL model (Parsons, 1949), represent the political subsystem.

Based on the theoretical framework, the research question focused on the role of governmental institutions in addressing the social dimension of climate change. In reconstructing the role concept, the research integrated the structural-functional perspective with the interactionist approach. The latter emphasised the attributive aspect of the role, derived from social representation, through the sharing of a symbolic universe in the process of collective interaction. (Mead, 1934).

By merging the two perspectives, the role transformed into a mobile concept adaptable to the social realities that define it (Macioti, 1992; Sannella, 2024). The circular view of the relationship between institutions and communities that co-construct the concept of role highlights the need to continue the subsequent phases of research through a transdisciplinary approach (de Freitas, Nicolescu, Morin, 1994; Nicolescu, 2002), which integrates disciplinary knowledge and recognises the involvement of civil society, institutions, and businesses within the context of the quadruple helix of innovation (Carayannis & Campbell, 2009) as a crucial element of empirical research.

The research design was developed using a sequential-exploratory mixed-methods approach (Creswell & Plano Clark, 2011) and was guided by three research dimensions: institutional, environmental, and social. The first phase of the research, conducted in the United Kingdom and Italy, aimed to reconstruct both countries' legislative and institutional frameworks regarding climate change as a driver of the ongoing socio-ecological transition, focusing on its implications for public health.

In this step, we conducted background research using qualitative methodology. Eighteen interviews were conducted with privileged witnesses, 12 in the United Kingdom and 6 in Italy, who were identified among members of governmental institutions, NGOs, academics, and experts in both climate and health.

After completing the interviews, we conducted a computer-assisted analysis using the *NVivo* software. It enabled us to identify some key concepts of the research dimensions, which have been operationalised into empirical variables, and to articulate the research question into three main hypotheses.

The second research step involved a non-standard quantitative investigation examining the Italian representation of governmental climate action and testing the research hypothesis. To this end, we designed a structured web survey targeting the Italian population as the unit of analysis. The survey was non-probabilistic using snowball sampling. We administered a structured questionnaire between December 10, 2024, and March 10, 2025, via the web through email distribution and social media publication. The web survey was open-access, and the respondents were self-selected. After collecting the quantitative data, we analysed them through SPSS.

This research will discuss the main findings of the qualitative-quantitative analysis in relation to the theoretical premise. The primary objective of this analysis is to determine whether the institutional commitment to climate action aligns with the demand for social protection from civil society, which is becoming increasingly vulnerable to the risks generated by late modernity









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## INTRODUCTION

Climate change is one of contemporary society's most pressing and complex challenges. While its anthropogenic nature is firmly recognised within global scientific debates, the social dimension of climate change is steadily emerging. What was initially conceived as an objective natural fact has increasingly acquired multiple meanings through refracting from different social systems. Thus, a sociological perspective is crucial for inquiring how the complex dynamic between individuals and the sociocultural, economic and political context shapes environmental and climate processes. This study aims to investigate the role of governmental institutions in addressing the social dimension of climate change through a combination of qualitative and quantitative research in the UK and Italy. The analysis has been developed through a transdisciplinary approach that combines academic research with practical realms, yielding scientifically reliable and socially robust policy outcomes.

The theoretical foundation of this research, detailed extensively in the first chapter, builds upon the sociogenesis of climate change. It emphasises the fundamental role that socio-economic systems and institutional processes play in climate change acceleration and shaping social vulnerabilities. Adopting structural-functionalist frameworks and integrating insight from environmental sociology, we critically assess how social structure mediates the interaction between human activities and the climate system. The emergent properties of social structure, derived from the interaction of sociostructural processes, amplify the pressure of individual action on climate and environmental degradation and generate uneven social impacts. Scientific evidence corroborates this theoretical framework, highlighting the primary roles of production and consumption models and socio-structural determinants in exacerbating climate change and shaping its uneven social impacts.

From this premise, we focused the research on the role of institutional social structure in addressing climate change. Institutions are the fundamental elements of social structure, as they act as a behavioural model, a relatively stable formation of values, norms, customs, and status and expectations, which define and regulate social relations by orienting social action. From the structural-functionalist perspective, each institution is preordained to fulfil a specified functional imperative, ensuring social order. Thus, their role is strictly prefixed by prescriptive norms that ensure predictability, social control and stability. This approach has been criticised for its overly rigid and deterministic view of institutions, which limits the potential for social change and undervalues individual agency and subjectivity. For this reason, we considered integrating the structural-functionalist perspective with the interactionist, which views the

relationship between institutions and personal action as circular. From the latter, institutional roles are dynamically constructed through social interactions, collective representation, and socialisation processes rather than firmly defined by external norms. The interactionist approach emphasises the active role of social actors in challenging social order and contributing to social change through a critical reevaluation and negotiation of social expectations from institutions. Thus, the need to integrate the two perspectives emerged in this research, considering the current social order's negative social and environmental externalities. In this regard, we primarily examined how social inequalities arising from a rigidly stratified structure shape the differential impacts of climate change, particularly in terms of its health dimension. Climate change affects health through multiple pathways. Immediate exposure to extreme climate events may determine the development of pathologies or exacerbate existing health conditions.

Furthermore, climate change may indirectly contribute to an unhealthy status by disrupting ecosystem services or affecting other health determinants, such as working and living conditions, food and water security, and healthcare services. The sociological debate about the health gradient highlights that socioeconomic factors have a significant impact on health conditions. Thus, stratification within and among different countries generates vulnerability to climate-related health risks, constraining societies' adaptive capacities to climate change.

Framing the social dimension of climate change necessitates an innovative research approach that fosters collaboration between the natural and cultural sciences. In this regard, the transdisciplinary approach offers valuable insight into the climate change debate. Unlike interdisciplinarity, which primarily integrates methods and knowledge across academic disciplines, transdisciplinary research bridges the gap between research and its social and political applications by engaging a broader range of social actors in the research process, including civil society, policy-makers, and practice communities. Due to our society's complex interconnection of climate issues and socio-political structures, transdisciplinarity fosters political commitment, facilitates evidence-based policy-making, and ensures the effective implementation of climate solutions. We examined some existing transdisciplinary policies to verify if they effectively contribute to holistically inquiring about the different dimensions of the climate change phenomenon.

Building upon these theoretical premises, the work develops an empirical investigation presented in chapters two and three. It aims to determine the role of governmental institutions in addressing the social dimensions of climate change through a mixed-method analysis and a transdisciplinary approach. The second chapter primarily introduces the overall research design and then focuses on the qualitative step of empirical research. Initially, it offers

methodological insights by discussing sample selection, interview structure, and analytical processes. Next, it presents the research findings by organising the discussion around the key concepts that emerged from the analysis.

The research design has been developed using a sequential-exploratory mixed-methods approach guided by three interconnected dimensions: environmental, institutional, and social. The selection of a mixed-methods approach, incorporating both qualitative and quantitative research tools, is driven by the need to attain a comprehensive understanding of the phenomenon under investigation, thereby enhancing the research itself in terms of breadth, depth, validity of the resulting findings, and the levels of understanding achieved. The circular perspective on how institutions and communities collaboratively shape the role concept emphasises the need for a transdisciplinary approach in the empirical phase of the research. Its main objective is to verify whether the social representation of the government's role fits with its prescriptive traits deriving from climate and environmental legislation.

Following the presentation of the research process, the second chapter outlines the background research conducted in the United Kingdom and Italy, employing a qualitative methodology. We conducted 18 semistructured interviews with qualified witnesses, including 12 in the UK and 6 in Italy, who were identified among members of government institutions, businesses, civil society, and academic experts in climate and health. The sample choice followed the Quadruple Helix model of innovation, which emphasises the intrinsic value of transdisciplinarity in designing innovation trajectories to co-produce knowledge and develop robust, context-sensitive policies. The interviews explored how institutional policies address climate-related social challenges in various geographic and socio-economic contexts. After collecting and transcribing the interviews, the material was analysed through the *NVivo* software.

Subsequently, the chapter presents the main findings from the qualitative analysis by organising the discussion around the key concepts that emerged from the elaboration of the interviews. It mainly addresses the following items: a) climate change public awareness and perception; b) drivers and barriers for climate action; c) the role of social actors (government, business and civil society); d) social expectation from governmental climate action; e) climate legislative and institutional framework; f) climate change-health nexus and adaptation strategies. The analysis presents excerpts from the interviews and connects these empirical findings to the theoretical propositions from Chapter 1, highlighting both confirmations and divergences. Ultimately, the chapter synthesises the main results into bullet points, setting a clear trajectory for the following step of the empirical research.

Following the qualitative exploration, Chapter 3 focuses on the second phase of the empirical research, illustrating the quantitative analysis conducted

through a web survey targeting the Italian adult population. Aligning with the research's analytical dimensions, environmental, social and institutional, the quantitative research mainly aimed to investigate the social representations of Italian citizens. More precisely, the questionnaire items concern citizens' perceptions of climate change and the role of social actors, especially the governmental ones, in addressing the climate crisis and promoting public health. Moreover, they relate to social action and the adaptation process.

The rationale behind the survey method lies in its ability to gather various opinions, attitudes, and expectations from a broad demographic range. While qualitative data offers detailed narratives, the quantitative approach allows for generalising findings and testing hypotheses elaborated during the qualitative phase. This sequential-exploratory mixed-methods process aims to develop a thorough and integrated understanding of the inquired phenomena, aligning with the transdisciplinary framework that guides this research.

After illustrating the quantitative methodological process, the chapter presents the data we elaborated through SPSS. Firstly, it displays the main findings of the univariate and multivariate analyses of the variables we used to measure the research dimensions. Next, it delves into the significant step of testing the following research hypothesis: *1) If citizens' actions are relevant to tackling climate change, then the government should orient the actions of citizens; 2) If the government guides citizens' actions, then citizens will take actions to tackle climate change; 3) The government must promote citizens' health if climate change is a public health risk.* Finally, the chapter concludes with a comprehensive discussion of the research findings, examining the qualitative and quantitative results. It endeavours to combine the insights gathered from the interviews and web survey data, emphasising shared patterns and inconsistencies and connecting them with the research theoretical framework.

This work aims to provide a comprehensive theoretical and empirical contribution to the complex relationship between social systems, institutional policies, and climate change. Through a transdisciplinary approach, this study aims to offer significant insights into sociological literature and practical guidance for policymakers committed to promoting sustainable and equitable social development in the face of climate-related challenges.



**CHAPTER 1: THE ACCELERATION OF CLIMATE  
CHANGE AS A SOCIAL PHENOMENON. SOCIOLOGICAL  
PERSPECTIVE AND INSTITUTIONAL APPROACH**



## 1.1. THE SOCIOGENESIS OF CLIMATE CHANGE: THE ROLE OF SOCIAL STRUCTURE AND SOCIAL STRATIFICATION

It is undeniable that climate change is one of the most significant challenges of contemporary society. Following the discussion of the United Nations Framework Convention on Climate Change (UNFCCC, 1992), which highlighted the anthropogenic drivers of climate change, it has become increasingly evident that climate change cannot be considered merely a natural phenomenon. This chapter aims to go beyond the anthropogenic origins of climate change, examining whether it can be fundamentally sociogenic (Dietz et al., 2020; Harvey, 2021; Padovan & Sannella, 2023). The sociogenic of climate change relies on the fact that the principal causes of climate change and environmental degradation originate from socioeconomic processes and political factors. The growth of the human population, together with the increased energy production and consumption that rely still upon 80% on the use of fossil fuels and the exploitation of land, primarily contribute to increasing greenhouse gas (GHG) emissions and the depletion of natural resources, impacting the Earth's climate system (Lee, Romero et al., 2023; Buizza, 2023). Robust scientific evidence indicates that the increasing accumulation of greenhouse gas (GHG) emissions in the atmosphere is associated with a near-linear rise in the average global surface temperature (Masson-Delmotte et al., 2021; Ritchie et al., 2023).<sup>1</sup> Furthermore, by analysing the rise in the global average temperature (+0.22°C from 1979 to 2000 and +0.52°C from 2001 to 2022), we can confidently assert that climate change is accelerating (Buizza et al., 2022).

From the sociogenic perspective, following Duncan's POET model (1964) on the complex dynamics between social and environmental realms, some authors emphasised the role of the exponential economic growth of industrialised countries and their intensive production of commodities as central driving forces behind ecosystem unsustainability and the acceleration of climate change. (Meadows et al., 1992; Jorgenson et al., 2010; Rosa et al., 2015). However, as Marx (1973, p. 90, or ed. 1939-1941) argues, *the very process of production itself involves consumption, is immediately consumption*. Therefore,

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<sup>1</sup> The reports indicate a near-linear relationship between the accumulation of anthropogenic CO<sub>2</sub> emissions in the atmosphere and the increase in global surface temperature. In particular, they assess that each 1000 Gigatonnes of CO<sub>2</sub> emission will likely cause a 0.27°C to 0.63°C increase in global surface temperature with a best estimate of 0.45°C.

we cannot treat the production of goods and the consumption of nature as separate entities. Human reproduction and livelihood production involve the consumption of natural resources, including matter and energy. Nevertheless, the consumption of nature for these aims has a metabolic logic, sustaining the historical-biological continuity of the human species and its members. The advent of modern capitalism profoundly challenged this logic, generating a *metabolic rift* between human society and the environment, *the material estrangement of human beings within capitalist society from the natural conditions that formed the basis for their existence* (Foster, 2000, p. 163). The Cartesian dualism between *res cogitans* and *res extensa* legitimated the illusion that humans, especially in Western countries, can dominate and colonise the environment without feeling part of it (Maturo, 2024). Capital valorization has shifted the natural consumption process for bio-social reproductive goals to extractivist practices, generating and accumulating profit through the large-scale and high-intensity appropriation of nature. From this perspective, exploiting matter, particularly fossils and energy, is essential for the current capitalist system to auto-regenerate, extending its domain through the centralisation of power. To the extent that some authors glimpse its degeneration into *fossil capitalism* (Angus, 2016) or *extractive capitalism* (Petras and Veltmeyer, 2014).

In attempting to define the sociogenesis of climate change, current research draws on the structure-oriented sociological perspective developed by Dunlap et al. (1994) and Crenshaw and Jenkins (1996), which posits that sociological analysis of climate change should centre on social structure and socio-structural processes. Social structure is *the institutional and demographic matrix that constitutes any society (i.e., its latent and manifest social organisation)* (Crenshaw and Jenkins, *ibidem*, p. 344). The structure concept refers to regularities, or patterns, in how individuals behave and relate to others. These constitute a collective framework of stable interdependent relationships between different social roles, positions, institutions, groups, or classes of equal or different levels; that is, the social structure. It exists independently of the identities of the individual persons who succeed one another over time and cannot be altered by isolated action (Rytina, 2000, p. 2822; Gallino, 2004, *or. ed.* 1978, p. 676). Some social factors, such as race, gender, and class, are classified as structural because they reflect patterns over which individuals have limited control, as they are stable, impersonal, and rigid to modify. According to the structure-oriented paradigm, society is an emerged property; it is a reality of its own, nonreducible to individual behaviour rules. This applies to all social structures' elements. In line with this approach, Menger (1871) identifies the

institution, like any part of the complex social system, as an autonomous decision-making subject with its own life and personality, arising to respond to the needs of individuals but independent of those who compose or represent it and destined to endure beyond their existence. Crenshaw and Jenkins (ibidem, p. 345) state that the social structure's emergent properties are generated by the interaction between various socio-structural processes, such as social stratification, labour division, population size and density, the spatial arrangement of human activities, and the governmental and economic institutions that regulate social systems. From a structure-oriented perspective, these socio-structural factors mediate the impact of individuals on the environment and the Earth's climate systems, generating nonlinearity and differentials in the social outcomes of climate change.

This contrasts with the IPAT framework, introduced by Ehrlich and Holdren (1971), according to which the environmental impact results from a linear function of population, affluence and technology (Impact=Population\*Affluence\*Technology). Although the IPAT model effectively identifies the driving anthropogenic force of climate change, its approach seems simplistic and even reductionist. According to Crenshaw and Jenkins, the IPAT model overlooks emergent properties of social structure and fails to capture the nonlinear relationship between socio-structural variables and their environmental impact. A prominent example is provided by the determination of a country's rate of GHG emissions from the IPCC report (2023, pp. 44-45). It assesses the nonlinearity between population size and greenhouse gas (GHG) emissions per capita. Less populated countries, such as those in North America, Japan, Australia, Eastern Europe, and the Middle East, have the highest per capita emission rate.

In contrast, a substantial proportion (41%) of the population lives in countries that emit less than 3 tCO<sub>2</sub>-eq per capita. For the report, the relationship between population and consumption-based GHG emissions per capita is also nonlinear. For example, Africa and southern Asia, two of the most populous regions, have the lowest consumption-based emission rates per person. In line with the structure-oriented perspective, the report states that socio-institutional processes, such as taxation, urbanisation, technology, energy, land use, lifestyle, and patterns of consumption and production, influence the global GHG emission rate, determining the relevant driving force behind human-caused climate change.

The structure-oriented approach can be applied to various dimensions of sociological analysis on climate change; it examines the interaction between social systems at the micro level (individuals), the meso level (organisations and

cities), and the macro level (nations and global systems). As we stated, social structures and processes exacerbate anthropogenic impacts on the environment and the Earth's climate system. Additionally, they generate differentials in the social impact of climate change, ascertaining how different societies and regions are affected by climate change. Social stratification is the most relevant determinant of the uneven impact. As Kasperson and Kasperson (2001, p. 2) note, grasping vulnerability is crucial to understanding the broader implications of climate change. Certain social stratification circumstances, such as the distribution of wealth and issues related to education and health, indicate a country's level of development and determine its vulnerability to climate risk.

As the IPCC report (2023, pp. 49-51) states, regions with significant development constraints are highly vulnerable to climate-related hazards. Inequity and marginalisation linked to gender, ethnicity, and low income, especially for many Indigenous Peoples and local communities affected by colonialism patterns, exacerbate climate vulnerability. Between 2010 and 2020, human mortality from floods, droughts, and storms was 15 times higher in highly vulnerable regions than in shallow areas. Again, in line with the socio-structural approach, the report reveals a non-linear relationship between GHG emissions and the impacts of climate change. Throughout 2019, Least Developed Countries (LDCs) and Small Island Developing States (SIDS) had significantly lower per capita emissions (1.7 tCO<sub>2</sub>-eq and 4.6 tCO<sub>2</sub>-eq, respectively) compared to the global average (6.9 tCO<sub>2</sub>-eq). Paradoxically, they are the most affected by climate change due to their high vulnerability to climatic hazards, with global hotspots in West-, Central-, and East Africa, South Asia, Central and South America, Small Island Developing States (SIDS), and the Arctic. We can draw the same conclusion, considering the historical cumulative net anthropogenic CO<sub>2</sub> emissions per region from 1850 to 2019. From a historical perspective, countries that are highly vulnerable to the effects of climate change are those that have contributed the least to it.

There is an enormous gap, an ecologically unequal exchange (Jorgenson, 2012; Ciplets et al., 2017), between those who caused climate change and those suffering its consequences. This is primarily due to resource plundering from low and middle-income nations and pollution from the externalities of production. As low- and middle-income countries increase their exports of natural resources to manage the growing expenses of imported manufactured products from high-income countries, they encounter environmental harm, which includes deforestation, water contamination, loss of biodiversity, air pollution, and desertification, among other issues (Hargrove, 2022). Along this line, some scholars have theorised that historically, the most

industrialised countries must pay their *climate debt* to developing states for the atmospheric space they have consumed (Martinez-Alier, 2003; Timmons Roberts and Parks, 2007). Despite their generally shallow carbon footprints, people of colour in the Global South are those most affected by the climate crisis, so to consider climate change is racist (Gonzalez, 2020; Yearby, 2020).

Due to the strong stratification of most societies, similar racial divides and other deep structural inequalities exist within nations. In all complex societies, valued resources are unevenly distributed, resulting in the most privileged individuals and families receiving an outsized share of power, prestige, and other valued resources from social institutions (Grusky, 2000). The functionalist theory of Davis and Moore (1945) considers social stratification an immutable feature of society. From this perspective, society must motivate individuals to fill the most significant social positions, building a hierarchy of rewards (e.g., prestige, property, power). How social institutions distribute these privileges depends on the individuals' willingness to reach the most critical positions of the occupational structure. Thus, the stratification system and its unequal distribution of resources are an *unconsciously evolved device by which societies ensure that important positions are conscientiously filled by the most qualified persons* (Davis and Moore, 1945, p. 243). From this perspective, jobs, occupations, and social roles are initially matched with reward packages of unequal value, such as property and prestige. Individuals are then allocated to positions (classes), defined and rewarded.

The functionalist perspective has been criticised for neglecting the "power element" of stratification systems. The holders of key roles can use their power to exert their influence over the allocation of resources and safeguard or extend their privileges. According to Wrong (1959, p. 774), the stratification system is self-reproducing because the incumbents of functionally essential positions shape individuals' expectations of the distribution of expected rewards, leading them to demand even wider ones.

However, sociologists arguably debate the basis of social stratification. The Marxist and neo-Marxist class-based approach considers class the fundamental unit of social stratification. In line with this perspective, the class stratification paradigm has a solid economic basis, as it relies on the ownership of the means of production. Social inequality is a functional component of such a structured society. It depends on the fact that the bourgeois class, possessing the means of production, appropriates the difference between the value of the labour product and the remuneration sufficient to maintain the working class. The means of production (capital), ownership, and the accumulation of surplus profit enable the dominant class to gain more power and privileges, to the

detriment of the working class, which is relegated to the lowest rung of the social order. Marx argues that the mode of production represents a society's fundamental social structure, which conditions all other social structures and the individuals that comprise it (Gallino, 2004, or. ed. 1978, p. 680).

Additionally, Weber agrees that the economy is a prior factor in class stratification; however, he equates the economic class of workers with their market frameworks (Weber, 1968, pp. 926–40, or. ed. 1922). Through market competition for jobs and valued goods, workers, especially skilled ones, can gain opportunities to accumulate wealth and income, thereby moving from one social class to another. The complexity of modern social systems suggests a multidimensional approach to recognising stratification. In this stance, Weber considers the stratification system to be complicated by the existence of status groupings. They are forms of social affiliation based on a shared lifestyle, education, and family background (e.g., the nobility and ethnic caste) that can compete, coexist, or overlap with class-based groupings. The multidimensional approach stresses the importance of considering all status group features (such as race and gender) and the complex ways they interact with one another and with class results. Furthermore, the re-emergence of racial, ethnic, and nationalist conflicts in the late postwar period undermined the class-based approach. This led some authors (Glazer and Moynihan, 1975; Hartmann, 1981) to consider social stratification's ascriptive features (such as gender, race, and ethnicity) as its primary driving force, affecting the later social status of individuals.

Whether we consider social stratification a class-based or ascriptive process, differential access to resources, power, and privileges across social groups implies social inequality. Theorising inequalities could be regarded as one of sociology's significant inputs to climate change issues. As Beck (2013) states, climate change globalises and radicalises social inequalities, especially in countries with a solid social stratification. The author contends that contemporary society has undergone a fundamental transformation from one primarily defined by disparities in wealth and income to one where, despite the persistence of these inequalities, the main issues are environmental global risks that affect all social strata. There is strong evidence that marginalised groups, such as poor people, Indigenous communities, women, etc., are more vulnerable than others to the effects of climate change (Cizreli et al., 2023; Moss, 2009; Posner and Weisbach, 2010; Shue, 2014; von Lucke, 2021). This means that social stratification's marks are determinants of vulnerability to climate change, thereby limiting environmental and climatic adaptation (Mearns and Norton, 2009).

As discussed in this section, a structure-oriented perspective emphasises the role of social structure and socio-structural processes in mediating the impact of individual actions on atmospheric and environmental degradation and differentiating social outcomes related to the climate crisis. For this reason, the current research cannot overlook the analysis of institutional social structures and their role in shaping collective and individual action in addressing climate change. We will delve into this inquiry in the following sections.

## **1.2. THE ROLE OF INSTITUTIONS BETWEEN LEGISLATIVE FRAMEWORK AND CITIZENS' REPRESENTATION**

The reflection on the nature of institutions and the interconnection between these and collective and individual action has been a central concern in sociological thought since its inception. In the lexicon of social sciences, an institution can be defined as a behavioural model, a relatively stable formation of values, norms and customs, status and expectations, which define and regulate social relations, both among members of the same group, with a socially relevant function, and between external and internal subjects of the group itself. Conceived as a vital part of social structure, the institution operates independently of its members and beyond their existence (Gallino, 2004, or. ed. 1978, pp. 392-393; Scott & Marshall, 2009, pp. 358-359).

The importance of studying institutions in sociological analysis has been evident since the classic contributions of sociologists. Millar (1812, pp. 59-60) and Ferguson (1782, pp. 181-202) emphasise that the emergence of property in the late 18th century was a crucial factor in developing European civil and political institutions. Both authors emphasise the spontaneous nature of institutions. Far from being the result of a contractual action or an arbitrary assumption of power, they emerge unintentionally and develop dynamically as organised expressions of the various social structures arising from unequal property distribution among individuals. Their theories anticipate the subsequent structural-functionalistic analyses of institutions as they ensure stability within the social structure during a specific historical period. In nineteenth-century Anglo-Saxon functionalism, the concept of institution is often used as a synonym for an organised group that performs socially significant

functions for which it receives legitimacy, support, and resources from society. This framework was adopted by Durkheim (1982, p. 157) between the end of the 19th century and the beginning of the 20th century, for whom the genesis and functioning of institutions are at the core of sociology. The author considered them *every belief and conduct established by society*. According to Durkheim, the peculiarity of institutions lies in their ability to impose themselves on the members of the social group based on a shared normative and value framework. Similarly, Weber considers how social action is directed within collectively recognised legitimate forms, namely institutions; he further highlights the latter's capacity to shape individual action through internalisation processes.

The Durkheimian collectivist approach influences the latest structural-functional theories, according to which guaranteeing social order is essentially the responsibility of institutions, which possess and acquire a set of statuses and roles that satisfy universal social needs and functions. For Parsons (1991, or. ed. 1902), the institution has a strategic structural significance in the social system. Following his AGIL (Adaptation Goals Integration Latency) model, which posits that the social system must meet four fundamental functional imperatives, each institution is preordained to fulfil a specific social function. This confers stability to the social system. The institution is conceived as *a complex of institutionalised roles that integrate status relationships because there are no roles without corresponding statuses and vice versa* (Parsons, *ivi*, p. 25).

From this perspective, the concept of role is essential in defining institutions. Although it is inseparable from status (recognised social position), the role allows for identifying the structure of the institutional actors accompanying their status. The role provides the boundaries of behaviour, norms, or limits (prescriptive aspects) based on the explicit or implicit expectations of the group of institutional actors concerning certain statuses (attributive aspects). Parson's structural-functionalistic theory stresses the centrality of the prescriptive aspect in defining an institution's role. According to this approach, the regulatory element is inherent to the very concept of institution. It assumes a dual meaning. On the one hand, it is a tool to orient institutional action within the relevant social structure. (Parsons, *ivi*). The norm that institutionalises the role prescribes behavioural models to which institutions must conform to execute their functions. The mechanism of compliance with the role is thus ensured by the sanctions institutions would incur if they deviate from the prescriptive aspects of the norms. This is useful for laying the foundations

of social organisation where duties related to a social position emerge independent of the individual occupying a particular role.

Furthermore, the regulatory aspect of the role is addressed to collectivity. To be defined as an institution, a behavioural model must have a binding force for society. The norm represents the decisive element for making the actions of citizens predictable and coordinated. Thus, the normative mechanism allows the institution to fulfil the function of social control, ensuring that collective behaviours do not deviate excessively from those prescribed (Ross, 1901; Becker, 1966). From this perspective, the sociological conceptualisation of the role is mainly indebted to the legal tradition.

The normative approach has been criticised because it offers an oppressive and all-encompassing vision of institutions. On the one hand, appealing to the norm-sanction binomial enables institutions to maintain social stability; conversely, it can also limit social change. Considering roles as a series of regulatory precepts from occupying a specific social position diminishes the value of individual subjectivity and social interaction. For this reason, additional sociological perspectives must be considered alongside the traditional structural-functionalist approach, which views the relationship between institutions and personal action as circular. According to the constructionist and critical realism schools (Berger and Luckman, 1966; Archer, 1997), institutions cannot be conceived as a fixed, normative reality but are continuously and critically reshaped by individuals. The latter interprets and reinterprets the behavioural model based on their subjectivity and externalises it through socialisation, thereby contributing to the transformation of institutions. In the same direction moves the conceptualisation of the role, as developed by the interactionist sociologist Mead (1934, p. 141), who identifies it in the representation carried out by the social actor within the process of interaction and socialisation. The definition proposed by Luciano Gallino (2004, or. ed. 1978, p. 564) provides a good summary of sociological theories on the role. The author defines it as a set of norms and expectations that converge on individuals as they occupy a specific position within a structured network of social relations or a social system. From this perspective, the role enables a comprehensive understanding of the circularity between the institution and the citizen, connecting the macro- and micro-social levels. Institutions provide behavioural models for individuals, orienting their actions by transmitting a normative and value system that the individual internalises. The system, as learned, is not static but is continuously critically elaborated by the citizen through interaction and socialisation with others. In this process, individuals redefine their expectations of institutions, depending on their reference habitus.

Thus, the sociological analysis of the institutions' role can only be conducted by adopting a dual perspective. The macro-social perspective defines the role by the norms and expectations associated with the social position that the institution holds. In contrast, the micro-social perspective views the role as corresponding to the representation that the individual constructs in their interactions with others.

At this point, we cannot overlook that social interaction primarily occurs within intermediate organisations, such as groups or communities, in contemporary societies that are heavily stratified. Sociological research cannot, therefore, disregard a third level of analysis, the mesosocial. Consequently, for a comprehensive understanding of the role of institutions, we must inevitably couple the concept of individual representation with that of social representation of roles. Moscovici defines social representation as the result of an elaboration process carried out by individuals belonging to the same social group, who express their membership in that group (Bettin Lattes, 2011, p. 778). Its intergroup features contrast with the Durkheimian concept of intragroup collective representation, which is universal and shared by all society's actors independently of their group membership (Moscovici, 1988, p. 222). According to the author, social representation, originating from the interaction between individuals within the same group, contributes to the redefinition of common sense regarding a specific object or social phenomenon based on the values and ideas shared by the community to which they belong. From a mesosocial perspective, the role corresponds to representing a group or reference community.

Ferrarotti (2003, p. 335) arguably suggested that the role is a mediating concept between the individual and the social structure. It allows for analysing the relationship between the individual and the relevant institution within a specific historical and social context. For this reason, the role can be considered an operational concept functional for empirical analysis. On the one hand, disassembling the role into operationalisable parameters enables an understanding of how the institutions orient individual action, providing a behavioural model for citizens while delimiting its legitimacy through normative instruments. On the other hand, it allows for understanding whether individual and social representations of the role align with the set of norms and expectations that converge on the institution based on its social position.

The structural-functionalist perspective views the institution as an emergent property, not reducible to the individual members that comprise it. Conversely, the interactionist paradigm emphasises the value of the individual in redefining and legitimising the role of institutions. While the former approach

considers the maintenance of social order as the essential function of institutions, the latter views it as fluid and negotiable (Blumer, 1969).

The necessity of integrating the two theories emerged in this research. The structural-functionalistic paradigm's evaluability relies on highlighting the role of institutional structure in guaranteeing social order through orienting personal and collective actions in the transition processes generated by late modernity. However, as stated in the first section, the current social order established by the economic and political institutions falters in the face of environmental unsustainability and climate change acceleration. The latest evidence from the 2024 OECD Survey on Drivers of Trust in Public Institutions indicates that only 42% of the global population is confident that the country will succeed in reducing greenhouse gas emissions over the coming ten years. Thus, we need to integrate the structural-functionalistic paradigm with the interactionist perspective, which entails the possibility of social change through a collective and social redefinition of institutional role in addressing the social dimension of climate change (Sztompka, 1993). Moreover, combining the two theories is valuable for a holistic perspective on adaptation issues. Debating the different declensions of adaptation is crucial for examining how societies confront emerging challenges from climate change and evolve in response to changing climatic and environmental scenarios.

### **1.2.1. FROM SOCIAL TO CLIMATIC ADAPTATION**

In the sociological lexicon, adaptation refers to a dynamic exchange relationship between a collectivity and its social and natural environment, which aims to ensure a specific level of social and cultural development (Gallino, 2004, or. ed. 1978, p. 7). The adaptation process may happen in two ways: individuals or groups may modify their norms, behaviours, and cultural values in response to external stimuli or transform the social and natural environment. The latter modality is the only possible in the Parsonian functionalist theory. The author emphasises humans' active mastery of the natural environment, explicitly rejecting the notion of passively adapting to environmental change. From his perspective, adaptation is a functional imperative of every social system and contributes to the overall community's stability, as do the other imperatives. The continued and appropriate adjustment of social structure components prevents sudden social change, preserving its equilibrium.

On the contrary, symbolic interactionism entails a more dynamic approach to adaptation through a dialectical process between social actors and the environment. It posits that individuals adapt by comprehending and reinterpreting social symbols, meanings, and expectations during their interactions, emphasising the significance of subjective experiences and individuals' active role in shaping society. Social interaction enables the continuous transmission and exchange of a symbolic apparatus comprising cultural heritage, norms, behaviours, and knowledge. In line with this approach, some scholars emphasise the important role of culture in shaping adaptation processes and outcomes (Griswold, 2008). The cultural dimension can influence how people perceive risks, which, in turn, affects collective actions and constrains adaptation options, as choices are framed by the range of options provided by one's cultural background.

The transition processes from climate change render adaptation a central concept in institutional policy-making. The first definition of climate adaptation can be found in the IPCC Third Assessment Report (2001, p. 982): *the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*. Since then, numerous sociological contributions have examined social adaptation pathways as a response to the impacts of climate change.

From a structural-functional perspective, social systems play a crucial role in equipping individuals with the adaptive capacities necessary to address climate change. The sociology of loss (Elliot, 2018) demonstrates how the collapse of social systems drastically reduces a population's adaptation opportunities. However, as argued in the first paragraph, the social structure can also limit adaptation or drive maladaptation pathways, generating climate vulnerability through unequal wealth, power and privileges (Harlan et al., 2015). A significant testimony is provided by the extractive capitalism process, which produces and increases social vulnerability and exposure, constraining adaptation possibilities (March and Swyngedouw, 2022).

Although the third and fourth IPCC assessments consider vulnerability as a function of exposure, sensitivity, and adaptive capacity, the fifth and final assessment notably separates exposure from vulnerability. The latter is defined as *the propensity or predisposition to be adversely affected. It encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt* (IPCC, 2022, p. 2927). While the previous conceptualisation of vulnerability mainly focused on the physical effects of climate change, the current version suggests it is fundamentally a social creation of risk shaped by social processes (Oppenheimer, 2013).

Aligning with a structure-oriented perspective, the author argues that vulnerability stems from current or historically complex social processes and that hazards induced by climate change can exacerbate it.

However, as Wisner et al. (2004, p. 19) note, social and cultural processes can mediate risks associated with objective hazards. Again, the need to integrate the structural-functionalistic perspective with the interactionist arises; both may offer important insights for climate adaptation policy-making. The symbolic systems, particularly the transmission of cultural values and social norms, assume particular significance when socio-structural ones are inadequate to ensure collective adaptation and cohesion. They also allow for a tailored differentiation of adaptive pathways depending on the group to which they belong. In line with this, some scholars have contended that the value of the commoning process lies in its potential as an alternative social infrastructure for building community resilience (De Angelis, 2017; Varvarousis, 2019). In line with Griswold's perspective, Adger et al. (2013) argue that social and cultural capital are crucial for an intersectional approach to climate adaptation. They argue that the interaction among structural factors, including age, gender, and ethnicity, influences individuals' and communities' adaptive agency by equipping them with the abilities, adaptive skills, and essential resources to withstand the impact of climate-related crises. Furthermore, ecological culture is at the core of ecosystem-based adaptation measures. They aim to strengthen nature's resilience due to its significant contribution to ecosystem health services.

In this section, we have stressed the sociogenesis of the climate crisis. Economic, social, and political organisations that address production and consumption patterns mediate anthropogenic GHG emissions and environmental degradation. Moreover, social stratification among and within different regions is responsible for the uneven impact of climate change. However, the need to revise the current social order and rethink the role of institutions emerged. To this end, collective and social representations of institutional roles should be examined, as they may offer valuable insights that contribute to social change. Ultimately, we contended that the sociological perspective is essential to the institutional adaptation framework. Although we highlight the social dimension of climate change, the contribution of sociology and social science to climate issues has long been debated. The following section will analyse the main reasons behind the delayed entrance of the sociological perspective in the climate change debate.

### 1.3. FROM THE “STRANGE SILENCE” TO THE INCREASING CONTRIBUTION OF SOCIOLOGICAL THEORIES TO CLIMATE CHANGE ANALYSIS

At the beginning of the 21st century, some scholars stated that the sociological perspective has long been absent from the climate change framework, referring to a *strange silence in mainstream sociology* (Lever-Tracy, 2008, p. 450) or *sociological abstinence* (Grundmann, R., Stehr, N., 2010, p. 899) on global warming.

Lever-Tracy discusses two main factors contributing to sociology's lack of interest in climate change. The first is sociological scepticism toward teleological claims and disinterest in the future among modern societies. The second one is an ongoing suspicion about naturalistic interpretations of social facts. Regarding the first aspect, the author refers to Giddens's (1990, p.45-53) idea of a reflexive and self-reference modern society in which traditional institutions and historical teleology disappear, and social systems and relations are withdrawn from the local context of interactions and reorganised across large time-space through the globalisation disembedding mechanism.

Although Lever-Tracy invokes Giddens' reflection on modern societies' teleological cut to justify sociology's low interest in climate change, she fails to overlook Giddens' contribution to the risk institutionalisation process and its calling for a new public discussion about climate change. Giddens does not consider historicity a simple devotion to the past but a tool to shape present choices and chart the possible and likely future. He contends that risk is pivotal in a society that moves away from the past and traditional methods while embracing an uncertain future. In his work (ivi, 1990, p. 7), he views modernity as a double-edged phenomenon in which opportunities and threats coexist. On the one hand, the development of modern social structures has provided individuals with more opportunities to experience a secure and fulfilling life than any pre-modern system. Conversely, modernity hides a dark side; it creates a new risk profile stemming from *creating environment or socialised nature* (ivi, 1990, p.124). Besides the traditional hazards arising from natural events, modern societies face a new category of ecological threats stemming from the transformation of nature by human and social knowledge systems. Modernity is strongly marked by risks of this sort: from nuclear accident radiation spreading to, unsurprisingly, the increasing global warming caused by extractivist capitalism and industrialised processes.

Additionally, strong evidence suggests that extractivism contributes to the acceleration of climate change and puts pressure on both human and non-human life. For example, the annual outlook from UNEP-IRP (2024) states that the extraction and processing of natural resources, such as fossil fuels, metallic ores, non-metallic minerals, and biomass, contribute to over 55 per cent of greenhouse gas (GHG) emissions and 40 per cent of the health-related impacts from particulate matter. In 2007, a qualitative analysis conducted in New South Wales, Australia, on over 60 people from the Upper Hunter region, a site with significant coal mining and power industries, reveals that most interviewees reported distress due to the loss of solace in their supportive environment because of its profound transformation, resulting from the extractivist processes of the last twenty years. Suffering was determined mainly by ecosystem health loss, desolation, threats to individual health and well-being, and a sense of powerlessness. To identify this condition, the Australian philosopher Glenn Albrecht coined the term *solastalgia*, defined as *the distress produced by environmental change impacting people while they are directly connected to their home environment* (Albrecht et al., 2007, p. 1).

The nexus between the exploitation of nature, the acceleration of climate change, and its adverse impact on health and social well-being has been delineated by the 2022 Lancet Report on Health and Climate Change, which calls for “health at the mercy of fossil fuels” (Romanello et al., 2022, p. 1621). It estimates that “1.2 million deaths resulted from exposure to fossil fuel-derived ambient PM2.5 in 2020 alone.” Moreover, the firm reliance of most countries on fossils undermines community well-being. It jeopardises social stability through unstable and erratic fossil fuel markets, vulnerable supply chains, and geopolitical tensions, as the Russian-Ukrainian conflict dramatically witnessed.

Furthermore, Giddens reflects on a new array of risks associated with modernity. The disembedding mechanism that governs modern society leads to the abstraction of social systems operating in time-space extended contexts. Some examples are bureaucracy, money, and the market. The abstraction process creates the risk of disorientation from being immersed in a world of occurrences we do not entirely grasp, which often appears beyond our influence. In abstract social systems, the interactions between individuals and social structures are detached, as they tend to be represented by impersonality and automation. As modern society is characterised by fragmentation, heterogeneity, uncertainty and risks, trust plays a significant role. In particular, the author emphasises the importance of trust in expert systems, referring to science and technology, on which individuals’ lives and institutional processes depend in complex modern structures.

Along with this perspective, Giddens states that the institutionalisation of risk is an essential component of trust. Recognising that all actions can be assessed in terms of risks places a significant responsibility on experts to manage operationalisation risks. As Giddens argues (ivi, 1990, p.84), *The reliance placed by lay actors upon expert systems is not just a matter as was usually the case in the premodern world of generating a sense of security about an independently given universe of events. It is a matter of the calculation of benefit and risk in circumstances where expert knowledge does not just provide that calculus but creates (or reproduces) the universe of events due to the continual reflexive implementation of that very knowledge.* Thus, the guidance of expert knowledge allows for a marginalisation of risk. Giddens's reflection on modernity and globalisation led him to consider, in his subsequent work, "The Politics of Climate Change" (2009), the social and political implications of climate change, which he deems one of the most urgent issues of modernity to be addressed.

As we stated above, Lever-Tracy considers a second factor in sociology's lack of interest in climate change. According to the author (2008, pp. 454-455), classical sociologists, such as Weber and Durkheim, have consistently viewed nature as society's unproblematic background governed by science and technology, in which no social facts exist. This has resulted in a strict separation between the natural and social sciences, contributing to sociology's marginal role in discussions about natural phenomena. The contribution of environmental sociology has partially solved this dichotomy. In particular, the Ecological Modernization School and the Eco-Marxists have raised the question of human-caused environmental effects and how these are fed back into society. In their reflection, the Eco-Marxists emphasize the contradiction between capitalism's self-regenerative and expanding structure and the finite natural conditions of its treadmill production (Buttel et al., 2002, pp. 7-8).

Along with this perspective, Dunlap (2022) highlights sociology's role in the environmental and climate debate by stressing the urgency of developing a new sociological paradigm that overcomes the traditional anthropocentric perspective. Consistent with Lever-Tracy's thought, the author analyses some classical sociological postures, revealing their shortcomings in considering humans separate from and above the rest of nature. In particular, he focuses on the Durkheimian perspective, which states that we cannot explain social facts through individual variables.

Social facts are central to Durkheim's reflection. He defines them as *any way of acting, whether fixed or not, capable of exerting over the individual an*

*external constraint or which is general over the whole of a given society whilst having an existence of its own, independent of its individual manifestations* (Durkheim, 1982, p. 59, or. ed. 1895). To Durkheim, social facts possess an objective reality, and their cause can be found only among antecedent social facts (ivi, p. 143). This results in an antireductionism taboo that roots the sociological dismissal of biological, physical and environmental factors as possible reasons for social phenomena (Dunlap, 2002, p. 332).

According to Dunlap's perspective, Weber's sociological posture, inherited by Mead, Cooley and other contemporary constructivists, also contributes to classical sociology's anthropocentric base. Weber focuses its sociological investigation on social action: *We shall speak of action insofar as the acting individual attaches a subjective meaning to his behaviour — be it overt or covert, omission or acquiescence. Action is social insofar as its subjective meaning takes account of the behaviour of others and is thereby oriented in its course*" (Weber, 1968, p. 4). From this viewpoint, the social realm can be defined only by referring to the significance that individuals ascribe to it. They have a determinant role in defining which social facts are relevant to their life and actions. This means that other determinants, such as biological, physical, and environmental factors, could be ignored because humans consider them unimportant (Dunlap, ivi, p. 334).

This anthropocentric perspective, combined with the Durkheimian socio-centric stance, led mainstream sociological theory to develop a Human Exemptionalism Paradigm (HEP) that views individuals and society as exempt from ecological principles and environmental constraints (Catton and Dunlap, 1979, p. 250). Following this approach, sociology has been late in inquiring about natural phenomena and recognising a broader environmental and climate issue facing modern and contemporary societies. This contributed to the marginalisation of social science's role in the construction of climate science.

Thus, Catton and Dunlap (ibidem) stress the urgency of a New Ecological Paradigm (NEP). The fundamental assumptions of NEP can be summarised as follows. Humans undoubtedly possess unique characteristics, such as culture and technology, compared to other species, yet they are equally involved in ecosystem interdependencies. Thus, human affairs are influenced not only by social and cultural factors but also by the structure and processes of natural systems. This means the effects of human and social actions are not entirely predictable. Despite the potential for human expansion of this carrying capacity, societies rely on a finite biophysical environment that imposes significant constraints. This new paradigm could inspire sociological analysis to

conceive human-nature relationships more dialectically and bridge the disciplinary gaps between social and natural science.

In this regard, alongside the arguments of Lever-Tracy and Dunlap, we must consider another important factor behind the delayed recognition of the sociological contribution to the climate issue. Since the IPCC was formed in 1988, the global community has had access to considerable scientific data on the nature, sources, and impacts of climate change. As some scholars arguably state (see, e.g., Godal, 2003; Grundmann et al., 2010; Bjurström & Polk, 2011; Brulle and Dunlap, 2015), even though there is a rich body of empirical research focusing on the social dimension of climate change, the social sciences, especially sociology, have not been effectively incorporated into the reports generated by the IPCC and other organisations. Brulle and Dunlap (ibidem, p. 4) point out that, in the 1986 Bretherton Model, which analyses the interaction between sixteen processes of the Physical Climate System, all human actions are lumped into a metaphorical, inaccessible black box. This indicates that, from the natural science perspective, the climate system has been considered detached from its social context. Similarly, Godal (ibidem, p. 247) observes that the IPCC structure follows a clear-cut disciplinary line from the natural sciences to the social sciences, where the latter is based on the former.

As a result, the science of climate change has typically adhered to distinct disciplinary boundaries. Indeed, we contend that the interaction between the natural and social sciences is valuable due to its holistic approach to climate and environmental issues. We cannot deny the valuable role of natural sciences in stressing the anthropogenic factors of climate change; however, their approach may not completely address the intricate dynamics and challenges of global climate change. Tackling the human-caused impacts of climate change requires more than just technical solutions; it must also consider social, political, cultural and economic factors that influence human orientations (Rosa et al., 2015). The disciplinary distinction between natural and social sciences appears inadequate in analysing the complex interaction between social processes and the Earth's climate systems. Since the Great Acceleration in global warming after 1960, an anthropogenic solid carbon footprint has increasingly impacted ecosystems, making human and social processes the most significant driving forces of climate change. This led part of the scientific community to envision society entering a new era known as the *Anthropocene* (Crutzen, 2005). Recognising human beings' specific weight in bringing the Earth's human and non-human systems closer to the tipping points and the unsustainability of contemporary societies' consumption and production models has posed a challenge for all sciences, irrespective of their disciplinary sector.

Sociology has had to revise the traditional theoretical and methodological approach, modify the reference paradigms, and rethink social structures. The complexity of climate change challenges the scientific community to overcome the binary distinction between natural and social sciences. Addressing the social dimension of climate change stresses the urgency for the social sciences to go beyond synthesising knowledge from multiple disciplines and foster new collaborative processes that span and transcend traditional boundaries. It means assuming a transdisciplinary approach. The following section will argue that the latter offers valuable insights into the research and policy-making process, enabling a deeper understanding of the complex socio-economic and political dynamics driving the climate change phenomenon.

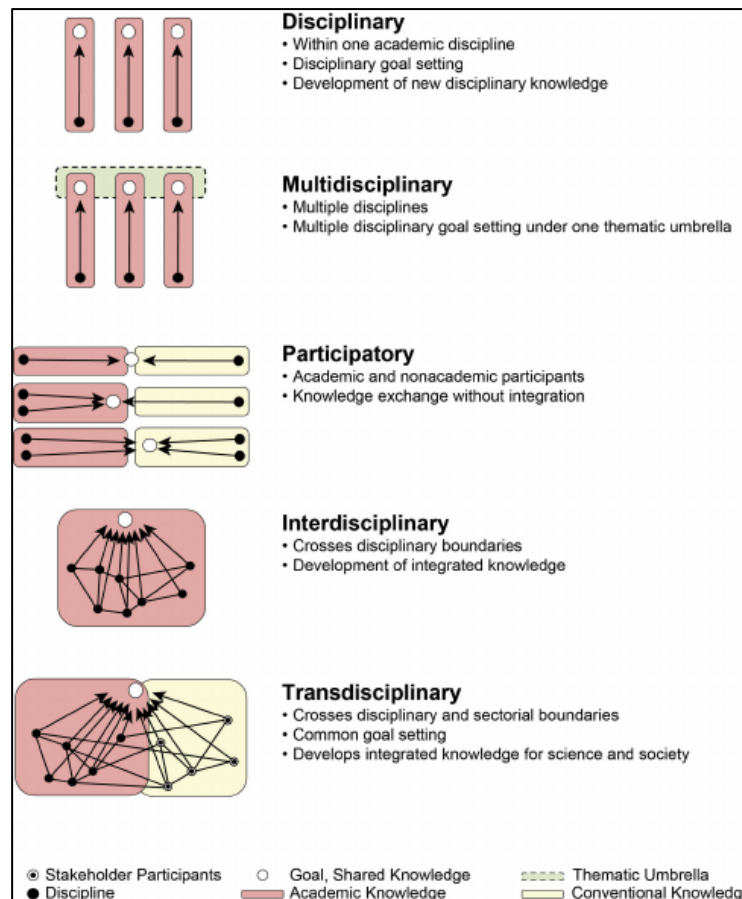
#### **1.4. THE VALUABLE INSIGHT OF TRANSDISCIPLINARY RESEARCH IN CLIMATE CHANGE STUDIES**

The historical reference of transdisciplinarity can be traced back to the last century, when in 1987, in Paris, the quantum physicist Basarab Nicolescu, already president of the *Centre International de Recherches Transdisciplinaires* (CIRET), highlighted that transdisciplinarity, indicated by the prefix “trans”, concerns what is at once between the disciplines, across the individual disciplines, and beyond all disciplines. Its main objective is understanding the world, which requires the unity of knowledge (Nicolescu, 2002, or. ed. 1996, p. 44). As de Freitas, Morin, and Nicolescu highlight in the Charter of Transdisciplinarity (1994), there are not a single but multiple levels of reality, which are knowable in different ways and at varying times, giving rise to distinct levels of knowledge. Nicolescu (2014) presents a model in which reality is viewed not merely as a single object different from the subject but as a system where varying levels of reality about both the object and the subject, each with its space-time, constantly interact. Along this path, transdisciplinary researchers must overcome classical binary logic based on the principle of non-contradiction between A and non-A states, as it is no longer sufficient to explain reality. In fact, according to the author, while A and non-A appear to be contradictory on one level of reality, they can coexist at another one, the so-called T-state. Transdisciplinarity is based on the principle of the “included third,” the T-state, which allows for understanding the complexity of reality and its level of interaction while maintaining logical coherence.

The transdisciplinary approach is complementary to the traditional ones rather than contrasting or contradicting them. They form the four arcs of knowledge, with disciplinary, interdisciplinary, and multidisciplinary approaches, whose boundaries overlap and intersect. As Nicolescu states (2002, or. ed. 1996, p.100): *If multidisciplinary and interdisciplinarity strengthen the dialogue between two cultures, transdisciplinarity allows us to envision their open unification. [...] it provides a methodological basis for reconciling two artificially antagonistic cultures, the scientific and the humanistic, by overlapping within the open unity of transdisciplinary culture.*

In Fig. 1.1, Morton et al. (2015) picture the main features of the different research pathways. The disciplinary and multidisciplinary approaches enable the development of specialised knowledge, individually or within a shared framework. Even if multidisciplinary enriches the research process by incorporating several disciplines, it relies upon the independence of the investigators. The participatory perspective facilitates knowledge exchange between academics and non-academics, yet it fails to fully integrate the disciplines. Quite the opposite, interdisciplinary research crosses disciplinary boundaries, transferring methods and outcomes from one field to another. However, it does not involve conventional expertise, and its objectives remain under the disciplinary umbrella. Ultimately, the transdisciplinary paradigm advances, extending beyond interdisciplinary integration. It bridges the gap between research and its applications, collaboratively generating systematic knowledge by engaging a broader range of stakeholders (Lyll et al., 2015).

Fig. 1.1 - Graphical representation of disciplinary, multidisciplinary, participatory, interdisciplinary, and transdisciplinary research



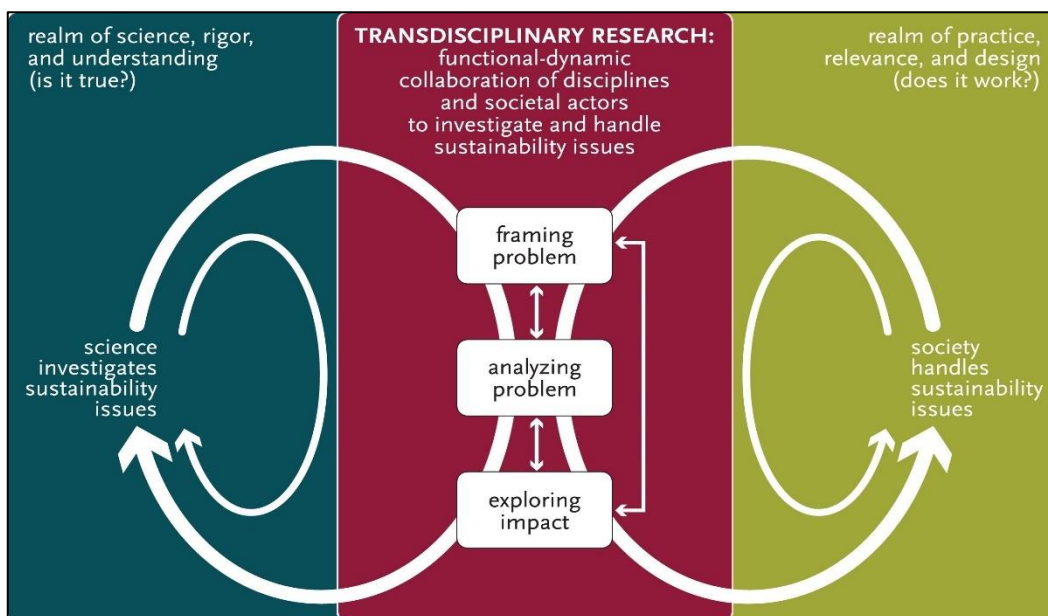
Source: Morton, L. et al. (2015). "Architectures of adaptive integration in large collaborative projects". *Ecology and Society*, 20(4), p. 2, <http://www.jstor.org/stable/26270306>. Redrawn from Tress et al. (2014).

The need for a transdisciplinary approach arises from the urgency to tackle complex societal challenges associated with managing human-natural systems, such as climate crises or sustainability issues, through solutions that emerge from diverse perspectives. The complexity of climate change primarily arises from the challenge of reaching a common understanding of its ontology (Esbjörn-Hargens, 2010). From this perspective, climate change can be considered *a multiple, boundary, or dialectical object*. *What was original material – climate change – takes on an altered form (refracted or bent as in light),*

*acquiring new content as it passes through and is captured by various epistemological and cultural domains, such as scientific knowledge, social interaction, politics, and religion.* (Padovan, Sannella, 2023, p.7). Confronting multiple objects shows we are not dealing with a simple case where different perspectives view a single object in varied ways. Instead, we are facing various perspectives utilising a range of techniques, practices, and methods to create multiple objects that overlap and diverge in different ways, ultimately resulting in what we refer to as climate change.

For this reason, addressing these challenges requires an iterative and non-linear research process, engaging multiple expertise and roles. As shown in Fig. 1.2, the transdisciplinary process combines scientific theory, methodology, and analysis with practical realms, producing both technically reliable and socially robust relevant outcomes. In line with this approach, Binder (2014) offers valuable insight into the benefits of a transdisciplinary perspective in developing future desirable scenarios for a community aiming to achieve climate neutrality by 2050. The author emphasises the importance of engaging diverse stakeholders in knowledge co-design, co-production, and co-dissemination. She illustrates that while disciplinary knowledge provides the scientific basis for understanding and modelling climate systems, transdisciplinary processes ensure the inclusion of civil society knowledge in the project design and the dissemination of results. This approach facilitates monitoring relevant societal issues and contributes to a more effective reception of the outcomes, thereby increasing the likelihood of their implementation.

Fig. 1.2 - The transdisciplinary research process



Source: Pohl, C. et al. (2021). "Conceptualising transdisciplinary integration as a multidimensional interactive process", *Environmental Science & Policy*, Volume 118, 2021, p. 20, ISSN 1462-9011, <https://doi.org/10.1016/j.envsci.2020.12.005>.

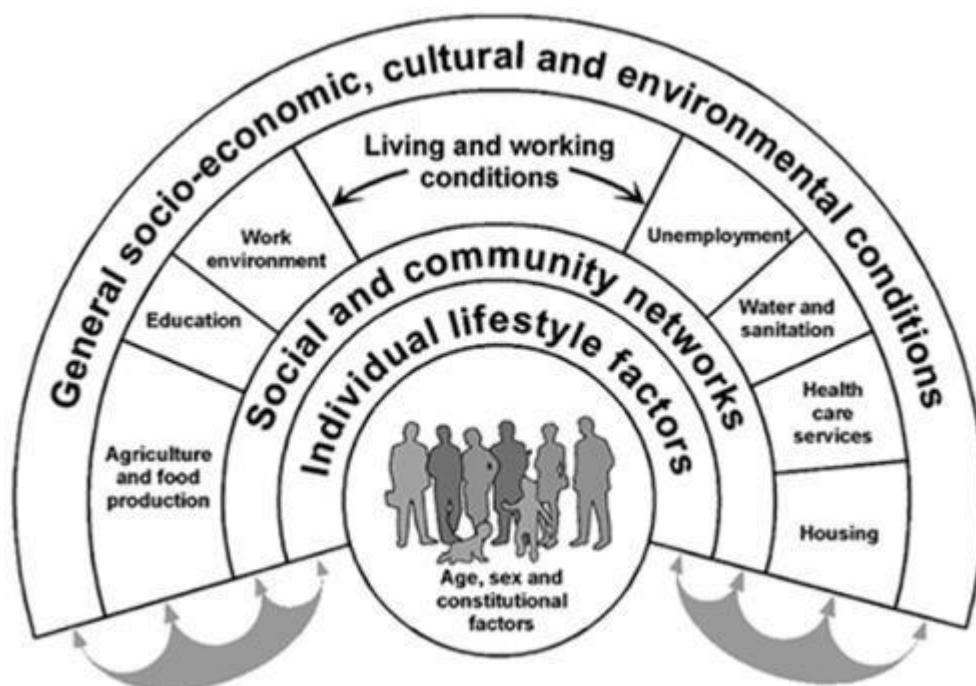
In this research, we argue that a transdisciplinary and participative approach is more suitable than the traditional ones for inspiring more effective institutional policies on climate change. While the interdisciplinary process calls for academic integration, blurring the line between disciplinary knowledge, the transdisciplinary participatory approach extends engagement to non-academic stakeholders, such as policymakers, groups, and practice communities, combining all relevant knowledge while considering a wide range of perspectives. This fosters a sense of empowerment and ownership over real-world problems and their potential solutions. The participation of nonacademic stakeholders is crucial for successful implementation due to the deep nexus between climate issues and socio-political structures in our society. In particular, the engagement of institutional actors in the climate knowledge co-production process can enforce political commitment to the evidence-based policy shift. Consequently, the transdisciplinary approach can be utilised in the implementation step to assess the social impact of introducing a new policy, serving as a "barometer of change" (OECD, 2020, p. 24).

In this section, we analysed the increasing contribution of sociological perspectives in climate and environmental public debate, which has traditionally been a domain of the natural science discipline. Through a transdisciplinary dialogue (Piko and Kopp, 2007), sociology can offer valuable insight for institutional policy-making in addressing the social dimension of climate change. When referring to the latter, we cannot overlook the sociological reflections on the complex social pathways through which climate change affects public health, which will be analysed in the following section.

## **1.5. SOCIOLOGICAL FRAME FOR ADDRESSING CLIMATE CHANGE-HEALTH NEXUS**

In this work, we build upon expanding the health concept, as defined by the WHO in 1946: “the complete physical, mental, and social well-being, and not merely the absence of disease or infirmity.” A sociological perspective on health must consider the complexity of the factors influencing communities’ well-being, referred to as health determinants (Ardigò, 1997). The first reference to the concept of health determinants dates to the “Rainbow model”, elaborated by Dahlgren and Whitehead in 1991 at the request of the World Health Organization Regional Office for Europe (Fig. 1.3). According to this model, the determinants of health can be described as a series of concentric layers corresponding to different levels of influence factors on individual health. Every stage needs specific policy strategies to reach the health equity goal. The most impactful component is the structural socioeconomic, cultural and environmental context. Descending towards the innermost gradient, we can observe the material and social conditions in which people live and work; some relevant elements, such as education, housing, healthcare, and employment status, can significantly influence this realm. Then, we can identify individual relationships within his groups and community context, as well as his lifestyles and attitudes. At the inner stage are biological characteristics: sex, age, and genetic makeup; that is, the so-called unmodifiable determinants of health because of the relative difficulty in intervening on them.

Fig. 1.3 - The Dahlgren-Whitehead model of health determinants



Source: Dahlgren, G., Whitehead, M. (2021). "The Dahlgren-Whitehead model of health determinants: 30 years on and still chasing rainbows", *Public Health, Volume 199, 2021*, pp. 20-24, ISSN 0033-3506, <https://doi.org/10.1016/j.puhe.2021.08.009>. License by Creative Commons Attribution 4.0 International Public License, <https://creativecommons.org/licenses/by/4.0/>. [See Dahlgren et al. or.ed., 1991]

Some years later, in 2005, the WHO established the Commission on Social Determinants of Health (CSDH) to evaluate the influence of non-medical factors on community health outcomes and health disparities among and within countries. Its final report (2008) defines the Social Determinants of Health (SDOH) as individual daily working and living conditions and a broader range of structural elements that shape them, such as social programmes and policies, economic systems, and political frameworks. This perspective highlights the role of society and social processes in generating health status. Previously, Durkheim endangered this nexus. In his work on suicide (1952, or. ed. 1897), he theorised how social facts might determine individual pathology, consequently affecting community health levels. In particular, the author identified two relevant social patterns of suicides: social alienation and anomy. He found a stable high percentage of suicides in groups with a low social

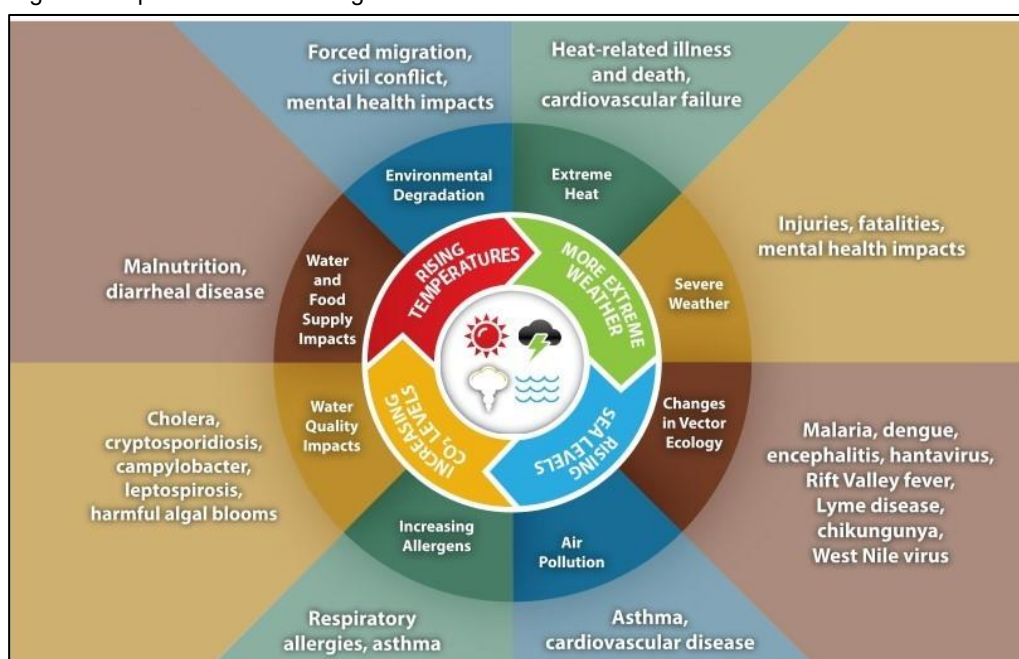
integration among the members. The same phenomenon occurs during societal crises of an economic or political nature due to the lack of social control and the weakness of social norms.

To the author, institutions fail to fulfil their function of guiding individuals' development during these events. It inevitably affects their health status, as it is undeniably linked to the ability to conduct a fulfilling life that aligns with personal aspirations and desires. Similarly, the CSDH 2008 report recognises the pivotal role of socioeconomic institutions in determining health and health equity. Their function is to ensure the basic conditions for thriving, including education, income, housing, social protection, and access to healthcare. Furthermore, the report contends that health status follows a socio-economic gradient (Marmot, 2010). Thus, institutions must fairly distribute socioeconomic resources through effective social policies to achieve health equity. Significantly, the report embodies one of the first references to climate change as a determinant of public health and health equity, as "it affects the way of life and health of individuals and the planet" (p.1).

Fig. 1.4 pictures the impacts of climate change on human health. The alteration of the natural climate cycle by human activities generates rising sea levels and temperatures, more extreme weather events, and CO<sub>2</sub> accumulation in the atmosphere. This environmental stress (Harlan et al., 2014; Ding et al., 2014) generates a cascade of effects, including extreme weather events, increased air pollution and allergen spread, water and food supply shortages, and environmental and water quality degradation. Immediate exposure to these conditions increases the risk of the development of pathologies. Besides mortality or morbidity from directly experiencing climate-sensitive hazards, climate change may indirectly affect human health through complex exposure pathways. Most adverse outcomes originate from climate-induced disruption of secondary factors, such as social systems and ecosystems (Banwell et al., 2018; IPCC, 2022). The indirect impact primarily concerns other social health determinants, such as working and living conditions, food and water security, healthcare services, education, and inequalities (Buizza, Misiti, Sannella, 2022; Raffetti et al., 2024). Other threats from ecosystem disruption include biodiversity loss and environmental degradation (Semenza, 2020; Mirzabaev et al., 2023). When the adverse impact severely disrupts the normal functioning of societies and communities, leading to environmental, economic, or human losses, conflicts, mass migrations, and war scenarios, it can be considered a climate disaster (UNGA, 2017). Notably, the risk of being adversely impacted by climate change is unevenly distributed, as it relies on the interaction between hazards, exposure, and vulnerability (see the previous section for evidence on

how climate change affects vulnerable groups). Low- and middle-income countries (LMICs) face numerous existing health threats, including poverty, food insecurity, soil degradation, deforestation, rapid urban growth, water shortages, and inadequate healthcare resources (IPCC, 2023). Moreover, these factors heighten their vulnerability to extreme climate conditions, constraining their ability to adapt. This leads to double discrimination processes.

Fig. 1.4 - Impact of climate change on human health



Source: Center for Disease Control and Prevention (CDC) (2024), *Preparing for the regional health impact of climate change in the United States*, p.3, <https://www.cdc.gov/climate-health/media/pdfs/2024/05/Regional-Impacts-Climate-Change-H.pdf>.

Grasping the complex pathways through which climate change affects human health and health inequalities requires integrating the sociological perspective of health promotion into the policy-making process through a transdisciplinary approach. Systemic addressing of the various health determinants may enhance the social adaptation process to new health scenarios from climate and environmental risks by decreasing the vulnerability of human and natural systems and strengthening social justice (Sannella, 2019).

This section examined how the sociological perspective, long missing in the climate change discussion, is crucial for addressing its social dimension,

mainly relating to sociostructural processes and health issues. Through a transdisciplinary research process connecting climate change boundary objects, the interaction among disciplines and social realms can produce evidence-based and socially acceptable policy options. In the next section, we will analyse existing policies to verify if transdisciplinarity could help institutions shape the social environment while promoting better health and addressing the climate crisis.

## **1.6. TRANSDISCIPLINARY PERSPECTIVE FOR PUBLIC HEALTH PROMOTION**

Since the 1980s, traditional public health systems have shifted their focus from disease prevention to health promotion. The release of the Ottawa Charter for Health Promotion in 1986 likely influenced the development of the new public health regime (Green & Montenegro, 2023). The concept of health promotion is central to the postmodern welfare system. Late modernity is marked by systemic risks that individuals cannot avoid, which are inherent to globalised industrial society. Although generating wealth, achieving a high level of development also creates risks associated with managing significant technologies to maintain those standards. Everyone is at risk in the postmodern society, regardless of social extraction or country of origin. This universality undermines the interpretative frameworks provided by traditional institutions, and the individual is compelled to continuously self-reflect and adapt themselves (Beck, 2013).

From this perspective, we can easily understand the intrinsic value of health promotion in mitigating modernity's risks, such as those related to climate and environmental concerns. As health promotion aims to enable individuals to achieve their fullest health potential by increasing their control over health determinants (Ottawa Charter for Health Promotion, 1986), it is crucial to cope with the risks of potential adverse health impacts from climate change. The greater the possibility that individuals intervene in the factors that determine their health, the higher their opportunity for personal and social adaptation to actual or expected climate and environmental scenarios.

Suppose individuals can effectively choose to act on their determinants, for example, by adopting a healthy lifestyle. In that case, we cannot overlook that the enabling process is an institutional essential mandate. They must ensure that all basic health conditions are met and that equal access to them is provided. Additionally, institutions are strongly responsible for the social

construction of risk. As Beck argues (ivi, p. 337), we can consider two different aspects of risk: reality and perception. The first is connected to its tangible impact, which emerges from industrial production and is ascertained from scientific research. On the contrary, how institutions, especially cultural ones, construct and disseminate knowledge about reality significantly impacts individual risk perception. How people perceive risk influences their actions, prompting them to respond proactively to potential future adverse outcomes. Consequently, constructing risk becomes an essential tool for institutions, encouraging individuals to take immediate steps to mitigate future risks. Based on the above, we can affirm that institutions play a vital role in addressing climate-related health risks for society. They can facilitate social adaptation through health promotion policies to increase their control over health determinants. Meanwhile, they can stimulate individual mitigation actions through orienting knowledge and perception of health risks coming from the future adverse impacts of climate change.

The changing nature of health pathways, driven by emerging new environmental and climate risks of late modernity (such as air pollution, global warming, and ozone layer depletion), has brought out new transdisciplinary perspectives in public health.

One of these perspectives is the ecological public health model (Rayner & Lang, 2015), which has been introduced to help reshape societies, inform policy, and integrate long-term considerations into short-term political decisions. This approach originates from the idea that public health policies cannot disregard intersectoral actions on social, cultural, economic and environmental health determinants. For this reason, it proposes a new model for policymakers, science- and evidence-based, integrative, multi-actorial, and multi-dimensional, calling for greater inclusion of non-institutional knowledge in decision-making.

Another perspective besides the ecological public health model is the One Health (OH) approach, one of the most holistic strategies for managing climate and environmental health risks. The term was coined at the beginning of the 21<sup>st</sup> century (Gibbs, 2014; Queenan et al., 2017) to emphasise the relational aspects of human health and its interdependence with the well-being of non-human entities, including animals, plants, and ecosystems. New health risk pathways emerge from environmental degradation, biodiversity loss, the spread of infectious diseases, and climate change. These phenomena, together with the “silent pandemic” from antimicrobial resistance (WHO et al., 2022), affect human health while threatening the existence of all planetary living organisms. It requires new transdisciplinary health governance, capable of bringing together various expertise from different disciplines and, additionally,

involving civil society knowledge. Several scholars (Sannella, Favretto, Balduzzi, 2024; Zinsstag et al., 2023; Berger-Gonzalez et al., 2020) contend that the transdisciplinary dimension of the OH approach integrates the theoretical aspects of research across different academic fields with empirical evidence from non-academic domains. The OH holistic perspective has been implemented internationally through the One Health Joint Plan of Action (2022), carried out by a quadripartite agreement between WHO, Food and Agriculture Organizations (FAO), the United Nations Environment Program (UNEP), and the World Organization for Animal Health (WOAH), aimed at addressing social, economic and environmental determinants of health through involving multilevel actors.

A prominent international example of a transdisciplinary policy addressing the complexity of health determinants is the 2030 United Nations Agenda for Sustainable Development. Both the ecological public health and OH approaches emphasise the similarities between health determinants and the dimensions of sustainable development, suggesting that advancements in the Sustainable Development Goals (SDGs) can significantly promote health improvements and, in turn, vice versa. However, this latter statement is debated in the following paragraphs.

### **1.6.1. THE INTERNATIONAL SCENARIO OF SUSTAINABLE DEVELOPMENT**

The sustainable development paradigm (Nocenzi, Sannella, 2020) promotes a holistic approach to addressing the complexity of late modernity. It has been inspired by a *trans* perspective since its origin. It postulates overcoming human exemptionalism and going beyond the present dimension, the local context and, above all, the disciplinary boundaries.

Although the concept of sustainable development was elaborated in the 1980s, the sustainability issue already emerged in the first modernity, with the rise of capitalism and the ideological and political assumptions that justified self-interest, colonial expansion, and the superiority of empire, which underpin it. The increasing scarcity of raw materials derived from the exploitation of natural resources has raised concerns about the need for sustainable use of these resources (Caradonna, 2014). However, sustainability was primarily overlooked until the first decade of the 20th century due to the anthropocentric perspective that treated common goods, such as soil and water, as mere human commodities.

Only at the beginning of the 20<sup>th</sup> century did a new ecological approach emerge, mainly due to the recognition of ecology as a distinct scientific discipline. At that time, the sustainability concept shifted to an ecosystemic standpoint, no longer focusing on humans but rather on limiting their environmental impact.

The '70s were crucial for introducing sustainability in international fora. The Club of Rome report (1972) highlighted the potentially catastrophic effects of continuous and uncontrolled economic growth in the future and called for revisiting traditional concepts of progress and development. The Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration), published in the same year, emphasised balancing human development needs with environmental protection and improvement. Later, the new paradigm of sustainability was explicitly declared as sustainable development. The term was first used in the World Conservation Strategy of the International Union for the Conservation of Nature and Natural Resources (IUCN) (1980). However, the document lacked a definition of the concept. The following year, Lester Brown anticipated the idea of a sustainable society as one that meets its needs without jeopardising the ability of the next generation to satisfy its prospects (1981). In the late 1980s, the Brundtland Report (WCED 1987) resumed Brown's words to validate the concept of sustainable development.

Compared with the previous concept of sustainability, which prioritised ecological concerns over economic growth, sustainable development consists of three environmental, social, and economic dimensions, later known as the triple bottom line, to reconcile in a balancing process enlightened by the integration principle. It entails the idea that societies naturally tend to improve their human development level by increasing the production of goods and services or using technologies. Far from being considered the ultimate evil, economic growth is more than desirable. Nevertheless, it must be primarily decoupled from environmental pressure and climatic degradation. Additionally, economic growth cannot disregard the equality and non-discrimination pillars of the "Leave No One Behind" (Klasen et al., 2018) principle.

Since its first theorisation, operationalising sustainable development and its ambitious project has been challenging for policymaking. The integrative approach faced a significant constraint in developing a reliable definition of social sustainability. As Giovannini (2018) argues, thresholds have been extensively employed in economic and environmental realms to identify potential limits beyond which a system may become unsustainable, such as planetary boundaries or the debt-to-GDP ratio. However, the lack of a theory of

revolution that can forecast when a society reaches a tipping point and consequently sparks a revolution has hindered the ability to clearly define what is socially sustainable and develop reliable indicators to measure it. The UN 2030 Agenda represents a significant step forward in this direction. Social sustainability has been operationalised through specific objectives and relative targets. Several indicators have been developed to measure progress toward achieving the goals, and an international agency, the High-Level Political Forum, has been established to monitor implementation.

Health and health promotion (Goal 3) are crucial aspects of social sustainability. The 13 targets of Goal 3 demonstrate a holistic approach to health. Reaching a healthy status strictly relies upon social, environmental and economic determinants, so it involves contextual actions in all the other goals, particularly eradicating poverty, ensuring social justice and peace, protecting the environment, developing international cooperation, promoting inclusive growth, and tackling climate change. Health promotion is transversal to all the other SDGs that directly or indirectly recall it and plays a vital role in societies' sustainable development. The Geneva Charter of Well-Being (2021) explains this link, highlighting the need for intersectoral policies and global commitment to improving human and environmental health while ensuring intra- and transgenerational equity.

The integrated model of the sustainable development paradigm, as the UN Agenda had operationalised it, has been firmly criticised for its inability to reconcile economic growth with environmental preservation, social equity, and well-being. A *steady-state economy* (Georgescu-Roegen, 1971; Daly, 1977) with a reasonably consistent, slightly varying consumption rate has been proposed as an alternative to the growth model to fulfil essential human requirements and maintain a high standard of living while minimising the ecological footprint of the global economy to a sustainable standard, fairly shared among countries. Other approaches call for downsizing global and local economies to preserve ecosystems and reduce social stratification among and within countries (Demaria et al., 2013). The degrowth interpretative framework challenges the possibility of decoupling ecological impacts from economic growth, typical of *homo economicus* (Foucault, 2008) and its utilitarianism approach. It proposes a new economics of happiness, where social relations are based on sharing and the commodification of environmental resources.

Along with this perspective, recent studies suggest that a growth-oriented economy does not necessarily lead to increased sustainable and equitable development. This is because the social returns from higher resource use tend to diminish over time, a phenomenon acknowledged as the Easterlin

Paradox (Easterlin, 1974). As a result, in a growth-oriented economy, welfare and social well-being stop improving after reaching a certain level of growth (O'Neill et al., 2018; World Happiness Report, 2020).

The 2020 World Happiness Report (WHR) highlight several tensions where efforts to attain sustainability might compel individuals to alter their behaviours, possibly impacting their overall well-being. This evidence contrasts with the ecological public health approach, which posits that pursuing sustainable development benefits health. The report reveals a strong correlation between each country's Sustainable Development Goals (SDG) and Subjective Well-being (SWB) indices. However, heterogeneity emerged in the relationship between different Sustainable Development Goals (SDGs) and Subjective Well-being (SWB). For example, some environmental goals, such as numbers 12 and 13, correlate significantly negatively with SWB in all regions. This could be a paradox, considering that the Environmental Protection Index (EPI) positively correlates with SWB, as the report indicates. The paradox may rely on the fact that well-being is positively linked to environmental protection outcomes. Still, it is not necessarily positively correlated with the means required by climate and ecological policies to achieve these outcomes, such as taxation or behavioural changes.

However, the report's evidence reveals a disconnect between income increases and life satisfaction and several trade-offs between different sustainable development goals. Consequently, the theoretical integration model proposed by the UN Agenda is practically complex for policymakers. They face balancing sustainability's distinct objectives, addressing emerging trade-offs, or prioritising one dimension prevailing over the others. Recently, the EU legislator seems to have opted for the latter choice.

### **1.6.2. THE EU NATURE RESTORATION LAW: PRIORITISING ECOLOGICAL DIMENSION TO PROMOTE HEALTH**

Sustainable development is one of the objectives of the European Union's comprehensive project to establish an internal market. Theorising sustainable development in the EU legal framework follows the UN Agenda's rationale of balancing economic, social, and environmental dimensions. The EU legislation states that economic growth must be ensured by designing a highly competitive social market economy that relies on economic integration, strong social cohesion and environmental protection to achieve sustainable development (TEU, art 3). While initially conceived as an objective (TEU, art.

21 (f)), environmental protection has become a significant legal principle in EU policy implementation (TFEU, art. 11; EU Charter of Fundamental Rights, art. 37).

In line with this perspective, the EU's commitment to ecosystem preservation and nature restoration has intensified over the last two decades. Two relevant legislations on biodiversity conservation were introduced: the Birds Directive (1979, amended in 2009) and the Habitat Directive (1992). This was followed by the EU's approval of the UN Convention on Biological Diversity in 1993. Both directives established a network of sites, known as Natura 2000, which includes public lands and private properties, where human activity is ecologically constrained by the sustainable use of resources that ensures the long-term survival of Europe's most valuable and threatened species and habitats.

Building on these two key directives, the EU Commission implemented its inaugural biodiversity policy in 2011, the EU Biodiversity Strategy for 2020. It aimed to halt the decline of biodiversity and ecosystem services within the EU by 2020, restoring them as much as possible and contributing to the global effort to combat biodiversity loss. Despite their undeniable ecological features, the directives and the strategy have been criticised for a far too soft approach to environmental concerns. Some scholars argue that the directives did not sufficiently clarify how sustainability might limit human activities on Natura 2000 sites and lack a climate-sensitive perspective (Kistenkas, 2013). Moreover, the EU Biodiversity Strategy for 2020 was strongly criticised for its failure in nature restoration, stemming from the non-binding nature of its targets, which led to low commitment among member states (Bijlsma et al., 2019). The lack of a coordinated approach during implementation was a significant issue.

The EU Green Deal (EUGD, 2019) approval strengthened the European commitment to protecting and restoring the ecosystem to the extent that some scholars have contended about a possible reshaping of sustainable development (Chiti, 2022a; Pascucci, 2024), endorsing an ecological primacy (Sbert, 2020). Undeniably, the Green Deal is a "new growth strategy". At first glance, the emphasis on the economic objective does not appear to undermine the traditional EU legal framework's alignment with the tripartition of sustainable development, where environmental conservation and social cohesion are external constraints to the market (EUGD, art. 41; Chiti, 2022b). However, the EUGD legal framework seems to consolidate a more ecological understanding of sustainability than the traditional triple bottom line of sustainable development.

The new Biodiversity Strategy for 2030 (2020), which stems from it, proves this. Unlike the previous one, the new plan transforms ecological policy objectives into binding targets for member states. It emphasises the bleak state of nature and underscores the necessity for a commitment to ecological restoration through effective instruments and channels for strategy implementation.

In line with this approach, the EU enacted its first ecological regulation, the Nature Restoration Law (NRL, 2024), to recover biodiversity through ecosystem restoration and achieve EU climate mitigation and adaptation targets. The restoration measures should cover at least 20% of the Union's land and marine areas by 2030. By 2050, all ecosystems requiring restoration should be addressed, particularly those with the most significant potential to remove and store carbon and prevent and mitigate the effects of natural disasters. Earth's natural carbon sinks are crucial to the EU achieving net zero by 2050, as mandated by the EU Climate Law (2021).

At the recent 2024 UN Biodiversity Conference, COP16, strong evidence emerged on the crucial role of forests in absorbing a significant percentage (approximately 15.6 gigatonnes) of CO<sub>2</sub> emissions. Environmental degradation from deforestation, fires, drought, and other climate-related impacts severely affects their mitigating function, more than half of that percentage leaks back into the atmosphere. A recent study (Weiskopf et al., 2024) found that biological carbon capture and biodiversity are tightly connected. According to the study, a relevant decrease in the richness of plant species impairs natural ecosystems' ability, especially soils, to capture and store CO<sub>2</sub> emissions. So, biodiversity-mediated carbon sequestration is a fundamental source for climate mitigation. According to this perspective, achieving the 13<sup>th</sup> Sustainable Development Goal (SDG) and the Paris Agreement targets powerfully depends on the country's commitment to the 15<sup>th</sup> SDG in protecting nature and restoring ecosystems.

Biodiversity and ecosystems also play a crucial role in achieving the 3<sup>rd</sup> Sustainable Development Goal (SDG) health targets. Green spaces can reduce exposure to environmental stressors like heat and air pollution and facilitate stress recovery (Marselle et al., 2021). A recent Keune et al. (2022) study explores possible pathways between biodiversity and health outcomes. Due to the dilution effect, regions with high differentiation in animal species have a lower rate of infectious disease transmission owing to lower infection rates in vectors. According to the amplification effect, every environmental change creates an intensified disruption in the ecological balance, such as the transmission of infectious diseases among vectors, ultimately affecting human and animal populations. The perturbation and the pathogen pool diversity

hypothesis explain other relevant connections between ecosystem alteration and disease development. According to these, fragmented habitats cannot support the same diversity and abundance of pathogenic species as the original habitat; a high level of pathogen interaction leads to heightened transmission of pathogens across various habitats, species, and populations. Moreover, increasing evidence (IPCC, 2022; Duarte et al., 2020; Luther et al., 2020) proves that ecosystemic policy options, such as Ecosystem-based Adaptation (EbA) and Nature-based Solutions (NbS), can lower climate risks and benefit community health.

The same consideration about the link between the different SDGs is valid at the European level. As stated in the NRL (Article 1, 22), biodiversity recovery can significantly contribute to the EU Climate Law's objective of achieving net zero and support the Union's efforts to implement the One Health approach by preventing and enhancing resilience to potential communicable zoonotic diseases, thereby reducing the risk of pandemics. By referencing the Ottawa Charter on Health Promotion, the NRL aligns with the objectives of the WHO, which identifies a secure ecosystem as a fundamental requisite for health and calls for integrating environmental protection into health promotion policies.

Undeniably, the NRL strengthens the member states' commitment to preserving nature, recognising its crucial value in determining human health and halting the acceleration of climate change. However, we cannot disregard that ecosystem health is not a value per se. Nevertheless, it is functional to the Western countries' anthropocentric perspective. In fact, according to the EU Commission in the original NRL proposal, ecological integrity benefits humanity by providing various ecosystem services, including clean air, potable water, and fertile soil, essential for securing social cohesion and developing economies.

However, we must contend that the NRL's primary ecological goal suggests a more hierarchised structure between the sustainable development dimensions, where ecological concerns seem to prevail over socio-economic interests. Moreover, by enacting the NRL, the ecological decline of sustainability should be operationalised nationally. The legal preference for regulation over directives is not incidental, as it should enable a uniform and binding implementation of restoration targets among member states. They must set up National Restoration Plans (NRPs) to indicate their restoration paths, targets, and deadlines based on ecosystem status, through which the EU Commission evaluates their progress in achieving the law's objectives.

Unfortunately, the EU's engagement in ecological prioritisation and its coherent implementation risk being betrayed by the possibility for member states to postpone or derogate the targets in the presence of relevant socio-

economic circumstances; it is the case, for example, of restoration measures regarding sites dedicated to food production, renewable energy or military defence. Thus, the ecological goal relies firmly on the institutional compliance of the member states.

The latter statement aligns with the sociological premise presented in the first chapter, which stems from the significant role of institutional social structure in addressing climate change and ecological issues. In the next chapter, we will present the results of a qualitative-quantitative analysis in the UK and Italy to verify how the institutional role is operationalised in the legislative framework and represented in social realms. The primary objective is to determine whether the current institutional social structure aligns with international and national climate change and sustainability commitments and responds to social liability demands from citizens facing a planetary crisis.

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## **CHAPTER 2: EXPLORING THE ROLE OF INSTITUTIONS THROUGH A MIXED-METHOD APPROACH: A QUALITATIVE ANALYSIS IN THE UK AND ITALY**



## **PREMISE**

This section will introduce the empirical part of the research process. Firstly, we will present the overall research design, starting from the formulation of the research question and hypothesis through the methodological approach to the final step of introducing the research results (par. 2.1). Then, we will focus on the first step of the empirical process. We will illustrate the qualitative analysis we conducted through semi-structured interviews in the UK and Italy. We will initially introduce the methodological note, describing the sample selection, the interviews' structure, and the qualitative analysis process (par. 2.2). Next, we will present the research findings by organising the discussion around the key concepts that emerged from the analysis (from par. 2.3 to par. 2.8). In this part, we will try to connect some extracts of the interviews to the theoretical framework we analysed in the first chapter. For the Italian extracts, the English translation will be in parallel. Ultimately, we will synthesise the results in bullet points (par. 2.9). These will orient the second step of quantitative analysis that we present in Chapter 3 of this work.

### **2.1. RESEARCH DESIGN**

The literature review in the first chapter has enabled us to construct the theoretical framework for formulating the research question and selecting the methodological approach appropriate for the empirical phase.

The theoretical premise concerning the sociogenesis of climate change has suggested focusing our attention on the relationship between social structure and the phenomenon of climate change. The structure-oriented perspective has allowed us to capture some fundamental aspects of this relationship. Firstly, it has been observed that certain socio-structural factors, particularly the choice of production and consumption models, play a decisive role in accelerating anthropogenic climate change. Secondly, it has been observed that a strongly stratified social structure significantly influences the unequal distribution of climate change impacts across society. These two observations allow us to highlight the social dimension of climate change, both in terms of its causes and effects.

The structure-oriented approach has directed the analysis towards public institutions, a vital component of social structure, particularly government institutions. The sociological concept of governmental institutions exhibits

distinct traits from a legal and technical perspective. Far from being reduced to a mere executive apparatus, the government is considered one of the fundamental social institutions in sociology. As Parsons (1949, p. 491) states, government institutions enforce social norms through laws and regulations, influencing collective values via public policies and programs. According to the AGIL scheme, governmental institutions form the political subsystem. The latter is building around the fulfilment of functional imperatives, as for the other social subsystems. Government institutions are preordained to collective goal attainment. Their role is to guarantee social order and provide a stable framework within which other institutions operate.

As evident from a structural-functionalist perspective, the concept of institution is closely linked to its role, such that one cannot speak of one without referring to the other. The role is a key concept in sociological theory but is also functional to empirical analysis (Ferrarotti, 2006, or. ed. 1992, p. 60). In the previous chapter, we noted how both the norm and the expectation contribute to defining the concept of role, with the former representing the prescriptive aspect and the latter the attributive one. Each social actor is assigned a role prescribed by a norm, whether codified or not, and simultaneously attributed through the collective expectations that stem from the social position that the actor occupies. The structural-functionalist theory is firmly anchored in the prescriptive aspect of the role. The norm is a fundamental element, not only because it defines the boundaries within which institutions must operate but also because it guides collective action, ensuring social order. As noted, the normative approach has been criticised for proposing an excessively static view of social reality, which effectively relegates the individual to the role of a mere recipient of institutional dictates while denying the possibility of social change.

Therefore, analysing institutions' roles has highlighted the need to review the structural-functionalist approach, considering new perspectives on the circular relationship between institutions and citizens. Consequently, further theories, such as critical realism and interactionist perspective, have been explored. The latter particularly emphasises the significance of social interaction in the symbolic construction process of the role, which thus becomes a dynamic and continually evolving concept (Macioti, 1993; Sannella, 2024). The circular view of the relationship between institutions and communities that co-construct the role concept has highlighted the necessity of conducting the empirical part of the research through a participatory, transdisciplinary approach (de Freitas, Nicolescu, Morin, 1994; Nicolescu, 2002, or. ed. 1996). The latter identifies the connection between various scientific disciplines and public involvement as an essential element of empirical research and a vital tool for policy-making.

The theoretical framework just examined has led us to formulate the overarching research question: *What is the role of government institutions in addressing the social dimension of climate change?*

Once we have identified the overarching question, our research has been designed following a sequential-exploratory mixed-methods approach (Creswell and Plano Clark, 2011; Mauceri, 2019). It is guided by three interacting dimensions: environmental, institutional, and social. The choice of a mixed-methods approach, which combines qualitative and quantitative research tools, is motivated by the need to achieve an exhaustive understanding of the phenomenon under study to enhance the research itself in terms of breadth, depth, and validity of the results produced and the levels of understanding attained (Flick, 2017). In particular, the mixed-methodology approach allowed us to explore the institutional role from both legislative and social perspectives, verifying whether the social representation of the government's role aligns with its prescriptive traits derived from climate and environmental legislation.

We conducted background research in the United Kingdom and Italy in the first phase using a qualitative methodology. Focusing on these two countries was driven by a rational choice confronting the research objective (Weber, 1968, or. ed. 1922). Although some authors consider the English Industrial Revolution and the shift to steam power as the historical origin of the fossil economy, a primary contributor to climate change (Malm, 2016), the UK demonstrated a robust institutional commitment to environmental issues. It was the first country to enact climate legislation, the Climate Change Act of 2008, whose details will be explored further in this chapter. On the contrary, Italy's political engagement with climate and environmental issues is limited. Climate legislation recently emerged at the European level in 2021 and remains fragmented and under-implemented. Thus, we analysed the two countries' differential approach to verify how different levels of institutional commitment could orient public perception of climate change. Additionally, we sought to determine whether the legislative instrument could stimulate proactive governmental and social climate actions.

Between May and December 2023, 18 semi-structured interviews were conducted with qualified witnesses, including 12 in the UK and 6 in Italy, identified among members of the government institution, businesses, civil society, and academic experts in both climate and health, following the Quadruple Helix model of innovation (Carayannis and Campbell, 2009). The latter emphasises the intrinsic value of transdisciplinarity in shaping research and innovation trajectories through a dynamic interplay between science, government, business, and civil society. The qualitative research followed the

methodological approach of Constructivist Grounded Theory (CGT) (Charmaz, 2000; Mills, 2006), according to which the subject of investigation, defined through the background theory, is re-read, reworked, and specified considering the explored contexts and the researcher's interaction with the participants in the study. Whereas the CGT preferred a purely inductive logic, we opted for the abductive approach, whereby a double engagement with existing theory and careful methodological steps elicited theoretical innovation (Timmermans & Tavory, 2012).

The qualitative step of the research mainly aimed to explore the UK and Italian institutional and legislative frameworks concerning the research dimensions to understand what role the governmental institutions of the two countries play in tackling the climate change phenomenon. In particular, the interviews wanted to understand whether and how the government orients public perception and social action concerning climate issues. Additionally, we aimed to analyse how institutional and legislative framework addresses the climate change-health nexus. In this regard, we focused on the government's role in shaping social representation of climate-related risk for health and promoting public health, mainly through adaptation strategies. After completing the interviews, we conducted a computer-assisted analysis using *NVivo* software. It enabled us to stress some key concepts of the research dimensions: climate change, governmental institutions, role, social action, health, and adaptation.

Then, we operationalised the sensitising concepts into empirical variables and articulated the research question into three hypotheses:

- 1) *If citizens' actions are relevant to tackling climate change, then the government should orient the actions of citizens;*
- 2) *If the government guides citizens' actions, then citizens will take action to tackle climate change;*
- 3) *The government must promote citizens' health if climate change is a public health risk.*

Thus, we started the quantitative analysis step to investigate the Italian representation of governmental climate action. Qualitative research investigates the existence and intensity of relationships between variables in the empirical study of actions or socially prevalent attitudes (Corbetta, 2014, or. ed. 1999). To this end, we designed a structured web survey targeting the Italian population as the unit of analysis. The sampling was non-probabilistic, using snowball techniques. We administered a structured questionnaire between December 10, 2024, and March 10, 2025, via the web through email distribution and social media publication. The web survey was open-access, and the respondents

were self-selected. After collecting the quantitative data, we analysed them through SPSS.

In the final research step, we interpreted and discussed the qualitative and quantitative analysis results. We integrated the interview and web survey data, highlighting shared patterns and discordance and connected them with the theoretical framework.

The following section provides a preliminary insight into the methodological process related to the quantitative analysis. This will help to further understand the interview results.

## **2.2. QUALITATIVE ANALYSIS METHODOLOGICAL NOTE**

The first step of the qualitative analysis was the selection of the interviewees. We selected some privileged witnesses whose knowledge and expertise allowed the comprehensive representation of the varied universe for the investigation (Corrao, 2005). Following a transdisciplinary perspective, we aimed to identify members of UK and Italian governmental institutions, civil society representatives, businesspersons, academic researchers on climate change from diverse backgrounds, and health experts. The first 12 interviews were conducted in the UK from May to September 2023, during the PhD visiting research period at Imperial College London's Department of Physics within the Grantham Institute for Climate Change and the Environment. Given the prominent role it played in research and development and in supporting the work of the UK Government to address climate change, the research visiting period at the Grantham Institute represented a significant chance to analyse innovative projects around the climate change-health nexus and to get in touch with the privileged witnesses identified during the research period.

Firstly, we interviewed two scholars from the Grantham Institute: Dr Ajay Gambhir and Dr Neil Jennings. The first interviewee was a senior research fellow on climate change mitigation who had previously worked as an economist and policy analyst in the UK Government, Contributing to developing the Climate Change Act in 2008. The second was a PhD in Climate Change from the social science side and the partnership development manager at the Grantham. He worked on the co-benefits of climate action, both public perception and how they can be incorporated into decisions. The third interviewee was Martin Siegert, a glaciologist and polar scientist who previously co-directed the Grantham. The following conversation was with Sir Brian Hoskins, a PhD in mathematics who analysed the atmospheric fronts. He gave

his first public talk on climate change in 1975. Then, in 1990, he served as an adviser to the UK Government's Secretary of State for the Environment during the last year of Margaret Thatcher's government. In 2007, he worked as a reviewer for the IPCC, and in 2013, he founded the Grantham Institute at Imperial College, while Lord Nicholas Stern started a sister Institute at the London School of Economics (LSE). The following discussion was with Prof. Paolo Vineis, a professor of environmental epidemiology at Imperial College. He mainly worked on the exposome, including climate change and chemical factors.

Additionally, he served as an adviser to the Health Council in Italy, where he led a project on co-benefits of mitigation. The sixth interviewee was Lord Adair Turner, the first chair of the Climate Change Committee, an independent body set up by the Climate Change Act in 2008, which advises and assesses the UK government's climate strategy. His career has spanned business, public policy, and academic intellectual activities. In 2006, he became a cross-bench member of the House of Lords. In 2016, after holding various business and governmental roles, he became the chair of the Energy Transition Commission, a coalition of companies, investors, academics, institutions, and NGOs worldwide, committed to achieving net-zero emissions by mid-century. The following conversations were conducted with two experts: one in climate science and the other in health. The first was Dr Carlo Buontempo, a PhD in Physics and director of the Copernicus Climate Change Service, the European Commission's Earth Observation Program. Its mission is to operationalise the generation, distribution, and use of climate data for decision-makers.

The second is Prof. Frank Kelley, a Community Health and Policy Professor at Imperial College London. There, he directed the Environmental Research Group, a collective of scientists and researchers primarily examining the links between poor air and water quality and human health outcomes. The ninth interview was with Dr Piers Forster, the current interim chair of the Climate Change Committee. He is a climate scientist and a lead author for the Intergovernmental Panel on Climate Change Reports. The tenth interviewee, who shares a similar political and research background, preferred to remain anonymous. The last step of the qualitative analysis in the UK focused on the healthcare and public health dimensions. In this area, we interviewed Prof. Bob Klaber, who was responsible for the research at Imperial College Healthcare. Its research and innovation strategy is crucial to the NHS's ambition to become the world's first net-zero healthcare system. Finally, we conducted the latest interview with Prof. Lea Berrang Ford, a professor at the University of Leeds at the Priestley Institute for Climate Futures. Because of her strong background in

epidemiology, adaptation, and global policy related to climate and health and the health impacts of climate change, she was seconded to the UK Health Security Agency to lead the innovative Centre for Climate and Health Security.

The second round of interviews was conducted in Italy from October to December 2023. Although we attempted to secure the same number of UK interviews, only six of the twelve contacted agreed to be interviewed. We employed the same transdisciplinary approach in selecting key witnesses, identifying them among academics, civil society representatives, government and businesses. Initially, we interviewed two health experts and government advisors, Dr Marco Martuzzi and Prof. Walter Ricciardi. The first is the director of the Department of Environment and Health of the National Health Institute, which collaborates with the government to produce scientific reports on health issues. The second is a professor of Hygiene at the Catholic University in Rome and former president of the National Institute of Health.

Additionally, he served as a scientific advisor to the Government, particularly to the Minister of Health, and was vice-president of the Italian Institute of Planetary Health. The next interviewees were representatives from civil society with previous high-ranking government positions. Prof. Enrico Giovannini is a full professor of Economic Statistics and Analysis and policies for sustainable development at the University of Rome Tor Vergata. He fulfilled various roles throughout his career, including Chief Statistician at the OECD, President of Istat, and Minister of Labour and Social Policies. Additionally, he held a significant position as a civil society figure; in 2016, he founded ASVIS, the Italian Alliance for Sustainable Development, of which he is currently the scientific director. It brings together more than 300 civil society organisations to implement the 2030 Agenda in Italy. Dr Rossella Muroli is a sociologist with a strong environmental background. From 2007 to 2017, she served as the scientific director and president of Legambiente, one of the most significant Italian environmental NGOs. The following year, she was appointed Vice-President of the Environment Commission of the Chamber of Deputies. The sixteenth interviewee was Dr Mario Tozzi, a geologist and researcher at the National Research Council in Italy and a journalist and science communicator specialising in environmental and climate change topics. The last respondents were the Italian Republic senator Aurora Floridia, the Senate's Environment and Energy Transition Committee member, and a delegate to the Council of Europe. She was the first signatory of the Italian Framework Law on Climate proposal, applying the European Climate Law of 2019.

All 18 interviews were semi-structured around the research dimensions. In particular, the qualitative tool aimed to explore the following issues: a) the

social representation of climate change; b) possible social risks and opportunities from the socio-ecological transition; c) the role of social actors (government, science, civil society and business) in tackling the climate change phenomenon; d) the institutional and legislative framework around the climate change-health nexus; e) governmental action for health promotion and climate change adaptation.

After completing the phase of collecting and transcribing the interviews, the material was analysed using computer-assisted methods through the *NVivo* software. The software facilitated an intimate familiarity with the data by allowing for meticulous management of the empirical ground. It enabled extensive and in-depth inspection, focusing on potential interpretative implications and continuously comparing the data as collected and archived. This aligns with the methodological approach of Constructivist Grounded Theory (CGT), which values the researchers' open attitude towards various possible lines of interpretation to avoid imposing a single theoretical framework on the data (Charmaz, Belgrave, 2012).

Although the CGT perspective has inspired qualitative research, the analysis process has deviated from its iterative logic. We preferred to follow a linear chronological order (Salvini, 2015), which was deemed more functional for the exploratory purpose of the research. As in Miles, Huberman, and Saldaña (2014), the first analysis phase was data condensation through initial coding operations and focused coding, also known as categorisation. Through these operations, it has been possible to transform the available information (empirical basis) into analytical areas (themes). The coding helped select specific passages of text, which were subsequently inserted into their respective nodes, namely key concepts or sensitising concepts, that we deemed corresponded to the interviewer's interpretation regarding a particular topic.

Subsequently, we initiated the second phase. The initial codes were re-analysed to identify possible common patterns: areas, frameworks, and relatively homogeneous models within them. Once a homogeneous cluster was identified, we assigned it a category representing the meanings expressed by each group of initial codes. The third phase aimed to identify possible relationships between the codes and categories, thereby uncovering potential interpretative pathways in the collected material. Finally, we prepared an investigation report, which we will present in the following paragraphs. It assembles and presents the data, including interview excerpts and discusses the results in light of the theoretical perspectives relevant to this research.

To facilitate the reading of the data, we have assigned a number from 1 to 18 to the interviewees, following the chronological order in which the

interviews were conducted. The excerpts from the interviews are presented with a reference to the interviewee's number, as shown in Table 2.1.

**Table 2.1 - Interview list**

Source: Own elaboration

Interviewee n.1	Ajay Gambhir
Interviewee n.2	Neil Jennings
Interviewee n.3	Martin Siegert
Interviewee n.4	Sir Brian Hoskins
Interviewee n.5	Paolo Vineis
Interviewee n.6	Lord Adair Turner
Interviewee n.7	Carlo Buontempo
Interviewee n.8	Frank Kelley
Interviewee n.9	Piers Forster
Interviewee n.10	Bob Klaber
Interviewee n.11	Anonimous
Interviewee n.12	Lea Berrang Ford
Interviewee n.13	Marco Martuzzi
Interviewee n.14	Walter Ricciardi
Interviewee n.15	Enrico Giovannini
Interviewee n.16	Rossella Muroi
Interviewee n.17	Mario Tozzi
Interviewee n.18	Aurora Florida

### **2.3. THE PUBLIC PERCEPTION OF CLIMATE CHANGE: DRIVERS AND BARRIERS TO SOCIAL ACTION**

The first aspect that emerged from the analysis of the interviews relates to the public perception of climate change. The first chapter analysed how material events, such as climate change, acquire new content as they are refracted through various epistemological and cultural realms. Therefore, we recognised the importance of examining the social representation of climate change to identify whether it may shape collective actions (Berger and Luckmann, 1966). According to many respondents, public awareness is generally growing. This is primarily because more individuals are experiencing emergencies from extreme weather events. Previous research has suggested that concern over climate change and confidence in its impacts are significant

determinants of individual willingness to take climate action (Dienes, 2015; Howe et al., 2019).

### Climate change awareness

<p><i>I think that is starting to change people's focus in and around it, and it's much more of an agenda that gets talked about. Yes, there are still some people who deny it or are anti it. [...]</i></p> <p><i>But certainly, in the last couple of years, things have really started to change around the understanding. What was driving me around that that was undoubtedly a growing understanding and worry about what's happening to our planet. [...]</i></p> <p><i>I think it's individual awareness connected to lots of other individual awareness. One way to create change is not to think that you're the first person to ever come up with this stuff, because I'm not.</i></p> <p>(Interviewee #10)</p>	
<p><i>People only notice it when it is flooded, there are torrential rains, exhausting heat.</i></p>	<p><i>La gente se ne accorge soltanto quando è allagata, c'ha le piogge torrenziali, il caldo estenuante.</i></p> <p>(Interview #13).</p>
<p><i>Awareness is increasing and then above all people now realize, that is, they pay with their skin, directly on their skin the consequences of climate change with</i></p>	<p><i>La consapevolezza sta aumentando e poi soprattutto le persone adesso si rendono conto, cioè pagano con la loro pelle, direttamente sulla loro pelle le conseguenze del cambiamento</i></p>

<p><i>the intensification of extreme events that now affect at all latitudes</i></p>	<p><i>climatico con l'intensificarsi di eventi estremi che colpiscono ormai a tutte le latitudini.</i></p> <p>(Interviewee #14)</p>
<p><i>Unfortunately we're starting to see major changes happening in the world's largest ice sheet in Antarctica. And when that ice sheet starts to change, the whole world will feel the effects of it in terms of sea level rise, but also in terms of ocean changes and therefore climate problem that stem from it. [...]</i></p> <p><i>And what we're seeing is more and more people in all those different areas are starting to take net zero much more seriously. Unfortunately, one of the reasons they are taking it seriously is because they can see the effects of climate change already.</i></p> <p>(Interviewee #3)</p>	
<p><i>It's something that is in front of our eyes and in my opinion this is a mechanism that is changing the conversation a bit.</i></p>	<p><i>È una cosa che sta davanti ai nostri occhi e secondo me questo è un meccanismo che sta un po' cambiando la conversazione.</i></p> <p>(Interviewee #7)</p>
<p><i>And I think as the sort of the emergency nature of climate change becomes clearer and clearer to people, you know, when they're on holiday in Greece and it's 46 degrees or, you know, things that are in the news today and floods and really palpable changes here in our climate</i></p>	

<p><i>that, you know, even if you're not a data-driven person, you can just, you know, feel and smell over a short period of time.</i></p> <p>(Interviewee #10)</p>	
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While recognising the increasing public attention on climate change, some respondents argue that genuine concerns have emerged later than the alarm raised by the scientific community over 50 years ago.

### Scientific warning

<p><i>We had to worry about climate change since 1975, and we're still worrying about it. And we know a little, we know quite a lot more about it, but the concern hasn't changed that much. The concern was there, and that the action, well, some action has been taken, but not that much when you're considering how long we've known about it.</i></p> <p>(Interviewee #4)</p>	
<p><i>But now the scientific evidence is overwhelming and 99.9% of the world's scientists involved in this, in various capacities, absolutely agree. [...]</i></p> <p><i>This has primarily concerned climate scientists, who have been telling us these things for 70 years; the climate scientists who solely focused on climate had informed us, reiterated, and warned us about it for 70 years. No one listened to them. [...]</i></p>	<p><i>Ma ormai le evidenze scientifiche sono overwhelming e il 99,9% degli scienziati mondiali che si occupano a vario titolo di questo sono assolutamente concordi. [...]</i></p> <p><i>Questo ha riguardato innanzitutto gli scienziati climatici, che queste cose ce le dicono da 70 anni, gli scienziati climatici che si occupavano solo di clima queste cose ce le avevano dette, ridette, stradette, avvertite ormai da 70 anni. Non li ha ascoltati nessuno. [...]</i></p>

<p><i>Thus we have reached a point where it is difficult to evade this reality, which has been emphasised in various ways for decades and yet still does not find an appropriate timing for the proposal of solutions.</i></p>	<p><i>Quindi siamo arrivati al punto in cui è difficile eludere questa realtà che però è stata sottolineata a vario titolo da decenni e che però ancora oggi non trova un tempismo adatto nella proposta di soluzioni.</i></p> <p>(Interviewee #14)</p>
<p><i>In short, the signals from the scientific community, starting from the more specific climatological and environmental aspects in the strictest sense, the atmosphere, yes, those have been evident for several decades, there is the Club of Rome, I do not know if they used the expression “climate change”, but clearly sustainability, the paradox, and the impossibility of unlimited growth were very clear.</i></p>	<p><i>Insomma, i segnali dal mondo scientifico, iniziando da quello più ristretto climatologico e ambientale nel senso più stretto, l’atmosfera, sì quelli son parecchi decenni, ecco il Club di Roma, non so se usasse l’espressione “cambiamento climatico”, ma chiaramente la sostenibilità, il paradosso, l’impossibilità di una crescita illimitata era molto chiara.</i></p> <p>(Interviewee #13)</p>

The interviewees identify possible reasons for the temporal misalignment between scientific evidence and individual response. The first relates to *habitus*, which Bourdieu (1990) defines as the ongoing influence of previous experiences on how actors perceive, think, and act. The author suggests that *habitus* enhances the reliability and coherence of practices over time more effectively than official rules or social norms. In line with this, some respondents consider how some features of human habit constrain a proactive climate response while influencing people's trust in experts.

**Barrier for social action: habitus**

<p><i>You know, we're creatures of sort of habit. Human beings are. It's a great phrase that you should mend your roof while the sun is shining. And it's a really good phrase, because it makes complete sense, that you see</i></p>	
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<p><i>a hole mending when the sun is shining before it gets too bad. But it's a good phrase, because most often that's not what we do. We mend it when it becomes an emergency and reapply.</i></p> <p><i>[...]</i></p> <p><i>Humans by nature solve problems once they have appeared and you know no one can deny when a flood happens. So, we have a very good record of solving environmental problems, once it happened.</i></p> <p><i>[...]</i></p> <p><i>Of course, it feels unfair to accuse people of not doing things earlier, when it's just built in our nature, nothing to do so, but I think that there's a mindset that's needed to change for climate.</i></p> <p><i>(Interviewee #3)</i></p>	
<p><i>As a species, I believe we are terrible at trusting experts. We do not believe them, we do not believe. In this sense, I am a bit pessimistic, but I do not think they will reach an agreement based on what the experts say. However, I think we are quite good at reacting when we come face to face with danger.</i></p> <p><i>[...]</i></p> <p><i>Part of this is due to the way our nervous system is wired; there are many articles on what are called System One and System Two, rationality and activity. I don't know, you can call it whatever you like. When you see the lion in front of you,</i></p>	<p><i>Come specie, penso che siamo terribili a fidarci degli esperti. Non ci crediamo, non crediamo. In questo senso sono un po' pessimista ma non credo che arriveranno a un accordo sulla base di quello che dicono gli esperti. Si però io penso che siamo invece abbastanza bravi a reagire quando tocchiamo il pericolo con mano. [...]</i></p> <p><i>Un po' è proprio per come è fatto il nostro sistema nervoso, no, ci stanno molti articoli su quelli che si chiamano Sistema uno e Sistema due, razionalità e attività. Non so, puoi chiamarlo come vuoi. Quando vedi il Leone davanti a te scappi. Non</i></p>

<p><i>you run away. You do not think too much, but if instead you need to do a calculation that requires time and effort even at an energy level, well, you take the most acceptable shortcut. This is somewhat what happens at a societal level for all of us. So yes, we know, because the experts tell us, that it is getting warmer, that the glaciers are melting, but as it does not directly affect me, I compartmentalise it as something that is happening. However, I have to survive every day, so that is fine. It isn't going to come from the fact that I drive a car or take a plane, is it? I carry on with my life. I think we will continue to deceive ourselves into thinking we can live this way, parking this problem, until we find ourselves facing the lion, until we crash against the wall.</i></p> <p><i>[...]</i></p> <p><i>Therefore, I think this climate emergency will become increasingly predominant until at some point it will be impossible for any person, regardless of colour, regardless of being left or right, whether they are a socialist or a liberal, because it will become an existential issue and completely unacceptable for every human being.</i></p>	<p><i>stai a pensare a pensare troppo, però se invece devi fare un calcolo che anche a livello di energia richiede tempo, sforzo, beh piuttosto prendi la scorciatoia più accettabile. E questo un po' è quello che succede a livello sociale a tutti noi. Allora sì, sappiamo, perché ce lo dicono gli esperti, che sta facendo sempre più caldo, che si squagliano i ghiacciai, però a me che non mi tocca direttamente, lo metto in una cosa che sta succedendo. Però devo sopravvivere ogni giorno e quindi va bene. Non verrà mica dal fatto che guido la macchina, che prendo l'aereo? Io vado avanti nella mia vita. Io penso che continueremo un po' a illuderci di poter vivere in questo modo, parcheggiando questo problema, fino a che non ci troveremo il Leone davanti, fino a che non sbatteremo contro il muro.</i></p> <p><i>[...]</i></p> <p><i>Per cui io penso che questa emergenza climatica diventerà sempre più preponderante fino a che a un certo punto sarà impossibile per una qualsiasi persona, non importa il colore, non importa se di destra o di sinistra, se è un socialista o un liberista perché sarà una questione esistenziale e totalmente inaccettabile per ogni essere umano.</i></p> <p><i>(Interviewees #7)</i></p>
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Respondents stress the second barrier to climate action: cultural. Some cultural representations frame climate change as an ideological rather than a universal concern and a scientific issue, leading to political and class-based polarisation (Pettenger, 2007). In line with this, some empirical studies have indicated that individuals who back right-wing parties are generally less inclined

to endorse climate policies than those who support left-wing parties (Ziegler, 2017; Kousser and Tranter, 2018). The respondents advocate for the crucial role of scientific culture in confronting the complex issue of climate negationism, which often arises from the manipulation of scientific evidence related to the uncertainties of climate change.

### Barrier for social action: ideological polarization

<p><i>More specifically, regarding climate change, there is also a cultural issue, namely that it is still not perceived in its reality; it is seen as a sectoral or even ideological matter, rather than a problem that affects everyone. Thus, climate change is not considered an urgent issue. It is the concern of a few, the greens, environmentalists, and so on. There is therefore an ideological polarization regarding climate change.</i></p> <p><i>[...]</i></p> <p><i>There is somewhat of a priori attitude to deny that this is about climate change, that climate change is actually relevant, and there is a lack of attention. Lack of attention on the part of the population, which also means a lack of attention from politicians and a limited involvement of technicians and scientists, who are not truly engaged.</i></p>	<p><i>Più specificamente per il cambiamento climatico c'è anche un problema culturale, cioè non viene ancora percepito nella sua realtà, viene visto come una questione settoriale o addirittura ideologica e non come un problema che interessa a tutti. Ecco, il cambiamento climatico non è considerato un problema urgente. E' appannaggio di alcuni, i verdi, gli ecologisti e così via. C'è quindi una polarizzazione ideologica sul cambiamento climatico.</i></p> <p><i>[...]</i></p> <p><i>C'è un po' un atteggiamento a priori di voler negare che si tratti del cambiamento climatico, che il cambiamento climatico sia realmente rilevante e c'è una disattenzione. Disattenzione da parte della popolazione che vuol dire quindi anche disattenzione da parte dei politici e scarsa presenza dei tecnici e degli scienziati, che non vengono realmente coinvolti.</i></p> <p><i>(Interview #5)</i></p>
<p><i>Often, we hide behind this notion of uncertainty; obviously, uncertainty exists, and there are many things we still do not know.</i></p>	<p><i>Spesso ci si nasconde dietro questa cosa dell'incertezza, ovviamente esiste l'incertezza, ci sono tante cose che non sappiamo</i></p>

<p><i>However, there is also much certainty, which means that this knowledge (scientific, ndr) can impact and should impact our choices and should not be ideological—that is that.</i></p>	<p><i>ancora, però esiste anche molta certezza per cui questa conoscenza (scientifica, ndr) può avere un impatto e dovrebbe avere un impatto nelle nostre scelte e non dovrebbe essere ideologico, questo è.</i></p> <p>(Interviewee #7)</p>
	<p><i>È stata da molti anni una conoscenza un po' di nicchia purtroppo e l'attenzione generale è arrivata parecchio più tardi.</i></p> <p>(Interviewee #13)</p>
<p><i>I think the trouble is, the thing that's really difficult at the minute is that it's just not for so many people struggling with the day-to-day of their lives, it's just a really hard conversation to land, and the risk is those of us who've got a bit more resource in our lives and our families and things, yes, we've got the sort of confine headspace to intellectualize this. And you and I can go to dinner with our friends on a Saturday night and chat about this sort of stuff. But many people are desperately trying to find, you know, the cheapest possible food to put on the table for their family and kids. So, I think it's a very, very difficult conversation to land. And it's a bit like there's a microcosm of the global piece where China and India are saying, well, hang on, you guys in the West have had your 30, 40 years of burning coal and building your economies. Now it's our turn. And I think at a more individual, family, and local</i></p>	

<p><i>community level, there's a piece that sort of goes on around stuff. So, I think it's going to be a really difficult one to swing.</i></p> <p>(Interviewee #10)</p>	
<p><i>There is fundamentally a cultural unawareness that is cross-cutting. And I must say that from this perspective, citizens have perhaps shown the greatest willingness to change.</i></p> <p>[...]</p> <p><i>Furthermore, we now have forces in government that exploit a populism whereby ecological transition is for those who can afford it.</i></p>	<p><i>C'è di base un'inconsapevolezza culturale che è trasversale. E devo dire che da questo punto di vista i cittadini e le cittadine sono forse la parte della società che hanno dimostrato una maggiore disponibilità al cambiamento.</i></p> <p>[...]</p> <p><i>Peraltro adesso noi abbiamo delle forze al governo che esercitano, che cavalcano un populismo per cui la transizione ecologica è di quelli che se lo possono permettere.</i></p> <p>(Interviewee #16)</p>
<p><i>The institutional process is also hindered by a lack of understanding of the topic. There is a kind of reluctance to say, "OK, I will try to understand what is happening." The matter is so complex that it is easier to rely on slogans provided by my party.</i></p> <p>[...]</p> <p><i>For these issues, which are transversal and do not, in my opinion, have a political colour, we should really work together and accelerate progress, rather than placing a flag on a specific piece of legislation.</i></p> <p>[...]</p>	<p><i>Il processo istituzionale viene anche frenato dalla poca conoscenza del tema. C'è una specie di ritrosia nel dire ok, cerco di capire che sta succedendo. E' talmente complessa la questione che è meglio affidarsi a slogan che mi dà il mio partito.</i></p> <p>[...]</p> <p><i>Per queste tematiche che sono trasversali, che quindi non hanno a mio avviso un colore politico, si dovrebbe veramente lavorare insieme e accelerare e non mettere la bandierina sul disegno di legge specifico.</i></p> <p>[...]</p>

<p><i>It is truly a matter of cultural transition; I often say that it is a question of cultural transition that needs to be accelerated.</i></p>	<p><i>Cioè veramente è una questione anche di transizione culturale, spesso dico che è una questione di transizione culturale che va accelerata.</i></p> <p>(Interviewee #18)</p>
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The last constraint to a proactive social answer emerging from the interviews' analysis originates from the public conversation on climate change. The public debate on the climate crisis is often marked by negative narrative and dramatisation, generating a sense of public resignation. Some studies (Irwin and Wynne, 1996; O'Neill et al., 2017) demonstrate how media coverage of climate change mitigation has influenced public perception by tackling political, economic, scientific, and cultural themes. To address these issues, some respondents argue that institutions should facilitate clear communication with the public through informative and participative mechanisms.

### **The barrier to social action: miscommunication**

<p><i>Communication is not getting the message across in a sufficient way because people are not changing their lifestyles in a sufficient manner to ensure that we achieve stability again.</i></p> <p>(Interviewee #8)</p>	
<p><i>Italy or the Italians are bombarded, in my opinion, by a negative dramatization of climate change, which generates a lot of fear and concern. Presenting the benefits of climate change is one of the tasks that both institutions and the entire apparatus from television to social media, etc., should take on.</i></p>	<p><i>L'Italia o gli italiani vengono bombardati, a mio avviso, da una drammatizzazione negativa sul il cambiamento climatico, quindi viene generata tanta paura, tanta preoccupazione. Presentare anche i benefici del cambiamento climatico è uno dei compiti di cui sia le istituzioni, ma anche tutto l'apparato dalle televisioni ai social, eccetera, si dovrebbe prendere carico.</i></p>

	(Interviewee #18)
<p><i>There is a problem with communication in terms of the science of what's exactly going on, what that science is, and part of the communication problem comes from the government, as they haven't really planned properly anyway.</i></p> <p><i>[...]</i></p> <p><i>The lack of planning has not enabled a clear communication with people. I think it is because people don't see a clear direction of where things are going.</i></p> <p>(Interviewee #4)</p>	
<p><i>You can bring a level of democratic participation and territorial information to the field, but this means exposing oneself, which is something the institution would never wish to do; however, I have the impression that it is a necessary process.</i></p> <p><i>[...]</i></p> <p><i>I am not suggesting co-design, as that would be somewhat hypocritical; specific skills, including technical ones, are needed, but there should be informative and evaluative mechanisms regarding the possible impacts.</i></p>	<p><i>La cosa che tu puoi mettere in campo è un livello di partecipazione, d'informazione democratico, territoriale, ma questo vuol dire mettersi tra virgolette a nudo, che è un po' quello che l'istituzione non vorrebbe mai fare, io invece ho l'impressione che è un processo necessario.</i></p> <p><i>[...]</i></p> <p><i>Non dico di coprogettazione, questo sarebbe tra virgolette ipocrita, ci vogliono delle competenze, anche tecniche, però meccanismi informativi e valutativi rispetto agli impatti possibili.</i></p> <p>(Interviewee #16)</p>

Regarding the communicative issue, many speakers argue that public conversation should evolve from moral imperatives to pragmatic arguments centred on social and economic benefits and future resilience. The following section will analyse the role of opportunity and the transgenerational

perspective in strengthening individual and political commitment to transition pathways.

### 2.3.1. OPPORTUNITY AND FUTURE: TWO KEY DETERMINANTS FOR SOCIO-ECOLOGICAL TRANSITION

In the previous paragraph, we discussed how individual and social awareness of climate change is increasing, as people are already experiencing adverse outcomes from it. According to the sentiment analysis of the interviews, 318 references relate to negative feelings regarding the climate issue. However, 424 citations are associated with positive emotions that are often related to the economic and social opportunities of the transition.

Along with this perspective, a recent study has shown that initiatives to reduce energy demand throughout the EU have mutually reinforced opportunities from European energy security and global efforts to combat climate change (Creutzig, 2022). Moreover, the health co-benefits from mitigation and adaptation actions are an emerging research focus (Luyten et al., 2023). Under this, some respondents argue that scientific communication on co-benefits from ecological transition may strengthen individual and institutional commitment to tackling climate change, especially on the mitigation side. From the UK interviewee's perspective, the benefit-oriented approach in the UK was an essential driver of the Climate Change Act 2008.

#### Opportunity from socio-ecological transition

<p><i>I think, felt that there was an opportunity to have an environmental act. Even the opposition Conservative Party at the time, led by David Cameron, who around that time had just, I think, become the leader of the Conservative Party, they saw an opportunity to be what's called compassionate conservatives and talk about social and environmental issues rather than purely economic growth issues.</i></p> <p><i>[...]</i></p>	
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<p><i>I think there is some discussion around resilient infrastructure planning in the UK, but at the moment, the main climate change conversation is still around the opportunities for decarbonizing energy.</i></p> <p><i>It's certainly now being talked about as an opportunity and not so much adaptation, but the transition to a green economy is seen as a big opportunity.</i></p> <p>(Interviewee #1)</p>	
<p><i>You've seen how fragile our economy is when it's hooked on fossil fuels. There's a better way to do it. And that is through renewables harnessing the power of our oceans and our wind and our sun in a way that's completely sustainable. And so there's this healthy buffer between us and some nations that will be selling us oil and gas that might not necessarily be the most stable. So, it kind of feels so obvious when you think about the transition in that way, because people suddenly understand that's something that they might want to do.</i></p> <p>(Interview #3)</p>	
<p><i>Climate Change Act is a new opportunity, a tremendous opportunity to really plan how we would go.</i></p> <p>(Interviewee #4)</p>	

<p><i>If you read the documents from Davos, from the World Economic Forum, there were already extremely radical documents at least ten years ago regarding the opportunity for a green transition that would also be an economic opportunity, significantly so. Documents that seemed almost utopian to me were however signed by leading economists and also by multinational corporations, in the sense that they stated that seriously and radically addressing climate change and environmental degradation would also be economically beneficial through the creation of jobs, talking about millions of jobs, and also through the promotion of women's employment, which is interesting.</i></p> <p><i>[...]</i></p> <p><i>The 2030 Agenda and the SDGs, for example, are an example of co-benefit in the sense that the various SDGs interact with each other.</i></p>	<p><i>Se lei legge i documenti di Davos, del World Economic Forum, già almeno dieci anni fa c'erano dei documenti estremamente radicali sulla opportunità di una transizione verde che sarebbe stata un'opportunità anche economica, fortemente economica.</i></p> <p><i>Documenti che mi sembravano addirittura utopistici però erano sottoscritti dai maggiori economisti e anche da multinazionali, nel senso che dicevano che affrontare seriamente e radicalmente il cambiamento climatico e il degrado ambientale sarebbe stato vantaggioso anche sul piano economico attraverso la creazione di posti di lavoro, parlavano di milioni di posti di lavoro, e anche attraverso il fatto di favorire il lavoro femminile, questo è interessante.</i></p> <p><i>[...]</i></p> <p><i>L'Agenda 2030 e gli SDGs per esempio sono un esempio di co-beneficio nel senso che interagiscono fra di loro i vari SDGs.</i></p> <p><i>(Interviewee #5)</i></p>
<p><i>The scientific evidence supports us; in this case, it is not scientific, medical, or health evidence, but economic. All economic analyses demonstrate that investments in this sector, besides benefiting the climate and health, also benefit the economy, provided they are made correctly and in a timely manner.</i></p>	<p><i>L'evidenza scientifica ci viene a supporto, in questo caso non è un'evidenza scientifica, medica o sanitaria, ma economica. Tutte le analisi economiche dimostrano che gli investimenti in questo settore, oltre che beneficiare il clima e la salute, beneficiano anche l'economia, se vengono fatti bene e con tempismo.</i></p> <p><i>(Interviewee #14)</i></p>

<p><i>In reality, the calculations made by many scholars, for example, an Italian scholar named Vergine, who has recently published a book, clearly show that even in terms of job placements, there would be perhaps three times as many compared to those employed in the world of hydrocarbons and fossil fuels; to be honest, those who could be involved in the ecological transition.</i></p>	<p><i>In realtà i calcoli che fanno tanti studiosi, per esempio uno studioso italiano che si chiama Vergine, che ha pubblicato da poco un libro, lì si vede molto chiaramente che anche in termini semplicemente di posti di occupazione sarebbero forse tre volte tanto, rispetto a quelli impiegati nel mondo degli idrocarburi, dei combustibili fossili, per la verità, quelli che ci potrebbero essere nella transizione ecologica.</i></p> <p>(Interviewee #17)</p>
<p><i>There is a demand for new job opportunities for the energy transition, also presenting opportunities for companies that will become increasingly competitive; indeed, some already are. They are also strongly urging institutions for a rapid change.</i></p>	<p><i>La richiesta c'è di nuove opportunità di lavoro per la transizione energetica opportunità anche per le aziende che diventeranno anche più competitive, in parte già lo sono, chiedono anche con forza alle istituzioni un rapido cambiamento.</i></p> <p>(Interviewee #18)</p>

In the UK, the co-benefits of climate action, especially for health, have steadily become a significant area of focus (Jennings et al., 2020). However, the co-benefits aspect is partially absent from the UK public debate (Sudmant et al., 2024). According to this data, the UK interviewees argue that a benefit-oriented public conversation could proactively shape social actions, overcoming ideological obstacles to endorsing them (Bain et al., 2016).

#### **(Health) Co-benefits communication**

<p><i>The co-benefits, as you say, of net zero, and your health and planetary health to academics are so obvious, but that hasn't yet been</i></p>	
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<p><i>really translated into public understanding.</i></p> <p>(Interviewee #3)</p>	
<p><i>Reducing the impacts of climate change will have a beneficial impact on health. If one does not have effective climate change policies, then there will be a negative impact on health, which will severely increase the burden on our national health system. So the two are very, very clearly linked, and by investing in one, in our climate change initiatives, we should indirectly invest in the other, which is the health of the public, and thereby reduce the costs associated with negative outcomes. So, there is a real benefit of spending in one sector, to benefit the other in this particular situation.</i></p> <p>[...]</p> <p><i>All health, one health will benefit from reducing CO2 emissions and reducing temperature increases. Biodiversity will be better, and not constrict. And that is good in many, many different ways for the planet. So all life, all organisms will benefit.</i></p> <p>[...]</p> <p><i>There could be real benefits there from maintaining a natural ecosystem.</i></p> <p>(Interviewee #8)</p>	
<p><i>As we talked about, this is the world we want to move to, the optimistic thing not being dragged to. But the optimistic view. This is the world we want to get to.</i></p>	

(Interviewee #4)	
<p><i>I think when you try and get people to change their behaviors and what they do, the obvious way is to talk about the co-benefits because you can get them immediately. You're not going to see the earth's temperatures drop at any time, but you can see the co-benefits for your health, air quality, and things in almost an instant. This is especially true among poor communities in the cities. If we can improve their housing and get rid of the cars and things, they're gonna get improved food they eat, that would be huge. And I think that's the way you can sell a lot of climate action as a social good that you wanted to anyway, even if it wasn't for climate change.</i></p> <p>(Interviewee #9)</p>	
<p><i>There are a whole series of adaptation options available to local administrators, which have clear co-benefits.</i></p>	<p><i>Esistono tutta una serie di opzioni di adattamento che sono disponibili agli amministratori locali e che hanno dei co-benefici evidenti.</i></p> <p>(Interviewee #5)</p>
<p><i>In reality, the beauty of co-benefits is that they go hand in hand with adaptation and mitigation. Another area of great interest is the green and blue spaces in cities, where there is also growing evidence of various types of health benefits that go quite in parallel with those of the urban environment.</i></p>	<p><i>In realtà il bello dei co-benefici è che vanno a braccetto con l'adattamento e la mitigazione. Un'altra area molto di grande interesse sono gli spazi verdi e blu nelle città, con anche lì evidenze in crescita su diversi tipi di benefici sulla salute che vanno ad abbastanza di pari passi con quelli dell'ambiente urbano.</i></p>

	(Interviewee #13)
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Another essential point of the discussion concerns the future dimension of climate change. The principle of intergenerational (Weiss, 2021) or transgenerational (Andina, 2019) equity, as applied in sustainable development, establishes a legal obligation for institutions to uphold fairness between generations in utilising and preserving the environment and its natural resources. However, we wondered whether the individuals involved are willing to change and possibly incur the costs of transitioning to more sustainable production methods for the sake of future generations, from whom they cannot expect to receive anything in return (Arrhenius, 2000; Pirni & Buizza, 2022).

According to some interviewees, assuming a transgenerational perspective is crucial in addressing climate change. Firstly, concerns for future generations' well-being may pressure individual and collective responsibility toward urgent actions. Then, focusing on future benefits can foster a shift in conversations about climate change and the enactment of strategic long-term policies.

### Future generations

<i>The concern for future generations rises very high.</i>
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(Interviewee #4)
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<i>We might even see the effects of it (climate change, ndr) in terms of trying to acquire resources and the geopolitical tension, the price of food, the availability of water; all these things are predictable and they're going to be more stressed in the future. The problem is, the longer we leave serious solutions, the more difficult they become and the more challenging it is.</i>
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*[...]*

*The climate problem is for us to solve, but if we don't do that, it's many generations ahead of us that we'll have to deal with these problems. So, it's really for us to take responsibility and it's a huge problem.*

*[...]*

*You'll probably be better off financially, be better off in terms of your health, certainly better off in terms of your children. And these are the sort of things that we need to start considering. It really is a multi-generational issue. You know, people care desperately about their children and their well-being,*

*and if you. So, that's undeniable and that's completely understandable. That happens. But if you start to explain climate change in terms of the life chances of your children, then you start. Doesn't really matter if you believe in climate change or not. It doesn't really matter because if you have a different type of conversation I think we need to think about the intergenerational issue a lot more because I think that will promote and provoke a lot more attention.*

*[...]*

*It's the right thing to do, some people will be convinced with that but many people won't. But if you were to say "Actually, this is better for your children, right, this is good business sense, this is something that is inevitably going to happen, we might as well do it sooner rather than later", as you start to have different types of conversations, probably we need to shift this from a moral position, like "Is the right thing to do?", because it takes you so far.*

(Interviewee #3)

Although the transgenerational perspective offers valuable insight into catching the transition's opportunity to benefit future generations, we cannot overlook the institutional obligation concerning intra-generational equity. In the first chapter, we have extensively discussed the uneven impact of climate change within and among countries, especially on health, and the role of a strong, stratified social structure in exacerbating this issue. Thus, prioritising equity should be relevant for institutional actions on climate change. In line with this, the qualitative analysis focused on how institutions shape the possible social impacts of transition processes.

## **2.4. THE INSTITUTIONAL MANDATE FOR A JUST TRANSITION**

Transition refers to a social process that moves from a specific condition to an uncertain one, altering the previous state yet remaining to be observed and interpreted. (Nocenzi, 2024). It entails a structural transformation from one relatively stable social system state to another, resulting from the co-evolution of economic, cultural, ecological, and institutional developments across various scales (Rotmans et al., 2001).

The term "just transition" was initially elaborated upon in the 1990s by the ILO (International Labour Organization) to reconcile the union movement's aims of securing decent jobs for workers with the necessity of environmental protection (ILO, 2010). Just transition is a crucial supportive mechanism for

climate action. It comprises principles, processes, and practices designed to ensure that no individuals, workers, areas, sectors, nations, or regions are left behind when shifting from a high-carbon to a low-carbon economy (Denton, F. et al., 2022).

According to the interviewee's representation, ensuring a just transition is a crucial institutional responsibility. They emphasise that institutions should offer subsidies to foster equal transitions, especially to low-income groups. For most respondents, every climate strategy involved some trade-offs, and equity should be the primary principle guiding climate actions, ensuring that the benefits of climate interventions are distributed fairly. The respondents argue that government institutions must tackle existing inequalities, particularly in health, to minimise adverse effects on populations in states of vulnerability and communities and avoid the risk of maladaptation (Schipper, 2020). However, some respondents argue that the just transition concept is not widely recognised in the UK political framework. This contrasts with actions taken in Scotland, where sectoral just transition plans are being developed.

### Just Transition

*Government should making sure that there are Social Security programs for people who lose their jobs because of damages from climate change, potentially.*

(Interviewee #1)

*The first thing to say is it's important to realize that some of what we do to mitigate climate change has almost no social impact whatsoever. By which, I mean when we decarbonize iron and steel production, we change technologies at a relatively small number of iron and steel making places in the world. But at least as a first order effect, you still make iron and steel at those places with the same employment as before. So you haven't changed the employment balance, you haven't changed how much steel is being produced, you've changed the technology with which you produce steel. So, changing from coal-fired power stations to offshore wind doesn't change one iota. The electricity that comes out of here doesn't change how you use electricity. And there are lots and lots of jobs in society which will be completely unaffected by a zero-carbon economy and a carbon-intensive economy*

*[...]*

*But you ought to be able to create zero-interest loans that are able to do it, and you're going to have to subsidize the bottom third. But it requires a lot of thinking, which is not just technical or economic expertise, it's designing a politically acceptable package. So that's some of the things where thinking about the employment. So as part of social. I would include employment and income distribution issues. That's what I've got to think about there.*

(Interviewee #6)

*We need to have some institutional responsibilities and changes to just how social contract operates.*

(Interviewee #9)

*So, you know, this particular intervention can create a lot of co-benefits or create trade-offs, depending on how it's implemented. And often equity has a major factor. So, depending on how you implement it, a particular intervention might primarily benefit those already healthy and well-off. But it exacerbates inequalities or exacerbates those that are not healthy. So, interventions cannot only improve net health but also reduce health inequalities. So inequality tends to be pretty important in the way, how, and details of how things happen.*

[...]

*There are a lot of interventions where it matters who's benefiting from them and who's being sort of subsidized or supported. And those things tend to have significant implications for how much benefit we get for human health.*

[...]

*I'm most familiar with the UK, but I'm sure Italy will have the same profile where we saw social and geographical inequalities in the population mapping onto Covid impacts. And so, it's a nice example of what climate is likely to do. So, I think Covid kind of highlighted the importance of existing inequalities on how we will experience impacts, as well as the importance of existing inequalities and the ability to update interventions. So, people's access to healthcare, access to whatever it be, vaccines, etcetera. So I think there are a lot of nice analogies with COVID, and both the UK and Italy will have, have gotten, in a sense, a really, a really acute preview of how much inequalities matter for these sort of major health impacts that are quite relevant to climate change.*

(Interviewee # 12)

*So, in Scotland, the social and economic consequences of being brought really into the foreground. In the UK it's not been the case. For example, the phrase just transitioned is not turned to get used in UK politics at all. We will talk about leveling up and fairness and other kinds of issues. But not just transition.*

*[...]*

*So, Scotland at the moment is working on sectoral just transition plans for four different sectors, plus one community-based sectoral plan around the biggest petrochemicals complex, for example. So planning is an important part of it.*

(Interviewee #11)

As argued, the low-carbon transition is a complex phenomenon involving substantial benefits and risks. Although it is an institutional mandate, addressing trade-offs challenges governments to achieve a just transition, mainly because it is a broad concept that permits different actors to interpret it in various ways (Winkler, 2020). To address these issues, the author emphasises the importance of multi-level governance through engagement with social movements and community stakeholders. In the next section, we will discuss the crucial role of civil society in transition processes.

## **2.5. CIVIL SOCIETY BETWEEN ADVOCACY AND CLIMATE ACTIVISM**

Some scholars argue that a global climate movement has emerged as a loose network advocating for action, making climate change a significant political issue worldwide and playing a crucial role in social change (Caniglia et al., 2015). From the qualitative analysis, the significance of civil society in the transition process has been raised. The UK interviewee discusses the context leading up to the enactment of climate legislation in 2008, stressing the role of civil society and NGOs in advocating for emissions reduction. They emphasise that addressing climate change necessitates public engagement through a bottom-up approach. While the government can establish supportive frameworks, much of the action will originate from the private sector and civil society, which can advocate for sustainability and transition to a low-carbon economy.

### **Civil society's role in the UK**

*So, the main drivers in 2008 and leading up to 2008 was a two or three-year period of politics and action by NGOs and civil society that provided the economic and societal context to allow for the Act to be passed.*

*[...]*

*And so there were many civil society groups, like Friends of the Earth, NGO's, that were calling for some kind of legislation and for the UK to be a world leader in legislating for some kind of emissions reduction.*

(Interviewee #1)

*There are many roles to play, some of it is a greater understanding of the problem by the public and some of it is businesses, understanding that their future needs to be net zero.*

*[...]*

*Of course, none of this is possible without people and we can look at the people from a number of perspectives. Firstly, people are shareholders in companies. They probably have it. Either they don't know about it because it's in their pension funds, or they do know about it because they're actively investing in companies, but they have a right to express their views on how these companies are behaving. Companies have employees, people who work for them, and they are increasingly interested in working for a company that's compliant with net zero. And, companies have customers, and they're also interested in buying things which are net zero. So, businesses don't exist in isolation. They exist with a multitude of different social interfaces. And what we're seeing is more and more people in all those different areas are starting to take net zero much more seriously.*

(Interviewee #3)

*But the government can't do everything. Most of the work will be done by people in the private sector or outside the government.*

(Interviewee #9)

*And so, yes, activists or people who actually had resources and could worry about other things could give the headspace for this.*

(Interviewee #10)

*And the second part of it was engagement so that the transition is not just something that's done top-down. You actually try to talk to people, understand what their concerns are and build it into the picture.*

(Interviewee #13)

The Italian context is quite similar. A vibrant, albeit fragmented, civil society supports environmental initiatives despite a lack of political backing and bureaucratic inefficiency. Nonetheless, it has shown resilience and proactivity, particularly in renewable energy production and waste management. Grassroots activism is essential for an effective social and ecological transition. Fostering a cross-community network could tackle the issues of citizen participation and trust. According to Daher et al. (2024), social movements may significantly contribute to social change by promoting a culture of sustainability.

### Civil society's role in Italy

<p><i>For now there are many initiatives in Italy, but quite local.</i></p>	<p><i>Per adesso ci sono molte iniziative in Italia, però abbastanza locali.</i></p> <p>(Interviewee #13)</p>
<p><i>Italy is a country where the government has a relative importance, clearly it is important, but there is a very resilient and very active economic, social fabric that very often goes ahead on its own and for example on the environment it has moved forward, because we have become in a short time, we were as usual late parties, but for example on the production of solar energy, we have made considerable progress in renewable energy, we have made considerable progress on waste disposal, so Italy is a strange country, a particular country for better or for worse, for worse because very often</i></p>	<p><i>L'Italia è un paese in cui il governo ha una relativa importanza, chiaramente è importante, però c'è un tessuto economico, sociale molto resiliente e molto attivo che molto spesso va avanti per conto suo e per esempio sull'ambiente è andato avanti, perché noi siamo diventati in poco tempo, eravamo come al solito partiti in ritardo, ma per esempio sulla produzione di energia solare, di energia rinnovabile abbiamo fatto notevoli passi avanti, sullo smaltimento dei rifiuti abbiamo fatto notevoli passi avanti, quindi l'Italia è un paese strano, un paese particolare nel bene e nel male, nel</i></p>

<p><i>its administrative machine is a slow, bureaucratic, ineffective, inefficient machine, not to say corrupt in some points, while instead there is a part of society, unfortunately a minority but very important, which is active and resilient and keeps the country afloat, so even on environmental aspects Italy is not the last in the wagon, because it has a civil society that has somehow kept it afloat, think of industry, associations, the third sector, citizens, part of municipal administrations, in some cases even regional.</i></p>	<p><i>male perché molto spesso la sua macchina amministrativa è una macchina lenta, burocratica, inefficace, inefficiente per non dire in certi punti corrotta, mentre invece c'è una parte della società, purtroppo minoritaria però molto importante, che è attiva e resiliente e tiene il paese a galla, quindi anche sugli aspetti ambientali l'Italia non è l'ultima del carro, perché ha una società civile che in qualche modo l'ha tenuta a galla, pensiamo all'industria, alle associazioni, al terzo settore, ai cittadini, a parte delle amministrazioni comunali, in qualche caso anche regionali.</i></p> <p>(Interviewee #14)</p>
<p><i>I must say that the positive side is that, despite the fact that very little emerges, despite being an absolutely unnarrated country, there is a social activism of organized civil society, of associations. which instead is very vivid, especially in the neighborhoods, makes a beautiful social plot that moves on the territories, but is fragmented and disappointed by politics, so it often lives in its own project, perhaps financed directly by the European Union or by the foundation on duty, but it no longer has almost the ambition to network, instead the construction of this capillary transversal network could be one of the antidotes that are put in place, One of the vaccines that are being implemented to combat the virus of lack of participation and trust.</i></p>	<p><i>Devo dire che il lato positivo è che, nonostante emerga pochissimo, nonostante sia un paese assolutamente non narrato, c'è un attivismo sociale di società civile organizzata, di associazionismo. che invece è molto vivido, soprattutto nei quartieri, fa una bella trama sociale che si muove sui territori, ma è frammentata e delusa dalla politica, quindi spesso vive nel proprio progetto, magari finanziato direttamente dall'Unione Europea o dalla fondazione di turno, però non ha più quasi l'ambizione di fare rete, invece la costruzione di questa rete trasversale capillare potrebbe essere a proposito uno degli antidoti che si mettono in atto, uno dei vaccini che si mettono in atto per combattere il virus della mancanza di partecipazione e di fiducia.</i></p>

	(Interviewee #16)
<i>Italy is a country famous for its creativity, there are good practices throughout Italy that only need to be discovered, they must also be presented for what can already be done to combat the climate.</i>	<i>L'Italia è un paese famoso per la sua creatività, ci sono delle buone buone pratiche in tutta Italia che vanno solo scoperte, vanno anche presentate per quello che si riesce già a fare per contrastare il clima.</i>  (Interviewee #18)

From the interviewees' representation, we can argue that the logic of collective actions (Olson, 1965) may influence the transition process, as in the UK, where civil society advocated for policy reform, holding the government accountable for their climate guarantee. Moreover, it can empower collective awareness through education and sensitisation campaigns, promoting interaction among the business sector, governments, academia, and communities and leading to a more inclusive and transdisciplinary approach to climate change mitigation (Binder, 2014).

However, some scholars from the institutional perspective on social capital (Woolcock and Narayan, 2000; Ostrom, 1996) argue that the ability of social groups to act in their collective interest relies on the quality of the formal institutions in which they exist. We can share this statement, particularly regarding the complexity of the climate change scenario, which requires many roles to address it. The following sections will analyse the interviewees' representation of the role of governmental institutions. It aims to determine whether the prescriptive aspect arises from the norm and the attributive part stems from the social expectation bridge.

## **2.6. THE ROLE OF GOVERNMENTAL INSTITUTIONS: SOME PRELIMINARY INSIGHTS**

The representation of the role of governmental institutions in addressing climate change varies between the UK and Italian frameworks. However, we can find some common patterns. The first relies on the need for polycentric

governance (Ostrom, 2010) to address complex problems, such as climate change.

In alignment with this perspective, the interviewees assert that the government plays a vital role in facilitating the transition process by establishing a legislative and financial framework that promotes investment in net-zero enterprises, reduces emissions, and mitigates the impact of climate change, particularly on public health. Implementing effective environmental taxation could incentivise sustainable behaviours, ensuring that those who pollute are held accountable for their actions while rewarding eco-friendly practices. Furthermore, the interviewees emphasize the importance of strategic leadership roles in governmental institutions for building public consensus.

Nevertheless, it is essential to recognise that the government cannot tackle the climate crisis in isolation; active engagement from businesses and individuals is crucial, as previously emphasised.

### **Government's role in tackling climate change**

<p><i>There's a huge role for public policy in addressing it (climate change, ndr) in terms of reducing emissions.</i></p> <p>(Interviewee #1)</p>	
<p><i>I think some people had this idea that governments globally can solve climate change for everybody, and that's really not the case. Still, the role is significant because with the right policy in place, it can encourage investments into net zero businesses. It can encourage a transition on innovation into net zero and it can essentially set the scene to promote acceleration to net zero, but it can't achieve itself. It does need businesses to do that, and it does need people to do that and there's only so much that governments can do on this issue, and we can argue</i></p>	

<p><i>whether they're doing that or the maximum they can do, but they don't have a silver bullet. This is not something that the government can flick a lever and climate change becomes a solved issue. It really isn't like that.</i></p> <p><i>[...]</i></p> <p><i>And, of course, if we don't solve climate change, if the politicians don't get this right, then we'll see it in our weather and in our climate, which will be a tragedy. So, they have an important role to play but the way I like to think about it is government needs to take this seriously. In the UK, we have a legally binding commitment for net zero. That's fantastic across party. So, that's fantastic as well. But I don't yet think that commitment has been properly translated into the public.</i></p> <p>(Interviewee #3)</p>	
<p><i>But what the government can do is really set up the right institutional support and framework up.</i></p> <p>(Interviewee #9)</p>	
<p><i>Well, to me there's a really important role for the government around leadership and around visible action around climate change. So really recognizing and publicly stating how important it is at a high level.</i></p> <p>(Interviewee#10)</p>	

<p><i>The role of institutions is strategic, it is fundamental, this is always true of course, but in the case of the ecological transition it is even more true because it is not a process that can be exclusively from top to bottom, it must naturally be a process of sharing.</i></p> <p><i>Alex Langer spoke of consensus, of the desirability of change; The construction of this desirability and therefore of a social consensus for transformation becomes decisive.</i></p>	<p><i>Il ruolo delle istituzioni è strategico, è fondamentale, questo vale sempre naturalmente, ma nel caso della transizione ecologica vale ancora di più perché non è un processo che può essere esclusivamente dall'alto verso il basso, deve essere naturalmente un processo di condivisione.</i></p> <p><i>Alex Langer parlava di consenso, di desiderabilità del cambiamento; la costruzione di questa desiderabilità e quindi di un consenso sociale alla trasformazione diventa dirimente.</i></p> <p>(Interviewee #16)</p>
<p><i>What we need governments to do is to assist the transition to really make it happen by setting the financial scene, to encourage it, and that can be things like tax concessions in the right place, it can be to understand where investments are needed, government investments are needed to leverage other private investments in the right way and so working with business is definitely thing to do.</i></p> <p>(Interviewee #3)</p>	
<p><i>So, the thing depends on a creative tension between the independent, comprehensive, analytical body (the Climate Change Committee, ndr) and the machinery of government, which is then subject to all the lobbying concerns, with a very particular feature, which I think is a really problematic feature in the</i></p>	

<p><i>UK, but also potentially elsewhere, which is the role of taxation, because clearly taxation levers can be powerful levers to drive progress towards a zero carbon economy. Carbon prices. But in the UK, the Treasury very tightly controls everything to do with taxation and hates any ministry talking about taxation, right? So, if the transport ministry had said, we think that in order to drive new technologies in aviation and to encourage people to go by train to Glasgow or Edinburgh, not airline, if they had said that, the chancellor exchequer would say, that's not your business and go to the prime minister and say, you tell these guys they're to shut up about that. We're in charge of it. It's very strong within the UK. We still get environmental taxes, but they tend to be driven entirely by the Treasury.</i></p> <p>(Interviewee #6)</p>	
<p><i>Environmental taxation is very important on this, in the sense that a part of the budget law of Italian taxation must absolutely be dedicated to financing the transition because I imagine as a citizen that the government that should guide my behavior tells me you do this, you have to finance it yourself and you have to pay for it yourself, so the institution does not put me in a position to do what it would like me to do Which in my opinion is another of the important things that the institution should do: encourage a new way of life. Encouraging</i></p>	<p><i>La fiscalità ambientale è molto importante su questo, nel senso che va dedicata assolutamente una parte della legge di bilancio della fiscalità italiana a finanziare la transizione perché io mi immagino da cittadina che il governo che dovrebbe orientare i miei comportamenti mi dice tu fai questo te lo devi finanziare da solo e te lo devi pagare da solo quindi l'istituzione non mi mette nelle condizioni di fare quello che vorrebbe che io facessi che invece secondo me è un'altra delle cose importanti che dovrebbe fare</i></p>

<p><i>behaviors that help our territory to combat climate change with environmental taxation would be possible, in the sense of saying those who pollute pay, those who do not pollute are rewarded.</i></p>	<p><i>l'istituzione incentivare un nuovo modo di vita. Incentivare dei comportamenti che aiutano il nostro territorio a contrastare il cambiamento climatico con la fiscalità ambientale sarebbe possibile, nel senso di dire chi inquina paga, chi non inquina viene premiato.</i></p> <p>(Interviewee #18)</p>
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The earlier statements indicate that business and finance engagement are crucial in enabling the transition. However, their willingness to take climate action is contentious from the perspectives of the UK and the Italian interviewees. While some respondents argue that businesses increasingly recognise the necessity of transitioning to net-zero emissions, others assert that entrenched interests in pollution-heavy industries present institutional challenges, primarily due to their significant political influence. Furthermore, some interviewees believe that fossil fuel companies have manipulated scientific evidence and political systems to deny the realities of climate change despite evidence indicating their awareness of its impacts.

### **Business' role: a controversial issue**

<p><i>The finance industry might want to understand that not only is it the right thing to do to stop investing in fossil fuel exploration, for example, but to start investing in renewable energy, but it makes brilliant business sense to do that as well. And what we're seeing is gradually businesses starting to understand this issue and want to migrate to net zero and that's a wonderful thing to observe.</i></p> <p><i>[...]</i></p> <p><i>But now we're starting to see a sort of a real movement in the business world reflecting on popular</i></p>	
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<p><i>opinion. And of course, we're starting to see governments take that seriously as well. Governments aren't doing enough. Businesses aren't doing enough and people aren't demanding enough. But we're starting to see those things happen.</i></p> <p>(Interviewee #3)</p>	
<p><i>There is more and more evidence that in the past there were few industries, today they are practically blocks of industries that belong to fuels, food, tobacco, weapons that are so powerful, they now have such impressive budgets and budgets, even higher than those of the countries in which they operate, that they become really difficult to cope with.</i></p>	<p><i>Ci sono sempre più forti evidenze che nel passato erano poche le industrie, oggi sono praticamente blocchi di industrie che appartengono ai combustibili, al cibo, al tabacco, alle armi che sono talmente potenti, hanno ormai dei budget e dei bilanci talmente imponenti, addirittura superiori rispetto a quelli dei paesi in cui operano, che diventano veramente difficili da fronteggiare.</i></p> <p>(Interviewee #5)</p>
<p><i>The problem is that (climate policy-making, ed.) clashes with exceptional vested interests, which very often have such connections at the government level as to resist change or even to make absolutely conflicting decisions taken, as happened recently in the United Kingdom. Therefore, unfortunately, the global political system is a system characterized by a strong embrication between political power and economic power and this makes it very difficult to propose operational solutions that are dictated by scientific evidence.</i></p> <p>[...]</p>	<p><i>Il problema è che (il policy-making climatico, ndr) si scontra con dei divested interest eccezionali, che molto spesso hanno delle entrate a livello governativo tali da resistere al cambiamento o addirittura da far prendere, come è successo recentemente nel Regno Unito, delle decisioni assolutamente contrastanti. Quindi purtroppo il sistema politico globale è un sistema caratterizzato da una forte embricatura tra potere politico e potere economico e questo rende molto difficile proporre delle soluzioni operative che vengano dettate dall'evidenza scientifica.</i></p>

<p><i>So it is really very difficult because in addition to the traditional difficulties that have always existed, today there are consolidated interests which, as the tobacco industry did in the past, have very sophisticated tools, have practically unlimited resources to face the advance of science and the proposal of science.</i></p> <p><i>[...]</i></p> <p><i>What is the obstacle? The obstacle is politics, in the sense that politicians today are largely conditioned by vested interests, so all over the world, especially in the most polluting countries, instead of having gone ahead with the pandemic, we have gone back and there are signs that in the big polluting countries the road is not even taken yet.</i></p>	<p><i>[...]</i></p> <p><i>Quindi è veramente molto difficile perché alle tradizionali difficoltà che sempre ci sono state, oggi si aggiungono proprio interessi consolidati che, come ha fatto nel passato l'industria del tabacco, hanno degli strumenti molto sofisticati, hanno delle risorse praticamente illimitate per fronteggiare l'avanzata della scienza e la proposta della scienza.</i></p> <p><i>[...]</i></p> <p><i>Qual è l'ostacolo? L'ostacolo è la politica, nel senso che i politici oggi sono in larga parte condizionati dagli interessi costituiti, quindi in tutto il mondo, soprattutto nei paesi più inquinanti, anziché essere andati avanti con la pandemia, siamo tornati indietro e ci sono dei segnali che nei grandi paesi inquinatori la strada non è ancora neanche imboccata.</i></p> <p><i>(Interviewee #14)</i></p>
<p><i>The economic system that they cannot, they cannot subvert, that is to say that doing something against climate change means imposing regulations, especially from an economic point of view on the free market and they do not want this, there is little to do. The reason for denialism is that, it's not that they have another truth to bring.</i></p> <p><i>[...]</i></p> <p><i>The petrocoal gases, they are in bad faith. We know this because they had commissioned studies several times from scientists,</i></p>	<p><i>Il sistema economico che non possono, non riescono a sovvertire, cioè vale a dire che fare qualcosa contro il cambiamento climatico significa imporre delle regolamentazioni, soprattutto dal punto di vista economico al libero mercato e questo non lo vogliono, c'è poco da fare. Il motivo del negazionismo è quello, non è che hanno un'altra verità da portare.</i></p> <p><i>[...]</i></p> <p><i>I gas petrocarbonieri, loro sono in mala fede. Lo sappiamo perché avevano commissionato più</i></p>

<p><i>independent scientists, paid by them. They could meet their needs and say "oh well, there's no problem" because what they asked them is: "what will happen if we continue to burn fossil fuels with these curves?" and they made reports that they kept secret but are now widespread. For example, there's one from '82 I think from Exxon Mobile where you can see how scientists predicted that carbon dioxide would reach 420 parts per million in 2020, which actually happened, so they knew for sure. They are in bad faith, they are the real culprits.</i></p>	<p><i>volte degli studi a degli scienziati, scienziati indipendenti, pagati da loro. Quelli potevano andare incontro alle loro esigenze e dire "vabbè non c'è nessun problema" perché quello che gli hanno chiesto è: "che succederà se continuiamo a bruciare combustibili fossili con queste curve?" e loro gli hanno fatto dei report che hanno tenuto segreti ma adesso sono diffusi. Per esempio c'è uno dell'82 mi pare di Exxon Mobile in cui si vede come gli scienziati prevedevano che l'anidride carbonica sarebbe arrivata a 420 parti per milione proprio nel 2020, cosa che è realmente accaduta, dunque loro lo sapevano per certo. Loro sono in mala fede, i veri colpevoli sono loro.</i></p> <p>(Interviewee #17)</p>
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The analysis highlighted that, despite differing perspectives, transdisciplinary and participatory collaboration among the government, public, and private sectors is essential for effectively addressing climate change (Cundill et al., 2019). However, investigations into the government's role revealed a significant lack of trust in its climate actions, which have not met citizens' expectations concerning mitigation and adaptation targets. This pattern of distrust is evident in both the UK and Italian institutional frameworks, as will be discussed in the following paragraph.

### **2.6.1. UK AND ITALIAN CITIZENS AMIDST DISTRUST IN GOVERNMENT AND THE BETRAYAL OF EXPECTATIONS**

The concept of trust is central to the sociological perspective of institutions. The neoinstitutionalist school argues that institutions form a

foundation for trust among actors, as they convey a significant level of taken-for-grantedness, thereby allowing shared expectations (Zucker, 1986). In this perspective, system trust (Luhmann, 1979) and trust in abstract systems (Giddens, 1990) play a critical role, as they help conceptualise how individuals develop confidence in institutions. Although absolute certainty is unattainable, individuals perceive the reliability of institutions through direct experience and mediated demonstrations that illustrate how institutions function.

As Möllering (2013) notes, the agency remains central to the neo-institutional theory of trust, as individuals are more or less consciously engaged in processes of institutionalisation and may endeavour to influence institutions. Since actors are not passive reproducers of structure, trust based on institutions between actors necessitates that the institutions underpinning such trust are themselves trusted. Along with this perspective, trust is a crucial indicator of how people perceive and evaluate their government institutions.

Data from the latest OECD Survey on Drivers of Trust in Public Institutions (2024a) indicate that a growing proportion of the population expresses low trust in the national government. According to the report, in 2023, almost half of the Italian respondents (46.7%) have no or low confidence in the Government, while this percentage increases in the UK (56.9%). If we look at the data on citizens' trust in governmental climate action, the percentage decreases for both Countries. Only 39% of Italians and 36% of Britons believe that the Government will succeed in reducing greenhouse gas emissions.

The evidence is consistent with the results of the qualitative analysis. The Italian and the UK interviewees highlight that citizens have low trust in politics and institutions. Particularly regarding the UK government, perceived incompetence and a chaotic COVID response contribute to scepticism towards government and science. Many respondents argue that the government's role in achieving climate and ecological targets is undermined by a lack of public trust in its institutional ability to pursue collective goals. Given the high confidence level at local levels, the interviewees emphasise that greater transparency and public engagement from local leaders are crucial for fostering community cooperation in sustainability efforts. Moreover, they emphasise the importance of trusted expert voices to convey climate-related messaging, particularly from academia.

### **Distrust in governmental climate action**

<i>I don't know what public opinion is, but I think there's generally</i>	
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*quite low trust in politics, institutions, or politicians. That's probably a globally wide phenomenon, but it specifically appears to be true from media reports and social media in the UK at the moment: there's, in general, low trust in the current UK Government, which stems back all the way to 2010, actually, the Conservative government.*

*[...]*

*Well, I think much of it's not necessarily because of climate action or lack of climate action. Much of it's because of general perceived incompetence, dishonesty, a feeling that the COVID response was chaotic and poorly planned. A sense of corruption and not following rules within the government itself. And so, there was a general distrust in the government, unfortunately, and also a kind of general distrust in science because the role of science was probably misportrayed during the pandemic. Lots of phrases like "we are following Science" we used when, you know, the science was developing, and actually, many of the scientific advisors were not asked by the government about specific policy measures. So therefore, their advice had no way of getting through to decision making. There's general distrust, there's also an inconsistency in government action compared to some of the needs of the country in response to climate change, so there's still a lot of permitting of building of new houses on areas that are liable to become increasingly flooded in the near future, and that*

<p><i>seems inconsistent with a range of climate change risk assessments that have been done in the UK, and therefore, it suggests that there's a disconnect between the goals of the Climate Change Act and the actions in the near term.</i></p> <p>(Interviewee #1)</p>	
<p><i>So, from the focus groups we did recently, bear in mind this was over the last six months when asked about what barriers you perceive there to be to more action on climate change; often, the barriers that came up were perceptual, a lack of trust. That's been exaggerated over the last one or two years, and then we'll go into details. I'm sure you're familiar with turbulent time. A combination of stuff which culminated, I suppose, with you know well, we've had three prime ministers in six months. The Prime Minister for 45 days, we had a Prime Minister who lied to Parliament who has been shown to lie to Parliament. So, there is just a lack of trust from both sides.</i></p> <p><i>[...]</i></p> <p><i>And so, what that then points towards in terms of the stuff that came out of our focus groups was around the importance of community groups, the importance of local authorities with that kind of a greater level of trust often being there at the local level in terms of government and institutions, but also the kind of levels of trust that still really exists and still high for scientists, for health</i></p>	

<p><i>professionals more generally as being a trusted source of information.</i></p> <p>(Interviewee #2)</p>	
<p><i>So, I think trusted voice are really needed here. So, government isn't necessarily the place. So, did we trust politicians in the COVID pandemic? Well, it turns out that politicians were telling lies essentially and unfortunately that's what we're finding out now. But no one is arguing that the academics involved, the chief medical officers involved, they were telling lies, they're trusted voices, right? They're seen as experts and quite right too. And I think there's a huge role for academia, for universities to put the messaging out to the public as a place of trusted information.</i></p> <p>(Interviewee #3)</p>	
<p><i>Yes, in my opinion it is a matter of a little trust in the institutions and in the role of the various functions of the Republic.</i></p>	<p><i>Sì, secondo me è una questione di un po' di fiducia nelle istituzioni e nel ruolo delle varie funzioni della Repubblica.</i></p> <p>(Interviewee #7)</p>
<p><i>To play this role in some way of synthesis and guarantee of sustainability at 360 °, the institutions should have a level of trust and credibility that we know is one of the weak points of our democracy. That level of trust for which I, as a citizen, accept a plant on my territory, because I know that the institution that I contributed democratically to</i></p>	<p><i>Per svolgere questo ruolo in qualche maniera di sintesi e di garanzia della sostenibilità a 360° le istituzioni dovrebbero avere un livello di fiducia e di credibilità che noi sappiamo essere uno dei punti deboli della nostra democrazia. Quel livello di fiducia per cui io cittadino accetto un impianto sul mio territorio, perché so che l'istituzione che io ho</i></p>

*elect, will protect my interests starting with health, this mechanism does not exist, it no longer exists. Also because in reality in our country many times the history of industrial development has coincided with a worsening of the health of citizens, think of ILVA in Taranto, the land of fires to name two cases, one legal and the other instead also linked to the dynamics of illegality of waste management. So this gap between the necessary function and the credibility necessary to exercise that function in the ecological transition emerges a lot and is blocking change, this is the reality.*

*[...]*

*There is a short circuit between trust and betrayed expectations*

*[...]*

*Environmental indicators can be indicators of consensus and building trust, because I really have to have a lot of trust in my mayor or in the councilor for the environment, to decide to make that effort called separate collection at home, that is, to transform my dining room substantially into the basic system of the circular economy. This mechanism also passes through the fact that the Mayor, instead of having me read the decisions in the newspapers, perhaps organizes initiatives, debates, meetings; the famous public debate.*

*contribuito in maniera democratica ad eleggere, tutelerà i miei interessi a partire dalla salute, questo meccanismo non esiste, non c'è più. Anche perché in realtà nel nostro paese tante volte la storia dello sviluppo industriale ha coinciso con un peggioramento della salute dei cittadini, pensiamo all'ILVA di Taranto, alla terra dei fuochi per citare due casi, uno legale e l'altro invece legato anche alle dinamiche di illegalità della gestione dei rifiuti. Quindi questo gap tra funzione necessaria e credibilità necessaria per esercitare quella funzione nella transizione ecologica emerge tantissimo e sta bloccando il cambiamento, questa è la realtà.*

*[...]*

*c'è un cortocircuito tra fiducia e aspettative tradite*

*[...]*

*gli indicatori ambientali possono essere degli indicatori di consenso e di costruzione di fiducia, perché io devo avere veramente tanta fiducia nel mio sindaco o nell'assessore all'ambiente, per decidere di fare quello sforzo che si chiama raccolta differenziata in casa, cioè trasformare il mio tinello sostanzialmente nell'impianto base dell'economia circolare. Questo meccanismo passa anche per il fatto che il Sindaco, invece di farmi leggere le decisioni sui giornali, magari organizza iniziative, dibattiti, incontro; il famoso dibattito pubblico.*

(Interviewee #16)

The analysis reveals that one of the primary reasons for the lack of trust in governmental climate action is the failure of institutions to meet citizens' expectations for effective climate crisis response. As is known, expectations associated with a social position contribute to defining the attributive aspect of the role and its consistency with the prescriptive aspect derived from social norms (Merton, 1957). A misalignment between the two components may signal a crisis in institutions, where the latter's behaviour does not conform to the one prescribed by the legal frameworks (Gallino, 2004, or. ed. 1978). After all, the mentioned evidence on government distrust reveals this discrepancy.

In particular, the misalignment between the climate target and governmental actions has generated a sense of disillusionment among citizens regarding their expectations. This is a pattern shared by the UK and Italy. Regarding the first country, there is a growing expectation that institutions will accelerate the decarbonisation of the UK energy system. However, the ongoing licensing of fossil fuels and discussions about reopening coal mines generate concerns. This inconsistency undermines the shift toward renewable energy and low-carbon sources, generating a sense of frustration with the slow pace of action. Many respondents stressed the need for more ambitious and strategic measures from decision-makers whose perspective is short-term. Despite claims from politicians about possessing solutions, citizens feel that governments are not creating the social conditions that enable climate-friendly behaviours.

### **Social Expectations from the UK Governmental Climate Action**

*I think at the moment it's, you know, in terms of reducing emissions, there's lots of discussion around clean energy, and perhaps there's a bit more expectation that institutions will help drive forward the decarbonization of the UK energy system. Although there's still some confusion over what role should be given to coal, oil, and gas in the UK, there's still permitting of new oil and gas licenses, discussions about reopening coal mines and that potentially confuses people because it provides an inconsistent picture around the shift away from fossil fuels and towards nuclear, renewables and other low-carbon sources.*

(Interviewee #1)

*The consistent message that comes out from that (the focus group, ndr) is that the public wants more, faster action than is currently being*

*proposed by their decision makers, so consistently, when people have the opportunity and time to discuss this in detail, they actually feel a level of more ambition. I think there is a level of frustration often that institutions aren't going faster than they are at the moment.*

(Interviewee #2)

*So, the UK government has been proactive in trying to mitigate the impact of climate change on citizens health. It's done so by introducing the Climate Change Act, as you referred to, and in that respect, it's leading often the world in some of these instances. However, clearly, given the acceleration of the warming of the planet, it's clear that even a progressive country like the UK is probably not doing sufficient enough yet to mitigate the impacts of climate change. And we are seeing increasingly the impacts on human health of climate change.*

(Interviewee #8)

*Government politicians will tell you that they have the solutions. Obviously, that's what they do. That's political life. But the reality is that they don't have them, not themselves.*

(Interviewee #3)

*The role of all government only should be, and the institution should be, to enable people to make the choices that we want them to make, what they want to make in general, but what has happened in general is that these governments and the institutions have made these choices difficult for people.*

*[...]*

*They are not enabling them to do what they would like to do.*

*[...]*

*This is a new opportunity, a tremendous opportunity to really plan how we would go and we frittered it away because the government does something and then it comes back.*

*[...]*

*The government has the biggest opportunity to do that, but they must know where they're going themselves. Their focus is on tomorrow. It's on that by the election in a couple of months. It's on party conference coming up. It's on the fact they had to have a general election in a couple of years.*

(Interviewee #4)

*I am concerned as a citizen of this country that we don't really have a clear strategy for who we are as a country, what should our future be. And I would argue that we should be.*

*[...]*

*I would argue strongly that bold and clear action on climate change is an area where we could and should show some real global leadership*

*[...]*

*I would like us to be much, much more strategic about it.*

(Interviewee #10)

The Italian framework is quite similar. The interviewees express uncertainty about the roles of institutions in sustainability and climate change, noting that while the topic is addressed in some governmental commissions, the level of government support remains unclear. They point out a disorganised approach across sectors, with transportation making progress, unlike Italy's lack of sustainable development targets (ASviS, 2024). Inaction from various governments over the past 20 years has led to contradictory policies and a failure to synthesise conflicting interests. Although there are cultural shifts toward new lifestyles, institutional changes often lag. The speakers criticise the government for ignoring scientific evidence for political gain, as sustainability issues remain insufficiently addressed in legislation. There is an urgent need for preventive measures and proactive environmental management in light of repeated crises, emphasising the necessity for immediate action and a cultural shift towards oversight and expertise to combat climate change effectively.

### **Social expectation from the Italian governmental climate action**

*(The institutions, ndr.) Do they play an active role? I don't know how to answer her. It is certainly not something easily visible or identifiable. At the same time, I don't think I know enough to be able to say no, no role, because the topic comes up, it's not that no one mentions it. At the institutional level, at least in the*

*(Le istituzioni, ndr) Giocano un ruolo attivo? Non le so rispondere. Certamente non è una cosa facilmente visibile o identificabile. Al tempo stesso non credo di conoscere abbastanza per poter dire no, nessun ruolo, perché l'argomento viene fuori, non è che non lo nomini nessuno. A livello istituzionale, almeno nelle*

<p><i>acquaintances I have, it comes out, in some commissions.</i></p> <p><i>[...]</i></p> <p><i>And at the level of government institutions for now I have not been able to find a contribution, then clearly these things also depend on who is uncomfortable, who it is that you meet.</i></p>	<p><i>frequentazioni che ho io, viene fuori, in alcune commissioni.</i></p> <p><i>[...]</i></p> <p><i>E a livello invece di istituzioni governative per adesso non sono riuscito tanto a trovare un apporto, poi chiaramente queste cose dipendono anche da chi si scomoda, chi è che si incontra.</i></p> <p><i>(Interviewee#13)</i></p>
<p><i>Italy is not on a path of sustainable development, as the data we process show, but above all it has become clear that successive governments have never fully embraced this logic. And it is a shame because the integrated vision that would have been useful has been missing. And this means that contradictory or very fluctuating policies have also been adopted.</i></p>	<p><i>L'Italia non è su un sentiero di sviluppo sostenibile, come mostrano i dati che elaboriamo, ma soprattutto è apparso evidente come i governi che si sono succeduti nel tempo non abbiano mai sposato fino in fondo questa logica. Ed è un peccato perché è mancata proprio quella visione integrata che pure sarebbe servita. E questo vuol dire che sono state anche adottate politiche contraddittorie o molto oscillanti.</i></p> <p><i>(Interviewee #15)</i></p>
<p><i>The truth is that the institutions are finding it increasingly difficult to have that role of synthesis between opposing interests, of gathering needs, of applying solutions and therefore of taking responsibility for choices.</i></p> <p><i>[...]</i></p> <p><i>Many things are changing from a cultural point of view, of the willingness to have new lifestyles. I see more progress on this front rather than on the institutional front.</i></p>	<p><i>La verità è che quel ruolo di sintesi tra gli interessi contrapposti, di raccolta dei bisogni, di applicazione delle soluzioni e quindi dell'assunzione di responsabilità delle scelte, le istituzioni fanno sempre più fatica ad averlo.</i></p> <p><i>[...]</i></p> <p><i>Tante cose stanno cambiando dal punto di vista culturale, della disponibilità ad avere nuovi stili di vita. Vedo più strada fatta su questo fronte piuttosto che sul fronte istituzionale.</i></p>

<p><i>Let's say that for 20 years now the alarm has been consolidated, they have done nothing, basically nothing. The role of the government is of the inaction of this, of the previous one and even of the one before that, because they do not realize that doing nothing has a price, evidently they think they are paying for it and therefore they count on it to be another's turn, the one after, in two generations, who have not realized what a climate crisis means.</i></p> <p><i>[...]</i></p> <p><i>Because it costs, in terms of consensus, popularity, re-election, many things, they are all costs; they are unable to subvert a predetermined system in any way.</i></p> <p><i>[...]</i></p> <p><i>(The institutions, ndr.) They are certainly guilty because I cannot think that the ministers of the environment do not get information from primary scientific sources. Instead, we have a minister of the environment who tells us that there are different opinions on the climate.</i></p>	<p>(Interviewee #16)</p> <p><i>Diciamo che da 20 anni ormai l'allarme è consolidato, non hanno fatto niente, fundamentalmente nulla. Il ruolo del governo è dell'inazione di questo, di quello precedente e anche di quello prima ancora, perché non si rendono conto che non fare niente ha un prezzo, evidentemente pensano di scontarlo e quindi contano che tocchi a un altro, quello dopo, fra due generazioni, che non si sono resi conto di quello che significa una crisi climatica.</i></p> <p><i>[...]</i></p> <p><i>Perché costa, in termini di consenso, di popolarità, di rielezione, di tante cose, sono tutti costi; non riescono a sovvertire in nessuna maniera un sistema predeterminato.</i></p> <p><i>[...]</i></p> <p><i>(Le istituzioni, ndr.) sono colpevoli senz'altro perché non posso pensare che i ministri dell'ambiente non si informino da primarie fonti scientifiche. Invece noi abbiamo un ministro dell'ambiente che ci dice che sul clima ci sono opinioni diverse.</i></p> <p>(Interviewee #17)</p>
<p><i>First of all, the issue of environmental, economic and social sustainability is an issue that struggles to enter the halls of parliamentarians. And just think that, it seems to me that there are 61 Community infringements. Yes. Amendments Nos 61 and 21 are for the environment. So try to think how</i></p>	<p><i>Innanzitutto la tematica di sostenibilità ambientale, economica e sociale è una tematica che fa fatica ad entrare nelle aule dei parlamentari. E pensi che, mi sembra che ci siano 61 infrazioni comunitarie. Sì. 61 e 21 sono per l'ambiente. Quindi provi a pensare quanto poco ci si stia occupando di queste</i></p>

<p><i>little attention is being paid to these issues that are instead fundamental</i>  [...]  <i>At the institutional level there is still no perception, that awareness of the need and urgency now to intervene in prevention. I emphasize the fact that we are still reacting in an emergency.</i>  [...]  <i>To date, I see only timid attempts to work in this direction, to work to combat the climate crisis.</i>  [...]  <i>We have no more time to lose, the planet is not waiting for our policies, this approach is no longer suitable for the world we are living in, absolutely.</i></p>	<p><i>tematiche che invece sono fondamentali</i>  [...]  <i>A livello istituzionale non c'è ancora quella percezione, quella consapevolezza della necessità e dell'urgenza adesso di intervenire in prevenzione. Sottolineo il fatto che si reagisce ancora in emergenza.</i>  [...]  <i>Ad oggi vedo solo timidi tentativi di lavorare in questo senso, di lavorare per contrastare la crisi climatica.</i>  [...]  <i>Non abbiamo più tempo da perdere, il pianeta non sta aspettando le politiche nostre, non è più adatto questo approccio al mondo in cui stiamo vivendo, assolutamente.</i></p> <p>(Interviewee #18)</p>
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Despite low trust and expectations being common issues in the UK and Italy, the two institutional frameworks take different approaches to climate issues. We will argue on this in the following two paragraphs.

## **2.6.2. TACKLING THE COMPLEXITY: THE ROLE OF EVIDENCE-BASED LEGISLATION IN THE UK INSTITUTIONAL REALM**

Some authors refer to climate change as a wicked problem caused by the complex interaction of environmental, social, political, and economic factors (Rittel and Webber, 1973; Head, 2008). One of the interviewees gave us a brilliant definition of this aspect.

*First of all, climate change won't solve itself as a problem without policy. I think that's well demonstrated because it's a public good problem, and it's often called a wicked problem. It's a problem which is*

*difficult to pin down the blame of it or the cause of it on any one thing. It's very dispersed, it happens over long-time scales, and we can't easily see it coming. There are other public priorities that are more immediate and so on. So it's called one of those difficult-to-solve wicked problems.*  
(Interviewee #1)

According to some UK respondents, the complexity of climate change makes people feel powerless and uncertain about how to contribute to solutions, thereby limiting their individual and collective roles in driving social change.

### **Climate change complexity**

*I think the second bigger issue is people don't necessarily feel very empowered to know what to do with it. And perhaps that's why it sort of historically, maybe over the last decade, has been left in the too-difficult box.*

*[...]*

*The only way to solve it, I think, is to have very grown-up conversations with the public.*

(Interviewee #10)

*There is a difficult, there are real difficulties about people who feel very small doing their little things, and this huge issue. First, they feel powerless because it's such a big issue, and second, they feel what can I do? What can I do and how is it going to affect my life?*

(Interviewee #4)

Moreover, the complexity challenges achieving a shared understanding of the climate change phenomenon, mainly concerning the roles and responsibilities different institutions must assume, as emerged from the analysis of the interviewee's representation in the previous sections.

From the structural functionalistic normative perspective, the norm's function is valuable in delineating institutional roles by prescribing the behavioural models to which institutions must conform in executing their functions. The mechanism of compliance with the role is thus ensured by the sanctions institutions would incur if they deviate from the prescriptive aspects of the norms (Parsons, 1991, or. ed. 1902). Considering this approach, the exploratory research focused on the role of law to determine whether it could

be relevant in enhancing institutional responsibility in addressing the complexities of climate change.

However, when comparing the UK and Italian legislative frameworks on the climate change phenomenon, we realise that some differences exist. While both countries have legally binding climate goals, only the UK has enacted a national climate law. We refer to the Climate Change Act (CCA), approved in 2008, which commits the Country to reduce carbon dioxide emissions by at least 80% by 2050 from 1990 levels. On the contrary, Italy's climate commitment at the European level to achieve climate neutrality by 2050 has not been implemented through national legislation. One of the most significant CCA innovations is the establishment of the Climate Change Committee (CCC), as mentioned earlier. It evaluates the government's ambition for a net-zero transition by scrutinising existing policies and advising on the necessary carbon budget for the nation to achieve net zero by 2050. The CCC works in a highly interdisciplinary manner, comprising experts from various backgrounds, including economics, climate science, academia, and business. The Act establishes an Adaptation Sub-Committee (ASC) within the CCC, explicitly tasked with adaptation targets.

The qualitative research analysed the drivers and impacts of the CCA, aiming to determine whether evidence-based climate legislation contributes to strengthening governmental accountability in addressing climate change. The UK interviewees' results highlight the CCA's innovative capacity, particularly in terms of cross-party support and the strong link with scientific evidence on climate change, such as the 2007 Stern Review and the IPCC reports. Moreover, the respondents argue that scientific assessments from the CCC are crucial in fostering social consensus on government climate strategies, as they effectively communicate these strategies to the public through the annual publication of progress reports. The Act establishes a legally binding target for 2050, along with a five-year carbon budget. The Secretary of State can amend both following the CCC assessment. This process enhanced the government's accountability in addressing climate action, enabling judicial review in cases of non-compliance.

As the first example of climate law in the world influencing subsequent legislations, it assessed the UK's leadership role in tackling climate issues. Regarding the impact side, it enhanced public understanding of climate action and led to significant progress in the energy sector. Despite its achievements, ongoing challenges related to the complexity of climate change persist. The first relates to fostering inter-departmental cooperation and ensuring comprehensive planning for ecological transition. Moreover, despite the consensus on scientific

evidence regarding climate change, institutions face the challenge of countering climate change deniers who exploit scientific uncertainties to create doubt (Dunlap and McRight, 2015).

### **Drivers: cross-party consensus and scientific evidence**

*At that time, when discussions around writing a Climate Change Act began, there had been something like eight or nine years of consecutive strong economic growth in the UK, and the general sense of increasing prosperity. So, economy and economic improvement was not one of the big national conversations that was taken as something that had been achieved, that then opened up room for discussion and thinking about other national priorities like, you know, alleviation of poverty for the poorest, further improvement of health services, and improvement of the environment.*

*[...]*

*In the UK, specifically the head of the Government Economic Service, former head of the Government Economic Service, Nicholas Stern, had been away for a year working with many government economists on his Stern Review of the economics of climate change. The review borrowed a lot of material from the forthcoming 4th Assessment report of the Intergovernmental Panel on Climate Change, the IPCC AR4 report, and some iconic diagrams like what we call the burning embers diagram, which shows a variety of impacts that could happen at 2,3,4,5 degrees of warming. Yeah, this was an important driver as well of climate*

<p><i>action. It was an important driver that, you know, we need to keep away from the world that gets to 3° or 4° of warming. I think the UK had strength and quite a lot of people involved in the science of climate change and the economics of climate change. So, this gave expertise.</i></p> <p>(Interviewee #1)</p>	
<p><i>So, I think the Climate Change Act was very good, particularly in the UK, because it was cross-party. I think that was a key aspect, and the fact that it's been replicated in one form or another by countries around the world is kind of indicative of the fact that it was a good piece of legislation that laid the foundation for others to follow suit.</i></p> <p>(Interviewee #2)</p>	
<p><i>Now, yes, I think Climate Change Act has to be one of the most successful bits of legislation in quite a long time. That worked.</i></p> <p>(Interviewee #9)</p>	
<p><i>The reason the Climate Change Act came together was because there was in the UK, we have a lot of climate scientists and it became obvious to the Labour government at the time, Tony Blair-Gordon Brown, that the UK needed to take this seriously. The science is serious. Let's do something about it.</i></p>	

<p><i>That's kind of been the approach today.</i></p> <p>(Interviewee #3)</p>	
<p><i>The Climate Change act, politically, I think, is interesting because it illustrates how you can sometimes have in politics, degrees of consensus across the political spectrum, which arose at a particular time and would not be repeated at other periods of time. But the net effect of it was to embed, in the UK, a very strong commitment to dealing with climate change. The act passed through parliament, if I remember, with about 600 votes for and three against. And that immediately tells us that the vast majority of all the parties, whether it be Labour, liberal, democrat or conservative, voted for it. This was a period in which the leader of the Labour party was Tony Blair, who had taken climate change very seriously and had commission from Professor Nicholas Stern, the Stern report on climate change. The scientific evidence had focused people's attention on the fact that we needed to get serious about climate change.</i></p> <p><i>[...]</i></p> <p><i>People sometimes draw a distinction between evidence-based policy and policy-based evidence, where governments decide a policy and then search for the evidence which might support that. So, this was an example of evidence-based policy. And the Climate Change Act deliberately referred to the work of</i></p>	

*the International Panel on Climate Change. I think there was a strong belief that of government, that they had to listen to the advice of science. We have a chief scientific advisor in the UK, just as we have a chief medical officer.*

*[...]*

*And I think, you know, there was, across the political spectrum, the vast majority of the political spectrum, the belief that there are some issues on which there is a science.*

*[...]*

*There are some things that public policy determines where there isn't really an expert answer. Do you want taxes to be highly progressive and quite high, and to redistribute money to poorer people? What do you think is an acceptable level of inequality? How far are you to redistribute? You can't turn to a group of economists and tell me the scientific answer, that is a moral judgement about the nature of the society you want to live in. But when you build a bridge across the Thames, you turn to the best engineers and they tell you, if you build this bridge in this way, it will stay up. And if you build it in this bridge, it will fall down. And I think what we had was accepting that climate change was one of these ones where there was a body of scientific research and we had to refer to it.*

*(Interviewee #6)*

<p><i>Yes, it seems to me that the first thing to say is that the UK is perhaps a little ahead of the curve when it comes to the connection between scientific evidence and legislation. The Anglo-Saxon world in general and the United Kingdom in particular have this culture of evidence-based policy, that is, that policies must be based on scientific knowledge, on data, they must be objective.</i></p> <p><i>[...]</i></p> <p><i>The Royal Society and the history of the English Industrial Revolution and the connection between technology and science have left a trace, in my opinion, in society that is stronger than it is at the European level. There is this cultural factor in which the status of science and objective evidence is considered more internalized in Anglo-Saxon culture, potentially than it is in European culture</i></p>	<p><i>Sì, mi sembra che la prima cosa da dire è che il Regno Unito forse è un po' all'avanguardia rispetto alla connessione tra le evidenze scientifiche e la legislazione. Il mondo anglosassone in genere e in particolare il Regno Unito hanno questa cultura della evidence-based policy, cioè che le policy debbano essere basate nella conoscenza scientifica, nei dati, debbano essere oggettive.</i></p> <p><i>[...]</i></p> <p><i>La Royal Society e la storia della rivoluzione industriale inglese e la connessione tra la tecnologia e la scienza hanno lasciato una traccia, secondo me, nella società che è più forte di quanto non lo sia a livello europeo. Esiste questo fattore culturale in cui lo status della scienza e delle evidenze oggettive è considerato più interiorizzato nella cultura anglosassone, potenzialmente di quanto non lo sia in quella europea.</i></p> <p><i>(Interviewee #7)</i></p>
<p><i>It must be said that science has played a decisive role because it has led us to see collective phenomena rather than just individual ones. It has allowed us to understand that many events, whether diseases or floods, depend on a complex context</i></p>	<p><i>Va detto che la scienza ha avuto un ruolo decisivo perché ci ha portato a vedere i fenomeni collettivi anziché soltanto quelli individuali. Ci ha consentito di capire che molti eventi, siano le malattie o siano le alluvioni, dipendono da un contesto complesso.</i></p> <p><i>(Interviewee #5)</i></p>

<p><i>I honestly think in case of the UK government, I mean, within the mainstream political system, I don't think there's any questioning that the science of climate change is wrong.</i></p> <p>(Interviewee #11)</p>	
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### Climate Change Committee

<p><i>I think the committees run in a very transparent way. They provide evidence for not just to government, but also to the public and they explain their findings and their recommendations to the public as well. The public face of the climate change committee is extremely good. I mean, it's essentially a quango. It's been developed, you know, outside of government but connected into government. And these things can sometimes be a bit opaque and a bit difficult to understand. But the Climate Change Committee works in quite a transparent way, I think.</i></p> <p>(Interviewee #3)</p>	
<p><i>(The CCA, ndr) set up the climate change committee and the structure of what are called carbon budgets, as an institutional structure, to make sure that the UK achieved this reduction in emissions.</i></p> <p><i>[...]</i></p> <p><i>And this therefore created a check and balance, a sense of an external expert not taking over the control of policy, but continually providing a challenge to policy. I think</i></p>	

<p><i>I would say that this structure has proved remarkably successful. It was designed in 2005 to 2006. I think there's basically a triumph of legislative and institutional creation, and I think its triumph is that it still leaves the hard political choices of taxes, regulation and public expenditure to the elected government. But it provides a source of external expertise and challenge, which makes it more likely that government will develop coherent long-term policies.</i></p> <p>(Interviewee #7)</p>	
<p><i>There is no similar mechanism or anything similar at European level that has not only the administrative function of doing this, but also social responsibility, that is, that it is a point of reference for citizens, that they can trust and that keeps a critical eye on what the European government or the European Parliament decides to carry out.</i></p>	<p><i>Non esiste un meccanismo simile o qualcosa di simile a livello europeo che abbia non solo la funzione amministrativa di fare questo, ma anche la responsabilità sociale, cioè che sia per i cittadini come un punto di riferimento, di cui si possono fidare e che tiene sotto uno sguardo critico quello che il governo europeo o il Parlamento europeo decide di portare avanti.</i></p> <p>(Interviewee #5)</p>
<p><i>So, (the CCA, ndr) set up our committee as the body that would take that longer-term perspective independently of what that target should be. But the thing that makes the act work in a powerful way is that we give our independent advice on these five-year carbon budgets to parliament, and then the government has to take our advice, or it has to explain to parliament why it isn't</i></p>	

<p><i>guaranteed. It hasn't always pretty much always accepted our advice. And when it accepts our advice, those targets become legally binding.</i></p> <p>(Interviewee #9)</p>	
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### **Government responsibility for legal obligations**

<p><i>There's a legal responsibility of the government, once it's accepted the targets, to actually put in the policies to achieve the targets now, but also what is necessary to achieve the targets in the future. So, Climate Change Act is constructed to actually have the final goal, but actually the pathway towards that and the intermediate target and also a legal obligation.</i></p> <p>[...]</p> <p><i>You set a legal obligation of the government to do this. But what happens if they don't? Well, they then have the possibility of judicial review, which has happened and is starting. The role of law is starting to become an interesting one.</i></p> <p>(Interviewee #4)</p>
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<p><i>So, when the target is set by the government, it becomes legally binding. And that means basically, if the government doesn't deliver that target, they can be taken to court. And that actually occurred last June, I think, when this organization called Client Earth took the government to court because they said there wasn't enough detail in the government's decarbonization pathway to show how it would deliver the fifth and fifth carbon budget targets.</i></p> <p>(Interviewee #9)</p>
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### **Impacts: Improving awareness and renewable energy**

<p><i>I think the awareness and concern around climate change increase. It quickly disappeared as soon as the global financial crisis hit.</i></p> <p>[...]</p> <p><i>So, I think that public perception of caring about climate change then went away for quite a long time after that. And yeah, I don't think it's really</i></p>
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*become such a big issue until the last few years. I think, you know, COP26 in Glasgow was probably the next moment in time when there was a large focus on climate change in the UK.*

(Interviewee #1)

*I'm not sure that the Climate Change Act itself has made yet much difference but think about it in terms of the things that we didn't expect.*

(Interviewee #3)

*The area in which, you know, just general climate policy has made a massive difference in the UK has been in terms of renewable energy, because the UK has made incredible, incredible progress on that step forward. Yeah. The reason for this was the electricity market reform about ten years ago was entirely informed by the need to get renewable energy into the system. So, it's important to design an electricity system that would accommodate renewable energy on a large scale. And it's worked in that sense.*

(Interviewee #11)

### **Ongoing challenges**

*So, trying to get every single government department interested is more challenging, and trying to get them to talk to each other is more challenging. I mean, quite often, I talk to ministers from different departments, and they don't know what each other's up to.*

(Interviewee #9)

*Let's see. I think in all policy areas, central in #10 Downing St., should be climate change expertise, and every single policy they look at, should go through the climate change lens. You put on these climate change glasses and say, is this actually fitting with our objectives on climate change?*

(Interviewee #4)

*You know, and basically what we thought was the importance of planning, because it's like the whole of society needs to move. And unless there's a plan where everybody understands their place in the picture, that's not out of the way for going forward.*

(Interviewee #11)

*But an important point about the relationship between science and public policy is how we deal in terms of the sophistication of ministers, the sophistication of the political process, and the communication to people of this inherently uncertain, rather than absolutely, it's not uncertain in direction. I think we are now at a stage where I think somebody who says climate change is not occurring and it's not made by man is either does not understand the data or understands it and is lying. I think in directional terms, we can now say it is definitive, but in terms of the scale of effect, it's probabilistic.*

[...]

*(Attributional scientists, ndr) make statements like "we cannot be certain", but we have a challenge that the climate change deniers and those who are against action deliberately use that the intellectual integrity of the scientific community to try to imply more doubt than those rigorous probabilistic statements that scientists are making. This is a challenge we have to find a way through.*

(Interviewee #7)

Although we previously noted that the disconnection between the CCA target and governmental action in the near term generated a sense of disillusionment among the public, the interviewees' representation of the Law is generally favourable. It is especially relevant to its contribution to strengthening cross-party political responsibility in addressing climate issues effectively through an explicit, legally binding, and evidence-based strategy.

On the contrary, the lack of a scientific and systematic approach severely impacted the actions of the Italian government on climate change, as discussed in the following section.

### **2.6.3. THE ITALIAN INSTITUTIONAL FRAMEWORK BETWEEN FRAGMENTATION AND IDEOLOGICAL POLARISATION**

Recently, the concept of a wicked problem has been refined to create a new category: the super-wicked problem (Lazarus, 2009; Levin et al., 2012). This type encompasses all the characteristics of the previously described

wicked problem while possessing some additional features. The most relevant issue is the lack of a common understanding from various stakeholders. Thus, a centralised institution accountable for levelling understanding and coordinating actions from different institutional players could be valuable.

The fragmentation between different institutional players and the existence of a social mess in which *every problem interacts with other problems and is, therefore, part of a set of interrelated problems, a system of problems* (Ackoff, 1974, p. 423) contribute to delineating the complex realm of climate change. To tackle this issue, Giddens (2009) emphasises the necessity for political institutions to adopt a systemic approach incorporating long-term environmental, social, and economic policy reforms rather than disconnected and fragmented measures.

The analysis is consistent with the interviewees' representation of the Italian political system and legislative framework. They all contend that the lack of a systemic and cross-sectoral outlook severely affects the effectiveness of the decision-making process. This is primarily due to the absence of a centralised authority that fosters collaboration and communication among various governmental departments and ensures coherence between political decisions and technical implementation. The Italian bureaucratic silos affect sustainability concerns integration into all policymaking processes.

The respondents argue that a national climate law would be necessary but insufficient because of the lack of implementation process, especially regarding European legislation. Consequently, the supranational nature of climate law has further hampered Italian climate action. Furthermore, the fragmented power dynamics between the state and regions affect a coherent implementation and result in uneven service availability across regions. The interviewees identify an additional constraint for a systemic process: the absence of an evidence-based policymaking process. The transfer of scientific research into practical policies by ministries or regions is slow and significantly swayed by lobbying, resulting in diminished effectiveness. There is a perception that science is often consulted only after events occur rather than proactively tackling potential issues through prevention. This leads to policymaking that is reactive and ideological rather than strategic. To address this issue, the respondents propose establishing a scientific committee that systematically connects science and politics while being less vulnerable to manipulation by political interests.

### **Fragmentation and implementation gap**

<p><i>Therefore, formally climate change is included among the topics dealt with by the Italian National Plan for Prevention. There are many limits in the National Plan for Prevention because there is no precise definition of timed objectives. It seems to me that in Italy there is often a lack of a sort of chain of transmission both from the upper to the lower levels, and from the political decision to the technical implementation.</i></p> <p><i>[...]</i></p> <p><i>What is needed to tackle climate change are intersectoral policies that mean communication between ministries. So, the thing I noticed, precisely in biographical terms, is the fact that there is absolutely no communication between ministries.</i></p> <p><i>[...]</i></p> <p><i>In fact, this is the difference between England and Italy, the fact that there is this transmission belt from declarations of principle or laws or constitutional changes when they are relevant, to the last official or person working in the field. You see much more than in Italy. And this applies in general to Italian policies.</i></p>	<p><i>Dunque, formalmente il cambiamento climatico è incluso tra gli argomenti di cui si occupa il Piano Nazionale per la Prevenzione italiano. Ci sono molti limiti nel Piano Nazionale per la Prevenzione perché non c'è una definizione precisa di obiettivi temporalizzati. A me pare che in Italia spesso manchi una sorta di catena di trasmissione sia dai livelli superiori ai livelli inferiori, sia dalla decisione politica all'attuazione tecnica.</i></p> <p><i>[...]</i></p> <p><i>Quello che ci vuole per affrontare il cambiamento climatico sono politiche intersettoriali che vogliono dire comunicazione tra i ministeri. Allora, la cosa che ho notato io, proprio in termini biografici, è il fatto che non c'è assolutamente comunicazione tra ministeri.</i></p> <p><i>[...]</i></p> <p><i>Infatti questa è la differenza tra l'Inghilterra e l'Italia, il fatto che c'è questa cinghia di trasmissione dalle dichiarazioni di principio oppure dalle leggi o dai cambiamenti costituzionali quando sono rilevanti, fino all'ultimo funzionario o persona che lavora sul campo. Si vede molto più che in Italia. E questo vale in generale per le politiche italiane.</i></p> <p><i>(Interviewee #5)</i></p>
<p><i>On climate change, there is no such clear decision-making apparatus. We are signatories of the various conventions and everything, but at the national level as well as at the international level I would say, the decision-making process is there,</i></p>	<p><i>Sul cambiamento climatico non c'è un apparato decisionale così chiaro. Siamo firmatari delle varie convenzioni e tutto, ma a livello nazionale così come a livello internazionale direi, il processo decisionale c'è, c'è tutto un</i></p>

<p><i>there is a whole machine but it is less structured and efficient. I don't know it well in depth, but it doesn't seem to me that we have a decision-making apparatus aimed at climate change. Clearly it emerges in policies in various sectors, such as the energy issue. These are considerations that are sometimes done well, sometimes they are done a little superficially, other times they are not done. So there is work to be done on that, which is understandable because we arrived not many years ago, despite the fact that the emergency has been clear for a long time, but the political attention is more recent.</i></p> <p><i>[...]</i></p> <p><i>It's also a challenge to have a gateway on sustainability and climate change, in the sense that it's important for all sectors and all sectors in one way or another consider it and pay attention, but the world is quite disorganized.</i></p> <p><i>Then there are sectors that have done a lot, I don't know about transport for example. A lot has been done in transport.</i></p>	<p><i>macchinario ma è meno strutturato e efficiente. Non lo conosco bene fino in fondo, ma non mi sembra che abbiamo un apparato decisionale mirato al cambiamento climatico. Chiaramente emerge in politiche di vario settore, come c'è la questione energetica. Sono considerazioni che a volte si fanno bene, a volte si fanno un po' superficialmente, altre volte non si fanno. Quindi su quello c'è da lavorare, che è comprensibile perché siamo arrivati da non molti anni, nonostante l'emergenza sia chiara da lungo tempo, però l'attenzione politica è più recente.</i></p> <p><i>[...]</i></p> <p><i>E' anche una difficoltà avere una porta d'ingresso sulla sostenibilità e nel cambiamento climatico, nel senso che è importante per tutti i settori e tutti i settori in un modo o in un altro lo considerano e prestano attenzione, però il mondo è abbastanza disorganizzato.</i></p> <p><i>Poi ci sono settori che hanno fatto parecchio, non so il trasporto ad esempio. Nel trasporto è stato fatto tanto.</i></p> <p><i>(Interviewee #13)</i></p>
<p><i>But let's say that in Europe EU policy matters a lot, so basically where the European Commission, the European Union have a strong power for the treaties and the environment is one of the issues that are managed at the EU level, it is clear that the prevailing legislation is European legislation and therefore the member countries can do nothing</i></p>	<p><i>Ma diciamo che in Europa conta moltissimo la politica comunitaria, quindi sostanzialmente dove la Commissione europea, l'Unione Europea hanno per i trattati, un potere forte e l'ambiente è una delle tematiche che vengono gestite a livello comunitario, è chiaro che la legislazione prevalente è quella europea e quindi i Paesi membri non</i></p>

*but adapt their legislation to European law, therefore the battle that is being waged there in the European Parliament, is being waged in the European Commission, is very important. Clearly, individual countries are in some way called upon to implement these policies and to try to anticipate in such a way that they avoid having a negative impact on the economy and national society, so it is clear that if you are always late, or do not participate in discussions, you suffer the decisions of others and then you have to make up for lost time. Therefore, a virtuous member country is a country that presents these problems to it, precisely because science proposes them to it and makes it understand them, shows them to them, takes them in time to take measures which, of course, are always inspired by European legislation.*

*[...]*

*In Italy there is a characteristic, that laws are necessary but not sufficient.*

*It is clear that, if there is no law, there is a variation of interpretations on the issues, in the sense that those who are further ahead go their own way, those who are further behind stay behind, but if there is a law, which clearly would be desirable in this case on the type of the European one and therefore inspired by those principles there, let's say of the Green Deal, it is a necessary condition for systematization, but not sufficient, because then the laws must be*

*possono fare altro che adeguare la loro legislazione alla legge europea, quindi è molto importante la battaglia che si fa lì al Parlamento europeo, si fa in Commissione europea. Chiaramente, i paesi singoli sono in qualche modo chiamati in causa per implementare queste politiche e per cercare di anticipare in maniera tale che evitino di avere un impatto negativo sulla economia e sulla società nazionale, quindi è chiaro che se sei sempre in ritardo, oppure non partecipi alle discussioni, subisci le decisioni di altri e poi devi recuperare il tempo perduto. Quindi un paese membro virtuoso è un paese che queste problematiche, proprio perché la scienza gliel propone e gliel fa capire, gliel fa vedere, le prende in tempo per prendere dei provvedimenti che naturalmente però sono sempre ispirati alla legislazione europea.*

*[...]*

*In Italia c'è una caratteristica, che le leggi sono necessarie ma non sufficienti.*

*E' chiaro che, se non c'è la legge, c'è una variazione di interpretazioni sui temi, nel senso che chi è più avanti va per conto suo, chi è più indietro rimane indietro, ma se c'è una legge, che chiaramente sarebbe auspicabile in questo caso sulla tipologia di quella europea e quindi ispirata a quei principi lì, diciamo del Green Deal, è una condizione necessaria per la sistematizzazione, ma non sufficiente, perché poi le leggi le deve applicare. Abbiamo*

*applied. We have countless cases of laws that exist in Italy, have also been transposed, but are not applied. In Italy the problem derives from the fact that there is a need for two or three steps, I explain compared to other countries. Other countries approve and implement, our country approves after which it has to move on to implementation, after which implementation goes through the central level and the regional levels and therefore there is a whole slowness of execution and this naturally increases inequalities enormously, because in fact as always happens in all sectors, if you live in a virtuous region, you have more services, you have a more breathable area, you have a more correct waste disposal, you have a more adequate energy production and if you live in a region that is lagging behind you have all the second-class services. [...]*

*Bureaucracies tend to work in silos, so it is clear that the law is the first prerequisite and then there is a need for them to be formally provided for in the law, because otherwise these collaborations, let's call them informal, occur only when there are leaders at the head of these jurisdictions who have a systemic vision and leadership and management skills and which is a rare event, it is not a common occurrence, most of the cases you have normal people who take care of their work without looking at that of others, so it always remains in the*

*innumerevoli casi di leggi che in Italia ci sono, sono state anche recepite, ma non vengono applicate. In Italia la problematica deriva dal fatto che c'è bisogno di due o tre passaggi, mi spiego rispetto ad altri paesi. Altri paesi approvano e implementano, il nostro paese approva dopodiché deve passare all'implementazione, dopodiché l'implementazione passa attraverso il livello centrale e i livelli regionali e quindi c'è tutta una lentezza di esecuzione e questo naturalmente aumenta enormemente le disuguaglianze, perché di fatto come sempre succede in tutti i settori, se tu vivi in una regione virtuosa, hai più servizi, hai un'area più respirabile, hai uno smaltimento dei rifiuti più corretto, hai una produzione di energia più adeguata e se invece vivi in una regione in ritardo hai tutte le prestazioni di serie B. [...]*

*Le burocrazie tendono a lavorare in silos, quindi è chiaro che la legge è il primo presupposto e poi però c'è bisogno che nella legge si prevedano formalmente, perché altrimenti queste collaborazioni, chiamiamole informali, si verificano soltanto quando ci sono dei leader a capo di queste di queste giurisdizioni che hanno visione sistemica e capacità di leadership e di management e che però è un evento raro, non è un evento comune, la maggior parte dei casi tu hai persone normali che si occupano del loro lavoro senza guardare a quello degli altri, quindi rimane sempre nella*

<p><i>regulation of the law the principle that the mechanics of implementation are also expressed in some way, if you only enunciate principles in the law and do not give operational indications, it is clear that this remains on paper, particularly in Italy where there are three levels and separate from each other.</i></p> <p><i>[...]</i></p> <p><i>That systemic vision, moreover, is complicated in Italy by the fragmentation of powers, in the sense that while in other countries the single power is at the central level, in Italy it is not, because between the State and the Regions there is a series, indeed even at this moment there would be a tendency towards this differentiated autonomy that would even give the regions even more powers. Everything that is decided does not have an automatic implementation chain, but must go through the regions in Italy.</i></p>	<p><i>regolazione della legge il principio che venga in qualche modo espressa anche la meccanica dell'implementazione, se tu nella legge enunci solo principi e non dai delle indicazioni operative, è chiaro che questo rimane sulla carta, particolarmente in Italia dove i livelli sono tre e separati tra di loro.</i></p> <p><i>[...]</i></p> <p><i>Quella visione sistemica peraltro da noi è complicata dalla frammentazione dei poteri, nel senso che mentre in altri paesi il potere unico è a livello centrale, in Italia non lo è, perché tra Stato e Regioni c'è una serie, anzi addirittura in questo momento ci sarebbe la tendenza a questa autonomia differenziata che addirittura conferirebbe a regioni ancora più poteri. Tutto quello che viene deciso non ha un'automatica catena di implementazione, ma deve passare attraverso le regioni in Italia.</i></p> <p><i>(Interviewee #14)</i></p>
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### **Ideological polarisation**

<p><i>Clearly, when it is time to send a law to Parliament, you should have done the impact assessment, you should have done the impact assessment on regulation. In reality, most of the laws are now made by decrees, which you close in a hurry because you are in an emergency or because boh. The evaluation is not done, not even qualitative, but it is not done ex post either, this is the problem.</i></p>	<p><i>Tu chiaramente quando è il momento di mandare una legge in Parlamento, dovresti aver fatto la valutazione di impatto, dovresti aver fatto la valutazione di impatto sulla regolazione. In realtà gran parte delle leggi ormai si fanno a colpi di decreti, che chiudi di corsa perché sei in emergenza o perché boh. La valutazione non si fa, neanche qualitativa, ma non si fa neanche ex post, questo è il problema.</i></p>
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<p><i>[...]</i>  <i>The new government arrives and takes and cancels everything and replaces it with two new out of the blue tools, which have not been evaluated. Is this a new thing? No, Einaudi spoke of it in 1955, in his "Useless Sermons". You have counted the laws approved in a hurry, that then you realize that you have made a mistake and then in a hurry you change them and then you realize that you have made a mistake and you change them again and in the end, says Einaudi, "everything becomes too complicated and no one can get their feet off anymore and therefore it is better to continue to tread the water in the mortar of urgent reforms or organize rallies and conferences on policies?"</i></p> <p><i>[...]</i>  <i>We will win the battle democratically only when these issues become a majority, it seems like a tautology but in reality it is the indication of a political direction, which is not where we are moving now.</i></p>	<p><i>[...]</i>  <i>Arriva il nuovo governo che prende e cancella tutto e lo sostituisce con due nuovi strumenti out of the blue, che non sono stati valutati. E' una cosa nuova? No, ne parlava Einaudi nel 1955, nelle "Prediche Inutili". Si è fatto il conto delle leggi approvate di fretta, che poi ci si accorge di averle sbagliate e allora di fretta le cambi e poi ti accorgi di averle sbagliate e le cambi di nuovo e alla fine, dice Einaudi, "tutto diventa troppo complicato e nessuno riesce più a cavarci i piedi e quindi conviene continuare a pestare l'acqua nel mortaio delle riforme urgenti o organizzare adunate e convegni sulle politiche?"</i></p> <p><i>[...]</i>  <i>Vinceremo la battaglia democraticamente solo quando questi temi diventeranno maggioritari, sembra una tautologia ma in realtà è l'indicazione di una direzione politica, che non è verso cui ci stiamo muovendo adesso.</i></p> <p>(Interviewee#15)</p>
<p><i>It seems to me that there is a big difference between the UK and Italy in this sense, namely that in the United Kingdom the institutions have a mandate and have objectives that they pursue regardless of political changes.</i></p>	<p><i>A me pare che ci sia una grande differenza tra UK e Italia in questo senso, cioè che nel Regno Unito le istituzioni hanno un mandato e hanno degli obiettivi che perseguono indipendentemente dai cambiamenti politici.</i></p> <p>(Interviewee #5)</p>

## Climate Science

<p><i>All in all, I think that the uncertainty we have about climate is much lower than the uncertainty we have in many other sectors that have an influence on our choices, on our policies. That is, let's take the example of the economy, no one is able to make a reliable projection or forecast on what interest rates or employment will be in the next 10 years. On the other hand, we are able to say with high certainty the fact that sea level will rise by 2 mm per year for the next 10 years, more or less this. I find it a bit of a reversal of the narrative, in the sense that while we often hide behind this thing of uncertainty, obviously there is uncertainty, there are many things that we don't know yet, but there is also a lot of certainty so that this knowledge can have an impact and should have an impact on our choices and should not be ideological, that is</i></p>	<p><i>Penso tutto sommato che l'incertezza che abbiamo sul clima sia molto più bassa dell'incertezza che abbiamo in tanti altri settori che hanno un'influenza sulle nostre scelte, sulle nostre policy. Cioè facciamo l'esempio del dell'economia, nessuno è in grado di fare una proiezione o una previsione affidabile su quelli che saranno i tassi di interesse o l'occupazione nei prossimi 10 anni. D'altro canto siamo in grado di dire con un'alta certezza il fatto che il livello del mare salirà di 2 mm l'anno per i prossimi 10 anni, più meno questo. Io trovo che sia un po' un ribaltamento della narrativa, nel senso che mentre spesso ci si nasconde dietro questa cosa dell'incertezza, ovviamente esiste l'incertezza, ci sono tante cose che non sappiamo ancora, però esiste anche molta certezza per cui questa conoscenza può avere un impatto e dovrebbe avere un impatto nelle nostre scelte e non dovrebbe essere ideologico, questo è.</i></p> <p>(Interviewee #7)</p>
<p><i>But as scientists in my opinion we have evidence on what the current state of things is and fairly robust evidence on what will happen in the future depending on some choices. And those are Constrains, they are fixed points that any politician has to deal with.</i></p> <p>[...]</p>	<p><i>Però come scienziati secondo me noi abbiamo delle evidenze su quello che è lo stato attuale delle cose e delle evidenze abbastanza robuste su quello che succederà in futuro a seconda di alcune scelte. E quelli sono dei Constrains, sono dei punti fissi con cui qualsiasi politico deve fare i conti.</i></p> <p>[...]</p>

<p><i>The evidence is what it is and anyone, whether on the right or left or in the center or any other possible alignment, will have to deal with reality</i></p>	<p><i>Le evidenze sono quelle che sono e chiunque, che sia di destra o di sinistra o di centro o di qualsiasi altro schieramento possibile dovrà fare i conti con la realtà.</i></p> <p>(Interviewee #14)</p>
<p><i>Scientific ideas are strengthened with consensus, consensus around the idea that current climate change is anomalous compared to the past, accelerated and homogeneous, distributed throughout the world and that it depends on sapiens, this consensus is around 97-98%, that is, those who write about the causes of climate change are basically a homogeneous scientific community. This has been the case for some time now, at least since 2010-2011. From that moment on, the consensus has grown a lot because the phase of discussion of published articles has been overcome and therefore there is the phase of consensus until new data arrive which, however, for now only corroborate this reconstruction, so there is no other position scientifically, there is only this.</i></p>	<p><i>Le idee scientifiche si irrobustiscono con il consenso, il consenso attorno all'idea che il cambiamento climatico attuale sia anomalo rispetto al passato, accelerato e omogeneo, distribuito su tutto il mondo e che dipende dai sapiens, questo consenso è intorno al 97-98%, cioè chi scrive di cause del cambiamento climatico è fondamentalmente una comunità scientifica omogenea. Questo già da un po' di tempo, almeno dal 2010-2011. Da quel momento in poi il consenso è cresciuto moltissimo perché è stata superata la fase della discussione degli articoli pubblicati e quindi c'è la fase del consenso fino a che non arrivano nuovi dati che però per adesso corroborano solo questa ricostruzione, quindi non esiste un'altra posizione scientificamente, c'è solo questa.</i></p> <p>(Interviewee #17)</p>
<p><i>The transfer of scientific research into the practice of the ministry or the regions is not only very slow, but is influenced by such a number of lobbying elements that in the end it gets a little lost.</i> [...]</p>	<p><i>Il trasferimento delle ricerche scientifiche nella pratica del ministero o delle regioni non solo è molto lento, ma è influenzato da un tale numero di elementi di tipo lobbistico che alla fine si perde un po'.</i> [...]</p>

<p><i>I have the feeling that the role of science is marginal for the Italian government, that science is involved a posteriori, after events have happened.</i></p>	<p><i>Io ho la sensazione che il ruolo della scienza sia marginale per il governo italiano, che venga coinvolta la scienza a posteriori, dopo che sono successi gli eventi.</i></p> <p>(Interviewee #5)</p>
<p><i>The struggle in Italy to accept supervision or one's own monitoring and to see it as a help, but in many environments. I come from the world of training and education, I have been used to experiencing supervision as something positive, while here you live a lot as they are controlling me. And this is also a cultural attitude that should, how to say, be put aside to seize the opportunities. That is, who is an expert Let's listen to him</i></p>	<p><i>La fatica in Italia ad accettare la supervisione o il proprio monitoraggio e a vederlo come un aiuto, ma in tanti ambienti. Io vengo dal mondo della formazione e dell'educazione sono stata abituata a vivere la supervisione come un qualcosa di positivo, mentre invece qui si vive molto come mi stanno controllando. Ed è anche questo un atteggiamento culturale che andrebbe, come dire, si è messo da parte per coglierne le opportunità. Cioè chi è esperto Ascoltiamolo.</i></p> <p>(Interviewee #18)</p>

### The value of a systemic approach

<p><i>Now it doesn't seem to me that in recent years this concept is so present, but perhaps it is a model that could be considered, let's call it that, but given the urgency of climate change it could be "Climate in all policies".</i></p> <p>[...]</p> <p><i>In a few, countries such as the UK or others, it has been shown that, with systemic interventions, but feasible interventions, it is possible to reduce emissions enough.</i></p>	<p><i>Ora non mi sembra che in questi anni questo concetto sia così presente, ma forse è un modello che si potrebbe considerare, chiamiamolo così, ma data l'urgenza del cambiamento climatico potrebbe essere "Climate in all policies".</i></p> <p>[...]</p> <p><i>In pochi, paesi tipo UK o altri, si è dimostrato che, con interventi di sistema, però interventi fattibili, si riescono a ridurre abbastanza le emissioni.</i></p>
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<p><i>While in Italy there is always this difficulty of not thinking systemically. Science is also very departmental, it does not have a systemic culture.</i></p> <p><i>[...]</i></p> <p><i>In short, we should think systematically, industry, transport, agriculture.</i></p>	<p><i>Mentre in Italia c'è sempre questa difficoltà di non pensare in modo sistemico. Anche la scienza è molto a dipartimenti, non ha una cultura sistemica.</i></p> <p><i>[...]</i></p> <p><i>Insomma si dovrebbe pensare sistematicamente, industria, trasporto, agricoltura.</i></p> <p><i>(Interviewee #13)</i></p>
<p><i>In the approach followed by England on climate change issues, in particular the transition, decarbonization, there they organized round tables sector by sector. Not here! So we do not deal with complex problems in a systematic and complex way, instead trying to solve very complex, very complex issues extemporaneously. For this reason, I contextualize the idea that the sustainability of the 17 goals of the Agenda is a way to water down the problem, but it is a way to address it by taking on the complexity.</i></p>	<p><i>Nell'approccio seguito dall'Inghilterra sui temi del cambiamento climatico, in particolare la transizione, la decarbonizzazione, li hanno organizzato settore per settore tavole rotonde. Qui no! Quindi non affrontiamo in modo sistematico e complesso problemi complessi, cercando invece di risolvere estemporaneamente temi molto complessi, molto complessi. Per questo contesto l'idea che la sostenibilità dei 17 obiettivi dell'Agenda sia un modo per annacquare il problema, ma sia un modo per affrontarlo facendosi carico della complessità.</i></p> <p><i>(Interviewee #15)</i></p>
<p><i>For each measure that is presented, it should also be read from the point of view of the impact on the environment and sustainability and this is absolutely not done, so this is a fundamental point.</i></p> <p><i>[...]</i></p> <p><i>All the more reason for a scientific committee to be set up to</i></p>	<p><i>Per ogni provvedimento che viene presentato bisognerebbe anche leggerlo dal punto di vista della ricaduta sull'ambiente e sulla sostenibilità e questo non viene assolutamente fatto, quindi questo è un punto fondamentale.</i></p> <p><i>[...]</i></p>

<p><i>which I can rely and which explains to me what is happening and on this basis I can then initiate policies, policies to support the territory, the country and citizens.</i></p>	<p><i>A maggior ragione va istituito un comitato scientifico a cui mi posso affidare e che mi spiega quello che sta succedendo e su questa base posso poi avviare delle politiche, delle politiche siano a sostegno del territorio, del paese e delle cittadine e cittadini.</i></p> <p>(Interviewee #18)</p>
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Throughout the analysis conducted thus far, we have sought to reconstruct the roles of social actors in climate change. As mentioned in the first chapter (par. 1.5), the latter poses a fundamental threat to public and planetary health. In line with this, the qualitative analysis has primarily focused on the public representation of climate risk to health, aiming to understand whether it can influence collective climate action. Furthermore, we have sought to understand how institutional policies, particularly those related to adaptation, address the climate change–health nexus.

## **2.7. CLIMATE CHANGE IS A RISK FOR HEALTH: SCIENTIFIC DATA, PUBLIC UNDERSTANDING, AND GOVERNMENT ACTIONS**

At the beginning of the qualitative analysis, we discussed the growing public concerns and social actions regarding climate change, driven by an increasing perception of climate risks. Beck (2013, p.327) refers to this as the *performative nature of risk*. *The concept of risk characterises [therefore] a particular stage, intermediate between safety and destruction, where the perception of threatened risks determines thoughts and actions*. As modernity has emerged, risks have evolved from fatal and external, to which individuals felt passively exposed, into something that can be managed (Luhmann, 1996).

Along with this perspective, a higher perceived risk leads individuals to seek a more significant reduction of current risks and to push for stricter regulations to achieve the desired decreased risk (Slovic, 2000). We have already argued that reflection around the co-benefits of ecological transition, especially for health, significantly strengthens social and political commitment to tackle climate change. Given the existential threats to human health posed

by climate change, we question whether the risk perspective can also enhance individual and social willingness to act (O'Connor et al., 1999). Unambiguous scientific data on health risks associated with climate change emerged from the qualitative analysis.

### Scientific evidence on climate-related health risk

*Climate change itself is expected to have lots of different implications on health, and some examples are that the warming underlying warming trend caused by climate change is expected to result in more intense and more frequent heat waves, and that is potentially fatal for some people. Obviously there are also physical health threats from other elements of climate change, like extreme weather, flooding, loss of homes, the physical danger that comes from increased intensity, weather events, and so on. There are also potential health impacts, like malnutrition and starvation, that come from crop failures that could result from agricultural droughts and crop heat stress, both of which are estimated to increase as temperatures get warmer, so all of those physical impacts of climate change are relatively well understood. There's huge uncertainty around the extent and frequency of them, but nevertheless, they are risks to people in many different parts of the world. There's also a large mental health burden of climate change.*

*(Interviewee #1)*

<p><i>Yeah, I chair advisory Committee or Review Committee or something for the health and climate change from the UK and there, these top health academics really view this climate change as the biggest threat to health in the future. They said that with 2° warmer, essentially, the human body cannot cool itself. They use an American military version of the temperature. But if that temperature gets above 35, it takes account of the humidity as well as the temperature. And if it gets above 35, the human body cannot cool and the projections are that will happen for significant times. In parts of China, India, you know, people will not be able to work essentially.</i></p> <p>(Interviewee #4)</p>	
<p><i>The idea of the exposome, which also includes climate change, is that we have to get out of a certain simplistic approach to the environment in which one chemical was considered at a time, for example, and instead we have to adopt an approach that considers the whole life course. Look at all exposures, because we are exposed to tens of thousands of chemicals in the environment and they interact with each other in ways we don't know, so we need to have a more systemic approach and perhaps the term systemic is the one that most characterizes the exposome and what we need to do about disease risks. Systemic is a key word.</i></p>	<p><i>L'idea dell'esposoma, che include anche il cambiamento climatico, è quella che dobbiamo uscire da un certo approccio semplicistico all'ambiente in cui si considerava una sostanza chimica per volta, per esempio, e dobbiamo invece adottare un approccio che considera tutto l'arco della vita, cioè il life course. Considera la totalità delle esposizioni, perché noi siamo esposti a decine di migliaia di sostanze chimiche nell'ambiente e queste interagiscono fra di loro in modi che non conosciamo, quindi dobbiamo avere un approccio più sistemico e forse il termine sistemico è quello che più caratterizza l'esposoma e quello che dobbiamo fare nei confronti dei</i></p>

	<p><i>rischi di malattia. Sistemico è una parola chiave.</i></p> <p>(Interviewee #5)</p>
<p><i>Health comes up often, if only because I think since 2003 with the heat wave in France, Spain and Italy it has become a theme, a fairly popular theme perhaps not the right word but certainly a topic of interest for the scientific community, so there are various European programs that look at the connection between health and climate change, Starting above all with heat waves and the impact that heat waves have on health. (Heat stress, ndr.) has an impact on our health that is measurable. That is, a curve can be drawn that represents the risk as a function of the increase, of the thermal stress. And this in the short term. If we look at it a little further, there is an even more worrying aspect of the fact that already now, in some parts of the Tropic, especially in the humid tropics, we are close to a climatic condition, in which physically our body cannot cool down, that is, there is no physical mechanism that allows us to maintain the body temperature at 37 ° and practically this means that in these areas, which already exist at some times in some areas of the planet, in these areas it is physically impossible to live without air conditioning. No, then that becomes an existential risk.</i></p>	<p><i>La salute esce spesso, se non altro perchè penso a partire dal 2003 con l'ondata di calore in Francia, Spagna e Italia è diventata un tema, un tema abbastanza popolare forse non è la parola giusta però certo un tema di interesse per la comunità scientifica, per cui esistono vari programmi europei che guardano alla connessione tra salute e cambiamento climatico, partendo soprattutto dalle ondate di calore e l'impatto che le ondate di calore hanno sulla salute. (Lo stress termico, ndr) ha un impatto sulla nostra salute che è misurabile. Cioè si può disegnare una curva che rappresenta il rischio come funzione dell'aumento, dello stress termico. E questo a breve termine. Se lo guardiamo un po' più in là, ci sta un aspetto ancora più preoccupante del fatto che già adesso, in alcune parti del Tropico, specialmente dei tropici umidi, siamo vicini a una condizione climatica, in cui fisicamente il nostro corpo non si può raffreddare, cioè non esiste il meccanismo fisico che ci permetta di mantenere la temperatura del corpo a 37 ° e praticamente questo vuol dire che in queste zone, che già esistono in alcuni momenti in alcune aree del pianeta, in queste zone è fisicamente impossibile vivere, senza aria condizionata. No, allora quello diventa un rischio esistenziale.</i></p>

	(Interviewee #7)
<p><i>Climate change is absolutely an ecological determinant of health, whose impacts will manifest clearly along the social gradient in health.</i></p> <p>(Interviewee #12)</p>	

Some respondents noted that the scientific consensus on climate-related health risks was not adequately communicated to the public. Communication is a fundamental element in shaping perceptions of risk, as it is essential per se for influencing behaviour (Watzlawick et al., 2014). Thus, for the interviewees, the slow and ineffective translation of data into public understanding limited social perceptions of risks, hindering a proactive collective response. This resulted in insufficient government action on climate change, which prevented adverse health outcomes.

### Ineffective translation of scientific data

<p><i>I think to your question around whether sort of public health concerns influence climate change policy directly, No.</i></p> <p>(Interviewee #1)</p>	
<p><i>Climate change and incidentally, air pollution, which is an enormous effect on people's health as well, both come from the same issue, and that is the use of fossil fuels. So, the one biggest step that can be taken is the removal of fossil fuels from basically our use.</i></p> <p><i>[...]</i></p> <p><i>Of course, the health consequences of a world that is more than 2° warmer than it was in pre-</i></p>	

<p><i>industrial times are going to be really significant. So, we need to work much harder to preempt these problems and invest in transition.</i></p> <p>(Interviewee #3)</p>	
<p><i>I think certainly here in the UK, although there is an increased understanding of the potential impacts of climate change on citizen health, there still is not a sufficient understanding of the critical timelines which are involved. As a consequence, I think that there is insufficient action being taken by the government to achieve the reduction in the temperature increase that is before us. Therefore, one potential solution to this is an improved understanding of the link between CO2 emissions, climate change, heat impact, and human health. So therefore, the citizens can demand change and faster change. So, I think it's until the government is pushed further, we probably will not act faster.</i></p> <p>(Interviewee #8)</p>	
<p><i>And so I would say the nature of the scientific evidence available to us in climate and health to be able to provide the type of evidence needed for policy, is weak and requires a lot of translation in order to be usable.</i></p> <p><i>[...]</i></p> <p><i>One of the challenges broadly is that it is not a field that has a, the climate field in general, less so on the health side, but the climate field, in</i></p>	

<p><i>general, does not have a strong culture of evidence synthesis.</i></p> <p>(Interviewee #12)</p>	
<p><i>The idea that climate change affects health is beginning to make headway, for example, in the national prevention plan, in some sectors of the ministry, the population and so on. What are the intermediate links in the causal chain is not clear, it is clear to few and therefore also what initiatives to take.</i></p>	<p><i>L'idea che il cambiamento climatico influisce sulla salute comincia a farsi strada per esempio nel piano nazionale della prevenzione, in alcuni settori del ministero, della popolazione e così via. Quali siano gli anelli intermedi nella catena causale non è chiaro, è chiaro a pochi e quindi anche quali siano le iniziative da prendere.</i></p> <p>(Interviewee #5)</p>
<p><i>I work a lot in situations where decision-making processes take place and where public health instances, evidence, information, data enter or should enter, we try to get them into this process as much as possible. Climate change has taken on increasing prominence in recent decades; As I think we will discuss soon, the public health aspect has arrived, it is there, but it is a late entry in a certain sense and still, in our view, it is insufficient, we need more public health consideration in the global debate and in global decisions on the climate crisis</i></p>	<p><i>Lavoro molto in situazioni in cui i processi decisionali hanno luogo e dove le istanze di sanità pubblica, le evidenze, le informazioni, i dati entrano o dovrebbero entrare, cerchiamo di farli entrare il più possibile, in questo processo. Il cambiamento climatico in questi decenni ha assunto una preminenza sempre maggiore; come penso discuteremo presto, l'aspetto di salute pubblica è arrivato, c'è, ma è un ingresso tardivo in un certo senso e ancora, a nostro modo di vedere, è insufficiente, ci vorrebbe più considerazione di sanità pubblica nel dibattito globale e nelle decisioni globali sulla crisi climatica.</i></p> <p>(Interviewee #13)</p>
<p><i>And I think the increasingly clear link between planetary health and human health is an area that is</i></p>	

<p><i>just not one to be ignored. And if you train up to be a doctor, like I did in the 1990s, and, you know, we've had to think and learn about that a bit more.</i></p>	
<p>(Interviewee #10)</p>	

The UK and Italian interviewees argue that the challenge of translating scientific evidence into political commitment impacts the policy-making process concerning the systematic addressing of the climate change-health nexus.

To address this issue, in 2022, the UK established the Centre for Climate and Health Security (CCHS), a division of the UK Health Security Agency (UKHSA) Science Group, led by Lea Berrang Ford, one of the interviewees. The CCHS has an institutional obligation under the national adaptation programme established by the Climate Change Act to furnish the public and the government with synthesis reports on scientific evidence regarding the impacts of climate change on public health. The research process is modelled closely on the IPCC reports, which primarily focus on gathering existing evidence, consolidating it, and enhancing its policy relevance. The Centre collaborates with various governmental departments, academic partners, and local authorities.

Although UK institutions acknowledge the need to tackle the connection between climate change and health comprehensively, the Italian framework encounters significant limitations due to fragmented legislation.

### **2.7.1. ADDRESSING THE CLIMATE CHANGE-HEALTH NEXUS: A CHALLENGE FOR THE ITALIAN LEGISLATION**

In 2024, we conducted exploratory research within the X (formerly XII) Committee of the Italian Senate, which is responsible for health and social affairs. We analysed the legislative acts, draft-law included, from 1948 (I legislature) to the present (XIX) to understand whether and to what extent health legislation was oriented towards a holistic approach, which included its environmental and climatic determinants; what we might today refer to as One Health (Gibbs, 2014; Queenan et al., 2017). The research revealed that such a perspective is virtually absent. Between the 1960s and 1990s, only a handful of inconsistent measures were implemented to address air pollution. These actions primarily stemmed from the need to react to emergencies, such as the

hazardous substance releases from industrial sites, highlighted by the unfortunate incidents at ICMESA in Seveso and ILVA Taranto. The same emergency rationale guided the X Committee's sole climate-related action, Law No. 127/2023. This law was designed to safeguard agricultural workers from the heatwaves that affected Europe and Italy in 2023, resulting in more than 60,000 fatalities (Ballester et al., 2023).

The reactive nature of the measures just analysed suggests that the Italian legislator has not fully embraced the logic of health promotion, which involves a systematic approach to its determinants to strengthen the resilience and well-being of individuals (Guidi, Caponetto, Ardis, 2019).

The interviewee's Italian representation aligns with the research findings. All respondents argued that a systemic strategy connecting health and climate change is lacking, as it is primarily oriented towards individual concerns. They identified two significant constraints. The first concerns the lack of a cohesive legislative framework recognising the connections between health and environmental committees and ministers. The second stems from Italian localism and regionalism, which have already been addressed in the previous section and obstruct effective environmental and health responses. Additionally, the interviewees argue that the role of the National Health Service (NHS) should be reconsidered to enhance a systematic approach to public health.

### The Italian framework on the climate change-health nexus

<p><i>In Italy there is this big problem of regionalism, so there is continuous negotiation between the central government and the regions through the State-Regions Conference. Speaking of evidence, acquisition of evidence and political action, I do not know if you know that the northern regions, that is, Lombardy, I do not know if Piedmont, Veneto, Emilia Romagna, these four, do not want to adopt the new European directive on air pollution, to reduce particulate matter. So localism, which in my opinion could have been predicted many years ago, populism-localism, are actually</i></p>	<p><i>In Italia c'è questo grosso problema del regionalismo, per cui c'è una continua contrattazione tra Governo centrale e Regioni attraverso la Conferenza Stato-Regioni. A proposito di evidenza, di acquisizione dell'evidenza e azione politica, non so se sa che le regioni del nord, cioè Lombardia, non so se anche Piemonte, Veneto, Emilia Romagna, queste quattro, non vogliono adottare la nuova direttiva europea sull'inquinamento atmosferico, ridurre il particolato. Quindi il localismo, cosa che secondo me si poteva prevedere molti anni fa, populismo-localismo,</i></p>
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*extremely regressive from the point of view of the environment and therefore also of health.*

*[...]*

*Being a doctor of the health environment, I wanted the Ministry of Health and the National Health Service to pronounce on climate change, health impacts, co-benefits and collaborate with the Ministry of Ecological Transition. In reality, none of this happened, partly because there was Covid that absorbed the energies of the Ministry of Health, the Minister, the technicians, etc. Partly because there is a cultural issue, i.e. climate change in the Ministry of Health is not yet perceived as a problem within its competence and therefore neither is the collaboration with the Ministry of Ecological Transition.*

*[...]*

*It seems to me that everything is very patchy. This is the first consideration and the second consideration is that often the trigger for the change of ideas or choices is made up of personal cases, so there can be an awareness when pathologies occur in the family, etc., etc., but otherwise as a collective and political problem it is not grasped.*

*sono in realtà estremamente regressivi dal punto di vista dell'ambiente e quindi anche della salute.*

*[...]*

*Essendo io medico di ambiente sanitario volevo che il Ministero della Salute e il Servizio Sanitario Nazionale si pronunciasse sul cambiamento climatico, sugli impatti sulla salute, sui co-benefici e collaborasse con il Ministero della Transizione Ecologica. In realtà non è successo niente di tutto questo, un po' perché c'è stato il Covid che ha assorbito le energie del Ministero della Salute, del Ministro, dei tecnici, eccetera. In parte perché c'è una questione culturale, cioè il cambiamento climatico nel Ministero della Salute non viene ancora percepito come un problema di sua competenza e quindi neanche la collaborazione con il Ministero della Transizione Ecologica.*

*[...]*

*Mi sembra che sia tutto molto a macchia di leopardo. Questa è la prima considerazione e la seconda considerazione è che spesso il trigger nei confronti del cambiamento delle idee oppure delle scelte è costituito da casi personali quindi ci può essere una sensibilizzazione nel momento in cui si verificano delle patologie nella famiglia eccetera eccetera ma altrimenti come problema collettivo e politico non viene colto.*

*(Interviewee #5)*

<p><i>I believe it is a public health duty to address climate change and sustainability on all fronts. Undoubtedly, adaptation is the most immediate, the most natural, in the sense that one of our key words here (at the Istituto Superiore di Sanità, ed.) is primary prevention, so primary prevention in the field of environment, climate and health has many paths.</i></p> <p><i>[...]</i></p> <p><i>Unfortunately, however, they did not teach me so much the methodology for systemic work. In public health I would say no. I remember that in these days we are also busy in Italy, we were discussing with the European Commission, the infringement procedure on ILVA in Taranto. So yes, even there the discourse is at a fairly limited level to the case at hand, let's say. This systemic reasoning does not exist, so they look at the object of the dispute if they have completed technological improvement works and then ask what the health impacts are.</i></p>	<p><i>Penso sia un dovere della sanità pubblica occuparsi del cambiamento climatico e della sostenibilità su tutti i fronti. Indubbiamente l'adattamento è quello più immediato, più naturale, nel senso che una delle nostre parole chiave qui (all'Istituto Superiore di Sanità, ndr) è prevenzione primaria, quindi prevenzione primaria in campo di ambiente, clima e salute ha moltissime strade.</i></p> <p><i>[...]</i></p> <p><i>Purtroppo però non mi hanno tanto insegnato la metodologia per il lavoro sistemico. In sanità pubblica direi proprio di no. Ricordo che in questi giorni siamo anche impegnati nell'Italia, stavamo discutendo con la Commissione Europea, la procedura di infrazione sull'ILVA di Taranto. Quindi sì, anche lì il discorso è a un livello abbastanza circoscritto al caso di specie, diciamo. Questo ragionamento sistemico non c'è, quindi si guarda nell'oggetto del contendere se hanno completato delle opere di miglioramento tecnologico e poi chiedono quali sono gli impatti di salute.</i></p> <p><i>(Interviewee #13)</i></p>
<p><i>The discourse on health is different, the implications on health are instead typically left to the member countries, Europe's power is little and here all the Italian delay is emerging, in the sense that, after years and years of great results due to the national health service, today it is a defunded, weakened national</i></p>	<p><i>Diverso è il discorso sulla salute, le implicazioni sulla salute sono invece tipicamente lasciate ai paesi membri, è poco il potere dell'Europa e qui sta emergendo tutto il ritardo italiano, nel senso che, dopo anni e anni di grandi risultati dovuti al servizio sanitario nazionale, oggi è un servizio sanitario nazionale</i></p>

<p><i>health service, with very demotivated health workers, poorly paid. So on the environment we have to follow European legislation and work there, on health we have to work at national level.</i></p> <p><i>[...]</i></p> <p><i>It is clear that, I repeat, if we had a reference law and this law also dictated organisational rules, because it is clear that the administrations are different, but the administrations in Italy are the regional one for health, the municipal one for social and the national or even international one for the environment, so clearly there are three jurisdictions.</i></p>	<p><i>definanziato, depotenziato, con operatori sanitari molto demotivati, mal pagati. Quindi sull'ambiente noi dobbiamo seguire la legislazione europea e lavorare lì, sulla sanità dobbiamo lavorare a livello nazionale.</i></p> <p><i>[...]</i></p> <p><i>È chiaro che, ripeto, se noi avessimo una legge di riferimento e questa legge dettasse anche delle regole organizzative, perché è chiaro che le amministrazioni sono diverse, ma le amministrazioni in Italia sono quella regionale per la salute, quella comunale per il sociale e quella nazionale o addirittura internazionale per l'ambiente, quindi chiaramente sono tre giurisdizioni.</i></p> <p><i>(Interviewee #14)</i></p>
<p><i>The fact that there is a separation of the issues, as if dealing with the environment, does not also mean doing prevention on health. But you have the Environment Commission and the Health Commission and they are not two places that dialogue, they are forced by some mechanism to interact.</i></p> <p><i>[...]</i></p> <p><i>Yes, there are joint hearings, but there is still a separation, so there is still one committee that dominates over the other concerning a measure that arrives.</i></p>	<p><i>Il fatto che c'è una separatezza dei temi come se appunto occuparsi di ambiente non volesse dire anche fare prevenzione sulla salute. Però c'hai la Commissione Ambiente e la Commissione Salute e non sono due luoghi che dialogano, sono costretti da qualche meccanismo a interagire.</i></p> <p><i>[...]</i></p> <p><i>Sì, le audizioni comuni ci sono, però rimane una separatezza, per cui c'è comunque una commissione che domina sull'altra rispetto a un provvedimento che arriva.</i></p> <p><i>(Interviewee #18)</i></p>

Analysing the Italian scenario reveals that the health framework is significantly shaped by a lack of a systemic and cross-sectoral approach, which overlooks the importance of controlling environmental and climatic determinants through health promotion in attaining holistic health.

However, health promotion is crucial for personal and social adaptation to current or anticipated climate and environmental change scenarios (WHO, 2023). Thus, a holistic perspective on health is essential for enabling the adaptive capacity to cope with transition processes.

From the interviewees' representations, it appears that the Italian public health sector should primarily focus on adaptation, which is typically carried out through prevention plans; none mention the health promotion perspective. However, according to the interviewees' representation, institutions face challenges in delivering adaptation solutions, which we will address in the next section.

## **2.8. CLIMATE CHANGE ADAPTATION: THE MITIGATION “POOR RELATIVE”**

Since its initial definition in 2001 by the IPCC (see Chapter 1, paragraph 1.2.1), climate change adaptation has come to encompass various interpretations, ranging from minor technical adjustments to significant policy decisions. (Falzon, Sen, 2024).

Unlike the strict definition of mitigation, adaptation remains open-ended, primarily relating to what an adjustment process entails. The lack of clarity created significant financial challenges, hindering institutional policymakers from effectively implementing necessary adaptation measures (Levina and Tirpak, 2016). Moreover, many countries struggle to find universal indicators for assessing whether and how their adaptation measures contribute to their objectives of bolstering their resilience to climate change. This challenge primarily stems from the difficulty of establishing a causal relationship between adaptation actions and reduced climate risks (OECD, 2024b). Considering all of these factors, adaptation has been defined as mitigation's “poor relative” (Zhao et al., 2018; Yule et al., 2023).

This perspective fits with the interviewee's representations of the institutional adaptation framework. The UK respondents argue that, despite the crucial role of adaptation in benefiting public health, the public debate on this issue is very scarce. They discuss the residual nature of adaptation in relation to mitigation. This primarily stems from the financial shortfall in the private sector

and the lack of a legally binding commitment for adaptation, given the subordinate position of the Adaptation Sub-Committee to the CCC and the challenges associated with monitoring adaptation progress. Additionally, its decision-making process is more complex than the mitigation side, involving multiple governmental sectors. However, they contend that incremental adaptation measures could be valuable.

The Italian respondents highlight further constraints in delivering effective adaptation strategies. The first is that while mitigation is a centralised concern, adaptation generally falls to local authorities and different government departments, complicating decision-making. Moreover, they argue that increasing climate change primarily requires mitigation efforts from governments; otherwise, adaptation options would be useless.

### Adaptation VS Mitigation

*There's a role for public policy in addressing climate change in terms of adaptation, both short term and long term to many of the consequences of climate impacts that I just described. So, things like building sea walls to lessen the risk of flooding, things like adapting buildings so that they reflect more heat. Or perhaps they have air conditioning or cooling properties.*

*[...]*

*I think there is very little conversation in the UK about adaptation. The first conversation I was really aware of in broad national media about adaptation was last year. We had a three or four-day period of very, very hot temperatures, almost 40°C in the UK in mid-July last year, so mid-July 2022. There were a few media stories about the need for adaptation to climate change, whether that was, you know, more reflective buildings or how you manage the heat in your building*

<p><i>through closing blinds and curtains and windows and so on, how to keep yourself cool and hydrated and so on. And so, I think that people will become aware, and there's a role for the Government to help make them aware that adaptation strategies are likely to protect their physical and mental health in a lot of different ways. But until that point, I would say that the discussion on adaptation in the UK is quite poor and therefore yeah, I would expect I can't say authoritatively, but I would expect there to be very little expectation in institutions' ability or track record in delivering effective adaptation in response to climate change in the UK.</i></p> <p>(Interviewee #1)</p>	
<p><i>When you look at adaptation, actually, there are more people involved in it and that's because when you're adapting to something you're solving a problem that exists at the moment or predicting it to exist. And that's been something that we've been doing in Department of Environment Rural Affairs for many years. We have been doing it in the Department for Health for many years, reacting to things. So, I think that's where from a government perspective, it becomes a bit more complicated because there are already investments in adaptation and so the lines of decision-making manifest themselves in lots of different places. Whereas for</i></p>	

<p><i>mitigation, the decision chain is a bit easier to understand.</i></p> <p>(Interviewee #3)</p>	
<p><i>I think it doesn't get you any headlines if you're stopping a flood. You don't get any rewards for that if you're actually doing something headline, which says that we're getting this much wind energy now, and that's actually what gets more positive headlines. Adaptation is very difficult to make a headline out of to make it a favorite child for governments. It's not good news, and to a certain extent the adaptation and mitigation should be handled together anyway.</i></p> <p>(Interviewee #4)</p>	
<p><i>We haven't been so successful with adaptation. We don't have the same authority as a Committee. The adaptation committee is officially a sub-committee of our committee, so it's not so important or powerful. So, the government doesn't care so much about it. Well, because they do not have to respond to parliament. So, they don't have the same parliamentary oversight that we have. So, I think the government just had to publish a report in response to the adaptation committee. However, for our committee, the government's response had to be scrutinised by the parliament. So, the mitigation policy gets scrutinised by parliament, but adaptation might not.</i></p>	

<p><i>[...]</i>  <i>There's also responsibility very peak in the Ministry, the Department of Environment, Agriculture and Fishery, which is probably one of the weakest ministerial governments. It's not a job that anyone wants.</i></p> <p>(Interviewee #9)</p>	
<p><i>The financing gap for adaptation is much bigger than it is for mitigation. And it's partly because adaptation is a public good. And it is much more difficult to get private money to leverage it up around adaptation than it is for mitigation. And so that's why it is, it involves public sector expenditure. And that has been, that has been more difficult to get going where you can do electronic market reform, you can set in place an incentive structure and the private money just falls into it. It's just a completely different culture.</i></p> <p>(Interviewee #11)</p>	
<p><i>Notably, while the UK does have a legally binding target on mitigation, there are no legally binding targets on adaptation. That's significant. Very few people imagine it's feasible to have legally binding adaptation targets. So, it's more of legislation, sort of, you know, different flowers growing in the legislation. I think it's quite significant that adaptation is difficult to track, and it means having something legally binding. Becomes harder. Yeah, the</i></p>	

<p><i>legislative landscape of adaptation is probably very different from mitigation.</i></p> <p>(Interviewee #12)</p>	
<p><i>I think at an individual level, the major benefit will be life will continue as normal and people will not be forced to change many aspects of their activity. Be that where they go on vacation, as a simple example, be that the foods that are available for them to purchase in their local supermarket. So, it's a maintenance of normal activity and without needing to go through enormous steps of adaption.</i></p> <p>(Interviewee #10)</p>	
<p><i>One of the problems with adaptation, in my opinion, is the fact that while mitigation is a typically global problem, adaptation is an essentially local problem. So adaptation strategies are typically diversified and quite patchy. [...]</i></p> <p><i>However, let the consequences be clear and we must always take into account that if we decide to slow down the transition to net zero and wait longer, well, we should do more on the subject of adaptation.</i></p>	<p><i>Uno dei problemi sull'adattamento, secondo me, è il fatto che mentre la mitigazione è un problema tipicamente globale, l'adattamento è un problema essenzialmente locale. Per cui le strategie di adattamento sono tipicamente diversificate e abbastanza a macchia di leopardo. [...]</i></p> <p><i>Però, che siano chiare le conseguenze e bisogna sempre tenere in conto che se decidiamo di rallentare la transizione verso il net zero e aspettare più lungo, beh, dovremmo fare di più sul tema dell'adaptation.</i></p> <p>(Interviewee #7)</p>

<p><i>So, on adaptation it is naturally fine to study adaptation strategies, but these adaptation strategies make sense if they are done together with a strategy of zero climate-changing emissions, that is, to say that you adapt to a certain regime, you do it because you think that climate change will add up plus 1.5 degrees in the near future and oh well do your thing to adapt to this. Instead, if you do nothing, you risk those degrees being reduced to 4 or 3, and you have made strategies for one and a half; it certainly does not work like that. Therefore, they should, in any way, push towards mitigation coupled with addressing the causes. You can plant more trees and conserve whales, but you don't have to give more money to the coal companies; you do not have to drill them anymore. The two go hand in hand. This story that we mythologise, what do you mythologise? It will not help if you do not also act on the causes.</i></p>	<p><i>Allora, sull'adattamento va bene naturalmente studiare delle strategie di adattamento, però queste strategie di adattamento hanno senso se vengono fatte insieme a una strategia di azzeramento delle emissioni climalteranti, cioè a dire che tu ti adatti a un certo regime, lo fai perché pensi che il cambiamento climatico arriverà a sommare più 1,5 gradi nel prossimo futuro e vabbè fai le tue cose per adattarti a questo. Invece, se tu non fai niente, rischi che quei gradi saranno 4 o 3 e tu hai fatto delle strategie per uno e mezzo, sicuramente non funziona così, quindi dovrebbero loro in ogni modo spingere verso una mitigazione accoppiata all'agire sulle cause. Puoi piantare più alberi, conservare le balene, ma non devi dare più soldi ai petrocarbonieri, non gli devi fare più trivellare, le due cose vanno di pari passi. Questa storia per cui noi mitighiamo, cosa mitighi? Non servirà se non agisci anche sulle cause.</i></p> <p>(Interviewee #17)</p>
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## 2.9. QUALITATIVE RESEARCH'S MAIN FINDINGS

In this final paragraph, we will synthesise the main findings of the qualitative analysis by referencing the nodes and sets developed using the NVivo software. This will help orient the second step of the quantitative analysis, which we will illustrate in Chapter 3.

### Climate change

Public awareness of climate change is steadily increasing. This is primarily due to the increasing frequency of disruptions caused by extreme weather events. Despite the long-term availability of scientific data, individual concerns and social responses have recently appeared. Three main factors contribute to the temporal misalignment: habitus, culture, and communication. Furthermore, the complexity of climate change constrains social actions. Further discussion on the opportunities for social transition is crucial for proactively enhancing public and institutional commitment to tackle climate issues. Health improvement, energy security, economic development and transgenerational equity are the most significant co-benefits of climate actions.

### **Socio-ecological Transition**

Although the transgenerational perspective provides valuable insights into seizing the opportunity presented by transitions for the benefit of future generations, governmental institutions are responsible for ensuring intra-generational justice in implementing transition processes. Equity, particularly in the health dimension, is crucial in addressing the trade-offs of climate and environmental actions. It avoids the uneven distribution of transition costs and the risk of maladaptation for the most vulnerable.

### **Role of social actors**

The multidimensional nature of climate change challenges achieving a shared understanding of the phenomenon, particularly regarding the roles and responsibilities that different social actors must assume. Governmental institutions play a crucial role in facilitating the transition process through legislation and financial instruments and in building public consensus around climate action. However, the complexity of climate issues necessitates polycentric governance, which involves engaging civil society and the business sector. Social movements and NGOs are vital to the government's advocacy in addressing the climate crisis, as seen in 2008 with the enactment of the UK Climate Change Act (CCA). Moreover, civil society can foster collective awareness through education and sensitisation, contributing to cultural and social change. The engagement of the business sector is also crucial, particularly regarding the willingness to transition to a low-carbon economy, which remains a topic of debate.

### **Trust and expectations**

There is a general distrust in the government's ability to pursue collective goals, mainly concerning climate and environmental targets. The primary

reason is that public expectations regarding the ability of institutional climate actions to address the climate crisis have been disappointing. Several significant factors have contributed to social disillusionment. The first is the ongoing licensing of fossil fuels, which moves away from climate and sustainability targets. The second is the government's short-term and ideological perspective, constraining systemic and strategic climate actions. The last is that the government failed to create social conditions that can cope with climate change. Trusted voices from science and academia may help rehabilitate the role of political institutions and enhance social commitment to climate action.

### **Evidence-based legislation**

Evidence-based climate legislation is crucial for strengthening the government's accountability in reaching climate and environmental targets, thereby increasing public trust. The institutional and legislative frameworks vary between the UK and Italy. The first has a solid scientific culture, which has driven the enactment of the CCA. Moreover, scientific data systematically informs the UK's climate action through the Climate Change Committee (CCC), a statutory body independent of executive power that advises and assesses the government's climate strategies. Even if climate deniers use the climate evidence's probabilism to support their ideological polarisation, science plays a growing role in shaping collective understanding. The legally binding feature of the Act enhances institutional commitment to reach climate targets. Conversely, the absence of a scientific and systemic approach significantly affected the Italian government's actions on climate change. The supranational nature of climate targets, deriving from the European Climate Law, complicates the effective implementation of climate actions. Further constraints arise from the absence of a centralised authority that fosters collaboration and communication among various government departments and different regions. This results in fragmented policies and uneven implementation. Moreover, the scientific approach is more residual and ideological than strategic.

### **Health**

There is a scientific consensus regarding the health risks associated with climate change. Ineffective data communication with the public has limited the social perception of risks, inhibiting proactive collective response. Moreover, the difficulty of translating scientific evidence into policy options has challenged governmental institutions to adopt a systemic and strategic approach. Recently, the UK has attempted to systematise the connection between scientific

evidence around the climate change-health nexus and the policy-making process by establishing the Centre for Climate and Health Security (CCHS). This governmental agency provides scientific evaluations of the effects of climate change on public health for the citizens and government. On the contrary, the lack of a systemic and holistic approach marks the Italian institutional frameworks. Disconnection among parliamentary commissions and regionalism limits governmental institutions from considering climate and environmental determinants in health policies.

### **Climate Adaptation**

Government institutions face significant constraints in delivering effective adaptation measures. The most relevant issue is the absence of universal indicators and legally binding adaptation commitments, particularly in the UK, given the Adaptation Sub-Committee's lack of accountability about the CCC's institutional mandate. Further limits arise from the challenge of involving private investments and the complexity of the adaptation decision-making process, which involves various departments and local authorities. In the UK, this has resulted in a limited commitment from the government to adaptation, unlike mitigation efforts, which have led to scarce discussion and expectations among citizens.

The theoretical framework discussed in the first chapter and the main findings of the qualitative exploratory analysis oriented the subsequent quantitative step of the empirical research. The next chapter will discuss this by illustrating the methodological process and presenting the results.

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**CHAPTER 3: THE SECOND STEP OF EMPIRICAL  
RESEARCH: A WEB SURVEY FOR CATCHING THE  
SOCIAL REPRESENTATION OF ITALIAN CITIZENS**



## **PREMISE**

This section will be devoted to the quantitative analysis we conducted through a web survey that targeted the Italian adult population. We will initially introduce the methodological note, describing the questionnaire structure and the administration procedure, the sampling technique, and the data analysis process (par. 3.1). Next, we will illustrate the results of the multivariate analysis by exploring the relationships between the variables used to measure the research dimensions and subdimensions, and the socio-demographic values (from par. 3.2. to par. 3.5.). Subsequently, we will delve into the step of verifying the research hypothesis (par. 3.6.). In the concluding section (par. 3.7.), we will delve into a comprehensive discussion of the research findings, focusing on both the qualitative and quantitative results. We will endeavour to combine the insights gathered from both the interviews and web survey data, emphasising shared patterns and inconsistencies, and connect them with the research theoretical framework.

### **3.1. QUANTITATIVE ANALYSIS METHODOLOGICAL NOTE**

In the quantitative step of the analysis, we conducted web survey research using a self-completed online questionnaire targeting Italian residents aged 18 years and older. We designed the questionnaire using *LimeSurvey* software. The first section of the questionnaire consists of 20 questions, 19 of which are closed-ended and one is open-ended. The items focus on the three interacting research dimensions: environmental, institutional and social. More precisely, items from one to six aim to measure climate change awareness and perception; items from seven to ten point on the role of institutions, especially government, in addressing climate change; items from eleven to seventeen focus on the health dimension and the adaptation issue; items eighteen and nineteen concern the social action. Finally, the last item attempts to assess the government's trust. In the second section, we requested socio-demographic data, including age, gender, educational qualification, city of residence, and affiliations.

The questionnaire underwent pre-testing from December 1st to 7th, 2024. This pre-test phase helps minimise measurement error and respondent burden, assesses whether respondents interpret the questions accurately, and ensures that the sequence of questions does not influence their answers (Martire, Parra, Cataldi, 2023).

The questionnaire was made available online from December 10, 2024, to March 10, 2025, in an anonymous format. After generating a questionnaire link, we forwarded it through emails and social media. The non-probabilistic technique uses snowball sampling (Coleman, 1958-1959). Initially, we identified potential respondents from the target population and asked them to complete the questionnaire. They also assisted in identifying other potential respondents we invited to complete the questionnaire. This sampling method can create biased samples because early participants might refer to others with similar traits or viewpoints. To overcome this, we varied and stratified the initial sample. The choice of this technique mainly relies on the practical constraints of acquiring a list of population members from which the sample can be drawn.

We collected a sample of 603 cases, of which 520 answered all the questions. The sample stratification is relatively satisfactory in terms of gender, age, educational level, and territoriality. However, we noted a higher frequency for specific socio-demographic values than others, mainly due to the sampling bias we just analysed. We will further delve into this aspect in the following paragraphs.

Once we had completed the data collection step, we began the codification process, which involved cleaning and preparing the data for analysis. Initially, the data was imported into Excel for a detailed review and organisation. To improve clarity, English translations were included for each survey item. Each question received a distinct variable label (for instance, CC\_Yes for “Do you ever think about climate change? [Yes]”) to facilitate more straightforward navigation of the dataset (see Appendix....). Following this, the questions were categorised into the three research dimensions. For each of them, we identified some sub-dimensions (Table 3.1).

**Table 3.1 - Research dimensions and sub-dimensions**

<b>Environmental</b>	<ul style="list-style-type: none"> <li>• Climate Change Awareness (CC_Awareness)</li> <li>• Climate Change Social representation (CC_Representation)</li> <li>• Climate Change Acceleration (CC_Accel)</li> <li>• Information on Climate Change (CC_Info)</li> <li>• Climate Change Responsibility (CC_Resp)</li> <li>• Role of Social Actors (Soc_Actors_Role)</li> </ul>
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<b>Social</b>	<ul style="list-style-type: none"> <li>• Climate Change Health Risk (CC_Health_Risk)</li> <li>• Perceived Public Health Risks from Climate Change (CC_HealthRisk_Public)</li> <li>• Perceived Own Health Risks from Climate Change (CC_HealthRisk_Own)</li> <li>• Government Health Promotion (Gov_Health_Promotion)</li> <li>• Government Climate Policies for Health Promotion (Gov_CCPolicies_HealthPromotion)</li> <li>• Climate Change Adaptation (CC_Adaptation)</li> </ul>
<b>Institutional</b>	<ul style="list-style-type: none"> <li>• Social Expectations from Governmental Action (Soc_Exp)</li> <li>• Government Policies &amp; Tools for Climate Action (Gov_Tools)</li> <li>• Government Trust (Gov_Trust)</li> <li>• Climate Citizens' Actions (CC_Action)</li> <li>• Climate Sacrifices (CC_Sacrifice)</li> </ul>

Source: own elaboration

After this step, the cleaned dataset was exported to SPSS for analysis. In SPSS, missing values were carefully identified, recognising that many were due to the survey's skip logic. Each variable was meticulously assigned the appropriate measurement type to ensure accurate data interpretation. Categorical variables were classified as nominal, representing distinct categories without inherent order. On the other hand, ordinal variables were classified using suitable rankings that reflect their ordered nature, allowing for a meaningful comparison between the different levels of these variables. This organised approach ensured the dataset was neat, comprehensible, and prepared for the data analysis.

In this latter step, we first conducted univariate analysis to explore the socio-demographic variables and investigate the response frequency to each questionnaire item. It was helpful to have a precise statistical dimension of the inquired phenomena. Next, we conducted a multivariate analysis to cross the socio-demographic values with the sub-dimensions variable. This process primarily aimed to determine whether and how socio-demographic traits might influence the sample's representation about the research dimensions.

Finally, we employed bivariate analysis to examine the relationship between two specific relevant variables and test the research hypotheses. For this inquiry, we also applied the Pearson Chi-Square test (Pearson, 1900), which is commonly used in statistical research on random samples to verify if

the association between two categorical variables are statistically significant. Once we had completed the data elaboration, we prepared an analysis report that highlighted the main findings of the empirical process, which we will present in the following paragraphs.

### 3.2. PRELIMINARY INSIGHT FROM THE SOCIO-DEMOGRAPHIC DATA

The socio-demographic values were the first we analysed to provide a clear representation of the stratification traits of the survey sample. Only 522 of the 603 respondents provided socio-demographic information.

#### a) Age

The survey sample encompasses various age groups, predominantly those aged between 26 and 35 years old (30.3%). This is followed by participants under 26 years (27.2%). A smaller number of respondents are aged 36 to 45 (20.3%), while those aged 46 and older account for the remaining portion. This age distribution may indicate that younger individuals are more aware and sensitive to climate issues and the related policies.

**Table 3.2 - Age Frequencies**

		Responses		Percent of Cases
		N	Percent	
Demo_age <sup>a</sup>	Age: [Under 26]	142	27.2%	27.2%
	Age: [26-35]	158	30.3%	30.3%
	Age: [36-45]	106	20.3%	20.3%
	Age: [46-55]	47	9.0%	9.0%
	Age: [56-65]	42	8.0%	8.0%
	Age: [Over 65]	27	5.2%	5.2%
Total		522	100.0%	100.0%

a. Dichotomy group tabulated at value 1.

Source: own elaboration from SPSS

**b) Gender**

In terms of gender, the sample shows a more even distribution when compared to age. Female respondents represented 57.5%, slightly exceeding the number of male participants, who accounted for 37%. A minor portion identified as non-binary (1.3%), and 4.2% preferred not to disclose their gender.

**Table 3.3 - Gender Frequencies**

		Responses		Percent of Cases
		N	Percent	
Gender <sup>a</sup>	Gender: [Male]	193	37.0%	37.0%
	Gender: [Female]	300	57.5%	57.5%
	Gender: [Non-binary]	7	1.3%	1.3%
	Gender: [Prefer not to disclose]	22	4.2%	4.2%
Total		522	100.0%	100.0%

a. Dichotomy group tabulated at value 1.  
 Source: own elaboration from SPSS

**c) Educational level**

Survey participants reflect a wide range of educational backgrounds. Of these, 41.6% finished secondary education, while 19% earned a bachelor’s degree. Furthermore, 23.4% achieved a master’s degree, and 10.2% obtained a doctorate. Only a tiny percentage (5.9%) completed primary education. This distribution may suggest that climate and political issues are already addressed in secondary educational institutions. Overall, high educational levels do not significantly influence the survey participation.

**Table 3.4 - Educational level Frequencies**

		Responses		Percent of Cases
		N	Percent	
Education_level <sup>a</sup>	Education Level: [Primary]	31	5.9%	5.9%
	Education Level: [Secondary]	217	41.6%	41.6%
	Education Level: [Bachelor's degree]	99	19.0%	19.0%
	Education Level: [Master's degree]	122	23.4%	23.4%
	Education Level: [Doctorate]	53	10.2%	10.2%
Total		522	100.0%	100.0%

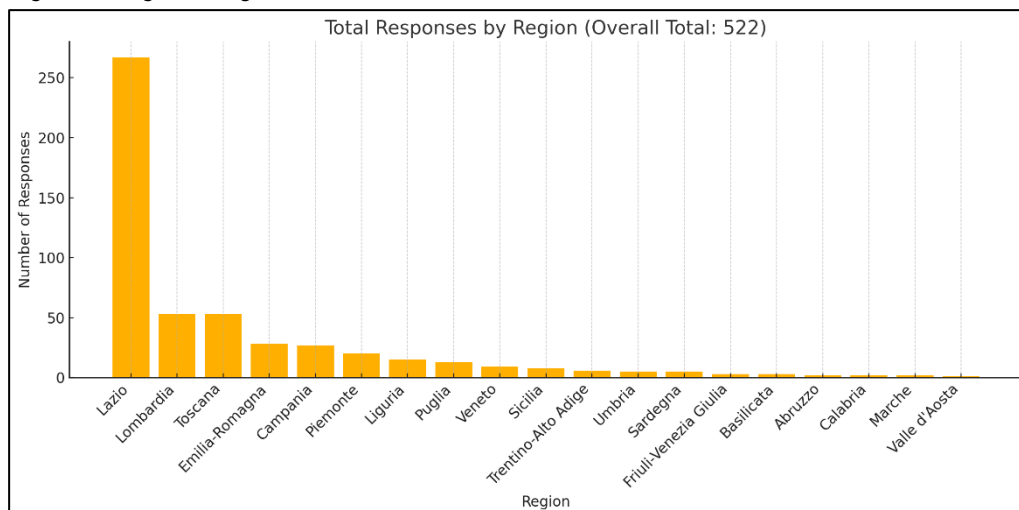
a. Dichotomy group tabulated at value 1.

Source: own elaboration from SPSS

#### d) Region

In terms of Italian regions, the data reveal significant participation from Lazio ( $n = 267$  cases), followed by Lombardia and Toscana ( $n = 53$  cases each), then Campania ( $n = 28$  cases) and Emilia-Romagna ( $n = 27$  cases). The remaining fraction is relatively evenly shared across various other regions, from the northern to the southern. Although the imbalance towards the Lazio region, likely due to some bias in the initial sample selection, participation from almost all Italian regions may suggest that the climate issue represents a shared concern, regardless of territoriality.

Fig. 3.1 - Regional origin



Source: own elaboration from Python

**e) Association membership**

In the final part of the questionnaire, we asked the respondents if they were involved in some civil society organisations. We consider this dimension helpful in verifying whether the collective representation of the climate phenomenon and governmental action can be shaped by social group influence. However, the analysis reveals that most respondents (86.4%) reported not being affiliated with any associations, while just 13.6% stated they were members of some organisation. This may suggest that group participation does not significantly impact either the individual's or the social perception of climate-related issues or public environmental commitment. This result is consistent with those from the analysis of climate change communication and climate action. We will delve into this aspect in the following paragraphs.

**Table 3.5 - Association membership Frequencies**

		Responses		Percent of Cases
		N	Percent	
\$Association_member <sup>a</sup>	Are you a member of any association? [Yes]	71	13.6%	13.6%
	Are you a member of any association? [No]	451	86.4%	86.4%
Total		522	100.0%	100.0%

a. Dichotomy group tabulated at value 1.

Source: own elaboration from SPSS

### **3.3. ENVIRONMENTAL DIMENSION: CLIMATE CHANGE AND SOCIAL REPRESENTATION**

In this section, we will examine how Italian citizens frame climate change, with a primary focus on awareness and perception, as well as information and communication issues. Furthermore, we will inquire about who people attribute the primary responsibility for the climate crisis and the leading role in climate actions.

#### **3.3.1. AWARENESS**

An overwhelming 93% of respondents acknowledge climate change, while only 7% disagree ( $n = 540$  cases). This strong recognition indicates that participants widely perceive climate change as a critical concern. Notably, awareness about climate change tends to diminish with age. Younger participants, especially those under 35, express more significant consideration of climate change; 131 individuals are under 26, and 153 are aged 26 to 35. In contrast, only 22 respondents over 65 indicated awareness ( $n = 489$  cases). In terms of gender, the concerns are almost evenly distributed ( $n = 489$  cases, with 178 males, 288 females, and 23 individuals identifying as non-binary or with an unknown gender).

Analysing educational levels shows a strong positive correlation: as education increases, so does awareness of climate change. Only 25 respondents with primary education indicated they think about climate change. At the same time, the number rises to 208 for those with secondary education and 115 for individuals holding a master's degree ( $n = 489$  cases).

Among the small group of respondents who stated they do not consider climate change (7% of the total sample), an examination of their reasons reveals various underlying factors (see Table 3.6). The most frequently cited reason was having other priorities (26.5%), indicating that daily responsibilities or personal concerns can overshadow environmental issues for some people. A sense of emotional overwhelm closely follows this—"it is too much for me" (23.5%)—and the perception that there is insufficient information available (20.6%).

Other respondents conveyed feelings such as "it is not my problem" (17.6%) or showed political and socioeconomic indifference, suggesting that "politics should deal with it" or that it is "a concern for wealthy individuals." Only one respondent, aged over 65, even denied the issue entirely, asserting, "It does not exist."

**Table 3.6 - Reason for climate change inattention**

		Responses		Percent of Cases
		N	Percent	
\$No_CC_awareness_reason <sup>a</sup>	No, why? [It doesn't exist]	1	2.8%	2.9%
	No, why? [There is little information]	7	19.4%	20.6%
	No, why? [I have other things to do]	9	25.0%	26.5%
	No, why? [I can't handle it]	8	22.2%	23.5%
	No, why? [It's not my problem]	6	16.7%	17.6%
	No, why? [It makes me sad]	2	5.6%	5.9%
	No, why? [Politics should take care of it]	2	5.6%	5.9%
	No, why? [It's for wealthy people]	1	2.8%	2.9%
	Total	36	100.0%	105.9%

a. Dichotomy group tabulated at value 1.

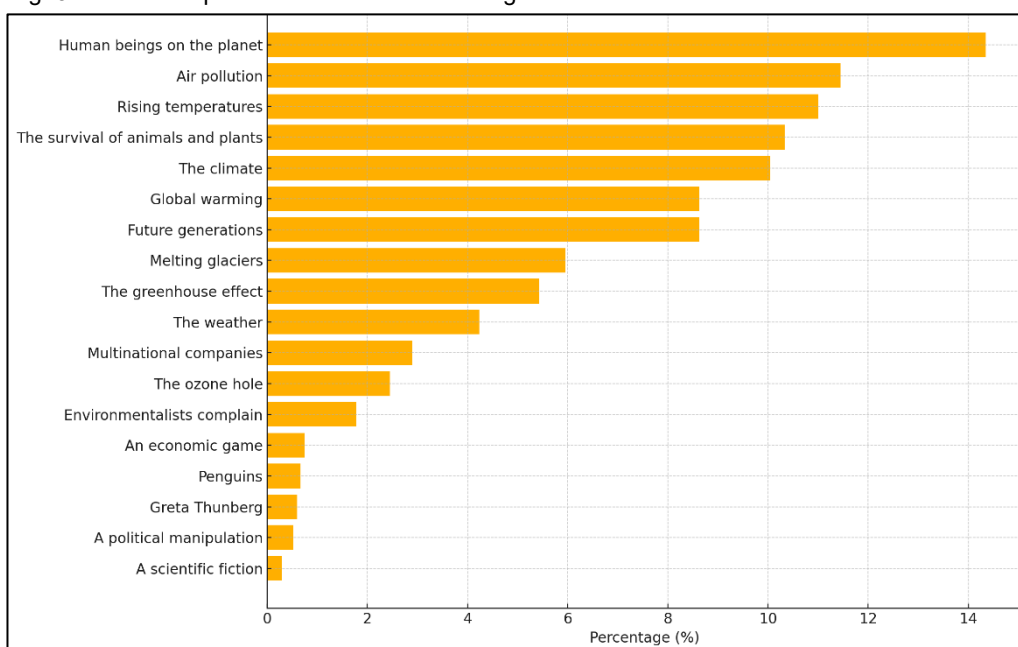
Source: own elaboration from SPSS

In summary, awareness of climate change is widespread among all demographic groups, particularly among younger people, women, and those with higher levels of education. This suggests that targeted awareness campaigns may be particularly effective in engaging older individuals and those with less formal education, while also addressing the emotional or informational barriers identified by those who are currently less involved.

### 3.3.2. PERCEPTION AND INFORMATION SOURCES

We aimed to deepen our understanding of public perceptions of climate change by asking participants, “What do you associate with it?”. They had a maximum of 3 responses for this item. The options we provided ranged across scientific perspectives, emotional concerns, and personal or symbolic interpretations.

Fig. 3.2 - Social representation of climate change



Source: own elaboration from Python

As the Fig. 3.2 shows, on a total of 1345 responses, the most frequently cited associations were “Human beings on the planet” (14.3%), “Air pollution” (11.4%), “Rising temperatures” (11.0%), and “The survival of animals and plants” (10.3%). This representation is primarily common among the younger generation (<35 years old). Notably, 10% of the responses, mostly from individuals with higher levels of education, relate to the concept of “climate,” while only 8.6% refer to “global warming” and “future generations.”

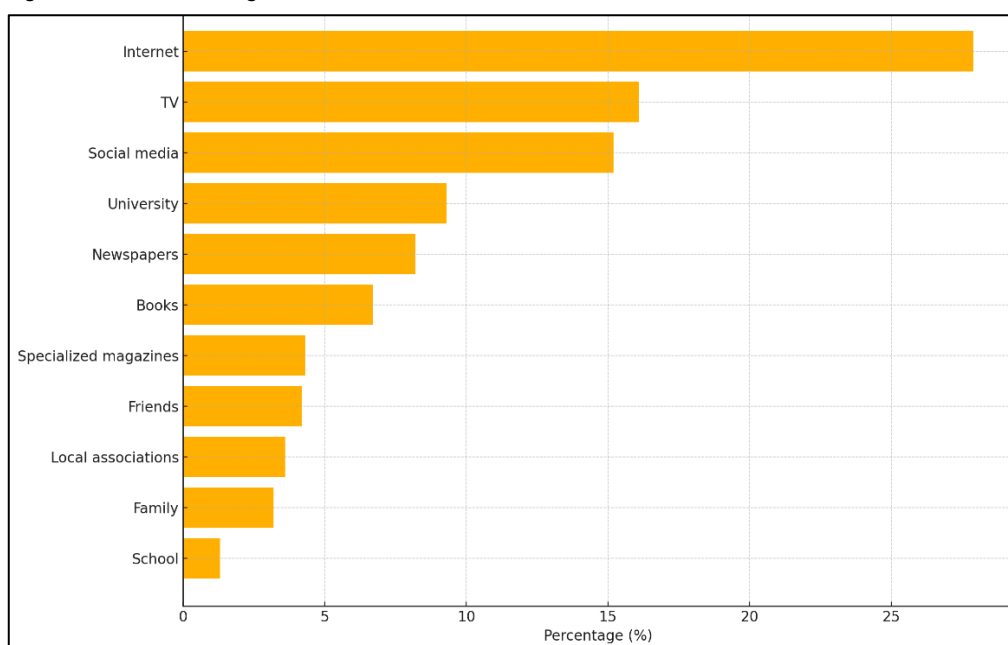
This result may suggest that, although climate change is perceived as a serious social and environmental concern, also from a transgenerational perspective, there remains a tendency to overlook its anthropogenic aspect.

However, only a tiny percentage (<1%) of respondents consider climate change to be a genuine issue, perceiving it instead as an *ad hoc stimulus* driven by socio-political institutions or the scientific community.

One relevant point to consider is that 4.2% of respondents confuse the phenomenon of climate change with weather. This representation is primarily common among the younger with a lower educational level. This finding suggests that scientific evidence on climate change may not be accurately translated into the public's understanding, or at least not effectively communicated to the citizens.

To address this issue, we asked the respondents, "Where do you collect information about climate change?". Also in this case, they could express a maximum of three preferences.

Fig. 3.3 - Climate change communication



Source: own elaboration from Python

Figure 3.3 illustrates that participants utilise various sources to catch information about climate change, with a particular preference for digital and social media, particularly among those under 26 and those aged 26 to 35. This trend emphasises the growing reliance of the younger generations on online information. The same selections result from the less qualified participants.

Unsurprisingly, the internet is the most referenced source. Of the total 1.275 responses, 27.9% indicate the latter, followed by television (16.1%) and social media (15.2%). Television remains significant across all age groups, particularly among those aged 36–45 and 56–65 years old. While traditional educational institutions, such as universities and schools, are seldom cited, universities (9.3%) outperform many conventional sources, underscoring the essential contribution of higher education to the dissemination of climate knowledge. While newspapers (8.2%), books (6.7%), and specialised magazines (4.3%) are less frequently consulted, they play a substantial role in raising awareness about climate change, particularly among older audiences and individuals with higher educational qualifications, such as those holding master's or doctoral degrees.

Notably, as outlined in paragraph 3.2 (Table 3.5), the social representation of climate change does not appear to be significantly influenced by primary and secondary group belonging, as friends, family, and local organisations are ranked low as preferred sources. This reveals that in the contemporary digital era, climate education is increasingly becoming personalised and self-directed. The results reveal variations in climate change communication linked to age and education. Younger and less qualified individuals often rely on the internet and social media. In contrast, older respondents and those with higher qualifications tend to prefer books, magazines, and traditional academic resources. Recognising these differences can aid in crafting targeted awareness campaigns that utilise age-relevant and education-oriented platforms, thereby enhancing the scientific dissemination of climate-related information.

### **3.3.3. THE ACCELERATION OF CLIMATE CHANGE: PUBLIC UNDERSTANDING AND SOCIAL RESPONSIBILITY**

To deepen our study on the social representation of climate change, we inquired whether respondents agreed with the scientific evidence indicating its acceleration. We also encouraged them to specify the main factors contributing to this issue. Remarkably, a substantial 95.7% of participants ( $n = 536$  cases) acknowledged that climate change has intensified over the last century, reflecting a strong consensus with scientific findings and a heightened level of awareness, with the highest agreement rates among respondents in the 18 to 45-year age group. Additionally, we can observe how scientific consensus is positively correlated with educational level. Highly qualified respondents,

particularly those who hold a bachelor's or master's degree and a PhD, demonstrate a higher percentage of agreement.

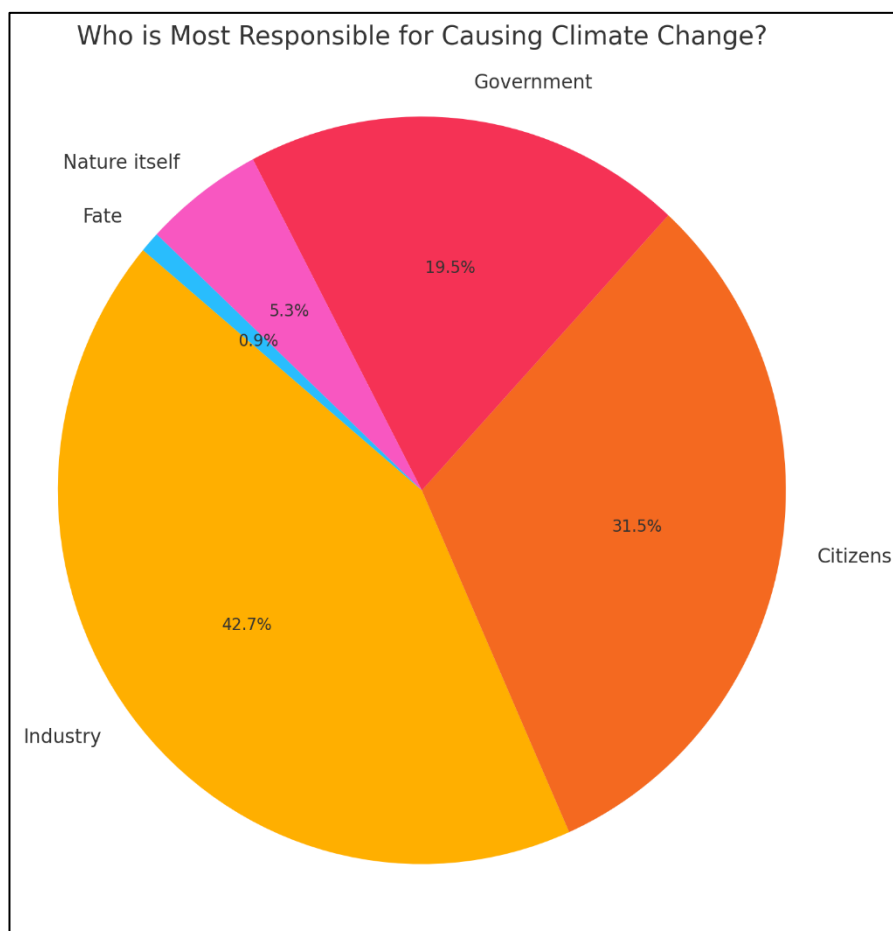
Nonetheless, a small fraction—only 4.3%—does not believe that climate change is accelerating. This reference is most common among older respondents and those with a lower educational level. When probed for their reasoning, the participants identified various factors. The most cited (21,7%) are the convictions that climate change is a constant phenomenon or that its pace has not accelerated. A lower percentage (13%) expressed skepticism towards scientific findings and uncertainty about trustworthy sources. The remaining respondents revealed concerns that media, politics, and economic interests distort public information.

In summary, the widespread acknowledgement of the climate change phenomenon and its accelerating pace suggests that public opinion has shifted from denial to an acknowledgment of climate change as a pressing and scientifically supported concern.

When asked about the leading causes of climate change (Fig. 3.4), the majority of respondents (42.7% of 543 participants) across all age groups, genders, and educational levels identified industry as the leading factor. Subsequently, 31.5% of the sample, particularly those under 35, acknowledged the primary impact of citizens, demonstrating a heightened awareness of how individual actions and lifestyle choices contribute to the climate crisis. Furthermore, 19.5% identified the government institutions as the most responsible, indicating the crucial role of the political system and governance, though to a lesser extent.

A minimal proportion attributed climate change to fate (0.9%) or nature itself (5.3%), indicating that the majority perceive climate change as an anthropogenic or sociogenic issue rather than a natural event.

Fig. 3.4 - Climate crisis accountability



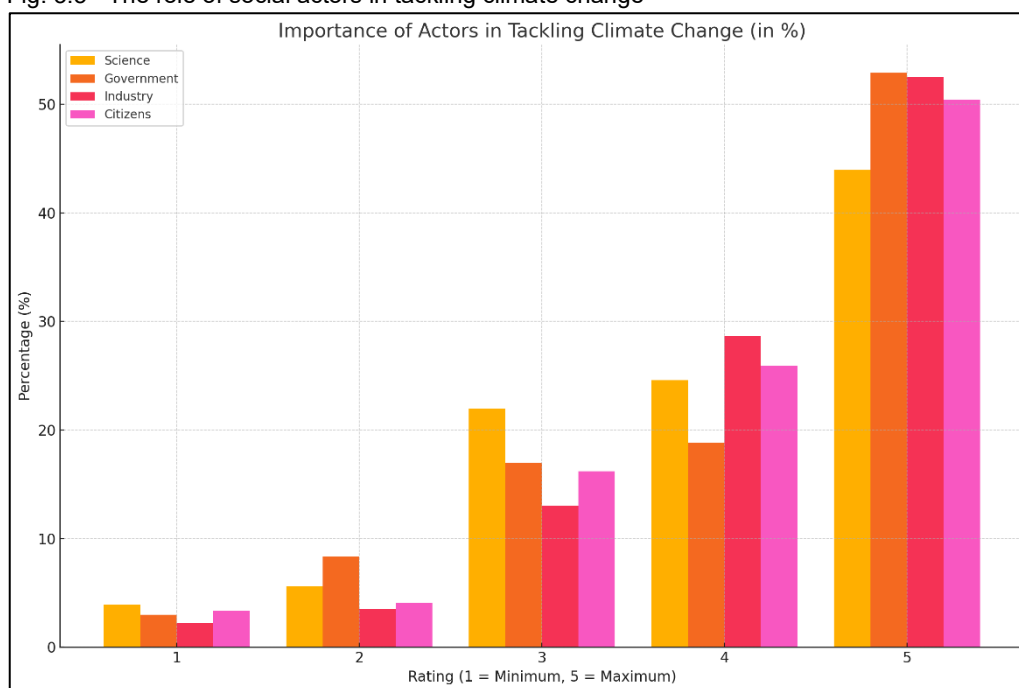
Source: own elaboration from Python

In summary, the key findings reveal that respondents identify major industrial activities— including emissions, air pollution, and resource exploitation—as the primary contributors to environmental degradation. However, there is a growing sense of collective responsibility to address the climate crisis. While industries and governments are deemed essential for driving socio-structural change, a substantial share of respondents believe that citizens carry the most significant responsibility. This emphasises the vital role of civil society in fostering greater ecological consciousness among people.

### 3.3.4. THE ROLE OF SOCIAL ACTORS IN TACKLING CLIMATE CHANGE

Once the social representation regarding the primary responsibility for the climate crisis was addressed, we asked respondents to evaluate the significance of four key actors—citizens, science, government, and industry- in tackling climate change. To measure this item, we utilised a Likert scale (Likert, 1932), ranging from 1 to 5, where 1 represented the least significance and 5 meant the greatest significance. This inquiry helped verify which institutions play the most relevant role in climate action, from the citizens' perspective.

Fig. 3.5 - The role of social actors in tackling climate change



Source: own elaboration from Python

As Fig. 3.5 shows, examining the maximum rate (5) suggests that the government and the industry sector play a primary role. On a sample of 537 cases, 52.9% referred to the government and 52.5% opted for the industry. A near percentage (50.5%) preferred citizens, and a lower share of respondents (43.9%) referred to science.

When analysing the aggregate data, which combines values 4 and 5 to indicate significant relevance and values 1 and 2 to mark a minor role, we encounter a slightly different scenario. A combined 81.2% of respondents

consider the industry to play the most significant role in tackling the climate crisis, while only 5.7% attribute the minor. This aligns with the results presented in the previous paragraph, which relate to the industry sector's leading responsibility in climate change causation. Following that, a substantial share of respondents consider that citizens (76.4%) and the government (71.7%) play a significant role in climate action. In comparison, a tiny percentage — 7.4% for citizens and 11.4% for the government — believe that they are the least significant. The lower percentage (68.5%) of the respondents who rated 4 and 5 indicates that science is the most relevant actor, while 9.5% identified expert actors as the least relevant. All of these representations are commonly shared by all age groups, genders and qualification levels, with no significant differences.

Overall, these findings revealed a shared commitment to addressing climate change among all social actors. Although the majority of respondents consider the industry should be at the forefront of solving the climate crisis, mainly by reducing its carbon footprint and transforming the production treadmill into sustainable activities, a significant share of participants highlight the crucial role of civil society and government in the transition process. These expectations underscore the need for a participatory and polycentric climate governance, emphasising that addressing climate and environmental degradation requires coordinated efforts across individual, scientific, political, and industrial sectors.

### **3.4. SOCIAL DIMENSION: CLIMATE-RELATED RISKS FOR HEALTH AND INSTITUTIONAL COMMITMENT FOR HEALTH PROMOTION AND SOCIAL ADAPTATION**

In this section, we will focus on analysing the public perception of the climate change-health nexus. Firstly, we will investigate the respondents' concerns around climate-related risks for individual and public health. Next, we will delve into the analysis of governmental actions for promoting public health and fostering social adaptation.

### **3.4.1. THE IMPACT OF CLIMATE CHANGE ON INDIVIDUAL AND PUBLIC HEALTH**

To determine the public perception of climate-related impacts on health, we first asked people whether they agreed that climate change represents one of the most significant risks to public health.

Table 3.7 indicates that, on a sample of 536 cases, over 91% acknowledged the severe impact of climate change on public health. The higher percentage (47.9%) moderately agrees with the statement, while another 43.3% fully recognises it. Only a tiny fraction disagreed, with 6.5% indicating “a little” and merely 2.2% not considering climate change a serious risk for public health. While these findings are evenly distributed across all age groups, some divides exist in terms of gender and educational level, where women and highly qualified respondents expressed the strongest agreement. Notably, the women's high concerns align with the evidence we presented in the first chapter on the gender-based vulnerability to climate change impacts.

**Table 3.7 - Climate change risks for health**

		Responses		Percent of Cases
		N	Percent	
CC_health_risk <sup>a</sup>	Climate change is one of the most significant risks to public health. Do you agree with this statement? [Not at all]	12	2.2%	2.2%
	Climate change is one of the most significant risks to public health. Do you agree with this statement? [A little]	35	6.5%	6.5%
	Climate change is one of the most significant risks to public health. Do you agree with this statement? [Enough]	257	47.9%	47.9%
	Climate change is one of the most significant risks to public health. Do you agree with this statement? [A lot]	232	43.3%	43.3%
Total		536	100.0%	100.0%

a. Dichotomy group tabulated at value 1.

Source: own elaboration from SPSS

Subsequently, we asked the respondents to identify a maximum of three climate-related impacts that they perceived as the most threatening to public and individual health (Tab. 3.8).

**Table 3.8 - Comparison between public and personal health concerns**

<b>Climate Impact</b>	<b>Public Health Risk (%)</b>	<b>Personal Health Risk (%)</b>	<b>Difference (Public - Personal)</b>
<b>Extreme weather events</b>	47.0	38.7	+8.3
<b>Increasing pollution</b>	37.7	39.6	-1.9
<b>Rising temperatures</b>	24.8	23.4	+1.4
<b>Reduction of natural resources</b>	29.5	35.5	-6.0
<b>Spread of diseases</b>	23.1	36.4	-13.3
<b>Extinction/reduction of species</b>	20.1	20.2	-0.1
<b>Social inequalities</b>	19.4	16.4	+3.0
<b>Increasing poverty</b>	14.2	16.1	-1.9
<b>Drought</b>	16.0	11.4	+4.6
<b>Rising sea levels</b>	12.1	7.5	+4.6
<b>Glacier melting</b>	10.8	7.1	+3.7
<b>Conflicts and migrations</b>	9.3	8.6	+0.7
<b>Changing traditions</b>	3.0	3.2	-0.2

Source: own elaboration from SPSS

The table above illustrates the percentage of respondents who consider each climate impact a significant threat to both public and personal health. Positive values in the “Difference” column indicate increased concern for public health, while negative values imply an amplified sense of personal risk. The sample of cases from the two items is similar, with 1,432 responses for public health risks and 1,413 for personal ones.

As shown, the health impacts from extreme weather events are considered the most threatening for the two samples. However, there is a substantial imbalance in favor of those who consider it a personal concern. Although less relevant, we can note the same disproportion for other environmental stresses, such as drought, rising sea levels, and melting glaciers, which are considered more detrimental to public health than to personal well-being. Conversely, the development and exacerbation of pathologies, as well as the depletion of natural resources, are considered more impactful on individual health (-13.3% and -6.0%, respectively) than on the public. Other environmental changes, including escalating air pollution and rising temperatures, are recognised as consistently high-risk factors, with similar levels of awareness in both personal and public spheres.

Notably, social impacts, such as inequalities and poverty, are considered less relevant health determinants than the environmental aspect, both from an individual and a collective perspective.

In summary, the results show that, although there are some divergences, the respondents are firmly concerned about the potential health and social adverse impacts of climate-induced phenomena. Overall, the analysis emphasises a strong public consensus that climate change is not merely an environmental issue, but also a significant threat to social well-being, highlighting the necessity of integrating climate action with public health policies.

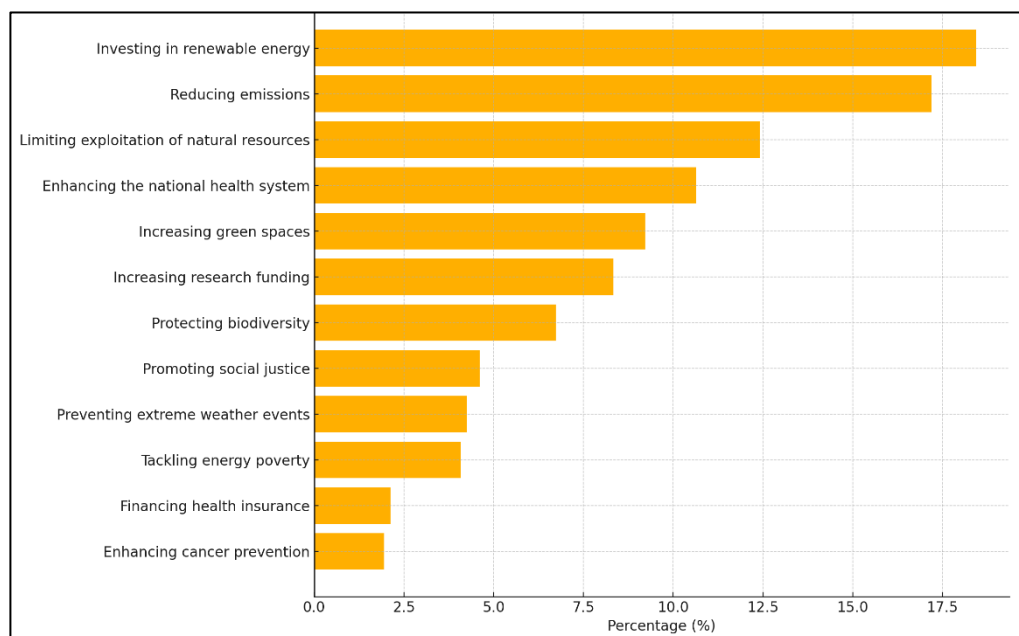
### **3.4.2. GOVERNMENT COMMITMENT TO HEALTH PROMOTION AND SOCIAL ADAPTATION**

Building on the main findings of the previous analysis, we examined the social perception of government commitment to health promotion, with a primary focus on identifying climate actions that could yield significant co-benefits for enhancing public health.

Initially, we asked the respondents if they considered governmental institutions to be effectively engaged in promoting public health. Notably, the majority expressed skepticism about governmental actions. On a sample of 536 cases, over half of the respondents (56%) identify low effort in health promotion from the government, while nearly one-third of them (29.3%) believe the institution lacked this commitment entirely. Less than 1% of respondents viewed the government as highly engaged. Examining the socio-demographic aspects, confidence in government health initiatives was notably low across all groups, reflecting a clear tendency towards either limited or moderate support, rather than robust confidence. In general, the findings reveal a perceived lack of trust regarding the government's efforts to promote health, emphasising a potential gap between public expectations and current policies.

Following that, we asked participants to choose at least one of a broad range of policy options that they believed would be more effective in enhancing citizens' health.

Fig. 3.6 - Policies for health promotion



Source: own elaboration from Python

Figure 3.6 clearly illustrates a trend towards sustainability policies and climate-related strategies. In a sample of 564 cases, the predominant choices were investing in renewable energy (19.4%), reducing emissions (18.1%), and preserving natural resources (13.1%) across all age groups, genders, and educational levels. In contrast, the insurance tool is considered almost insignificant, accounting for only 2.1%.

This data suggests a widespread perception among the respondents that public investments should prioritise proactive environmental solutions for enhancing citizens' health, rather than opting for a reactive-based approach. However, improving the healthcare system also plays a crucial role, as preferred by 11.2% of the respondents, primarily among the older population. This may indicate that individuals are deeply concerned about the potential for receiving adequate treatment should climate-related conditions worsen.

Overall, these insights demonstrate that environmental and climate issues are considered key determinants of public health. Thus, integrating health strategies and climate action is crucial for policymakers to enhance citizens' health, thereby countering the distrust sentiment the respondent expressed towards the government's commitment to promoting public health.

Furthermore, our analysis of adaptation values corroborates the need for a comprehensive approach in tackling climate change and health challenges. We inquired whether respondents believed that promoting public health by institutions would help citizens adapt to climate change more effectively.

**Table 3.9 - Health promotion and social adaptation**

	Responses		Percent of Cases
	N	Percent	
Promoted_health_leads _to_Adapt <sup>a</sup>	427	79.8%	79.8%
	108	20.2%	20.2%
Total	535	100.0%	100.0%

a. Dichotomy group tabulated at value 1.  
 Source: own elaboration from SPSS

Table 3.9 reveals that, of a sample of 535 cases, the substantial majority (79.8%) agreed with the statement, primarily among the youngest and most highly educated respondents. In contrast, only 20.2% expressed skepticism about the potential value of health promotion in enhancing climate resilience.

Significantly, when asked about the reasons for the disagreement, nearly half of the respondents (45.4%) emphasised the need to prioritise planetary health over that of human beings to allow for effective adaptation pathways, while a considerable portion (26.9%) believed that the primary governmental commitment should focus on mitigation efforts. The remaining share of the respondents expressed a lack of understanding of what adaptation entails (13.9%) or distrust in the effectiveness of adaptation strategies. Finally, the

lowest percentage (5.6%) indicated a pessimistic view regarding humans' chances of adaptation.

Overall, these findings reveal a strong public awareness of the potential value of health promotion in enhancing adaptation chances, thus confirming the need for a more integrated approach among climate and health matters. However, the data highlight that institutional efforts toward social adaptation may be squandered if the government fails to adopt a systemic perspective regarding the connections between human and non-human health.

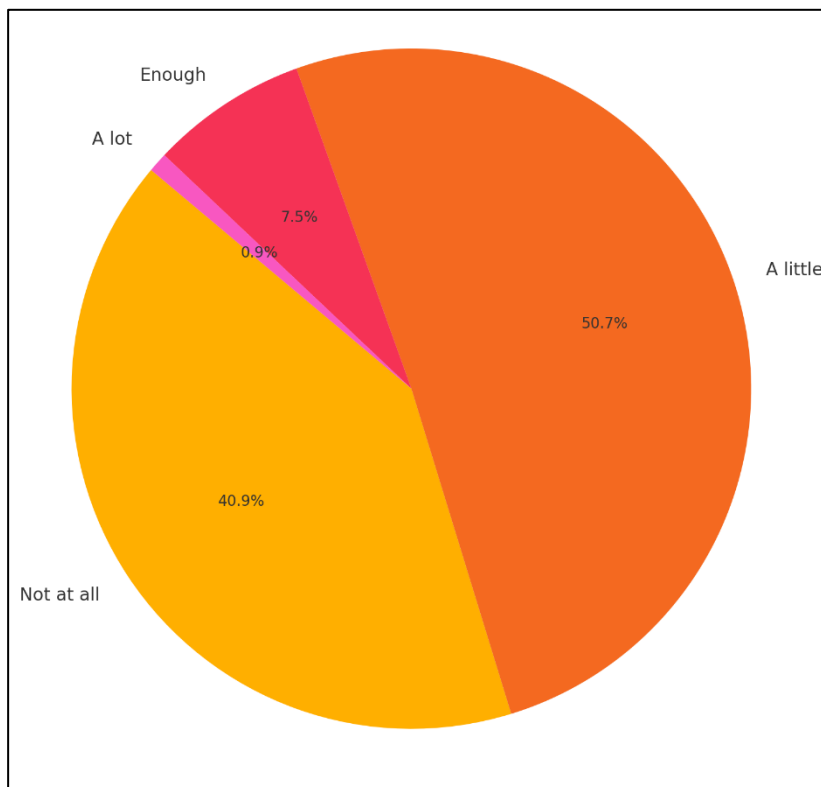
### **3.5. INSTITUTIONAL DIMENSION: SOCIAL EXPECTATIONS FROM GOVERNMENTAL ACTION AND CITIZENS' ENGAGEMENT**

This section will analyse how citizens assess the government's action in tackling climate change. For this inquiry, we utilised specific variables, including social expectations from the leading governmental role and public trust. Furthermore, we will delve into the citizens' commitment to tackling climate change by examining their willingness to take action.

#### **3.5.1. SOCIAL EXPECTATIONS AND PUBLIC TRUST**

In the previous sections, we have contended that, although the government is not significantly recognised as a primary driver of the climate crisis, it instead plays a leadership role in addressing climate and environmental issues, primarily concerning health matters. Based on this, it is crucial to analyse whether respondents consider governments to be engaged in orienting collectivity to adopt proactive, climate-friendly behaviours.

Fig. 3.7 - Social expectation from governmental leadership role



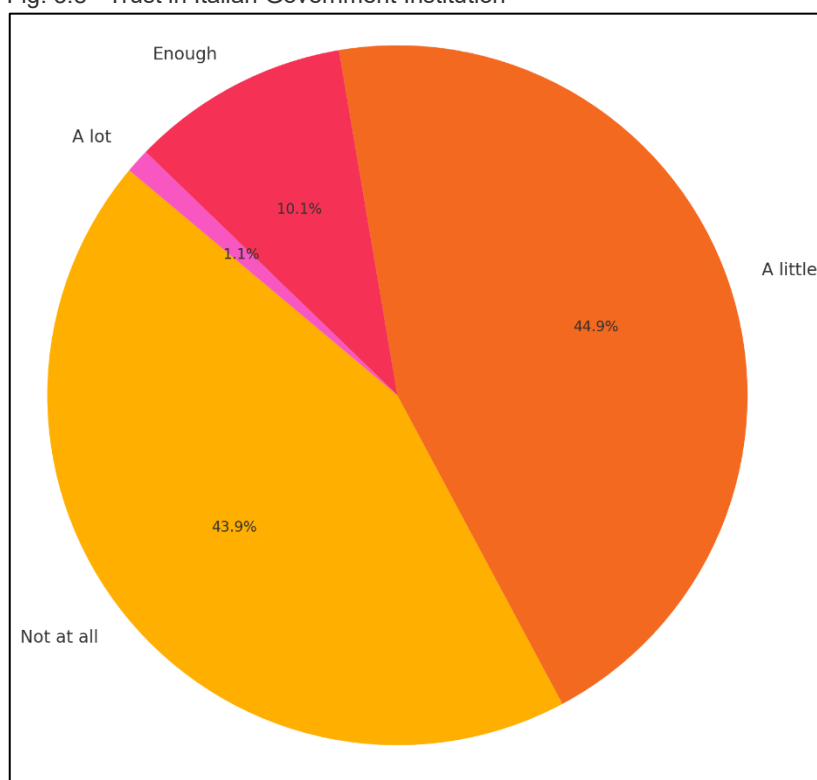
Source: own elaboration from Python

As shown in Fig. 3.7, an overwhelming majority of respondents expressed skepticism about the government's leading role in influencing climate-related collective behaviour, regardless of age, gender, or education level. On a sample of 536 cases, over 90% of participants reported that they are not at all or only slightly guided by the government in tackling climate actions. In contrast, the remaining 8.4% expressed sufficient or complete satisfaction with institutional commitment.

Even with the rising urgency of climate issues, the government's leading role seems to have little impact on fostering climate social engagement. This lack of guidance, combined with the low institutional commitment to health promotion, may be a relevant factor influencing public trust in institutional actors. Indeed, if we analyse the survey data relating to this latter aspect, we immediately realised that they follow the same trend of social expectation from governmental climate commitment.

As Fig. 3.8 illustrates, most Italian respondents (n = 535 cases) have low (44.9%) or no trust at all (43.9%) in their government, while only 11.2% feel sufficiently or fully confident. These results are equally distributed in terms of age, gender and educational levels.

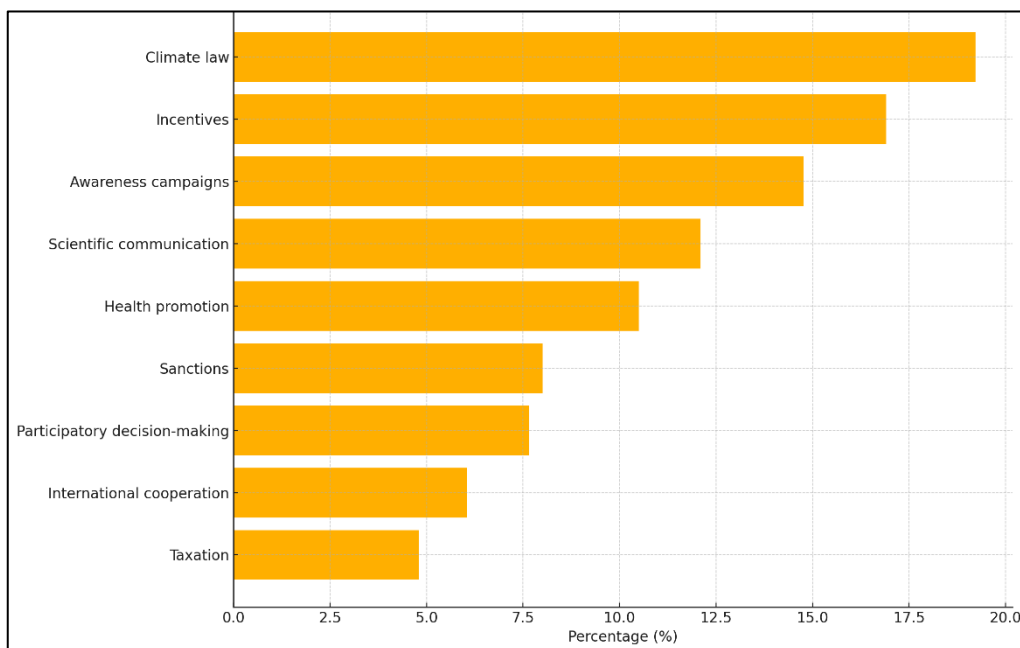
Fig. 3.8 - Trust in Italian Government Institution



Source: own elaboration from Python

Following that, we inquired about the potential value of policy instruments in increasing the leading role of governments, by asking participants to select which one could be more effective in orienting collective climate-related behaviours. This analysis could also be a helpful tool for institutions to contrast citizens' sense of distrust in their actions.

Fig. 3.9 - Effective policies in orienting collective behaviours



Source: own elaboration from Python

Interestingly, Fig. 3.9 shows that, out of 562 cases, climate law was the most popular choice, with 20.1% of respondents favoring it, particularly among those aged 25-45 and those with a middle-level education. This suggests a general high level of confidence in the effectiveness of binding regulations. Incentives trailed closely at 17.7%, especially among the youngest, indicating a general preference for positive reinforcement over punitive measures, such as sanctions (8.4%) or financial penalties, like taxation, which has the lowest rating (5.0%). Awareness campaigns (15.5%) and scientific communication (12.7%) were also commonly cited tools, highlighting the perceived importance of education and the dissemination of science in promoting climate-friendly behaviour change.

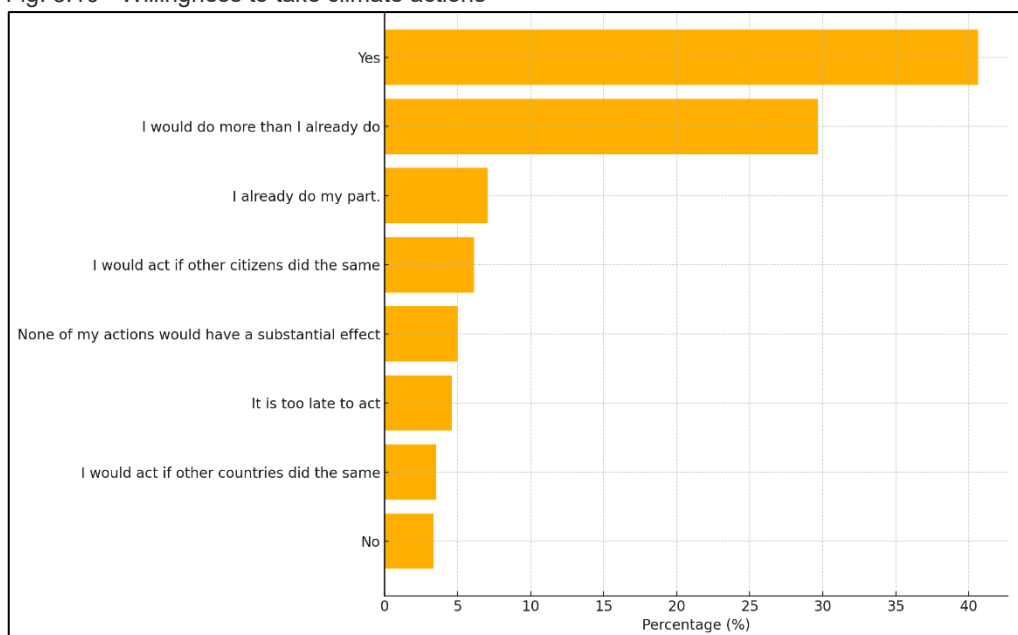
Notably, health promotion (11.0%) plays a significant role, especially among elder respondents, aligning with the results we previously examined regarding the deeper public understanding of the climate change-health nexus. It is worth noticing that participatory decision-making was one of the least selected (8.0%) across all socio-demographic groups. This data may be influenced by the perceived lack of trust in institutional policy-making, which we examined above.

Overall, the results indicate that social expectations and public trust in the Italian political system to guide collective action on climate change effectively are generally low. However, proactive policy instruments, such as positive incentives or educational and communication campaigns, if supported by climate law, could help build public consensus on the climate issue and enhance social confidence in governmental actions.

### 3.5.2. CITIZENS' ENGAGEMENT IN CLIMATE ACTION

In the final part of our survey, we asked respondents about their engagement in climate action. For this item, we provided several options for participants, which helped inquire not only about their effective engagement but also their willingness to act.

Fig. 3.10 - Willingness to take climate actions



Source: own elaboration from Python

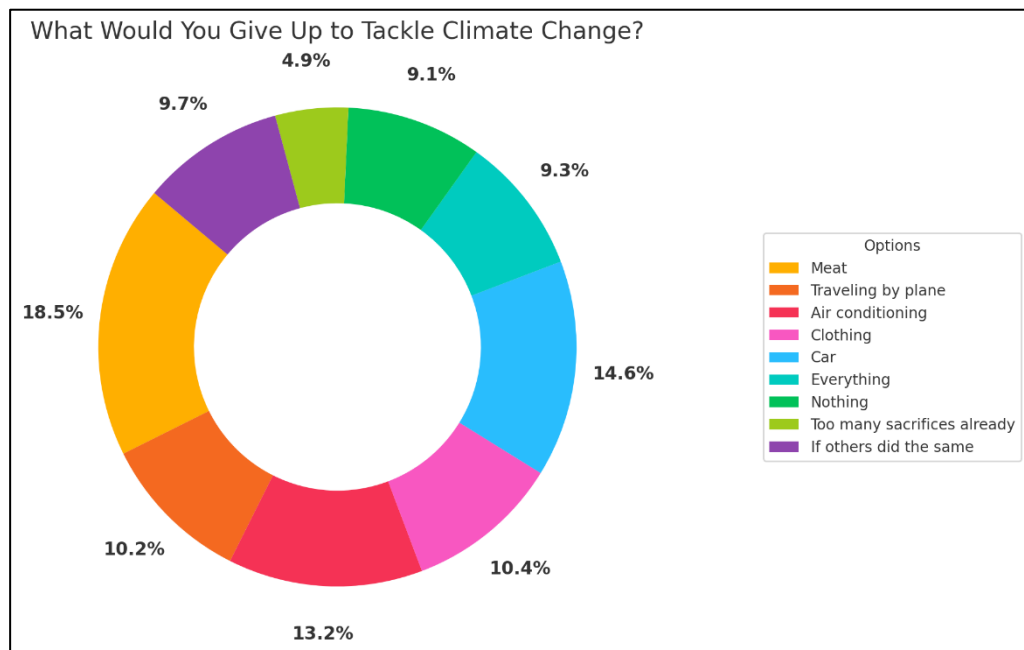
When asked if respondents take climate action (Fig. 3.10), a sample of 539 cases revealed an overall majority (40.6%) who gave an affirmative answer, primarily among the youngest groups, contrasting with the lowest percentage of respondents who expressed inaction (3.3%). Notably, a significant percentage

of participants (29.7%) indicated their willingness to take more effective actions, confronting a very low portion (7.0%) which expressed satisfaction with their current ecological behaviour. This result may be linked to the lack of institutional support, which we analysed above, highlighting the crucial role of government in fostering more climate-friendly actions.

Other answers referred to a conditional willingness, as driven by one of the other people (6.1%) or other countries (3.5%), highlighting that the logic of collective action may affect citizens' climate proactivity. Meanwhile, a minor portion of respondents (5%), mainly among the elders, expressed a sense of helplessness or pessimism (4.6%) regarding their climate efforts, which could hinder their commitment to broader ecological initiatives.

To deepen the analysis of social commitment, we asked participants to indicate what they would give up to be more effective in tackling climate change.

Fig. 3.11 - Individual sacrifice for improving climate commitment



Source: own elaboration from Python

The results (Fig. 3.11) reveal a significant propensity to make lifestyle changes, with 18.9% willing to give up meat, followed by 15.0% who would consider sacrificing their cars, and 13.5% renouncing air conditioning. Next, 10.7% would limit their clothing consumption, and 10.5% would stop travelling

by plane. These findings suggest that the public fully knows that significant habits associated with production and consumption patterns drive climate change acceleration.

Interestingly, almost the same percentage (around 9%) expressed that they would give up everything and nothing. In comparison, 5.0% answered that they already make too many sacrifices, which may suggest they are overwhelmed by other economic concerns. Additionally, 9.9% indicated they would only be willing to make sacrifices if others did, underscoring the significance of fairness and collective responsibility in encouraging climate action.

Overall, the findings highlight that citizens proactively engage in climate action, which effective policies could foster. Furthermore, they demonstrate a strong willingness to further involve themselves, even by renouncing a wide range of social commodities to be more effective in tackling climate change. It confirms the results we presented in the paragraph 3.3.4., regarding the crucial role the respondents attribute to citizens' action in addressing the climate crisis.

### 3.6. HYPOTHESIS TESTING

In this section, we will attempt to verify whether the research hypotheses we have elaborated can be validated or rejected through statistical significance analysis.

- **Hypothesis n. 1:** *If citizens' actions are relevant to tackling climate change, then the government should orient the actions of citizens.*

Two variables were considered to test this hypothesis. The first, "Social Actors' Role", identifies the importance assigned to the role of citizens in tackling climate change. Responses range on an ordinal Likert scale from 1 (the minimum rating) to 5 (the maximum rating). The second, "Social Expectations", assesses how strongly respondents believe that Italian governmental institutions, such as the parliament, government, or head of state, actively guide citizens in addressing climate change. Responses extend on an ordinal scale from "Not at all" to "A lot."

The variables were cross-tabulated and tested using the Chi-square to verify whether there is a statistically significant relationship between citizens' perceptions of their role in addressing climate change and those concerning governmental efforts to guide citizen action.

The case processing summary provides an overview of the number of valid and missing cases for the crosstabulation analyses. For this analysis, out of 540 responses, 536 were valid (99.3%), while only 4 (0.7%) were missing. This indicates that the dataset is mainly complete, with minimal data loss, ensuring that the results obtained from the chi-square tests are based on a strong and representative sample. Such completeness supports the reliability and accuracy of the statistical findings.

As Table 3.10 reveals, a considerable number of respondents (271 out of 536) rated the role of citizens in climate action as the highest priority (5 value on the Likert Scale). Additionally, 139 respondents considered citizens highly significant, assigned a rating of 4. However, despite this broad perception, many respondents considered that the government falls short in adequately orienting citizens' actions. Significantly, the 103 cases that consider the citizens' role as of maximum importance also indicated that the government does not guide their actions. At the same time, 150 stated that it provides low guidance.

**Table 3.10 - Hypothesis 1:Cross Tab**

	Social expectation from the government leadership role				Total	
	Not at all	A little	Moderate	A lot		
<b>How important is the role of these actors in tackling climate change?</b> (1=minimum rating, 5=maximum rating) [Citizens]	1	8	5	5	0	18
	2	9	10	2	0	21
	3	38	40	9	0	87
	4	61	67	8	3	139
	5	103	150	16	2	271
Total	219	272	40	5	536	

Source: own elaboration from SPSS

The Chi-Square test (Table 3.11) approached statistical significance ( $\chi^2 = 20.699$ ,  $df = 12$ ,  $p = .055$ ), indicating a marginal relationship between the two variables. Although it does not meet the conventional criteria for statistical

significance at  $p < .05$ , the result is sufficiently close to be regarded as interpretable in terms of significance.

The significant result suggests that individuals who acknowledge the importance of citizens' actions also expect more significant guidance and support from governmental institutions to orient collective climate-friendly behaviour. Thus, a passive or only minimal involvement from the government may discourage proactive citizen engagement. Previous analyses suggested that the government's leading role could be enhanced by enforcing climate legislation or providing proactive policy instruments, such as incentives.

Moreover, the institutional structure should strengthen scientific communication on climate evidence and promote sensitising campaigns to turn social awareness into action. This approach could bridge the gap between institutional climate commitment and social expectation and leverage public willingness for climate action.

**Table 3.11 - Hypothesis 1: Chi-square test**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.699 <sup>a</sup>	12	.055
Likelihood Ratio	17.503	12	.132
Linear-by-Linear Association	.043	1	.837
N of Valid Cases	536		

a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is .17.

Source: own elaboration from SPSS

- **Hypothesis n. 2:** *If the government guides citizens' actions, then citizens will take action to tackle climate change.*

To test Hypothesis 2, we considered two variables. The first is "Social Expectations", which are already referred to in the previous hypothesis testing. The second variable, "Climate Change Action", captures the extent to which individuals are effectively engaged or willing to take action against climate change. This variable encompasses a range of options, from affirmative to

negative statements to more nuanced ones, such as “I already do my part” or “It is too late to act,” and conditional attitudes like “I would act if other citizens or countries did the same.”

The case processing summary indicated that, on a total of 540 cases, 535 cases (99.1%) had valid responses for both variables, meaning they could be used in the hypothesis test. Only 5 cases (0.9%) had missing data and were excluded from the analysis. The high percentage of valid responses indicates strong data integrity for the analysis, making the results more reliable for interpreting whether a relationship exists between the two variables.

After crossing the variables, we conducted a Chi-Square test (Table 3.12) to examine the association between these two categorical variables. The results showed a p-value of .000, indicating a strong statistically significant relationship between them. The significance of the Chi-square test suggests that citizens' perception of the governmental guiding role is crucial for their willingness to take climate action or assume ecological behaviours. Thus, when people perceive that the government actively encourages climate-related behaviours, they are more likely to act or enhance their commitment to tackling climate change. Conversely, when the government is perceived as lacking in its leadership role, individuals are more likely to experience inaction, hesitation, or scepticism, considering their actions helpless or ineffective in addressing the climate crisis.

This finding supports the current research hypothesis, highlighting a clear link between institutional leadership and citizens' engagement in climate issues. This aligns with the previous analyses on the importance of governmental actors (par. 3.3.4), which many respondents consider extremely significant in climate governance.

**Table 3.12 - Hypothesis 2: Chi-square test**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	79.674 <sup>a</sup>	21	.000
Likelihood Ratio	45.167	21	.002
Linear-by-Linear Association	.292	1	.589
N of Valid Cases	535		
a. 14 cells (43.8%) have expected count less than 5. The minimum expected count is .16. <i>Source: own elaboration from SPSS</i>			

- **Hypothesis n. 3:** *The government must promote citizens' health if climate change is a public health risk.*

This hypothesis posits that individuals identifying climate change as a significant threat to public health are more likely to consider that the government should actively promote citizens' health. The rationale behind this assumption is that if citizens are aware of the public health impacts of climate change, they may naturally expect governmental institutions to play a crucial role in enhancing citizens' health through promotion policies.

To test this hypothesis, we considered two variables. The first is "Climate Change Health Risk", which examines the social representation of climate-related health risks. To measure this variable, we asked respondents to express their agreement rate with a statement around the significant health threat deriving from climate issues on a scale from "A lot" to "Not at all". The second variable is "Government Health Promotion," which analyses the respondent's perception of the government's commitment to promoting public health, again on a scale from "A lot" to "Not at all." The case processing summary indicated 536 valid responses.

Analysing the two variables cross-tabulation (Table 3.13), we immediately realised that, among the respondents who consider climate change a significant health risk ( $n = 232$  cases), the overall majority ( $n = 203$  cases) perceive a lack or a low governmental commitment in promoting public health.

**Table 3.13 - Hypothesis 3: Cross tab**

		Gov health promotion				Total
		Not at All	A little	Moderate	A lot	
CC_health_risk	Not at All	6	4	2	0	12
	A little	5	21	8	1	35
	Moderate	78	140	38	1	257
	Alot	68	135	26	3	232
Total		157	300	74	5	536

Source: own elaboration from SPSS

However, the Chi-Square test (Table 3.14) yielded a p-value of 0.205, which is above the conventional threshold of statistical significance ( $p < 0.05$ ), indicating that there is no statistically significant association between the two variables. In other words, although many respondents recognise the health impacts of climate change, their perception does not affect their expectations or trust around institutional commitment to promoting public health.

**Table 3.14 - Hypothesis 3: Chi-square test**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.153 <sup>a</sup>	9	.205
Likelihood Ratio	12.194	9	.203
Linear-by-Linear Association	.763	1	.382
N of Valid Cases	536		
a. 7 cells (43.8%) have expected count less than 5. The minimum expected count is .11. Source: own elaboration from SPSS			

Considering the results of previous analyses, several underlying issues may be suggested to explain the disconnection from the test results, such as the widespread distrust in institutions, the lack of governmental commitment to health promotion, or perhaps the perception that such efforts are disconnected from climate change strategies.

The need to integrate climate change mitigation and adaptation strategies with health promotion has emerged from a policy perspective, given the increasing public awareness of the potential health risks associated with climate-related phenomena. Notably, the respondents already contended that the potential value of health promotion lies in favouring adaptation paths and strengthening the government's leadership role by orienting collective behaviour. Thus, a more substantial institutional engagement in public health could benefit climate resilience and serve as an effective policy instrument to align social expectations with institutional climate and environmental commitments.

### 3.7. EMPIRICAL RESEARCH FINAL DISCUSSION

In this final section, we comprehensively discuss the empirical research. We will attempt to integrate the qualitative and quantitative data, connecting them to the theoretical framework presented in Chapter 1.

The main objective of the empirical research is to understand the role that governmental institutions play in addressing the social dimension of climate change. By referring to the social aspect of climate change, we allude to the impact of a given social structure on the acceleration of climate change (Dunlap et al., 1994; Crenshaw & Jenkins, 1996) and to the role of social stratification processes in generating climate vulnerabilities (Mearns & Norton, 2009; Beck, 2013) and health inequalities (Marmot, 2010; Sannella, 2019). By analysing these aspects, we argue that climate change is sociogenic (Harvey, 2021; Padovan & Sannella, 2023), with its primary causes and differential impacts on society originating from complex socio-economic dynamics and political choices.

Building on the fundamental responsibility of social structure in shaping climate and environmental processes, we sought to examine whether and how governmental institutions, meaning the political system (Parsons, 1949), tackle the climate crisis. Indeed, governmental institutions possess a crucial status in climate governance for several reasons. Firstly, they should enforce climate and environmental goals through laws and regulations. Next, they should act as behavioural models that regulate social relations and orient collective action. To define the role of government, we must refer not only to institutional norms (prescriptive traits) but also to citizens' expectations (attributive traits), deriving from the social position the government holds in the social structure (Gallino, 2004, or. ed. 1978). For this reason, our empirical research could not overlook a thorough analysis of the social representation (Moscovici, 1988) of the government's role, which primarily aimed to determine whether it aligned with the normative prescriptions.

The analysis of the interviews reveals that governmental institutions play a crucial role in tackling climate change. *First of all, climate change will not solve itself as a problem without policy. There is a huge role for public policy in addressing climate change, in terms of reducing emissions and in terms of adaptation, both short-term and long-term, to many of the consequences of climate impacts (Int.#1). The role of institutions is strategic, it is fundamental (Int.#11).* This is confirmed by the survey results, with 52.9% of the Italian

respondents assigning the maximum rate to the relevance of the government in addressing the climate issue.

According to the interviewees, the leading role of governments primarily concerns enabling social conditions for the social transition process (Nocenzi, 2024) through the legislative framework: *The role is significant because with the right policy in place, the government can encourage a transition on innovation into net zero and it can essentially set the scene to promote acceleration to net zero* (Int.#3); *What the government can do is really set up the proper institutional support and framework for society* (Int.#9); *What we need governments to do is to assist the transition to really make it happen by setting the financial scene, to encourage it* (Int.#3).

Along with this perspective, the respondents argue that the primary institutional responsibility is to drive a just social transition (ILO, 2010) by fostering equity in the distribution of costs and benefits from climate action. Governmental climate strategies have often neglected this primary objective, generating social and climate vulnerabilities: *The government should making sure that there are Social Security programs for people who are most impacted from transition* (Int.#1); *The phrase just transition is not turned to get used in UK politics at all* (Int.#11); *The role of all government only should be to enable people to make the choices that we want them to make, but what has happened in general is that these governments and the institutions have made these choices difficult for people, particularly for more vulnerable groups. They are not enabling them to do what they would like to do* (Int.#4); *We now have forces in government that exploit a populism whereby ecological transition is for those who can afford it* (Int.#16).

Another key aspect of the government's role is shaping public understanding and building social consensus around climate action through an effective communication process that presents scientific evidence on climate change. The interviewees highlight that the government often misses this function, constraining proactive social actions (Watzlawick et al., 2014): *Well, to me, there's a really important role for the government around leadership and taking visible action on climate change* (Int.#10); *It's a matter of consensus, of the desirability of change; the construction of this desirability and therefore of a social consensus for transformation becomes decisive (for driving social actions, ndr.)* (Int.#16); *In the UK, we have a legally binding commitment for net zero, it's fantastic, but I don't think that commitment has been properly translated into the public* (Int.#3). *Communication is not getting the message across in a sufficient way because people are not adequately changing their lifestyles to ensure that we achieve stability again* (Int.#8); *There is a problem*

*with scientific communication and part of the communication problem comes from the government, which has not enabled a clear communication with people (Int.#4).*

Overall, the qualitative analysis revealed that the government plays a crucial role in fostering climate action within society. Firstly, a fair policy framework may provide citizens with the necessary conditions for socio-ecological transition. Next, it may raise public awareness of climate issues, thereby influencing individual and social commitment to adopt ecological behaviours. Notably, these findings are consistent with the quantitative results from the second hypothesis testing. The significant p-value of 0.000 from the Chi-square test highlights a strong association between Italian citizens' perception of the governmental guiding role and their willingness to take climate action. Thus, when individuals perceive the government as promoting climate-friendly behaviours, they tend to engage more actively or deepen their commitment to face climate change. In contrast, when people represent the government as lacking effective leadership, they often experience inaction or uncertainty, considering their efforts futile or inadequate in addressing the climate crisis.

However, although the institutional role is central to climate governance, the complexity of climate change (Rittel & Webber, 1973; Esbjörn-Hargens, 2010) necessitates a polycentric approach (Ostrom, 2010). It entails the involvement of various social actors, such as the business sector and civil society, through a shared participative mechanism: *There are many roles to play; some of it is a greater understanding of the problem by the public and some of it is businesses, understanding that their future needs to be net zero (Int.#3); Government investments are needed to leverage other private investments in the right way, and so working with business is definitely thing to do. And the second part of it was engagement so that the transition is not just something that's done top-down. You try to talk to people, understand what their concerns are, and build it into the picture (Int. #13); The ecological transition is not a process that can be exclusively top-down; it must naturally be a process of sharing (Int. #16).*

The significance of civil society engagement in addressing climate change is widely acknowledged among respondents from the UK and Italy. So, *the main drivers in 2008 and leading up to 2008 was a two or three-year period of politics and action by NGOs and civil society that provided the economic and societal context to allow for the Act to be passed (Int.#1); Activists could give the headspace for the transition (Int.#10); There is social activism within*

*organised civil society and associations, which is particularly vibrant, especially in the neighbourhoods. This creates a beautiful social fabric that engages the territories (Int.#16).*

The interviewees argue that the logic of collective action (Olson, 1965) influences the transition process, underscoring the crucial role of climate activism in advocating for policy reform and holding governments accountable for their climate commitments. Again, this data aligns with the results of the quantitative research. Concerning the first hypothesis, the nearly significant result of the Chi-square test (p-value = .055) suggests a likely association between the significance of public engagement and institutional accountability in tackling climate change. The results reveal that individuals who acknowledge the importance of citizens' action also expect a strong commitment to climate action from the government. In contrast, low institutional effort or a lack of support may jeopardise social engagement. Notably, a significant share of respondents (76.4%) rated the role of citizens in climate action as the highest priority, based on aggregate data from values 4 and 5 on the Likert Scale. This suggests a broad understanding of the potential values of civil society in challenging institutional order, when it may prove ineffective in addressing the climate crisis (Sztompka, 1993). Thus, through associationism and interaction processes, citizens may drive social and environmental change (Blumer, 1969) by critically reshaping the governmental role and promoting a culture of sustainability (Daher et al., 2024).

Besides public involvement, the business sector's engagement is also considered relevant to foster the transition process. However, its role is controversial among UK and Italian respondents, as evidenced by both qualitative and quantitative data. From the survey results, a combined 81.2% of Italian respondents consider the industry to play the most significant role in tackling the climate crisis, while only 5.7% attribute the minor. Notably, most respondents (42.7%) across all age groups, genders, and educational levels also identified industry as the leading factor in accelerating climate change. The qualitative findings reveal that some respondents, mainly from the UK, argue that businesses are increasingly recognising the necessity of transitioning to net-zero emissions. Conversely, some argue that established interests in pollution-intensive sectors create institutional hurdles, primarily due to their considerable political influence, and foster the manipulation of climate scientific evidence: *What we're seeing is gradually businesses starting to understand this issue and want to migrate to net zero and that's a wonderful thing to observe (Int.#3); Unfortunately, the global political system is characterized by a strong embrication between political and economic power and this makes it very*

*difficult to propose operational solutions that are dictated by scientific evidence (Int.#14).*

However, the political pressure of the fossil-fuel industries significantly slowed the decarbonisation path, generating a sense of disillusionment among citizens regarding their expectations from governmental climate action, as highlighted from the interviewees: *There's still permitting of new oil and gas licenses, discussions about reopening coal mines and that potentially confuses people because it provides an inconsistent picture around the shift away from fossil fuels and towards renewables and other low-carbon sources (Int.#1); Given the acceleration of the warming of the planet, it's clear that even a progressive country like the UK is probably not doing sufficient enough yet to mitigate the impacts of climate change (Int.#8); Let's say that for 20 years now the alarm has been consolidated, the current and past governments have done nothing, basically nothing (Int.#17).*

The short-term perspective (Giovannini, 2018) of governmental climate action is also perceived as a significant factor in driving the disillusionment with social expectations: *The government has the biggest opportunity to do that, but they must know where they're going themselves. Their focus is on tomorrow. It's on that by the election in a couple of months. It's on party conference coming up. It's on the fact they had to have a general election in a couple of years (Int.#4); Because (tackling climate change, ndr.) costs, in terms of consensus, popularity, re-election; they are unable to subvert a predetermined system in any way (Int.#17).* From the quantitative results, it also emerged that a substantial share (over 90%) of Italian citizens consider governmental action to be entirely or firmly ineffective in driving social change towards more climate- and environmentally friendly attitudes.

The misalignment between social expectations and institutional responsibility in effectively addressing the climate crisis, which stems from climate legislation, has led to a shared sense of distrust in government among both Italian and UK interviewees. *I think there's generally quite low trust in politics, institutions, or politicians. That's probably a globally wide phenomenon, but here, in the UK, there's also an inconsistency in government action compared to some of the needs of the country in response to climate change and disconnection between the goals of the Climate Change Act and the actions in the near term (Int.#1); To play this role in some way of synthesis and guarantee of sustainability at 360°, the institutions should have a level of trust and credibility that we know is one of the weak points of our democracy. There is a short circuit between trust and betrayed expectations (Int.#16).* These

results align with the data from the last OECD Survey on Drivers of Trust in Public Institutions (2024a), which reveals that almost half of the Italian respondents (46.7%) have no or low trust in the Government, while this percentage increases in the UK (56.9%). Furthermore, the analysis of citizens' trust in government climate initiatives shows a decline for both countries. Only 39% of Italians and 36% of Britons believe their governments will effectively reduce greenhouse gas emissions. Examining the data from our survey, the results align with the ones we have just presented. Many Italian respondents (n = 535 cases), regardless of their age, gender, and educational level, have low trust (44.9%) or no trust at all (43.9%) in their government. In contrast, only 11.2% feel sufficiently or fully confident.

If the institutional commitment to mitigation is deemed insufficient to meet climate targets, the government's adaptation efforts are considered even more residual. The interviewees highlight several factors that challenge institutions in delivering effective adaptation measures, including financial shortfall in the private sector and the lack of centralised authority and legally binding targets. *I think there is very little conversation in the UK about adaptation. I would expect there to be very little expectation in institutions' ability to delivering effective adaptation in response to climate change in the UK (Int.#1); The financing gap for adaptation is much bigger than it is for mitigation. It is partly because adaptation is a public good. Moreover, it is significantly more challenging to secure private funding to support adaptation than it is for mitigation. Thus, that's why it is, it involves public sector expenditure (Int.#11); Notably, while the UK does have a legally binding target on mitigation, there are no legally binding targets on adaptation (Int.#12); One of the problems with adaptation, in my opinion, is the fact that while mitigation is a typically global problem, adaptation is an essentially local problem. So adaptation strategies are typically diversified and quite patchy (Int.#7).*

The qualitative-quantitative results disclose that science-based climate legislation plays a crucial role in addressing social distrust in governmental climate action. According to Luhman (1979) and Giddens (1990), trust in expert systems can illustrate how people build confidence in institutions. Moreover, a significant effort from governmental institutions in disseminating scientific evidence on climate may help build public consensus around climate action. So, *I think a trusted voice is really needed here. Well, it turns out that politicians were telling lies, essentially, and unfortunately, that's what we're finding out now. And I think there's a huge role for academia, specifically universities, to disseminate trustworthy information to the public (Int.#2); It must be said that science has played a decisive role because it has led us to see collective phenomena rather*

*than just individual ones. It has allowed us to understand that many events, whether diseases or floods, depend on a complex context (Int.#5).*

Notably, while the UK government follows a systemic approach in integrating scientific and political domains, the absence of an evidence-based policymaking process characterises the Italian institutional framework.

Concerning this aspect, the UK interviewees state as follows: *The reason the Climate Change Act came together was that in the UK, we have a lot of climate scientists which drive the climate legislation (Int.#3); The Climate Change Act was an example of evidence-based policy. It deliberately referred to the work of the International Panel on Climate Change. Moreover, (The CCA, ndr) set up the Climate Change Committee, which is independent of government. It comprises experts from a variety of backgrounds, economics, climate science, universities, business. Therefore, the CCA create a check and balance, a sense of an external expert not taking over the control of policy, but continually providing a challenge to policy. I think there was a strong belief in the government that they had to listen to the advice of science (Int.#7); I honestly think in case of the UK government, I mean, within the mainstream political system, I don't think there's any questioning that the science of climate change is wrong (Int.#11).*

In other ways, the Italian respondent expressed skepticism about the institutional commitment to provide legislation with scientific assessment: *The transfer of scientific research into the practice of the ministry or the regions is not only very slow, but is influenced by such a number of lobbying elements that in the end it gets a little lost. I feel that the role of science is marginal for the Italian government, that science is involved a posteriori, after events have happened (Int.#5); In Italy there is always this difficulty of not thinking systemically. Science is also very departmental; it does not have a systemic culture (Int.#7); In the approach followed by England on climate change issues, in particular the transition, decarbonization, there they organized round tables sector by sector. Not here! Therefore, we do not approach complex problems systematically; instead, we attempt to solve highly complex issues on an ad hoc basis (Int.#15).*

This qualitative data from the Italian interviews aligns with that from our survey. The lowest percentage (68.5%) of the respondents who rated 4 and 5 to the role of institutional actors in tackling the climate issue indicates that science is the most relevant actor. In comparison, a significant 9.5% even identified expert actors as the least relevant. Following that, a low share of respondents (4.3%) indicates that they inform themselves about climate change

through scientific magazines, which contrasts with the main percentage (59.2%, as aggregate data), which prefers the internet and social media.

Notably, when asked in the questionnaire to identify which government instrument could increase social expectations from institutions to effectively play a leading role in tackling climate change, an overall majority (20.1%) of respondents referred to “climate law,” particularly among those aged 25-45 and those with a middle-level education. Additionally, awareness campaigns (15.5%) and scientific communication (12.7%) were highly cited. These aggregated data highlight the perceived relevance of evidence-based legislation to building public trust in governmental climate action.

The latest results we aim to discuss relate to the climate change-health nexus. The qualitative and quantitative findings reveal a strong public awareness of climate-related risks to public health and a shared perception of the necessity to integrate health and climate issues. From the interviews emerged: *Climate change itself is expected to have lots of different implications on health (Int.#1); Reducing the impacts of climate change will have a beneficial impact on health. The top health academics really view climate change as the biggest threat to health in the future. So, there is a real benefit of spending in one sector, to benefit the other in this particular situation (Int.#4); In some areas of the Planet it is physically impossible to live without air conditioning. Then, climate change becomes an existential risk (Int.#7)*. These results are consistent with the data from the web survey. It indicates that, on a sample of 536 cases, over 91% acknowledged the severe impact of climate change on public health. The extent that when asked the respondents to identify which policy options could be more effective in promoting public health, the majority across all age groups, genders, and educational levels expressed a preference for sustainability policies and climate-related strategies, such as investing in renewable energy (19.4%), reducing emissions (18.1%), and preserving natural resources (13.1%). Furthermore, a significant share of the participants (79,8%) agree on the potential value of health promotion in enhancing climate resilience.

However, the broad social perception of climate-related risks (Beck, 2013) and the significant health co-benefits deriving from climate strategies do not significantly influence governmental commitment to mitigate climate impacts and enhance citizens' resilience by promoting public health (Ottawa Charter for Health Promotion, 1986). As the interviewees contend: *I think to your question around whether sort of public health concerns influence climate change policy directly, No (Int.#1); I think there is an increased understanding of the potential impacts of climate change on citizen health, but there is insufficient action being*

taken by the government to achieve the reduction in the temperature increase (Int.#8). The quantitative data provide significant corroboration of these results.

In a sample of 536 cases, over half of the respondents (56%) identified low government health promotion efforts, while nearly one-third (29.3%) believed the institution lacked this commitment entirely. The cross-tabulation of these data with the ones concerning the citizen's awareness of climate-related risk for health reveals that, among the respondents who consider climate change a significant health risk ( $n = 232$  cases), the overall majority ( $n = 203$  cases) also perceive a lack or a low governmental commitment in promoting public health. The p-value of the Chi-square test (0.205) suggests that the association between the two variables are highly statistically insignificant. This means that the public's perception of climate-related health risks does not influence the government's commitment to promoting public health.

The Italian interviewee's representations identify the leading factor of this misalignment: the lack of a systemic approach relating to the climate change-health nexus. *Unfortunately, they did not teach me much of the methodology for systemic work. In public health, no* (Int.#13); *Climate change within the Ministry of Health is not yet perceived as a problem within its competence, and therefore, neither is the collaboration with the Ministry of Ecological Transition. It seems to me that everything is very patchy* (Int.#14). *The fact that there is a separation of the issues as if dealing with the environment does not mean preventing health issues. However, you have the Environment Commission and the Health Commission, and they are not two places that dialogue; they are forced by some mechanism to interact* (Int.#18).

The lack of a holistic and cross-sectoral approach to health determinants is confirmed by recent research we conducted within the X (formerly XII) Committee of the Italian Senate, which is responsible for health and social affairs. By analysing legislative acts, including draft laws, from 1948 (I legislature) to the present (XIX), we discovered that the health policy-making process has almost neglected the primary role of environmental and climate factors in determining health.

Conversely, in the UK institutional realm, the co-benefits for the human and one health (Gibbs, 2014; Queenan et al., 2017) from climate and environmental action started to emerge: *The co-benefits, as you say, of net zero and your health and planetary health to academics are so obvious* (Int.#4); *And I think the increasingly clear link between planetary and human health is an area that is just not one to be ignored* (Int.#10); *All health, one health will benefit from reducing CO2 emissions and reducing temperature increases. Biodiversity will be better and not restricted. And that is good in many, many ways for the planet.*

*So, all life and all organisms will benefit. There could be real benefits there from maintaining a natural ecosystem (Int.#4).*

However, the qualitative results indicate that, although climate actions have significant co-benefits for health, they can also create potential trade-offs. Considering the socio-economic health gradient (Marmot, 2010), institutions should prioritise social justice in implementing climate strategies to avoid health inequalities (Sannella, 2019).

*As the interviewees stressed, We need to have some institutional responsibilities and changes to how the social contract operates (Int.#9). Climate change is an absolute ecological determinant of health, whose impacts will manifest clearly along the social gradient in health. So, you know, this particular intervention can create a lot of co-benefits or create trade-offs, depending on how it's implemented. Moreover, often equity has a significant factor. So, depending on how you implement it, a particular intervention might primarily benefit those already healthy and well-off. But it may also exacerbate inequalities or exacerbate those that are not healthy. So, interventions cannot only improve net health but also reduce health inequalities (Int.#12).*

To summarise, the empirical research highlights the leading role of governmental institutions and the legislative framework in tackling the social dimension of the climate crisis. However, the complex socio-economic and political dynamics underlying the climate issue and influencing its far-reaching effects require polycentric governance. It emerges from the interactions of diverse social actors, such as political and scientific institutions, businesses, and civil society. A transdisciplinary perspective (de Freitas, Morin, and Nicolescu, 1994) should guide the interaction process, enabling climate legislation to be scientifically reliable and socially acceptable, thus increasing public trust. Moreover, transdisciplinarity can significantly benefit health policy-making by facilitating a systematic approach to various health determinants. Despite its widespread adoption in the UK institutional framework, the Italian context has not yet reached a comparable conclusion.

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## **CONCLUSION AND POLICY RECOMMENDATION**

This study explored how climate change, rather than just a natural occurrence, is deeply intertwined with socio-cultural frameworks, institutional processes, and economic influences. We illustrated how the interplay of these factors drives environmental pressure and accelerates the climate crisis. Moreover, we analysed the crucial role of a strong stratified structure in generating social vulnerabilities and health inequalities, which the impacts of climate change exacerbate.

Through mixed-methods empirical research in the United Kingdom and Italy, we explored social representations, institutional mandates, and the effectiveness of existing governance frameworks in tackling climate actions and promoting social resilience. The key findings revealed that, while governmental actors play a crucial role in addressing climate change, their legitimacy and effectiveness often decline due to fragmented governance, ideological divides, and a widespread crisis of public trust. Citizens are becoming increasingly aware of and concerned about the consequences of climate change, notably its uneven impact on public health. However, they also express a disconnect between policy goals and social expectations. This misalignment underscores the urgent need to reassess the institutional role in facing climate change, emphasising the importance of evidence-based decision-making, a long-term perspective and participatory processes. Effective climate governance necessitates a substantial paradigm shift from traditional, siloed approaches to a transdisciplinary and polycentric framework. Integrating theoretical foundations and empirical evidence, this work highlights the significance of transdisciplinarity as a valuable research approach and a strategic political tool. As applied here, it extends beyond the integration of interdisciplinary knowledge by fostering collaboration among academia, policymakers, civil society, and communities. It acts as a crucial link between scientific rigour and social legitimacy.

Grounded in the research findings, we proposed the following policy recommendations:

### **1. Institutionalising transdisciplinary process in a polycentric climate governance**

The public policy process should be conducted within a polycentric governance framework, building on the complementary roles of all social actors, each leading its respective task. A transdisciplinary approach should be

prioritised in the initial phase of the process, focusing on the research and development of scientific knowledge for the decision-makers. During this step, experts from various fields should collaborate to produce a scientific report for policymakers, drawing on the most critical evidence, which should inform the next step of policy design. Before proceeding to the implementation step, an ex-ante evaluation of the policies should be conducted, again through a transdisciplinary perspective. Firstly, civil society should be engaged, specifically the most representative associations and businesses, to ensure the policies are accepted and meet social needs. Similarly, involving institutional representatives can enhance their accountability in the policy implementation process. Overall, this participatory approach should guarantee that the policies are scientifically reliable, socially acceptable, and pertinent to the social context.

A practical recommendation is establishing a national, transdisciplinary committee on climate change modelled on existing examples, such as the UK Climate Change Committee. Its primary role should be to deliver a scientific evaluation of governmental climate action. Moreover, it should facilitate the translation of scientific evidence into policy-relevant insights and make knowledge accessible to the public. This could help lead to climate-related behavioural change and avoid cultural and political polarisation on climate science.

## **2. Encouraging democratic engagement and restoring trust**

Given the current crisis in public trust, democratic participation needs to extend beyond the election process. It should include substantial involvement at every level of the policy cycle. Tools like citizens' assemblies, permanent climate forums, and organised consultations can foster a sense of community, strengthen policy legitimacy, and help rebuild public trust. However, the democratic engagement we suggest involves a participatory process, distinct from policy co-production, which should remain a scientific and legal prerogative.

Considerable attention should be directed towards the participation of youth and vulnerable groups, acknowledging their vital role in mainstreaming intra- and intergenerational justice into policy design.

## **3. Overcoming the short-term perspective**

A strategic perspective should inform climate policy-making. It should allow moving beyond short-term electoral cycles and prioritising systemic transition.

To this end, we recommend enhancing the intermediate and ex-post evaluation policy process by emulating the participatory and transdisciplinary approach utilised in the ex-ante phase. Strengthening the implementation stage should ensure that policies are responsive to evolving social needs and consistent with updated climate and environmental scenarios, allowing for a necessary realignment.

#### **4. The need for a national climate law**

While the European framework commits Italy to achieving climate neutrality by 2050, a national climate law could further enhance institutional and social efforts toward climate action and increase citizens' expectations of the government's liability. Moreover, it could enable a context-sensitive strategy to overcome the fragmented power dynamics between the state and regions, which often generate significant inequalities among territories. Along with this perspective, the national law should provide tailored adaptation targets by developing specific social indicators, including health, well-being, community cohesion, and regional exposure to climate-related hazards.

#### **5. Systemic approach for improving health promotion**

Considering the increasing social risks associated with the acceleration of climate change and environmental degradation, institutions should strengthen their commitment to health promotion by adopting a systemic approach. According to this concept, effective health policies should primarily consider how the complex interplay between various factors, including socioeconomic and environmental resources, influences human health throughout life. From this perspective, health issues should not be regarded as an exclusive prerogative of a specific governmental body. Therefore, institutions must promote cross-sectoral integration among various ministers and departments to improve public health, facilitating communication and proactive exchange. Next, a transdisciplinary dialogue among different experts should be implemented in health research.

**Final remarks: Imagining a new social pact in a transitioning world**

To align with sustainable development, we must rethink the concept of democracy. When discussing climate action, the focus is often restricted to developing and implementing plans for drastically reducing emissions, but this is merely the starting point. We need more than just renewable energy; we need more than dismantling the fossil fuel industry and capitalism. We need to develop a new kind of society. Sustainable development does not mean stepping back; it means trusting that our planet can support the lives of both humans and non-humans, provided we care for it. We often hear that the immediate solution to the climate crisis is to flee or relocate to wealthy countries where air conditioning is not a luxury but a common good. Fleeing is maybe today's most dangerous manifestation of the climate change crisis, as it epitomises how the problem has arisen. It conveys the notion of perceiving ourselves as individuals outside of an interconnected ecosystem in which every action impacts the rights of others, whether they are human or non-human. What about those who cannot flee? Until we develop policies that benefit everyone, there will remain individuals whose survival is persistently threatened by power.

This study indicates that climate change governance is now at a critical juncture. The rapid pace of environmental and climate degradation, along with the uneven distribution of its impacts, necessitates a significant reorientation of the existing social framework. Institutions are not neutral; they are woven into broader socio-structural processes that can either heighten vulnerability or promote resilience. How institutional structures interact with social expectations fundamentally influences society's capacity to tackle climate crises. To achieve climate and sustainability goals, we must reimagine the role of institutions from mere regulators to active agents of transformation.

A transdisciplinary approach, when viewed through the lens of social justice, offers a viable path forward. It is not just a methodological innovation but a necessary principle. This approach encourages us to reassess the fundamental principles of governance, transitioning from hierarchical structures to interconnected systems and from reactive strategies to proactive ones.