Perceptions of climate change as a security issue in the case of Greece: an application of Q-methodology in security studies

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Abstract

This study establishes the stakeholders' perceptions of environmental and energy security through the application of Q methodology in the case of Greece. It explains in detail the essentiality of including individual viewpoints and the opinions of actors such as the policy-makers, energy-industry leaders, members of NGOs and the public in the security field. More precisely, it presents the usefulness of applying Q methodology in the study of climate change as a security issue in a vulnerable country like Greece, which represents a range of countries with many interrelated economic, societal and political problems. In this study, Q methodology systematically reveals the traditional and non-traditional security approaches and theories and compares the academic and public perceptions. This thesis highlights Q methodology's research design and the difficulties involved in conceiving a methodological pattern of similar security research studies. This thesis applies Q methodology as a part of proposing a discussion on climate change as a security issue in the case of Greece in the period from August 2007-2016 prior to the Paris Climate Agreement. Q methodology is appropriate because it provides a systematic means of investigating human subjectivity. It has not been used to investigate climate change and security issues in general and in the case of Greece in particular. This research study, through this systematic analysis of the stakeholders' perceptions in Greece, has established three different discourses; Factor 1: Environmental and Energy Security-Policy Seekers, Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters and Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism. These factors shift the discussion from traditional security and climate change scepticism to ecological security and protection, while these also contribute to the knowledge both regarding the case study and the literature.

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Abbreviations

E.C.B	European Central Bank
EEA	European Environment Agency
ENCOP	Environment and Conflicts Project
EU	European Union
EYATH	Thessaloniki Water Supply and Sewerage Company
EYDAP	Athens Water Supply and Sewerage Company
GECHS	Global Environmental Change and Human Security
HRADF	Hellenic Republic Asset Development Fund (GR)
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IR	International Relations
MIT	Turkic National Intelligence Organization
NATO	North Atlantic Treaty Organization
OPCW	Organization for the Prohibition of Chemical Weapons
ONA	Office of Net Assessment (US)
PKK	Kurdistan Worker's Party
PM	Prime Minister
PPC	Public Power Corporation
PRIO	International Peace Research Institute
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
YPEKA	Ministry of Environment, Energy and Climate Change (GR)
WWI	First World War
GHGs	Greenhouse gases
UNISDR	United Nations International Strategy for Disaster Reduction

Chapter 1: Introduction

1.1 Introduction

This study has a specific focus on the application of a unique and pioneering research methodology in security studies, namely the Q-methodology, related directly to the evaluation of perspectives of climate change as a security issue in the case of Greece. Accordingly, this chapter outlines the reasons for analyzing climate change as a security issue, the explanations for examining the case of Greece, the justifications for applying Q-methodology and additionally, the aims and the structure of this thesis.

1.2 Climate Change as a Security Issue

The precise focus of this research is on the perspective of climate change as a security issue, with the aim to locate and uncover the discourses and points of views contained therein. Climate change has attracted the interest of the academic community in recent years, especially in the security studies discipline. There are a number of open debates on the appropriateness of linking climate change with security and vice versa. Additionally, as the threat of climate change seems to have risen and as the present policies in operation are clearly not working, there is a pressing need to take appropriate action related to climate change. This requires the introduction of new and radical policies to, at the very least, assuage the issue to some extent. It is therefore imperative to analyze people's perspectives while aiming to reach an understanding in-depth of how they have been influenced by the security discipline's existing attitude to climate change as a security issue theory, in addition to perspectives and policies. Obviously, there is a pressing need

to become aware of the scientific and public understanding of climate change as a security issue by virtue of providing conceivable perspectives and potential solutions.

1.3 Climate Change as a Security Issue in the Case of Greece

This research study has chosen to concentrate on climate change as a security issue in the case of a particular country, Greece. The reason that Greece has been selected as the case study of this research arises from the academic discussion of climate change and security, in which there is an extensive focus on the role of developed and developing countries needing to tackle the climate change threat. However, there is a limited or non-existent analysis of the vulnerable and middle rank developed countries, which have an unsustainable future due to the many interrelated issues that they have to confront. Thereby, the case of an indigent and vulnerable country like Greece, which is a full member state of the European Union and a typical Mediterranean country with many interconnected problems (economic, political, societal, etc.) as a direct consequence of the current global economic crisis, will be used as a representative case of a category of countries which are not covered extensively in the academic discussion.

Moreover, there is a need to open the discussion of climate change as a security issue in a vulnerable country, as other important matters monopolize the political and public interest and as climate change threat is not included in the Greek agenda. There is a need to determine the stakeholders' perceptions of whether they identify this issue; how they make sense of it; whether climate change is a threat to security; and if it is, what type of threat; what their understanding of security is; whose security is threatened; and how is climate change is ranked against other threats, etc. It is proposed that the stakeholders' perspectives in a vulnerable country like Greece will be examined and that the need to

establish new roots, approaches and attitudes in the general discourse of climate change in the security discipline will be the major contribution from this thesis to the existing knowledge.

The establishment of the different viewpoints of Greek stakeholders, including the public, seems to be an unequivocal necessity in the discussion of climate change and security. This is able to provide highly significant discourses and information based on the stakeholders' views which are otherwise missing or excluded from the academic discussion or literature of climate change and security. The aim is to determine whether they identify these issues; how they make sense of them; whether climate change is a threat to security; and if it is, what type of threat is it; what their understanding of security is; whose security is threatened; and how climate change is ranked against other threats. The answers to these questions produces actual discourses which specify the gaps that security studies have to target to avoid any complexities, misunderstandings and misguidance and also to inform the stakeholders of the most accurate ways of dealing with climate change. The establishment of the stakeholders' perceptions is appropriate for revealing any problem in the theoretical framework of security studies as well as being adequate for bridging the gap between the academic and stakeholders' discourses. Thus, the main research question which needs to be answered is:

What are the perceptions and opinions of the stakeholders (policy-makers, energy-industry leaders, national NGOs and the public) on climate change as security issue in a vulnerable country like Greece?

1.4 The Rationale of Applying Q-Methodology

In general, Q-methodology has the characteristics of being a unique and innovative methodological approach in social sciences. In terms of security studies, Q-methodology has not been applied even sporadically, no matter that the study of climate change as a security issue is a major source of disagreement, in which Q has to be used as a sophisticated analysis of human subjectivity. Accordingly, this thesis considers the application of Q-methodology in security studies to be necessary and a useful research mechanism for the entire field of security, as well as in the study of examining and establishing the perspectives of climate change as a security issue in the case of Greece in particular.

1.5 Aims of the Thesis

This thesis scrutinizes the prevailing discourses of climate change as a security issue in general, as well as in the case of Greece in particular. Also, it appraises the usefulness of applying Q-methodology as a means of research in security studies. Moreover this study establishes stakeholders' perceptions of climate change as a security issue in the case of a vulnerable country such as Greece, as well as analyzing and criticizing the different perspectives existing between the examined groups of participants. Finally, it enquires into the relationship between the established stakeholders' perception of climate change as a security issue in the case of Greece and the dominant academic perceptions of climate change as a security issue.

1.6 Contents of the Thesis

Chapter 2 focuses on the dominant international institutions' (IPCC, UNFCCC, UNISDR, EEA) perspectives regarding defining climate change, explaining the climate change projections, and the vulnerabilities of the EU and Greece. Additionally, this chapter considers the prevailing literature on climate change in security studies and focuses on environmental security and energy security. It also critically analyses the connections between climate change and violent conflict, national security and energy security. Finally, it presents the linkage between climate change, environmental security and energy security which is based on the orthodox security theory and rationale.

Chapter 3 highlights and analyzes the study of climate change as a security issue from a methodological perspective, as it develops patterns as in any security study with an interest in human subjectivity. Thus, it proposes the application of the Q methodology in the field of security studies. Additionally, it presents the six stages that the Q Methodology requires to be applied in any study. These six stages are the identification of an issue, the identification of the relevant group of participants, the selection of the participants, the selection of statements, the Q-sorts and the statistical analysis. Furthermore, it describes the research process of this study as it concentrates on the step by step practices followed as well as the results achieved throughout the research process. It presents the problems during the research process, explaining in detail the question selection, the structured interviews, the participant selection, the statement selection, the Q-sorts, the statistical analysis and finally, the three (3) factors that have been extracted from the stakeholders.

Chapter 4 discusses the climate change and environmental issues in Greece in the period from August 2007 - 2016 prior to the Paris Climate Agreement, which includes several

methods related to the country's security. The starting point of this case study was the wildfires of August 2007, which had major environmental, political and societal significance for Greece. This was considered to be a tremendous event which could have been linked directly or indirectly with security, as it presents the absence of environmental and energy security policies in a vulnerable country, which focuses exclusively on the economic and political difficulties prior to the economic crisis. The main aim of this study was to address the Greek ways of approaching climate change as a security issue, the Greek climate change-policies and energy security-policies as well as the problems of these policies. Additionally, it explains the very significant connection between the Greek stakeholders and climate change skepticism as has been revealed by this research study.

Chapter 5 scrutinizes and construes the three (3) factors (1, 2 , 3) and discourses which have been established though factor analysis. Additionally, it interprets each factor and discourse verbally as well as highlights the significant features expressed by the participants' comments, perceptions and attitudes. Finally, it mentions the perceptions of climate change as a security issue in the case of Greece, considers the established discourses in terms of the existing academic literature and their policy implications and supports the appropriateness of applying Q-methodology in security studies.

Chapter 6 is a concluding chapter that summarizes the findings of the research study and focuses on the ways of improving the current research as well as the areas for future research. Finally, it highlights and demonstrates the appropriateness and advantages of using the Q methodology in security studies.

1.7 Conclusion

This introductory chapter has presented the reasons why the researcher has chosen to focus on analyzing climate change as a security issue, applied the Q methodology in security studies and examined the case study of Greece in this particular topic. Following and focusing on this rational, this study analyses, firstly, climate change and the connection between climate change and security. Secondly, it examines and presents the Q methodology and this study's research design. Thirdly, it describes and explains the climate change and environmental issues in Greece which are or could be related to or connected with security. Finally, this study analysis and interprets the three (3) factors and discourses established by the stakeholders (policy-makers, energy-industry leaders, members of NGOs, the public).

Chapter 2: Climate Change, Security and International Institutions

"Climate change is no longer a doomsday prophecy, it's a reality." (Heiberg A., 1999), President of the International Federation of Red Cross and Red Crescent Societies

2.1 Introduction

The aim of this chapter is to give a detailed definition of climate change as well as an insight into what the climate change projections and vulnerabilities are, as these are conceptualized through the dominant international institutions' perspectives informing stakeholders in both Europe and Greece. This will indicate the most dominant environmental issues and debates which have arisen, not only for Europe as a union of states, but for one particular EU (European Union) member country, Greece.

The following analysis addresses the global understanding of climate change as has been identified and described by major institutions, such as the Intergovernmental Panel on Climate Change (IPCC), the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations International Strategy for Disaster Reduction (UNISDR) and the European Environmental Agency (EEA) which have dominated the general climate change discussion and the academic climate change framework. In brief, it introduces the meanings of climate change projections and climate change vulnerability and it highlights the main climate change related projections and vulnerabilities on global scale as well as examining the unique European and Greek climate change projections and vulnerabilities open to further study on a regional scale.

It concentrates on the ways in which the terms climate change, climate change projections and climate change vulnerability have been defined, explained and linked with various social, economic and human issues. It focuses on the way that these are used as important indicators for alerting the stakeholders to the climate change-related risks. The chapter

then discusses the way that all of the above can be used as policy-related concepts for avoiding the consequences of climate change. This chapter analyzes climate change, the main international institutions' position on the topic and the connection between climate change and security. The predominant reason for this review of the international institutions' literature and the security theory is to understand, criticize and create a theoretical base from which the analysis will build a valuable relationship between climate change, security and the Q methodology.

2.2 Climate Change and International Institutions

Climate change has attracted academic interest, as the scientific publications on the subject have been doubled in volume from 2005 (IPCC, 2014: 4). However, it is essential to observe that, in addition to the increased scientific interest, the term climate change does not have an agreed definition. An open debate exists between the human or/and natural impacts based on climate variability. This complicates trying to define climate change and clarifying the concept. According to the Intergovernmental Panel on Climate Change (IPCC) (2014: 5):

> ''climate change refers to a change in the state of climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use".

In contrast, the United Nations Framework Convention on Climate Change (UNFCCC) (ARTICLE 1) has explained that "climate change means a change of climate which is

attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".

These central definitions of climate change interpretation have created reasonable doubts as they do not define the extend of the human responsibility regarding environmental degradation. This has happened as both of them encounter difficulties in explaining whether the changes in the climate are anthropogenic or/and natural phenomenon. The division of the academic community into three leading groups was the outcome. The first group is the climate change deniers who claim that the changes in the climate are a natural phenomenon (Mazo, 2013: 41-49). The second group is composed of the supporters of anthropogenic climate change who believe that climate change is a 99% anthropogenic phenomenon (IPCC, 2013: PRESS RELEASE) and the last leading group supports that climate change is both an anthropogenic and natural phenomenon (UNFCCC: ARTICLE 1).

In contrast to the debate of whether or not climate change is a human or/and natural phenomenon, a specific explanation stands that climate change has been caused by the increased concentration of greenhouse gases (GHGs) in the atmosphere as a direct result of the "combustion of fuels from fossil carbon deposits such as oil, gas and coal" (IPCC WGI Annex 1: 946). As IPCC (WGI Annex, 1: 947) explains,

> "greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. This property causes the greenhouse effect. Water vapour (H_2O), carbon dioxide (CO_2), nitrous oxide

(N_2O), methane (CH_4) and ozone (O_3) are the primary greenhouse gases in the Earth's atmosphere".

In other words, the burning of fossil fuels increases the atmospheric concentration of GHGs and creates the greenhouse effect which is responsible for the increase of the Earth's surface temperatures as the "greenhouse gases trap heat within the surface-troposphere system" (IPCC WGI, Annex 1: 946). The enhanced greenhouse effect is associated with rising global mean temperatures which have, as a result, caused the melting of ice and snow, the rise in sea level, etc. As the United Nations International Strategy for Disaster Reduction (UNISDR) (2008: 2) mentions, "global temperatures have risen unusually rapidly over the last few decades" and as it continues, "there is a strong evidence of increases in average global air and ocean temperatures, widespread melting of snow and ice, and rising average global sea levels".

Finally, the analysis is necessary to focus on climate change projections in order to obtain expected impacts and vulnerabilities, as the IPCC's (2007: 30) observations highlight that the previous years have been ranked "among the twelve warmest years in the instrumental record of global surface temperature (since 1850)" and that the GHG concentration in the atmosphere is at the highest levels ever recorded for the past five hundred thousand (500,000) years, having also reached these levels far more rapidly than expected (UNISDR, 2008: 2).

2.3 Climate Change Projections

The term 'climate change projections', according to the IPCC (WGI, Annex 1: 943), refers to "a projection of the response of the climate system to emission or concentration scenarios of greenhouse gases and aerosols, or radiative forcing scenarios, often based

upon simulations by climate models". In addition, the IPCC (WGI Annex 1: 943) has clearly distinguished climate projections:

> "from climate predictions in order to emphasize that climate projections depend upon the emission/concentration/radiative forcing scenario used, which are based on assumptions concerning, for example, future socioeconomic and technological developments that may or may not be realized and are therefore subject to substantial uncertainty".

There are a plethora of climate change projections that combine the key factors and processes of climate change and include the GHG concentration in the atmosphere in the near or long-term future.

The climate change projections of IPCC (2014: 10) have revealed that there is a very strong agreement on the probable increase of the global surface temperature from $1^{o}C$ to $6^{o}C$ during the period of 2081 - 2100 based on the observed temperature changes and the projected or expected temperature changes "under continued high emissions and ambitious mitigation". These "continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system" (IPCC, 2013: 19). Thereby, this projection observes that there will be a definite increase of the global surface temperature at the end of 21^{st} century. However, if there is an even higher concentration of GHGs' emissions, then there will be a further increase of the global surface temperature and other changes in many climate-related factors (IPCC, 2013: 19).

Following the IPCC's climate change projections, there are particular expectations of changes and the impact both to the atmosphere and the ocean. According to the IPCC's (2013: 20) prognosis for future atmospheric alterations,

> ''the changes in the global water cycle in response to the warming over the 21st century will not be uniform. The contrast between wet and dry regions and between wet and dry seasons will increase, although there may be regional exceptions''.

Additionally, future expectations for the global ocean changes are undeniable as it is very likely to continue to warm during the 21st century (IPCC, 2013: 24).

Moreover, climate change projection on a cryosphere propounds that it is "very likely that the Arctic sea ice cover will continue to shrink and thin and that Northern Hemisphere spring snow cover will decrease during the 21st century as global mean surface temperature rises. Global glacier volume will further decrease" (IPCC, 2013: 24). It is comprehensible and evident that the phenomenon of melting of ice and snow will continue and that the global glacier will continue to decrease as well, as a consequence of the increase of surface temperatures. Therefore, further climate projections by IPCC (2013: 25) anticipate that the sea level "will continue to rise during the 21st century" as "the rate of sea level rise will very likely exceed that observed during 1971-2010 due to increased ocean warming and the increased loss of mass from glaciers and ice sheets".

The most dramatic climate change projection, according to IPCC (2013: 27) is the expectation that "most aspects of climate change will persist for many centuries even if emissions of CO_2 are stopped. This represents a substantial multi-century climate change commitment created by past, present and future emissions of CO_2". The IPCC's projections of climate change are interrelated, as any further prognosis is simply due to the ''chain reactions'' provided by the increase of global surface temperatures. As for the climate change emissions, the projections represent the existence and future of irreversible conditions, in which even if the GHGs were to stop today there would be no

immediate progress on climate change, as the impacts of it will last for multiple centuries and not only until the end of the 21st century.

2.4 Climate Change Projections for Europe and Greece

Climate change has not impacted only on a global scale. There is a need for additional regional projections for Europe and Greece in order to specifically focus on the expected impacts and vulnerabilities on a regional scale. In contrast to IPCC, which does not address territorial climate change projections, the European Environmental Agency (EEA) is producing information on the environment as an agency of the European Union to appraise the policy-makers and general public of its thirty-three (33) member countries, including Greece. According to the EEA's (2012: 19) report on climate change, impacts and vulnerability in Europe, there are significant projections on European temperature as the surface temperatures in Europe are expected to have increased between 2.5°C and 4.0°C by the end of the 21st century. Additionally, the land temperature projection for southern Europe in the summer periods, in which Greece is naturally included, and for eastern and northern Europe in the winter periods, proposes that Europe will face the largest temperature increases between 2071 - 2100 (EEA, 2012: 19).

Thereafter, an interrelated expectation on the atmosphere as a result of the increased surface temperature shows that the precipitation will continue to decrease in southern Europe during summers and continue to increase in northern Europe during the winters (EEA, 2012: 19). Finally, the EEA's (2012: 20) projections of the land and sea surface temperature present that the "global sea surface temperature is projected to rise more slowly than atmospheric temperature". However, the observations have shown that the

European seas' surface temperature increases at a far quicker rate in contrast to that of the global oceans (EEA, 2012: 20).

Furthermore, the EEA (2012: 21) has projected that the future European and global sea-level rise is expected to be in a range between "20 cm and about 2 m". Hence, the estimation of the forthcoming climate change and the rise in sea-level in particular is very likely to cause further coastal erosion as "one quarter of the European coastline for which data is available is currently eroding" because of the increasing human activities on the seashore (EEA, 2012: 21).

Another important projection based on climate change is the impact on Europe's forests. Southern Europe, in which Greece is included, is very likely to face a forest growth decrease in contrast to a forest growth increase in northern Europe (EEA, 2012: 23). Additionally, the increase in surface temperature has been projected to result in a parallel increase in the fire seasons, having natural consequence on the risk of forest fires (EEA, 2012: 23).

As the EEA (2012: 25-26) has highlighted, there are different regional climate change projections even within Europe and this is the main reason for dividing of the European continent into different regions such as the "Arctic", "northern Europe", "north-western Europe", "central and eastern Europe", the "Mediterranean region", the "cities and urban areas" and the "mountain areas". As suggested by the EEA (2012: 27), in order to understand in-depth the climate change projections for Greece, the analysis focuses on the designated Mediterranean region, which involves a group of member countries of the EEA such as Portugal, Spain, Italy, Greece, Turkey and Cyprus, as well as coastal parts of France, Croatia, Montenegro and Albania (EEA, 2012: 27). Greece is a country which belongs to the Mediterranean region and faces significant changes, risks and

vulnerabilities as climate change projections have indicated. Apart from the aforementioned climate change projections for Southern Europe in which Greece is naturally included, such as the "decrease in annual precipitation", the "increasing risk of forest fire" etc. (EEA, 2012: 28), there are numerous other very significant and unique projections for this area in particular. Climate change projections such as the "temperature rise larger than the European average", "increasing risk of desertification", "increasing risk of biodiversity loss", "increasing water demand for agriculture" and "decrease in crop yields" as well as a "decrease in summer tourism and potential increase in other seasons" (EEA, 2012: 28) synthesizes the projected climate change characteristics of the Mediterranean region in general and Greece in particular.

In addition, as the main climate change projections for Greece have noted, the information of a few key climate projections on greenhouse gas emission, renewable energy and energy efficiency for Greece is important to state via the European Environmental Agency (2013) as well. Thereby, these projections are based on the "20/20/20 triple objective[1]" with the view of adjusting the progress toward 2020, the GHG targets, renewable targets and efficiency objectives (20/20/20 targets) set by the EU countries including Greece (EEA, 2013: 10-11). Furthermore, Greece has been projected to meet its targets regarding the reduction of GHG emissions with the current measures in place and it is expected to face the 20% share of its gross final consumption of renewable energy (EEA, 2013: 12). Despite the fact that the country has made progress in reducing its energy consumption, it still requires additional policies or the further implementation of the existing measures to achieve these goals (EEA, 2013: 12).

[1] By 20/20/20 triple objective the European Commission has introduced new targets in 2007 such as ''a 20% reduction of EU's GHG emissions compared to 1990'', ''a 20% share of renewable energy in the EU's gross final energy consumption'' and ''a 20% increase of the EU's energy efficiency'' by 2020 (EEA 2013: 10-11)

However, the European Council (24/10/2014) has agreed on a 2030 new climate and energy policy framework by setting even more ambitious targets for GHG emissions reduction, renewable energy, energy efficiency and energy security as well as the target of achieving a fully functioning and connected internal energy market[2], while Greece is working to meet its 20/20/20 targets. Moreover, the analysis is concentrated on the vulnerability and resilience to understanding the global sensitivity and adaptations to climate change and to what extent climate change is likely to affect and impact both the environment and human population.

2.5 Climate Change, Vulnerability and Resilience

As the IPCC (2014: 5) informs and explains climate change to policy-makers, it has defined many ambiguous and complex terms which are very significant to facilitate an in-depth understanding of climate change. Thus, vulnerability has been defined as "the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and a lack of capacity to cope and adapt" (IPCC, 2014: 5). Unlike the definition of climate change, the term of vulnerability has a clear determination as it highlights central concepts and elements without potential "blind spots" and areas of misunderstandings for policy-makers.

Accordingly, as the IPCC (2014: 6) has noted:

[2] The European Council (24/10/2014: 2-5) set an EU target of 40% domestic reduction in GHG emissions by 2030 compared to 1990, an EU target of 27% for the share of renewable energy consumed in the EU in 2030 as well as an EU target of 27% for improving energy efficiency in 2030 compared to projections of future energy consumptions based on recent criteria.

> "differences in vulnerability and exposure arise from non-climate factors and from multidimensional inequalities often produced by uneven development processes. These differences shape differential risks from climate change. People who are socially, economically, culturally, politically, institutionally, or otherwise marginalized are especially vulnerable to climate change and also to some adaptation and mitigation responses. This heightened vulnerability is rarely due to a single cause. Rather, it is the product of intersecting social processes that result in inequalities in socioeconomic status and income, as well as exposure. Such social processes include, for example, discrimination on the basis of gender, class, ethnicity, age, and (dis)ability".

In other words, there is a very high probability that different forms of vulnerability are producing different climate change-related risks/impacts that are based upon very unstable social characteristics and processes in addition to being under development and not based upon the climate factors in isolation.

Therefore, resilience, as it has been defined by Chandler (2012: 217), is ''the capacity to positively or successfully adapt to external problems or threats''. As Cavelty, Kaufman and Kristensen (2015: 7) have mentioned, ''resilience always presupposes vulnerability or susceptibility to harm''. Many institutions, organizations and non-governmental organizations (NGOs) have promoted participatory methods to assess people's vulnerability to hazards, but nowadays there is a serious shift toward resilience (Cannon and Muller-Mahn, 2010: 12). However, one of the main problems with the resilience approach is that there is a ''shift in the way that human action is ''blamed'' for the problems of the system'' (Berkhout et al., 2003). This is as resilience, according to Adger's (2000) view, analyses ''the degree to which human action makes it possible for a social-ecological system to survive, revive or ''tip''. As Cannon and Muller-Mahn

(2010: 12) have properly identified, there is an essential antithesis between the concept of vulnerability and resilience as

> ‘‘vulnerability involves a clear, economically and politically induced condition that theorizes the way that people are exposed to a lesser or greater degree of risk. With resilience and the ecosystem focus, there is a significant loss of the idea that it is socio-economic systems themselves that expose people to different levels of risk’’.

Following the IPCC’s (2014: 6) explanations on vulnerability in relation to climate change, it is also has “very highly confident” that the “impacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability”. Hence, the consequence of extreme climate incidences does not only affect vulnerable ecologies and people, but it also reveals their vulnerability as being dependent on any change in the climate.

As Cavelty, Kaufman and Kristensen (2015: 7) have explained, ‘‘since resilience needs a vulnerable subject to thrive, it constantly re-produces it, therefore robbing human subjects of political opinions, especially options of resistance’’. In other words, resilience uses vulnerability and perpetually re-produces it for the systems that need to survive aside from instability and risks. However, the sacrifice is the loss of particular human rights and political opinions such as the privilege of resistance. Thereafter, ecological resilience has been defined by Bourbeau (2013: 8) ‘‘as the capacity of a system to experience disturbance and still maintain its ongoing functions and controls’’. Additionally, ecological resilience holds similar characteristics to the overriding concept as it ‘‘determines the persistence of relationships within a system and is a measure of the

ability of these systems to absorb changes and still persist'' (Holling, 1973: 17). All in all, the analysis has revealed that resilience and ecological resilience both need (climate) vulnerability to survive, in addition to the deprivation of political options and as a consequence human rights violations happen as well.

Moreover, there is a "high agreement" and "medium evidence" that "violent conflict increases vulnerability to climate change" as "large-scale violent conflict harms assets that facilitate adaptation, including infrastructure, institutions, natural resources, social capital, and livelihood opportunities" (IPCC, 2014: 8). Based on this statement, there is - at the very least - a high level of agreement that all forms of violent conflict are capable to create affection or sensitivity to climate change impacts or risks etc. As the analysis has shown, there is a connection between violent conflict, vulnerability and resilience. The considerable problem here is that vulnerability leads to violent conflict and vice versa. This issue has chain reactions, as violent conflict decreases resilience and adaptive capacities. The harmful impacts of extended violent conflict on the natural resources, states/countries, ecosystems human systems and socioeconomic systems have, as a result, caused the rise of vulnerability to climate change as a direct consequence of these effects. This connection has an essential climax on the continuity of the analysis as it demonstrates that, finally, climate change can easily lead to violent conflict.

However, the IPCC (2014: 11) admits that the "uncertainties about future vulnerability, exposure, and responses of interlinked human and natural systems are large". This acceptance of the unknown consequences of future vulnerability induces the further decrease of resilience as it challenges the human and natural systems without being able to maintain their ongoing functions and controls.

According to the IPCC (2014: 11), the method of understanding future vulnerability is challenging, as the "interacting social, economic and cultural factors" are incomplete but factors such as "wealth" and "international dimensions" (e.g. trade and relations among states) seems necessary to explain climate vulnerability at the regional levels. Climate vulnerability has key elements and concepts that are not only climate change related. They are, in many ways, connected to social, economic or political sensitivities to climate change. Additionally, climate vulnerability leads to violent conflict, which effects adaptation and decreases resilience, and even threatens natural resources. Apparently, the groups of the population, who are multi-dimensionally unequal, are highly vulnerable to climate change. The effects of climate-related extremes reveal this vulnerability to climate change in both ecosystems and human systems as well.

As for the case of Greece, there are a minimum of three very important vulnerabilities/environmental issues, according to the EEA (2015: 4), which are the "adaptation to the impacts of climate change", the "management and protection of natural environment" and the "management of the marine and coastal environment". According to the adaptation to the impacts of climate change, the EEA (2015: 4) mentions the necessity of particular actions in "the current growth model towards a sustainable, green economy and low or zero carbon emissions with the use of modern technology''. The second climate change issue/vulnerability is the "management and protection of the national environment in conditions of economic crisis", Greece holds a "high diversity of species and ecosystems" (EEA, 2015: 4) and their protection should represent a high priority issue for the country. Finally, through the "management of the marine and coastal environment", the EEA (2015: 4) stresses the growing importance for Greece to make use of the "tools of the Marine Spatial Planning, the Integrated Coastal Zone Management, the policy of addressing erosion and the EU Strategy for the Adriatic and

Ionian Region". There has not been, in this section, a very extensive analysis of Greek climate change issues/vulnerabilities. This is because the Greek case has been examined in-depth in relation to climate change and security in Chapter 4. The main aim of the analysis so far was to declare and unveil the perceptions of the international organizations and institutions on climate change, climate change projections, vulnerability and resilience and to understand how they have influenced and informed the Greek stakeholders. Additionally, it has revealed the connection between climate change, vulnerability, violent conflict and decreased resilience with the view to address that climate change can lead to violent conflict. This significant acknowledgement assists in linking climate change to violent conflict and security. The theories and approaches of this connection have to be considered as the perceptions of the international organizations, institutions and dominant academics and the stakeholders who have gained information from the theoretical connection of climate change with security. Thus, the analysis is an exhaustive examination of climate change and security connections, according to the theories of the security discipline.

2.6 International Relations, Security Studies and Climate Change

Since the end of the First World War (WWI) (1914 - 1918), International Relations emerged as a new and separate discipline of study, capable of performing "a new basis for security" and aiming to change the "old European interstate system" (Vogler, 2011: 11). Thus, the academics of International Relations have created a sub-discipline academic field in 1919, labelled security studies, with a view to avoid unprecedented sources of armed conflicts between the states in the aftermath of the Great War and

upholding the systematic study of security (Booth, 2005: 2; Collins, 2007: 2; Vogler, 2011: 11).

The study of security has been at the centre of International Relations an nowadays, we analyse 'what is security and how can we achieve it?', 'what makes an issue a dangerous threat to human or state security?' and 'how could the world avoid the threat of climate change and reach environmental security?' Security studies address the "political and social realities" of the world and "create the structures and processes by which humankind lives or dies" (Booth, 2005: 2). This characteristic of security plays a vital role in the matter of why security is a key basic need in human life. This also strengthens the necessity of focusing on the methodological roots of studying security due to making it more relevant for the people, as the scholars of security studies have declared.

Security studies have helped the discipline of International Relations to "distinguish itself from related disciplines such as history, economics, geography, and international law" (Sheehan, 2005 cited in Collins, 2007: 2). This is because it has focused on the study of security and the achievement of peace. However, securities studies have not separated their theories and methodological practices from the discipline of International Relations. More emphatically, security studies as a sub-discipline of International Relations have been influenced by the dominant International Relations' schools of thought, such as "the school of liberal internationalists" and "the rival school of 'realist' thought" (Vogler, 2011: 11). It has also been dominated by similar or even the same thematic unities, such as "environment", "society", "economy", "energy" etc. Although International Relations and security studies are two shares overlapped fields, focusing and analysing common phenomena and concerns, they do come from different points of view and therefore it is very difficult to strictly define the boundaries between the two. In the field of security studies, it is commonly accepted that there is no one specific approach or methodology

for studying the various and complicated phenomena and issues concerning the field. This is the main reason why security study analysts do not pay particular attention to their research methods. Security scholars adopt a traditional or non-traditional theory of security that it is able to efficiently support their study or they develop new theories to answer the significant questions that arise in the field. As Catherine Ann Sowerby (2008: 115) mentions, in the discipline of International Relations the "theory defines methodology in so much as it provides the framework for thoughts on the topic under consideration". In other words, the schools of thought in International Relations creates and uses theories which justify the methodology and analyse and emphasize the spheres of ontology[3] and epistemology[4] as well. Likewise, scholars of security studies take advantage of the discipline of International Relations; they do not intensively or primarily focus on the methodology, as theory in security studies explain the methodology and provide the security framework for analysis.

However, after the Cold War, security studies changed the concept of security with a view to broaden and deepen the term security, including more reference objects and new hazards (Fierke, 2007: 1). This broadening and deepening movement of the term security has disputed "the very notion of a state-centric world" (Vogler, 2011: 12), because it has tried to change the referent object of security which, traditionally, was the state. It has contained new threats, such as environmental degradation, terrorism, diseases such as HIV etc. This movement was not able to exist within the traditional theories of security which have only focused on state-centric approaches of the world. New sophisticated theories and methods of studying the security discipline were more than necessary.

[3] Ontology, as mentioned by Pierce (2008: 22) is "the branch of philosophy ('thinking about thinking') devoted to the nature of being". Strictly speaking, ontology (from the Greek words ών and λόγος) is the philosophical way of study the existing reality.
[4] Epistemology is what Booth (2005: 14) has defined as "beliefs about what comprises "true*"* knowledge". Specifically, epistemology (from the Greek words επιστήμη and λόγος) is the theory of understanding.

Moreover, this theory of security, named "critical theory" (Vogler, 2011: 12) or "critical security studies" (Fierke, 2007: 1), has been critical on the traditional theories and methodologies, presenting the critical approaches as a new and methodological correct theory for analysing the area of security.

Accordingly, Robert Cox (1981: 128-129) opened the expected debate between "problem-solving theory" and "critical theory" with his famous phrase "theory is always for someone and for some purpose". The problem-solving theory does not try to change the world, but its de novo goal is to create or define the limits and parameters of a specific problematic area where the "social and power relationships and the institutions" are the only actors competent enough to work together, bringing in desirable solutions (Cox, 1981: 128-129). This theoretical approach is based on permanent parameters (institutions and power relationships) which make the theory "non-historical or ahistorical" (Cox, 1981: 129). On the other hand, as Robert Cox (1981: 129) defines it, critical theory is critical because it queries the existing world order and it concerns itself with the origins of social and power relations and institutions with the view to exploring their participation in the changing process.

In contrast to the problem solving theory, critical theory is a historically-based theory and takes into consideration both past and the future's historical changes (Cox, 1981: 129). Ultimately, critical theory tries to establish a security framework focusing on the processes of change (Cox, 1981: 129). As Robert Cox (1981: 129) concludes, "the strength of the one is the weakness of the other", explaining the reasons for this debate and presenting the different methodological approaches involved in studying the area of security. This is because problem-solving theories are unhistorical or ahistorical, and they consider the world as it is. Critical theories are historical and they try to change the concept of security with a view to changing the world. The analysis has to explore this

debate between the problem-solving and critical theories. These various theories represent the different studying approaches of the security discipline and its sub-disciplines, such as environmental security, energy security etc., accentuating the incoherency in the ways of informing the stakeholders which is the focal point of this research analysis. Fundamentally, this analysis has to focus on the major approaches and perspectives of the main traditional and critical schools of security studies in security, environmental security and energy security in order to explain the problematic aspects and to suggest a new methodological application for the security discipline.

2.7 Approaches to the Study of Climate Change as a Security Issue

The reason for studying the different approaches of the security discipline derives from the debate between the problem-solving theory and critical theory. This is because it is polarizing security studies into two leading philosophical camps, which are always in an intellectual conflict, confusing the security framework. This analysis explores these perspectives and mentions the altered theories in the security field that have been used as methodological tools by the main traditional and non-traditional schools of thought. The reason for extracting these perspectives from this debate is due to perceiving the problematic issues in the research process and the theoretical and methodological gaps.

The meaning of security and its referent object has been questioned and even in this early analytical stage, the differences are detectable. As Keith Krause and Michael C. Williams (1997: ix) have mentioned, this is one of the basic problems of security studies, because the security concept is a derivative one and “it is in itself meaningless”. Also, for security in any meaning and conceptualization of the term, the term denotes that there is a referent object to be secured (Krause and Williams, 1997: ix). This is explained due to the nature

of the field, which is not self-referent (Krause and Williams, 1997: ix). However, there is no need to question the theoretical framework of security, because it is self-explanatory as it shows the new threats and challenges, and provides a sophisticated space for considerable argument (Krause and Williams, 1997: ix). Hence, Stephen Walt's (1991: 211-239) opinion that "one of the biggest threats to security is the seductive appeal of contrary methods for understanding it" began the debate between the supporters who share the same opinion with Walt, in which the referent object of security is the state and its opponents who claim that the new challenges and threats force the concept of security to re-think its referent object.

Nevertheless, this analysis briefly reviews, firstly, the major scholars' definitions of security in order to deeply scrutinize the meaning of it. Second, it focuses on the referent object(s) of security and develops an insight into this debate. Finally, it examines the two interconnected sectors of security, environmental security and energy security, in which the answers to this debate are reached with clarity and without complexity as happens in security.

2.7.1 Defining Security

The concept of security has not had an agreed definition and this has created a complicated debate on defining the term 'security'. The debate between problem-solving and critical theories is concentrated on the definition of security because both approaches are explicitly and surprisingly different. Historically, the problem-solving theories have defined security and its concept from a state-centric point of view, which has dominated the studies of security.

Most of the realists have adopted Walt's (1991: 212-213) definition of security, which mentions that security is "the study of the threat, use and control of military forces, the specific policies that states adopt in order to prepare for, prevent, or engage in war". In other words, the realist school of thinking concentrates mainly on the state and its policies, aiming to use its armed forces as a policy tool to either avoid or to participate in a war which is the only threat, as they claim. As Mohammed Ayoob (1997: 124) explained, this definition of security and its intellectual origins emerged from the total realist approach of security, which derived from Walter (1943: 51), in which "a nation is secure to the extent to which it is not in danger of having to sacrifice core values, if it wishes to avoid war, and is able, if challenged, to maintain them by victory in such a war". It is apparent that the realist security theory has mentioned the necessity of war if national security is challenged and its values are endangered.

However, these realist approaches to security have created many theoretical, practical and philosophical problems as they have constructed a "static", "state-centric", "militarized", "ethnocentric" and "power-centric" view of security (Booth, 2005: 9). Additionally, the realist theory of security creates or recreates the so called "security dilemma" (Dalby, 1997: 12) of which the practical consequences appeared during and after the Cold War. According to Dalby (1997: 12), the "traditional notion of the security dilemma" is the increased power of a state which obliges other states to take political and military action, in order to protect themselves from the first states' increased military and political power. Moreover, realist thinkers share a common view of security which, as Ken Booth (2005: 5) explained, "consists of the dominating significance of sovereign state, the drive of states to survive and maximize power, the expectation of interstate struggles, crises, and war, and the sanction of military force as an instrument of policy". This view dominated the security field for many decades until the aftermath of the Cold

War (Booth, 2005: 5). However, it remains a powerful theory of security, as realism explains the roots of power and hegemony (Booth, 2005: 5).

Furthermore, most of the realists, and even the neo-realists theorists, all agree that it is necessary to protect the security concept from broadening movements and elastic definitions, because this could make the discipline of security "analytically useless", and a "collapsing concept" such as "environmental degradation", "violation of human rights" etc. which is able to cause "intellectual confusion" (Ayoob, 1997: 126). Therefore, here it is suggested that these "collapsing concepts" have to be examined as "events, occurrences, and variables that may be linked to, but are essentially distinct from, the arena of security" (Ayoob, 1997: 129).

Nonetheless, the critics of the realist approaches are not only based on the definition of security and its concept. As Ken Booth (2005: 5-6) repeatedly stresses, realism is not able to describe the reality of the world. Booth (2005: 5-6) explains that realism does not intend to be realistic, as it tries to explain reality through realist approaches. The only reason that realists have analysed some parts of reality is that they have created the parts themselves, such as in the period of the Cold-War. According to Ken Booth (2005: 6), the realist theory is a "static theory" and its methodology is "unsophisticated". This is because the theory, when compared to other IR theories such as social constructivism, is unhistorical and static, due to having a camouflaged methodology. This methodology is based on the common-sense reality of the world without dealing with the problematic relationship between "fact and value, observer and the observed, and theory and practice" (Booth, 2005: 6). Finally, the realist theory appears to be an inappropriate theory and methodology as it aims to describe the existing reality of the security discipline and provides either an agreed definition of security or a way of studying it.

Likewise, the liberal theory is another traditional problem-solving theory which dominates the field of security and International Relations. In the field of security studies, the liberal theory is one of the major approaches of analysing (international) security in contrast to the realists' approach for examining (national) security. Similar to the realist approach, liberal internationalists define the state as the referent object of security; however, their definition of the state is not the same. Liberal theory conceptualizes the state as a "primary actor" in International Relations and, respectively, in security studies. As they have mentioned, the state has to put tremendous efforts into its survival rather than into its autonomy (Morgan, 2007: 25-26). Thus, "liberal internationalists" have strongly emphasized international institutions for cooperation, aiming to cope with the international anarchical system and to reach a condition of security, recognizing that the state needs to share some autonomy which could potentially lead to developmental interactions within other states (Vogler, 2011: 11; Morgan, 2007: 26). Moreover, liberal theory focuses on the "international regimes" or "regimes" (international institutions), which are suggested as being able to change the national interest, the government's behaviour and the major domestic actors by forcing them to adopt a global view on the environment, terrorism and any other threat and also to recognize that security is an interdependent issue (Morgan, 2007: 26-27). Finally, this theory emphasizes the "democratic peace theory", which mentions that the democratic countries are cooperating peacefully "among themselves" and that "they never go to war with each other", avoiding the threat of war between cooperative states and spreading "modern liberal democracy" as a security tool for wealth and peace (Morgan, 2007: 28).

However, there is no lack of critique of the liberal theory and its methodological ways of approaching the security field. Even if this theory is considered to be the "rival school" of realist theory (Vogler, 2011: 11), as in other problem-solving theories, it puts

enormous emphasis on the state's survival and it does not take into consideration any other views beyond the dominant state-centric view of security. Moreover, liberalists claim that internationalism - mainly through international institutions or international regimes - is the only possible path that can lead to the elimination of nationalism and national security while, at the same time, promoting democracy, globalization and interdependence as well as international security and peace-building. However, there are plenty of practical difficulties that might arise, as nationalism and national security or other state-centric approaches still remain vigorously alluring for states (Morgan, 2007: 31).

Thus, there are at least two major issues regarding liberal approaches that should be taken into consideration. Firstly, there are no practical liberal routes for answering all contemporary important matters or threats, such as, for example, climate change through "the process of economic globalization" (Vogler, 2011: 16). Second, the promotion of internationalism, capitalism and democracy has failed historically[5] to prevent wars and to ensure international security (Morgan, 2007: 31-32). Nonetheless, it is obvious that even if the liberal approaches and perspectives seem to be problem-solving and practical ways of answering reality, there are significant difficulties touching on the contemporary global problems like climate change and there are also enormous failures related to ensuring international security, while avoiding nationalism and violent conflict.

In a different approach, critical theory or critical security studies have tried to change the theory of security by recognizing and focusing on the existence of new threats which can only be prevented via the security discipline. Critical theory has an agreed approach to

[5] According to Patrick Morgan (2007: 31-32), there are three eras of promoting internationalism, democracy, capitalism and international security which failed historically to prevent war and eliminate nationalism or national security. First, was the era of World War I; second, was the era of World War II and finally, was the era of Cold War.

security which concentrates on "the traditional military-political understanding of security", highlighting that "security is about survival" (Buzan et al, 1998: 21). Thereby, it is not meaningless to highlight that critical theory defines the state as the referent object of security (Krause and Williams, 1997: ix), similarly to the traditional and orthodox security theories, but going a step further to the extent of territory, government and society (Buzan et al, 1998: 21). However, while critical theory has adopted traditional approaches when defining security and its referent object, it has not embraced a military approach to security. Instead, it has widened security beyond the "military sector" (Buzan et al, 1998: 1) and the "classical security complex theory" (Buzan et al, 1998: 15-19), considering the intellectual and political dangers of associating security with a wide range of threats and issues via the orthodox security approach (Buzan et al, 1998: 1).

During the wide and broad process of defining security, critical theory highlights the necessity for securitizing an issue or a threat as "a more extreme version of politicization" (Buzan et al, 1998: 23). For critical security studies, securitization means "what in language theory is called a speech act", in which a threat becomes a security issue "not necessarily because a real existential threat exists but because the issue is presented as such a threat" (Buzan et al, 1998: 24). However, an "issue is securitized only if and when the audience accepts it as such" and not necessarily during an actual discussion (Buzan et al, 1998: 25). Therefore, as Krause and Williams (1997: x) noticed, "the concept of security is not empty" and includes five sectors which emerged as a result of the securitization process. These sectors include military security, political security, economic security, societal security and environmental security (Buzan et al, 1998: 7). According to Buzan (1998: 7), the "environmental security sector is about the relationships between human activity and the planetary biosphere". This sector of

security explains the realistic and sensible interaction between human activity and the biosphere, thus inserting environmental issues into the concept of security.

Moreover, Krause and Williams (1997: xi) have suggested that "our approach to security studies thus begins from the analysis of the claims that make the discipline possible-not just its claims about the world but also its underlying epistemology and ontology, which prescribe what it means sensible claims about the world". Finally, critical theory, contrary to traditional problem-solving theories, tries to shift the concept of security into becoming methodologically and practically sensible for the world.

Major critiques of the critical theory have concentrated on its security rivals, to the extent that the intellectual debate is dominating the security discipline. Most of the critiques focus on the failure of this approach to overcome traditional and orthodox security thinking. Critical theory has been criticized for not being willing to separate security from the traditional approaches and because of this failed disconnection, it does not establish a safety arena for broadening and widening the security discipline. Additionally, securitization is a procedure of creating new threats based on common essence without examining whether a threat really exists or not. This is contrary to critical theory's feature of analysing the sensible and pragmatic realities of the world. Finally, the categorization of security into different sub-sectors, which are not self-explanatory, similarly to the concept of security, associates common everyday matters or threats (climate change, economic crisis) with the classic security complex theory.

As Robert Cox (1981: 128-129) observed, "theory is always for someone or for some purpose" and in this case, the academic approaches and theories of climate change as a security threat definitely seem to be for someone or for some purpose. Climate change as a security issue has not been addressed, and if it has, it is only under the rubric of a certain

security concept. Barnett (2001: 1) explained that the meaning of the existing concept of security, which concentrates on the climate change, named environmental security, is "by no means clear". However, due to the absence of agreement on the problem of whether climate change is able to be initiated as a security threat, the ambiguity continues (Barnett, 2001: 12), creating enough space for security schools to link climate change to other security concepts and cases. This increases the diversity of the academic approaches in the issue, raising concerns and "dilemmas of extended security" (Dalby, 1997: 12- 18) complicating the way that policy-makers and the public are informed on the issue. However, the fifth report of the IPCC (2013) informs the policy-makers and the public that, indeed, the "human influence on climate change is clear" while climate change is having a significant impact on nature and human beings. This suggests unequivocal solutions and recognizes this as a threat (IPCC Press Release, 2013: 1-2; IPCC Working Group I, 2013: 1-21). Academic perceptions and approaches to climate change as a security issue are varied and plentiful, creating strong debates not only in the academic community, but even between policy-makers and the public.

Therefore, the question that arises should concentrate on what the perceptions are of policy-makers and the public regarding climate change as a security issue, especially, in the case of a vulnerable country such as Greece. It would be interesting to study these perceptions, situating them into the academic debates and diverting approaches on the issue. Taking into consideration that there is no one commonly accepted approach on this issue, it would be also interesting to examine the perceptions or opinions that the policy-makers and the people adopt on the issue and to see if they are influenced by the academic discussion on climate change as a security issue.

2.7.2 Climate Change as a Security Issue

The academic community of security studies has responded to the challenge of defining and analyzing the security/insecurity issues arising from climate change. This has, as a result, widened the security concept to include the environment, energy, economy, society etc., and by suggesting various approaches to tackle climate-related threats and issues. Members of the academic security studies discipline highlight the linkage between security and the environment through the emerging concept of climate/environmental security. This has underlined the necessity of conceptualizing climate change as a new threat, attracting the attention of public policy makers to the issue. This has resulted in an ongoing debate in the academic security discipline, regarding the usefulness of a straightforward association between security and the environment. Supporters of this approach strongly believe that security can help in the context of the protection of the world from environmental threats.

On the other hand, opponents stress the impropriety of this approach, as security has been dominated by the traditional security complex theory, which ‘‘equates security with military issues and the use of force’’ in opposition to environmental protection (Buzan et al., 1998: 1). This persistent traditional security approach creates great political and philosophical complexities as it simply settles any issue next in priority to security. The climate change and energy issues that are associated with security are both unsuitable and incompatible, taking into consideration that security denotes the use of military force. This linkage directly threatens the objects of climate change and energy, e.g. the environment, resources, human populations etc. considering that the use of military force is against their viability. The forthcoming analysis suggests that security and its association with environmental security and energy security relies on traditional security theory, while mentioning the inadequate linkage with both the environment and energy.

Climate change is one of the highest priority issues worldwide which requires immediate and durable solutions. Environmental catastrophes happening all around the world have opened up the discussion that these problems have "serious security implications even for rich and powerful countries, such as the United States" (Abbott et. al., 2007: 10). Climate Change or Environmental Change has been identified by the Office of Net Assessment (ONA) of the Pentagon as a "threat" (Abbott et. al., 2007: 10) and it has agreed that " the next twenty years could result in a global catastrophe costing millions of lives in wars and natural disasters" (Marshall, 2003 cited in Abbott et. al., 2007: 10).

The fifth report of the Intergovernmental Panel on Climate Change (IPCC) (2013) informs policy-makers and the public that the "human influence on climate change is clear" and that the impacts of climate change on nature and human beings are identifiable, suggesting unequivocal solutions to target the threat (IPCC Press Release, 2013: 1-2; IPCC Working Group I, 2013: 1-21). Here, as Pearce (2005: 104) points out, climate change is a consequence of "anthropogenic activity".

Since the beginning of the Industrial Revolution, the atmospheric level of CO_2 has increased dramatically (Dodds et. al., 2005: 104). This became a significant issue in the 1980s. The rise of atmospheric CO_2 is at "chemical change" due to "carbon loading" that has created the "greenhouse effect" (IPCC Working Group I, 2013: 1-8). The greenhouse effect "produces planetary warming" over large areas of the globe and this is how the term "global warming" arose. Global warming, at this point, has been discussed as the outcome of "burning fossil fuels" which creates a "blanket in the atmosphere" which steadily increases the earth's surface temperature (IPCC Working Group I, 2013: 1-8). This is among the major phenomena that contribute to the contemporary changes on the climate, which have a huge impact both on human life and nature.

Some of the most significant and harmful effects of this process include the increase of the temperatures of the global average air, ocean and surface, and consequently "the melting of ice and snow and the rising of sea level, and so on" (IPCC Working Group I, 2013: 1-8). Therefore, the so-called "tropical cyclones", "extreme weather conditions", "ocean salinity" etc. are only some of the consequences of climate change (IPCC Working Group I, 2013: 1-8). As the IPCC (1995 cited in Kegley, 2009: 347) points out, "global warming is not coming, it is here" and the "effects of the continued rising temperatures will be both dramatic and devastating". Climate change is not only real and observable, but it also reinforces, the importance of finding proper solutions to tackle its effects and impact. One of the first ever discussions on climate change as a security issue was raised in the United Nations Security Council on 17th April 2007, indicating that many of the countries participating in the debate (e.g. USA, UK, Spain, Germany, Greece etc.) shared similar perceptions and approaches on climate change, in which it was recognized as a serious security threat. More precisely, here climate change is perceived as a threat to peace, as a threat to (national and international) security and also as a threat to food supplies, health, energy supplies, ecosystems and the economy etc. (UNFCCC, 2007a: 23). This discussion was a great opportunity for these countries to consider the specific policies available on the issue, highlighting that "climate change must take its place alongside those threats - conflict, poverty and the proliferation of deadly weapons - that have traditionally monopolized first-order political attention" (UNFCCC, 2007a: 24). This indicates a significant change in the discourse on the issue.

This change in the discourse regarding climate change signifies that powerful countries, such as the USA, the European Union (EU), Russia and China, have identified climate change as a threat to the security of their states and also to their citizens. At the same time, this discussion indicated the recognition of the anthropogenic activities and their

disastrous impact on ecology, which here is understood as the only security threat. This contemporary debate focuses on the link between security and the environment, which had already begun after the Cold War era (Barnett, 2001: 1), pointing out the interrealation between the two. This study attempts to explore the contemporary perceptions of environmental security by looking at whether there are causal connections between security and energy security.

2.8 Climate Change and Environmental Security

In an attempt to answer the question of what is environmental security, this study was developed based on the main theories that concentrated on security via different approaches and points of view. Based on that, this study concentrates on how security is directly associated with environmental security and energy security.

The major existing ecological and "interrelated problems of late modernity" (Barnett, 2001: 1) have alerted the scientific community that there is a need to pay attention to the environment. Environmental security has gained the attention of the environmental and security studies field, as it has to merge the two major scientific areas. Thereby, according to Barnett (2001: 1), security and the environment have borrowed elements of their de facto "ambiguous" and "amorphous" features into environmental security.

As Vogler (2011: 12) mentions, prior to the 1972 United Nations' (UN) Conference in Stockholm on the Human Environment, where problems of ''global degradation'' were discussed as being top priority issues, there was little or no theoretical interest in the notion of environmental security by International Relations' researchers[6]. It was only

[6] During the 1970s only economists and geographers focused research on the environmental issues beyond the IR's main area of interest (Stevis, 2006 cited in Kütting ed., 2011: 12).

after a number of environmental catastrophes occurred on a global scale when IR researchers developed an interest in environmental security, which emerged as the combination of two amorphous concepts which later developed into environmental security. In order to develop an insight into the notion of environmental security, apart from its origins, it is important to consider how the concept of environmental security is situated and defined within other theoretical approaches (Barnett, 2007: 188-190).

One of the most important theoretical approaches to environmental security, which is best known as "ecological theory" or the "Green philosophy" (Barnett, 2007: 188), attempted to locate environmental security in the interrelationship between security and the environmental change that results from human activity (Barnett, 2007: 188). As Graeger (1996: 110) notes, there is no one commonly accepted and agreed environmental security definition, but there is an undoubtedly an interrelation between the concepts of the environment and security. According to Graeger (1996: 110), the strong link between the two concepts is based on "environmental degradation", which acts as threat to "human security" and "all life on earth". Therefore, here, environmental change is a consequence of "civilian and military activities", "ecology" and the "natural environment" and it should be protected from human activities, which leads to huge environmental catastrophes (Barnett, 2007: 188, Graeger, 1996: 110). The second link tries to connect environmental degradation/change and violent conflict, suggesting that the environmental degradation/change is able to lead even friendly or peaceful countries to violent conflicts/wars, because of the absence of "resource management" (Graeger, 1996: 110). Here, the claim is that the use of military institutions for environmental protection, aiming to protect resources from illegal usage, could be another important cause of the states' existence (Graeger, 1996: 110). Finally, environmental degradation is linked to security; as the security concept is about having protection mechanisms like

"predictability", "control", "military forces" etc. that are capable of facing problematic issues such as "environmental migration", and securing the states (Graeger, 1996: 111).

According to Barnett (2007: 188), this "ecological security" approach is on the "periphery of the environmental security thinking" because it attempts to challenge and shape security thinking. In Barnett's words, it is "the reason for action from individual and national interests related to a concern for the overall welfare of the entire social ecological system of the planet" (Barnett, 2007: 188).

The second theoretical approach, which is at the center of environmental security thinking, attempts to redefine security with the view to "deepening" and "broadening" the security agenda (Booth, 2005: 14). Here, the security concept has been analyzed in order to include other threats except for "warfare" (Dalby, Summer/2002: 96). The "Copenhagen Research Group" (Buzan et al., 1998: viii) has adopted the so-called "traditional military-political understanding of security", by aiming to define and answer the main questions of ''What is security?'' and "What makes something an international security issue?" (Buzan et. al., 1998: 21). For that reason, as Waever (Buzan et al., 1998: 21) highlighted, it is necessary to borrow elements from the traditional definition of security, which briefly analyzes that "security is about survival". This approach is based on Buzan's (Buzan et al., 1998: 7) conceptualization and categorization of security in the different sectors, which includes the "political", "economic", "societal", "military" and "environmental" sectors respectively. According to Buzan's (Buzan et al., 1998: 7) analysis, all security sectors have different "types of interaction" while the environmental security sector has been defined as being the link between "human activity" and "environmental biosphere". Such connections are useful for security, as they are able to approach any "political problem as a security issue" (Booth, 2005: 14). Finally, security here is defined as an "essential contested concept" (Krause and Williams, 1997: 5-6),

which goes beyond the "statism" and "orthodox" theories of security and focuses more intensively on the "securitization" of other important matters such as the environmental issues (Page et al., 2003: 184). This conceptualization of security and its associated sector has been very influential on the field, with many theories adapting this approach by defining and studying environmental security.

Barnett (1997 cited in Glenn et al., 1998: 16) has addressed environmental security as "the proactive minimization of anthropogenic threats to the functional integrity of the biosphere and thus to its interdependent human component". Additionally, others have defined environmental security as "the relative public safety from environmental dangers caused by natural or human processes due to ignorance, accident, mismanagement or design and originating within or across national borders" (Glenn et al., 1998: 15).

However, this theoretical approach did not achieve its main aim, which was to focus beyond traditional security thinking ("military security studies"), but it succeeded only in broadening the security agenda via the adaptation of "basically neo-realistic perspective" (Booth, 2005: 14-15). According to Dalby (1997: 12-13), the above approaches on defining environmental security extended the security agenda and increased the "traditional notions of security dilemma"[7] while at the same time, inserting more "contemporary dilemmas" in each sector of security, making this scheme easily applied to environmental security.

On this point, Dalby (1997: 16) suggests that there are three dilemmas which emerge from the "problematique" of environmental security that should be taken under consideration when an analysis has to explore complex thinking related to the security

[7] According to Dalby (1997: 12), the "traditional notions of security dilemma" are the increased power of a state which obliges other states to take political and military actions, in order to protect themselves from the first states military threat.

concept. The first dilemma that arises from environmental security is raised by the connection between environment and "military institutions" (Dalby, 1997: 16). The aim here is to protect the environment from threats; however, "military institutions" tend to create even more problematic issues in the environment (Dalby, 1997: 16). The second dilemma highlights that if environmental security concentrates on the protection of the environment from human activities, then it also has to protect global society from economic growth and from the Western way of life, as these have been proven to be major sources of environmental degradation (Dalby, 1997: 16). Finally, the third dilemma focuses on the connection between the environment and security which promotes national security, "modernization" and "economic growth", concepts that are "antithetical to environmental protection" (Dalby, 1997: 17).

These two different approaches to security studies not only define environmental security concentrating on the different characteristics, but, both of them have also tried to expand the security agenda and focus on other important issues apart from the military security threats. On the one hand, the "Green philosophical theory" stresses the importance of protecting ecology from human activities, in order to overcome climate change/environmental degradation. On the other hand, the "Copenhagen school" (Booth, 2005: 14) re-defined security and it has broadened the security agenda, aiming to indicate the importance of protecting the state from other threats, including among the environmental/climate change rather than centralizing the discussion only on the "traditional threats" which are the military one.

The Copenhagen Research Group has based the theory of security sectors on "the process of securitization", which refers to "what in language theory is called a speech act" (Buzan et al., 1998: 26). Under this rationale, securitization does not describe the appearance of an "existential threat" as a referent object, because this is the "securitizing move" (Buzan

et al., 1998: 25). Instead, when the “audience accepts” the threat as a real one, then the issue is securitized (Buzan et al., 1998: 25). This “speech act” has been defined as “the processes of constructing a shared understanding of what is to be considered and collectively responded to as a threat” (Buzan et al., 1998: 26).

However, it is obvious that this theoretical approach puts greater emphasis on securitization as a political speech act and the way that this can be used by the political actors as a successful mechanism. This mechanism forces the audience to accept any threat as the state’s security issue, rather than focusing on sensible points which are able to expand and develop the concept of security.

In conclusion, the Green theory and the Copenhagen School were not able to give environmental security an agreed definition, because they both approach the issue of what security has to protect in a totally different way. For instance, Green theory suggests that it is more important to protect and secure the forests and wild life from human activity which is responsible for climate change rather than protecting the state and it’s mechanisms from climate change as the Copenhagen School suggests. However, they highlight that the concept of security is connected to various essential concepts, in addition to the environmental concept in two completely different ways. Moreover, the absence of an agreed definition of environmental security leads many researchers in the field of security studies to concentrate on the link between environmental change/degradation and violent conflict as an attempt to explain why and how security has to be utilized to protect the world from climate change.

2.8.1 Climate Change and Environmental Conflict

These theories should be further examined as they try to link environmental degradation with environmental conflict, in order to analyze whether there is any connection between the two issues and to understand why this link has gained so much attention in security studies.

There are six theoretical approaches of security thinking which have tried to connect the environment to violent conflict in order to address and examine the environmental security concept (Dalby, Summer/2002: 96-98). Firstly, the Toronto School, led by Homer-Dixon, suggests that the "construction of scarcity" and the complexity of the social and environmental actions is capable of leading to "political instability" (Homer-Dixon, 1999 cited in Dalby, Summer/2002: 96). According to the Toronto School, war and disorder appear from the struggle over resources which can easily be created by environmental degradation (Vogler, 2011: 20). Finally, they believe that "loss of livelihood", which arises from environmental change, could lead to large scale population actions and to armed conflicts within the state itself (Vogler, 2011: 20). In other words, they strongly believe that problematic situations, such as "poverty", "underdevelopment", "ecological collapse" etc. will eventually lead to violent conflicts (Vogler, 2011: 20).

Barnett (2001: 62) criticizes this theory, concentrating on the "methodological difficulties" of this approach. These methodological difficulties arise when the theory focuses on the complex interrelations between social and environmental systems and when it connects environmental degradation to violent conflict via resources, e.g. water. According to the critiques, this theoretical approach, is based on orthodox realistic security thinking, which traditionally concentrates on the state and its territory as a

realistic referent object of security. This approach does not explore environmental issues, but rather, it presents these issues as threats to the state's security (Vogler, 2011: 20-21). Finally, according to Vogler (2011: 21), this theory explains environmental security and environmental problems only from the perspective of "the powerful and the developed".

The second noticeable study was developed from the Environment and Conflicts Project (ENCOP) and Baechler (1999), who examined conflicts as direct consequences of environmental change, which are problematic aspects of modernity. As Baechler (1999) analyzes, the link between environmental change and violent conflict is a problem of "maldevelopment" and "environmental discrimination"[8] (Dalby, Summer/2002: 97) with environmental degradation being a cause of development, whereas violent conflict is a cause of people's resistance to the "expropriation of resources" (Dalby, Summer/2002: 97). However, as Vogler (2011: 20) notes, the above theory is an "empirical study" which does not provide theoretical answers for "policy-makers" or for "military elites", helping them to overcome "environmentally induced conflicts". In other words, it is not a theoretical approach which is able to explain how and whether a link between climate change and conflict exists.

For this reason, the third crucial study that should be discussed at this point is NATO's research on environmental change and a "set of syndromes" that, under specific circumstances, can lead to conflict (Dalby, Summer/2002: 97). This study aims to address the environmental issues for policy-makers as well (Vogler, 2011: 20).

[8] According to Baechler (1999), ''environmental discrimination'' as a term stresses that the violence is more likely to occur in more remote areas, mountain locations, and grasslands places where environmental stresses coincide with political tensions and unjust access to resources. Additionally, ENCOP explains that the concept of environmental discrimination emphasizes in situations in which politics creates inequitable access to natural resources and it is connected directly to the condition of maldevelopment (Dalby Summer/2002: 97).

Fourth, the International Peace Research Institute's (PRIO) study on the "environmental scarcity-conflict" claims that violent conflict exists because there is a struggle to control the "abundant resources" (de Soysa cited in Dalby, Summer/2002: 97). The PRIO's study points out that developed countries experience developmental difficulties when it comes to controlling their own resources and when trying to dominate the resources of the developing countries (Dalby, Summer/2002: 97). This can potentially result in violent conflicts among them (Dalby, Summer/2002: 97). Finally, PRIO associates violent conflict over resources with the "global political economy" and the substantial market value of the resources (Dalby, Summer/2002: 98).

Nonetheless, these three approaches (NATO, ENCOP and PRIO) have not attempted to expand or deepen the study which connects environmental change and violent conflict, but they have preferred to focus once again on the orthodox and traditional security. The fifth approach comes from Klare (2001: 98), who links environmental change and violent conflict with the traditional approach of "resource wars" and more specifically with conflicts, as a consequence of the difficulties involved in controlling oil supplies. It is, however, evident that the fifth theoretical school of thought does not diverge either from the main traditional view or orthodox security thinking. Once again, the referent object of security is the state, which is not able to control the resources e.g. oil, water, etc. and consequently leads to violent conflicts.

Finally, the sixth theoretical approach examines the change in the environment by the populations, linking this issue with climate change and violent conflict, focusing more on the survival of the humans rather than the survival of the states (Matthew, 2001 cited in Dalby, Summer/2002: 98). The Global Environmental Change and Human Security (GECHS) research stresses the necessity of exploring the complexity of the

environmental and social process of the above mentioned linkage, with the view of understanding how to solve the conflict (Dalby, Summer/2002: 98).

Almost all of the six schools of environmental security thinking do not manage to clearly and commonly define environmental security keeping a distance from the stereotypical and traditional ideas of security discourse. As Swatuk (2006: 216) notes, "almost as soon as the 'environment' appeared on the policy map of state security apparatuses, dissenting and critical voices could be heard questioning the appropriateness of linking environmental issues to (national) security practices". Thereby, a study focusing on the link between environmental degradation with violent conflict highlights that this linkage does not aid environmental security in protecting the environment. Instead, the link between environmental degradation and violent conflict helps the state to link national security with some environmental issues. All of the above approaches have linked environmental degradation and national security, so as to highlight that the concept of security with its traditional mechanisms (military institutions) could protect the environment.

2.8.2 Climate Change and National Security

The examination of the connections between environmental degradation and national security supports the understanding of whether or not and why this link could be dangerous for the environment. Such an analysis should also concentrate on why and how the connection between climate change and national security influences environmental security. Focusing on this connection, basic questions that should be answered concentrate on whether and how the military object of national security, is or is not useful for the environment. Most of the theoretical approaches on understanding security

explain environmental change and its association with violent conflict using the traditional security thinking that connects them to national security. However, national security is, in many cases, being criticized as unnecessary and dangerous for the environment, as mentioned above.

Barnett (2001: 92) criticized this link, concentrating on the clear connection between national/traditional security and its agent, which on this occasion is the "military". According to Barnett, the military is related to national security and is defined as "armed forces", "their bureaucracies" and "military-industrial complex" (Barnett, 2001: 92). According to the traditional security thinking and the connection with environmental degradation, the countries/states use their military power to solve issues, which arise as a consequence of environmental change, e.g. resource scarcity. Based on that, it would not be impossible or an exaggeration to consider that this could potentially lead to conflict or war between the countries/states with conflicted interests on the issue.

In Barnett's (2001: 93) words, "warfare leads to environmental degradation and the destruction of life". Therefore, it is sensible to consider the impact that this could have on the environment and that it is important to include this as an element in the discussion. Dalby (1997: 19) goes a step further and explains that if security continues to adopt realist approaches, in order to deal with new threats such as environmental degradation, climate change etc. it would be possible for the states to start using military tactics against new threats to the state, which now could also include "environmental refugees" and "economic migrants".

Considering Barnett's and Dalby's approaches on the issue, the link between environmental degradation and national/military security could have a negative impact both on human beings and on the environment. This comes as a result of the use of the

military, which in most cases, is associated with conflict and war and consequently, environmental degradation. Paradoxically, this comes in contrast to the security studies' thinking, which tries to find a resolution regarding any threat, avoiding the possibility of producing even more harmful conditions for the state which acts as the referent object in traditional security approaches.

Thereby, as Westing (1997: 145-149) claims, this link could be useful for the states which intend to use the environment as a military strategy in order to harm other states, using or creating environmental degradation through military tactics. According to Westing (1997: 145-149), these military tactics are not limited and they have multiple uses and effects. For example, if a state wants to attack an enemy state, it could use the "ozone layer" as a tool, using radiation as a weapon to produce harmful injuries.

Renner (1991: 132-152) suggests that the use of the military could not only have a disastrous impact on the environment, especially during war periods, but that it could also be harmful for the environment even in "not-war periods" because of the "use and degradation of land, the pollution and use of airspace, the use of energy and material resources and the generation of toxic wastes". Therefore, the military should be considered as one of the "largest sources of environmental change/degradation" and, on the contrary, it should not be considered as being able to support or lead to "environmental protection and recovery" (Barnett, 2001: 97).

Based on that, some of the strongest critics on the issue have concentrated on the inappropriate connection between environmental degradation and national security, pointing out that military institutions are one of the main causes of environmental degradation including unsustainable consumerism, economic growth, population increase etc. This discussion raises a strong point of consideration on whether

military/national security could protect the environment as environmental degradation is among the most significant consequences of military institutions, which can be understood as the tools of national security. Thus, the link between environmental degradation and national security does not contribute to the protection of the environment, but rather it supports the development of more environmental insecurities.

Nonetheless, five out of the six approaches as discussed above based on environmental security thinking have linked environmental degradation with national/military security, concentrating on the protection of the environment and ignoring basic critics on the issue. Booth (2005: 9) points out that it is important to go beyond this "statist, power-centric, masculinized, ethnocentric and militarized worldview of security". The concept of security should be associated and linked to the environment but at the same time, the concept of security should adopt and develop different approaches outside of the traditional ones.

Finally, based on the above, the approaches on security highlight the importance of resources as a cause of violent conflict between states. For this reason, further discussion and analysis on the issue should concentrate on the study of energy security by exploring the connection with security and environmental security.

2.9 Climate Change and Energy Security

The concept of energy security is "again becoming an important public issue" (Bielecki, 2002: 235). Therefore, it is important to develop an insight into the main causes of why this is happening and also to develop an understanding on why the states/countries have focused their attention on energy security.

The study of energy security should begin with an in-depth understanding of what is energy security and what it is trying to protect. Energy security is defined as the "access to secure, adequate reliable and affordable energy supplies" (Bordoff et al., 2009: 214). Bielecki (2002: 237) defined energy security "as a reliable and adequate supply of energy at a reasonable price". Historically, according to Vogler (2013: 5), the concept of energy security is closely associated with national security in which the energy supplies are used as "strategic requirements by the nation states". Energy security is used by the countries/states as a mechanism that contributes to achieve specific security goals and to protect their energy resources from other states. The major discussion on energy security emerged when the global economy struggled to solve the harmful impact of the so-called "oil crises of 1973-19 and later of 1979-1980" as well as when the concept of energy security was used as a public policy goal for "economic development" and "environmental protection" (Bielecki, 2002: 235-236).

The concept of energy security then drew the attention of the global community due to the so-called "global anxiety" of countries to adapt to the "reliable" and "affordable" energy requirements (Verrastro and Ladislaw, 2007: 95). This was even though most of the general public and also many politicians are not yet familiar with the concept of energy security (McKeown, 2007: 51-74). This comes as a result of the strong debates over important issues such as "nuclear power", "oil company's profits", "misconceptions regarding renewables" and so on which has made the concept of energy security even more complicated (Brown, 2007: 23-50). According to Hughes (2009: 2459-2460), the concept of energy security includes "four R's". This includes, first, the notion of "review" that aims to deeply understand the problem. Secondly, it includes the notion of "reduce" suggesting the "use of less energy". Then, is the notion of "replace", which suggests a "shift to secure sources" and, finally, the notion of "restrict", which denotes the

"limitation of new demand to secure sources" (Hughes, 2009: 2459-2460). However, it is significant to distinguish the energy production from energy consumption, as the character of the modern energy system is based on carbon emissions/fossil fuels which are strongly mentioned as being a threat to environmental security as they are related to the increase in climate change.

This "complex nature of energy security" (Verrastro and Ladislaw, 2007: 95), according to Hughes (2009: 2), is "the state of a jurisdiction's energy security is dictated by its energy supplies, the infrastructure required for producing, distributing, and possibly storing the energy, and the associated costs to the consumer". The concept of energy security pays attention to how secure the energy sources are, while it also focuses on the "existing infrastructure" and on the "potential secure energy supplies", prioritizing the needs of an energy secure state (Hughes, 2009: 2459; Hughes and Sheth, 1/09/2008: 8-15).

Verrastro and Ladislaw (2007: 95-96) notes that the "calls for energy independence" as suggested by the concept of energy security in countries/states with in an "energy-interdependent world", increases the complexity of the energy security's character. Hence, there are many essential security and environmental dilemmas that emerge from the major concerns of "global energy", which is necessary to rapidly increase, aiming to cover the requirements of developing countries, related to the challenge of gaining access to the resources and transferring them to the countries/states that require them (Verrastro and Ladislaw, 2007: 96). Moreover, as Verrastro and Ladislaw (2007: 96) have explained, energy independence in relation to "higher prices" results in so-called "resource nationalism". The term describes "the limitation or inaccessibility to oil and gas resources", and under specific circumstances could be able to threaten the environment and the countries (Verrastro and Ladislaw, 2007: 96). Energy independence

does not have a specific definition that clearly defines whether independence refers to a "completely energy self-sufficiency" or whether it denotes that a country could trade its energy supplies without destroying its economy and without making the state unstable (Verrastro and Ladislaw, 2007: 97), and that creates a significant complication when conceptualizing energy security.

Energy security is about trying to control and secure "the current energy infrastructure" transferring "low-cost fuels" and ensuring the "reliable production" (Verrastro and Ladislaw, 2007: 97). The infrastructure, which seems to be protected by energy security, is the main user of "traditional fossil fuel resources" and it is always opposed to using renewable sources (Verrastro and Ladislaw, 2007: 97). However, the use of fossil fuels is one of the major factors in the destruction of the environment and they significantly contribute to the problem of climate change. Therefore, the concept of energy security is supportive and promotes new renewable sources, which could act as an energy policy mechanism that secures not only traditional resources, e.g. oil and gas, but it also protects the environment from the use of fossil fuels.

To sum up, even if the concept of energy security has an agreed definition which explains exactly this concept of security, its significant features still result in a very complex and unclear conceptualization, as has happened to environmental security, which emerged after its link with security. The concept of energy security tries to protect the energy resources in order to help the states/countries to secure access to these resources. Moreover, energy security is used as a policy to protect the resources and as a secure mechanism to protect both the current infrastructure and global economy. However, the current infrastructure uses specific energy sources which threaten ecology. Energy security, though, has the basic aim to protect the environment from climate change by shifting the use of traditional energy sources to renewable ones. There is a strong debate

on whether that promotes renewable sources, aiming to secure the environment and at the same time, to protect the infrastructure which uses fossil fuels that damage the ecology. Finally, the energy security concept indicates that it struggles to find a viable way to connect the security of energy resources to environmental protection, in order to use that as an environmental policy mechanism or as a political solution regarding to the protection of the environment.

2.9.1 Energy Security and National Security

At this point, the discussion concentrates on why energy security struggles to find the linkage between secure energy sources and environmental protection. To do so it would be important to explore the traditional connection between energy security and national security.

Starting with the Report of Congress (Gallis, 2006: 1), it points out that energy is an important issue of security, especially for states such as the USA, the European Union etc. because some of the energy producers, e.g. Russia, use oil and gas as "political leverage". Therefore, what is suggested here is that it is important to use specific institutions, like NATO, and policies, e.g. support to their allies, in order to ensure energy security (Gallis, 2006: 1). Under this rational, NATO could have a political role in energy security as a global security organization because "NATO governments have already been involved in military efforts to secure energy resources"[9] (Gallis, 2006: 4-5), referring to the case of Gulf War and the Operation Earnest Will case. Finally, the report suggests that, especially in strategic places, e.g. Gulf, energy resources have to be

[9] There are two "operations" such as the first "Gulf War" and the "Operation Earnest Will", where the energy resources or energy's transportation has been protected by the NATO states (Gallis, 2006: 4-5)

protected by NATO, ensuring that the NATO states will have access to the resources (Gallis, 2006: 5). This process could bring security in specific and "strategic regions" (Gallis, 2006: 5).

In contrast, the NATO states are taking advantage of the institution in order to control specific resources, claiming that energy security could be used as a mechanism by them, via NATO, to secure and ensure access to insecure resources. In other words, NATO and its allies act as if they are a single state which needs to secure the essential energy resources, protecting its existence. According to this explanation, the NATO states are promoting a specific economic development and a Western way of life, via energy security, using "military operations" in order to secure the infrastructure and energy resources which are useful for them. In conclusion, energy security is considered to promote and intrinsically interconnect national security. Therefore, a given state might easily utilize its military forces (national security instruments) in order to securitize its resources or to access other resources.

The study of the connection between energy security and national security indicates that these two concepts of security are strongly interconnected. The main link between them is based on military forces, which are used as a solution to relevant problems regards to both energy security and national security, protecting their referent objects. Energy security uses the military institutions to secure the energy resources of a state, reassuring that it can be energy autonomous. Likewise, national security uses military force too, aiming to be autonomous and secure, as happens in every other sector of security, e.g. environmental security and societal security.

Focusing on the link between energy security and national security, there are at least three major dilemmas. The first one concentrates on the assumption that if energy security

protects the energy resources with the use of military institutions, then energy security could be a useful policy mechanism for solving environmental/climate change, while at the same time, the use of military force could create wars that are able to destroy the ecology, which should be under consideration. The second dilemma highlights that if energy security protects economic development via securitizing the current infrastructure, which to a very large extend depends on fossil fuels and if it also promotes and protects the Western way of life, which is another major source of environmental change, then how could it be an environmental friendly policy? Finally, the third dilemma develops under the same rational as the main traditional security dilemma which created the Cold War. That proposes that when a state and its allies use their military power with a view to securitizing energy resources, then an enemy state and its allies will feel insecure in the face of the increasing power of this other state and they will increase as a result their own power. This will be done with the aim of securing their access to the same energy resources. Thus, what is emphasized here is that these nationalistic tactics cause warfare between the states and consequently threaten the security of the environment.

The major consideration here is to focus on environmental security and energy security, which are intrinsically connected. Furthermore, this study examines the common characteristics of these security concepts and the common problems that they share. Finally, it recommends some potential solutions in order to connect the concepts in an alternative and more practical way.

2.10 The Linkage between Security, Environmental and Energy Security

After understanding the connections between energy security and national security, the next important point that this study should concentrate on is the connection between security, environmental security and energy security. This is important because the majority of the states, governments and main international organizations suggest that the main promising solution for protecting the state, the human population, the environment and the resources is this cliché and traditional linkage.

In addressing this problem, some of the main questions that arise concentrate on why, how and whether this connection between security, environmental security and energy security is able to overcome the limitations of "classical security complex theory" (Buzan et al., 1998: 15) and if it is offering an alternative theoretical approach to deal with climate change and energy issues? Finally, it is also important to develop an insight into the common traditional thoughts on these concepts and their features.

One of the major considerations that has arisen is that security is a complicated and abstract concept, which is related to and has impact on sectors such as societal security, economic security, environmental security, political security and military security, as well. This feature is also noticed in both environmental security and energy security, which in many cases are abstract and complicated concepts with no clear or strict definition. Secondly, the major referent object of all these three concepts is the state as the traditional security thinking dominating the concept of security. As a consequence, environmental security is also dominated by traditional security thinking, even if it is not appropriate for it. At the same time, energy security is used as a policy to secure resources and also as a policy to face and overcome the threat of climate change dominated by traditional security thinking.

To sum up, all three of the examined concepts originate from the same rationale while the concept of security is the one that has inserted the dominant traditional security thinking into environmental security. Environmental security has then, in turn, transferred that into energy security. At the same time, the three examined concepts share three major linkages among them. The first one is based on the traditional and national security thinking approach of using particular policies to protect the state from a new threat, e.g. climate change. The second linkage is based on environmental security, which is dominated by national security thinking. This is the only concept of security associated with the environment in a direct way, attempting to protect the state from environmental/climate change. Here, environmental/climate change causes violent conflict as a consequence of resource scarcity and therefore the state uses its military power to protect itself and ensure its survival. The third linkage focuses on energy security which is used in association with environmental security. Energy security serves as a policy of the state to securitize the energy resources, its economic development (through the usage of these energy resources) and its infrastructure, thus ensuring the survival of the state and the tackling of environmental/climate change. These three links explain the connection between the three examined concepts (security, environmental security and energy security) and climate change which, according to traditional security thinking, is a threat to the survival of the state.

Vogler (2013: 627-645) explains that there is a pragmatic, optimistic and "synergistic" approach, alternative to the traditional one, which is represented by the European Union's energy, climate change and security policy. The European Union re-conceptualized every concept separately and independently from the major linkages among them, as discussed above (Vogler, 2013: 627-645). As a consequence, the Commission re-defined the concepts of security beyond the stereotype and traditional/national thinking on security

(Vogler, 2013: 627-645). The policy of following alternative pathways rather than the traditional security thinking on energy security and environmental security could be one of the reasons why the European Union is at the pinnacle of "international climate leadership" (Vogler, 2013: 646).

However, this alternative approach, as suggested by the European Union, did not manage to dominate and be adopted by all of the key leaders of the international community when it comes to following a non-traditional way of thinking related to security, energy security and environmental security. Hence, security itself has not been able to overcome the connection with the traditional perspective of security. The concept of security has spread realist thinking to all of the sectors related to security and the consequences of military tactics have been highlighted via historical events, e.g. Cold War, as being harmful to the state, which is the referent object of the traditional security thinking. Thus, the military institutions are not able to protect the resources or secure the environment without causing warfare between the states. The militarization of these issues contributes to emerging additional threats for the states, the human population and ecology. The traditional thinking of security is completely antithetical to the security concepts and sectors, as it tends to create more threats and to increase the already existing ones.

2.11 Conclusion

Climate change could be considered a looming reality and an anthropogenic threat which requires immediate reactions, in order to protect nature, ecology and human populations. However, most of the countries define climate change as a threat to their national security and they do not concentrate on the catastrophic anthropogenic activities and their impact on the environment, e.g. the Western way of life. Security studies have been dominated

by traditional security thinking and up to an extent that contributes to the great complexity of defining security and its features and its association with the already complicated, and in many cases abstract, concepts of environmental security and energy security. The current debate on security and the linkage with environmental security does not contribute to defining the term or the features of environmental security to any real extent. There is still, not yet, an agreed definition and conceptualization of the concept of security. Therefore, the meaning of environmental security and the features or the nature of the security sector remains complex and undefined.

Chapter 2 focused on developing an insight into the major connections between security with environmental and energy security, which are based on the traditional security theory and could also be considered in addition to national security theory. This is understood based on the following points: firstly, environmental security is still affiliated with national security and this is the main problematic issues arising from this linkage, at least for environmental security. Secondly, energy security has been actualized as the only acceptable policy for protecting the resources and dealing with climate change, based on the connection to national security suggesting the use of military forces to reach these goals. Finally, security - whether it has a relevant link or not to any other field of study (environment, energy, economics, etc.) - delivers traditional security theory into its rationalization.

Therefore, as discussed in this chapter, nature, ecology and human beings are not seen of as the primary security's priorities nor yet as one of its basic aims. The concept of security and its sectors, e.g. environmental security and energy security, follows the route taken by traditional security and regard the state as the only referent object of security. Therefore, after reviewing the literature, these arises the necessity of adopting an alternative approach to understanding security and shaping security discourse, not

protecting only the state as a referent object, which should be under consideration able to provide more efficient solutions on the issue. One of the significant factors that could revolutionize the conceptualization of security is public opinion and discourse. Public opinion has a significant role in both international and national politics and therefore it would be of interest to consider its role in association with security studies. Thus, it would be important to consider how public discourses and opinion is shaped as well as which are the main public debates on the issue of climate change, environmental security and energy security in the case of a vulnerable and less developed country, like Greece. To do so, the next chapter focuses on the new methodology which this study suggests to be applied to security studies. This will be done in order to include, in the security field, not only academic opinions but non-academic perceptions as well.

Chapter 3: Q Methodology and Security

''Philosophers have hitherto only interpreted the world in various ways; the point is to change it.'' (Marx K., 1845)

3.1 Introduction

Chapter 2 has presented the links and connections between traditional security, environmental security and energy security. This study, through the application of Q methodology, answers the main research question, what are the perceptions and opinions of the stakeholders (policy-makers, energy-industry leaders, national NGOs and the public) on climate change as security issue in a vulnerable country like Greece, as well as the questions posed in the literature review. Thus, this chapter 3 explains the steps of applying Q methodology and the research design of this study due to fulfil its aims.

The application of Q methodology developed in six stages, which in this chapter have been discussed and described in detail. Below, a brief overview of each methodological step provides an insight into Q methodology and its application in this study.

Starting with the first step, this explains the identification of an issue or a particular topic that requires examination (3.3.1). The next step focuses on the identification of a relevant group of participants who have significant views and perceptions, or well-formed opinions related to the concourse (3.3.2). What follows is the selection of the participants (3.3.3) and then the next step concentrates on the development and conduction of structured interviews (3.3.4) through which the researcher will choose specific statements made by the participants and not by the researcher that reflects the concourse effectively (3.3.5). Finally, the Q-sort step (3.3.6) is the stage in which participants are asked to sort out the statements in an attempt to understand their attitudes and perceptions on the examined topic.

This chapter explains in more detail the exact steps of statistical analysis, based on what the study developed. Following this process, the different factors, attitudes, or perceptions were extracted, interpreted and established.

The analysis also provides the essential details of the research design of this study and the practical steps that were followed in order to complete the Q-methodology's steps as outlined above. Hence, the researcher highlights the research difficulties and solutions[10] that have been faced in all stages of studying the perceptions of climate change as a security issue in the case of Greece. Moreover, it explains and justifies the question

[10] By using the word problems, the researcher does not only mean the methodological difficulties which the study might have faced, but it also means the practical issues which were unexpected or unpredictable because of the uniqueness of this study.

selection of the structured interviews as well as the methodological roots[11] which have been followed in the interviews too. Proceeding to the structured interviews, it clearly presents the participant selection and the unique method of selecting the statements, which is usually the researchers' own decision and not grounded in the participants' unbiased selection, as has been developed especially for this research study. Finally, the chapter extensively analyses this study's Q-sorts and how they have been conducted by the researcher and the exclusive information and results (factors) of the statistical analysis (factor analysis) for this study in particular[12].

3.2 Previous Research of Discourse Analysis and Climate Change as a Security Issue

The UN Security Council debate, which attracted the interest of the academic community, presented countries' and states' approaches to climate change as a security issue, has also been used as an analytical tool for examining the influence of the academic discussion on countries/states and policy-makers. According to Detraz and Betsill (2009: 304-320), the UN Security Council debate has, up to a point, been informed by the academic discourses on environmental security but it does not provide a "discursive shift" to environmental conflict discourses, which seems to be the major concern of the academic community. However, this content and discourse analysis is limited, as it only focuses on the environmental conflict and environmental security discourses, ignoring significant connections between climate change and security (health security, energy security, economic security, etc.), as these have been suggested by the UN Security Council (2007)

[11] In this chapter, there are many details for the pilot structured interviews which have been contracted by the researcher aiming to select the questions for the actual structured interviews.
[12] The researcher provides plenty of details on the factor loadings, the correlation between the participants and the factors and the correlation between the factors too. Also, there are explanations, where necessary, on the PQ Methods' differences in the statistical analysis.

regarding specific environmental matters. Therefore, this approach does not provide a clear understanding or a guide regarding the countries' and states' perceptions and responses to climate change as a security issue. In addition, while the UN Security Council (2007) has indicated the distinctiveness of the less developed countries/states, which in any climate change are the most effected and vulnerable or threatened countries, this analysis does not include or suggest any significant path when dealing with these cases. In this context, this analysis does not indicate whether a less developed or a cohesive country, such as Greece, is following the UN Security Council's perceptions and whether it is adopting any relevant agreements and measures.

At the same time, there is a gap between the academic discourses and the countries/states' discussion on climate change as a security issue. The academic interest has been focused on specific links between the environment and security (e.g. environmental security and environmental conflict), while on the other hand, the countries/states' discussion connects climate change to various security concepts.

Therefore, it would be interesting to examine what the stakeholders' (policy-makers, energy industry leaders, NGOs, public) perceptions are of climate change as a security issue and to identify whether, how or up to which point these are influenced by the academic discourses, mitigating or bridging the gap between the two. Additionally, it is important to study the perceptions and responses of those who have a beneficial interest in a vulnerable and less developed country, as according to the UN Security Council (2007), climate change is having a significant impact on poor and less cohesive countries. Most of the relevant discourses of security studies do not provide or include any information on the stakeholders' discourses/perceptions on climate change and security, especially for the cases of least or less developed countries.

In a similar way, the academic discourses do not mention practical and actual ways of dealing with climate change as a security issue, as these discourses do not include or take into consideration the particular problems or characteristics of each particular case and example. However, these characteristics should be added into the discussion on climate change and security; questioning the impact that these might have on the overall discussion on climate change and security. Once the discussion is about conflict and climate change, most of the relevant academic discourses pay attention only to environmental conflict, as they have a state-centric and militarized view of security.

These discourses do not highlight the necessity and value of ecological/environmental protection, but they do spread the problems of security in the climate change discussion. These discourses spread the particular theories, policies, viewpoints and perspectives that are dominating the discussion on climate change and security as well as the stakeholders' perceptions. Another major concern of the study was focused on explore whether the perceptions of the stakeholders are influenced by the academic discourse, and whether the academic discourses are describing accurate, real and actual issues and cases.

In this study, Q methodology was used as a tool which will help in both the identification and understanding of the perceptions and discourses of stakeholders on the examined issue. Then, these perceptions were analyzed in reference to the academic discourses and perceptions, highlighting the links and association between the two.

3.3 Research Design: Q-Methodology, Discourse Analysis and Climate Change as a Security Issue

This research study applies Q methodology or "commonly (and incompletely) known as the Q-sorting technique" (McKeown and Thomas, 1988: 7), which in security studies is

suggested as an alternative approach to researching discourses and perceptions. Q methodology is simply a research method of extracting "human subjectivity" (McKeown and Thomas, 1988: 9; Cross, 2005: 208) where, in this method, subjectivity refers to "a person's communication of his or her point of view" and, therefore is a "self-reference subjectivity" as that presents "individual remarks" (McKeown and Thomas, 1988: 12) and "pure behavior" (Brown, 1980: 46) when a person expresses his or her opinions/attitudes/perceptions, such as, "In my point of view….", "I consider that….", etc. (for more examples see: Brown, 1980; McKeown and Thomas, 1988). Q methodology was invented by William Stephenson in 1935, aiming to be used in the "orderly examination of human subjectivity" in academic psychology (Brown, 1980: 5). However, even nowadays, 'Q' confers the characteristics of a "new and innovative strategy for conducting behavioral research" (McKeown and Thomas, 1988: 11) and it has been applied in the fields of political, communication, behavioural and health science as well as in many sub-fields and the broader fields of social sciences (Brown, 1980; 1997; 2003; Cross, 2005).

According to McKeown and Thomas (1988: 12), this research methodology holds a promising "more intelligible and rigorous" (McKeown and Thomas, 1988: 12) way of analysing human subjectivity "in a structured and statistically interpretable form" (Barry and Proops, 2000: 23). Barry and Proops (2000: 20) point out that Q methodology is used as a very successful attitudinal research for bridging the gap between quantitative and qualitative applications in social discourses, as it creates patterns of perspectives in certain groups of individuals and it utilizes the factor analysis as a statistical technique for allocating the range of these groups' discourses. Discourse in the lexicon of Q methodology simply refers to a "mode of communication" (Pierce, 2008: 280) or "a way of seeing and talking about something"; this methodology has a remarkable way of

collating and correlating perspectives, excerpting the hidden discourses from the data which has been held by the participants (Barry and Proops, 2000: 21). Hence, "conversations, commentary and discourses of everyday life" on a specific topic provide the basis for this particular research, which has been mentioned as the "flow of communicability", which is known as the "concourse" in the Q-sorting technique (Brown, 1993: 94).

In practice, Q-methodology uses six stages (Brown, 1980: 5-6; McKeown and Thomas, 1988: 12-13; Barry and Proops, 2000: 23; Danielson et. al, 2008: 93) and these stages have been followed by this particular research study:

- Identification of the areas of discussion and the certain groups of individuals, that the researcher wishes to focus on.
- A sample of the relevant participants share their viewpoints on an important issue with the investigator who is able, through these interviews, to collect a series of statements raised by the participants and not by him or her.
- The statements selected by the researcher for use in the Q-sorts (set of statements ranked by the participants).
- Q-sort ranked by the participants on the scale of "Most agree with" to "Most disagree with". Each Q-sort ranked by a participant is an individual Q-sort.
- Using statistical analysis (factor analysis), these Q-sorts are used to extract a few "typical Q-sorts" known as Factors, which indicate the commonalities of several individual Q-sorts.
- The researcher verbally interprets the Factors in order to extract the social discourses out of the statistical analysis. Finally, these discourses represent a new and actual way of seeing/understanding the world.

Q methodology has many reasons for being the recommended research method of human subjectivity for many studies, and for this research in particular (McKeown and Thomas, 1988: 11). Among the assets, McKeown and Thomas (1988: 11) explains that Q requires only a small number of participants, which is a corresponding reason for applying this research method to this proposed research topic. This is because it is interested in Greek stakeholders' perceptions and a large number of stakeholders would not be accessible. In addition, this research method provides specific techniques available on a small research budget, such as a computerized statistics program and a basic knowledge of research statistics (McKeown and Thomas, 1988: 12). Moreover, it is a sophisticated methodology and it has been used in many different fields for analysing subjectivity with a view to efficiently inform the policy-makers and scientists of the perceptions/opinions/attitudes on real matters (Brown, 1997) which are also key issues in proposing this research method for this study. It seeks to bridge the gap between the academic community and the stakeholders. Finally, the Q-sorting technique has some advantages over qualitative methods, because it uses factor analysis to establish the perspectives and interprets the results verbally (Danielson et. al, 2008). For this study, this is an appropriate asset, as this method will support the identification and establishment of specific patterns in the perspective of climate change as a security issue in the case of Greece in a unique way for the field of security studies, linking them with the security discipline.

In contrast, Q methodology has specific limitations, as it does not provide patterns in the traits (gender, age, class, etc.) in relation to the perspectives/opinions/attitudes, as does the R methodology (survey analysis). It is not able to point out whether the individuals that hold the viewpoints are affected by age, gender or race etc. or not (Barry and Proops, 2000: 22-23; Danielson et. al, 2008: 93). However, this proposed research study does not

have to focus on establishing patterns in the traits; this is because it needs to find out what the perceptions are of climate change as a security issue while aiming to understand how the perceptions have been influenced by the academic discussion on climate change as a security issue, which could be examined only by the application of Q methodology to security studies. Finally, this is the main reason why context analysis is not useful for this proposed research study; it is not able to identify new and unique perceptions of climate change as a security issue in the case of Greece and thus will not fruitfully add to the academic discussion about the results.

The study of attitudinal research (perspectives/opinions/responses to a specific matter of concern by a certain group of people) has intensely attracted the interest of the academic community and there are many studies, in different fields that have illustrated this with various applications of Q methodology. Some of the most interesting and significant studies, which have illustrated the use of the Q-sorting technique, include research studies that studied the perspectives of gay rights (McKeown and Thomas, 1988), the attitudes of members of local exchange trading systems in the UK to citizenship, environmental concern and sustainability (Barry and Proops, 2000) and other studies which examined the stakeholders' perceptions on the clean-up of Waukegan Harbour in Illinois (Danielson et. al, 2010), reconstructive democracy theory (Dryzek and Berejikian, 1993), the various responses to terrorism in a European context (Sowerby, 2008) and also the study of the stakeholders' views of the environment and the resource dimensions of sustainability (Curry et al, 2012) etc.

While Q methodology has been used in various fields, including political science, natural and health science or even International Relations, still there is no specific study on security studies in which the Q-sorting technique has been used as a research methodology in order to identify people's perceptions/opinions/attitudes in relation to a

security issue. An indicative example can be found in Sowerby's (2008) study that concentrated on responses to terrorism in a European context. This study focused on an issue associated with the academic discussion and field of security studies; however, it was not handled as a security related topic, but instead it was studied as an International Relations issue. Security studies, as a sub-discipline of International Relations and as a field of social sciences in general, does not have defined academic borders. As a sub-field, it has a precise agenda which entails any threat to survival (Collins, 2007) and climate change is one of these threats. Consequently, this proposed research will explore people's perceptions of climate change as a security issue in the case of Greece through the application of Q methodology for the first time in security studies, which stands as this research thesis's main contribution to the existing knowledge. The aim is to suggest an intellectual, innovative and effectual methodology for studying perceptions and opinions in security studies, in which textual analysis or context analysis have been the dominant research methodologies to a very great extent.

Q-methodology, which supports both the exploration of hidden discourses and the establishment of new discourses and perceptions, is employed in this study as an appropriate research method for approaching climate change and security, and for discovering the stakeholders' perceptions in the case of Greece. The discussion on climate change and security usually does not consider and has excluded the perceptions of stakeholders, creating a gap on policy making and public perception or opinion.

Therefore, Q is the proper method for approaching this topic as it has many advantages in relation to contacting and exposing the human subjectivity and answering the key questions raised by the researcher or as revealed by the topic. While the stakeholders' perceptions are often concealed and unknown, Q methodology is used as the key tool for

unveiling and establishing discourses/perceptions through a systematic analysis of perceptions.

These two significant characteristics of Q-methodology do not certify only the establishment of the actual discourses and the answers of the relevant research questions, but they also guarantee that this research will bridge the gap between the academic and stakeholders' perceptions. In addition, these characteristics of Q reassure that this research is unique and new as it discovers, from the very beginning, the particular area of discussion and the group of individuals involved in it as well as testifying on the occurred theoretical discourses. Even if the academic discussion is not uncommon and different on its own, the application of Q-methodology helps to make it exclusive and unique by having a highly significant contribution to the field of security.

In the case of establishing and revealing the stakeholders' perceptions of climate change as a security issue in the case of Greece, this research study is different and unique. It is very different, because it is the first time that a security study has explored and revealed the discourses of the stakeholders in relation to environmental security and it opens up a discussion in a very vulnerable and less developed country, including the discourses/perceptions of a different group of countries in the field of security studies. This study also applied and tests the use of Q methodology in security studies as an innovative research method for identifying and targeting the threats to security and as a systematic approach that supports the investigation/exploration of hidden perceptions. This process could potentially support the improvement of the policy relevance of security studies.

Q-methodology suggests six stages that need to be followed for the successful application of this method, therefore the next section of this chapter concentrates on a detailed review

and explanation of the six stages and methodological steps through which human subjectivity can be investigated.

3.3.1 Step One: Identification of an Issue

The first and most important step for applying Q method is to identify the issue/topic that needs to be studied. By the identification of an issue in a Q study does not only refer to the recognition of a specific topic, but, as noted by Barry and Proops (2000: 22) it also presupposes the acknowledgment of ‘‘a range of statements, arguments, disagreements, etc.’’ and the ‘‘inherent structures within it’’. In other words, this step provides an understanding of the dominant or most common discourses of a specific issue/topic, recognizing ‘‘a way of seeing and talking about something’’ or the essentiality of identifying ‘‘a set of views and attitudes on a particular topic’’ (Barry and Proops, 2000: 21). Thereby, “the strength of Q-Methodology is precisely that it allows individual responses to be collated and correlated, so as to extract idealized forms of discourses latent within the data provided by the individuals involved in the study” (Barry and Proops, 2000: 21). The ‘‘conversations, commentary and discourses of everyday life on a specific topic’’ (Brown, 1993: 94) provide the basis for any research study which uses Q methodology, and in Q method terms, this is known or described as the ‘‘concourse’’ or the ‘‘flow of communicability’’.

Q methodology is a methodological tool that extracts hidden discourses on a specific topic or issue and this feature of Q methodology is very beneficial for studies in which the identification of an issue and its discourses is difficult or has limitations, especially when the concourse contains multiple hidden and vague or unclear discourses which cannot effectively be detected and analysed. In the case of security studies, where most

of the threats or issues have been objectively identified by answering the main question of whether/what threatens security, the use of Q methodology would be an asset as it supports the accumulation of the concourse. This Q study concentrates on the discussion of climate change as a security issue in the case of Greece and this topic has been outlined in Chapters 2 and 4. Finally, once the identification of the areas of discussion (concourse) has been completed, the next step is to focus on the certain groups of individuals that can contribute to the study.

3.3.2 Step Two: Identification of a Relevant Group of Participants

One of the strengths of Q methodology is that it ‘’allows the participants to define their own viewpoints’’ (Webler et. al, 2007: 4). The next most important step is to identify the relevant group of participants for this issue or topic. Therefore, once the researcher has identified the exact topic of study (Step One), it is essential to identify the people whose perspectives and opinions are of interest to this particular topic (Webler et. al, 2007: 4). After the identification of the topic and the participants, the concourse will be generated by interviewing a sample of the relevant participants, who are willing to share their viewpoints regarding the identifying topic/issue as detected in the previous step (Barry and Proops, 2000: 23). Through these interviews, the researcher is able to collect/select a series of statements raised by the participants and not by the researcher (Barry and Proops, 2000: 23). However, Brown (1980: 186) explains that the selection, development and design of the statements (Q-set) is ‘‘more an art than a science’’. This means that there are many options for developing and designing the statements aside from the classical academic routes, e.g. the interviews. According to Stephenson (1952: 223), the statements ‘‘may be designed purely on theoretical grounds, or from naturally-occurring (ecological) conditions, or as required for experimental purposes, to suit the particular requirements of an investigation’’.

Therefore, the adaptation of developing and designing the statements by interviewing the participants is important for this study as it supports the in depth understanding and establishment of the viewpoints as indicated by the selected stakeholders. In other words, the interviews of the selected stakeholders provide the statements which have been developed and designed by the interviewees. This is a self-referent feature, as it shows and covers the range of the knowledge that the participants have on the topic.

Moreover, as the researcher will have deeply analysed the concourse, he/she will be able to identify the relevant groups of participants whose discourses, commentaries, conversations and perceptions are expressed through interviews in order to connect them with the identified issue or topic. However, it is necessary to mention that as in any study of the social sciences, similarly, and in any of security studies, the identification of the relevant group of participants is relatively ease to undertake as these studies classically have targeted the stakeholders' positions (Dasgupta & Vira, November/2005: 2). As soon as the identification of the relevant group of participants has taken place, a sample of these participants has to be contacted by the investigator, to interview a few of them and to generate the statements from this relevant sample of participants and not from the researcher (Barry and Proops, 2000: 23). Thereafter, the selected group of participants are asked to rank the statements and the researcher will go on to generate factors from their viewpoints (Barry and Proops, 2000: 23).

This research study has observed that there are similarities and differences between the academic and stakeholders' discourses, conversations and perspectives on climate change as a security issue in the case of Greece. As the academic discourses are well known, it is very important to extract the stakeholder's perceptions on this topic in order to establish patterns of communication between them and to bridge the gap.

Finally, by identifying the stakeholders as the relevant group of participants, it has been mentioned as an interest to focus on four different stakeholders' associations, such as the group of policy-makers, the group of energy-industry leaders, the group of members of NGOs and finally, the group of the public. The first category, the policy makers group, includes all individuals who are responsible or involved in the making of new policies at the governmental level or who are in a party or even in a city council in Greece. Therefore, in this group, there are two (2) participants who are members of the two major Greek political parties (Syriza and New Democracy), two (2) participants who are members of the Greek Communist Party, one (1) former minister who is now a member of parliament, one (1) participant who is a Major, two (2) participants who are alderman of a city council and two (2) other participants who are elected members of the same city council. The second group is comprised of energy-industry leaders and includes all individuals who own or work in energy-related businesses. Thus, here, the following participants comprised the group of the energy industry leaders: three (3) participants who work in renewable energy companies in Greece, two (2) participants who own a renewable energy company in Greece and also five (5) participants who are working in the Public Power Corporation (PPC). Thirdly, the group of NGOs is comprised of individuals who work in or who are members of an environment related NGO in Greece. For the ten (10) participants who took part as members of this group, eight (8) of them are members of an NGO and two (2) of them are working in the Greek branches of well-known international environmental NGO. Finally, the group of the public is comprised of individuals who are citizens of Greece, who have a vested interest on it. Therefore, in this group, there are six (6) participants who are university students, two (2) who are unemployed and two (2) of who are retired.

These are fundamental groups in which the association and link between climate change and security (environmental security and energy security) has a significant impact and therefore the mutual understanding and promotion of dialogue among them is able to influence their perceptions on the topic and in a later stage, this might also be reflected in the policy making. Considering that the study focuses on environmental security and on the energy security, it would be reasonable to question whether a sample that represents the Greek military should also be included and constitute an additional group. However, it was taken into consideration members of the Greek army have limited political rights; in most cases, it is not acceptable for them to express their opinion in public in relation to their military status (Alivizatos, 1987: 148-152), and so including such a group would had raised unsurpassed boundaries and limitations. Therefore, both for issues related to regulations, the legal framework and ethics, the researcher had to exclude this group from the study.

3.3.3 Step Three: Selection of the Participants

After the identification of the relevant group of participants the next step is the actual selection of the participants. Individuals who participate in a Q study are known as Q participants; they are not selected so as to represent a population as, for example, would happen in designed surveys. Instead, they are selected under the rational of having different interests which will contribute to forming various, or even contrasting, well-formed viewpoints, opposite to the process of selecting participants to answer a survey (Webler et al., 2007: 4).

Under this rationale, this study targeted particular groups of stakeholders (policy-makers, energy industry leaders, NGOs' members, public), so to make sure that various or even

contrasted and well-formed viewpoints will be included and guaranteed in the research. Focusing on Greece, these groups of participants represent divergent perceptions on climate change and security as they have different forms/features of social, economic, military, environmental, energy and human interests and positions. Finally, the suggestion in relation to selecting the participants in any security study is to aim for opposite groups of stakeholders due to pledging to gain contrasting statements and the variety of factors that can be generated in a Q study.

3.3.4 Step Four: Structured Interviews

Once the researcher has identified the topic and then selected the relevant participants based on the representation of various interests, seeking contrasted and well-formed viewpoints, the next step focuses on conducting interviews with a sample of the participants while aiming to generate the statements raised by them and not by the researcher (Barry and Proops, 2000: 23). Q methodology does not set any specific or particular limitations on the interviews, in the way of contacting participants or in performing the interviews. For example, it does not have set any limitation regarding the length or the type of interview that the researcher uses.

Therefore, the interviews are based on particular questions that need to be answered by the interviewees (the selected participants). These questions come from two different question poles based on the categorization of the questions. The first pole is the closed questions which look for closed answers while the second pole is the open questions which seek open answers (Pierce, 2008: 118). These question poles shape the structure of the interview according to the needs of the research. In this manner, the type of interview has been categorized as structured interviews, which have to ask a narrow pre-

defined set of questions on the topic and as unstructured interviews, which have to instigate a conversation with no predetermined questions (Pierce, 2008: 118).

Moreover, in the structured interview type, the researcher has to ask the same set of questions to all participant and without any reflections (Pierce, 2008: 118). In contrast, unstructured interviews base the questions on the preceding answers of each participant without any design or schedule (Pierce, 2008: 118). Additionally, the most common and widely used interview category in the social sciences is the semi-structured interview, which uses a small number of predesigned questions related to the topic and a few supplementary questions in order to help the researcher to ask questions based on the answers given by the participant (Pierce, 2008: 118).

However, as the structured interview is the most common type of interviews that is used in quantitative research (Bryman, 2012: 212), Q methodology, which is a mixed method (a combination of quantitative and qualitative methods), does not have any restriction on the type of interview as it seeks to generate statements on the identified topic. For this security study, the researcher chose to conduct one at a time, face to face (directly), highly-structured interviews aiming to collect specific answers on closed and predetermined questions with a very specific cue.

The main reason for choosing this type of interview (structured interview) in this security study is the necessity of being as objective as possible equally for all of the examined groups of stakeholders by asking them the same questions with the same question order, without exceptions and trying to avoid underestimating or overestimating any group of stakeholders' perspective, or without excluding any of the major examined and very significant sub-topics. Thereby, the study suggests that, especially for other security studies that wish to apply Q methodology, it would be preferable to conduct structured

interviews, so to overcome any bias problems/issues which might arise by contacting different groups of stakeholders. This is suggested as a procedure that will support the process of generating statements, which will manage to cover the entire range of the concourse. However, while this was suggested and tested in this study, it is important to clearly highlight that this is not a Q methodology commitment or requirement that the researcher is obligated to follow.

3.3.5 Step Five: Selection of Statements

There are many ways of selecting the statements and creating the Q sample. In a Q study, the term Q sample refers to the ‘‘collection of stimulus items’’ (McKeown and Thomas, 1988: 25) which in this study is the 48 statements collected on climate change as a security issue in the case of Greece. Additionally, as there are no correct ways to create a Q sample, there are other options than just interviews or discussions that have been used in this study. For instance, there are studies that generate the statements from academic literature (a literature review can be used also to create key themes) and/or popular texts (magazines, television programmes, social media, etc.) (Watts and Stenner, 2012). Additionally, there are studies that create ready-made Q samples which adapt statements from existing scales, questionnaires or even interview schedules (Watts 2001). No matter the technique or the combination of sources, the main aim of the researcher is to prepare a Q sample representative and to balance it, to cover/answer the research question (Watts and Stenner, 2012).

Therefore, there are many ways to distinguish between the Q samples; there are the ‘‘naturalistic Q samples’’ and the ‘‘ready-made Q samples’’ which represent the ways of collecting the statements and then the distinction in the method of selecting the statements

in relation to ‘‘structured’’ or ‘‘unstructured’’ Q samples (McKeown and Thomas, 1988: 25, Dasgupta & Vira, November/2005: 5-6).

Naturalistic Q samples include statements collected by interviews and written narratives, with the ‘‘interviewing naturalistic Q samples’’ being the most common as they are self-explanatory and make the next Q sorting procedures much easier (McKeown and Thomas, 1988: 25). However, when interviews are not possible to be conducted by the researcher, naturalistic statements can be collected from written narratives such as newspapers, television shows, social media, etc. (McKeown and Thomas, 1988: 25-26, Dasgupta & Vira, November/2005: 6). According to McKeown and Thomas (1988: 26) the ‘‘Q samples are naturalist since the items are taken from real-world communication contexts’’ which makes them extremely significant for any study as the statements straightforwardly reflect the participants’ perceptions.

On the other hand, ready-made Q samples are the statements that have been collected from sources other than the discussions/interviews with the participants and, thus, there are many subtypes, with the most common being the ‘‘quasi-naturalistic Q samples’’ (McKeown and Thomas, 1988: 26). These are quite similar to the interviewing naturalistic Q-samples but they use extrinsic sources on the topic. Another common subtype is ‘‘hybrid Q samples’’, which are a combination of naturalistic and ready-made statements (McKeown and Thomas, 1988: 26-27).

Concerning the selection of the statements, there is no possible way to include all communication opportunities or options, without excluding any of them in the selection process. However, there are the two basic techniques for selecting Q samples entitled ‘‘unstructured sampling’’ and ‘‘structured sampling’’ (McKeown and Thomas 1988: 28). By the structured selection of statements, the researcher sorts the statements into

categories aiming to ensure that all of the fields of the topic have been covered equally and that there are no cases of statements that have overestimated viewpoints (Coogan and Herrington, October/2011: 25). In contrast, in the unstructured selection of the Q sample, the researcher selects the statements that are relevant to the topic without ensuring that they cover all possible sub-topics. This unstructured selection of statements hides the risk of overestimating or underestimating some issues, perceptions and participants and creates a significant bias in the Q sample (McKeown and Thomas, 1988: 28). The suggestion here is that the researcher should select and use any of the Q collection and selection techniques which fit the topic or the examined issue. Nonetheless, it is necessary to stress that there is no significant reason to re-produce bias when there are alternative ways to avoid it. Finally, this security study used an interviewing naturalistic Q sample to collect the statements, and a unique structured sampling technique which will be presented in detail.

3.3.6 Step Six: Q Sorts

Straight after the selection of the statements and the creation of the Q sample, the selected participants were requested to state their different perspectives and opinions by sorting the statements in a Q sorting procedure which formed the Q sorts (Webler et al., 2007: 3). According to McKeown and Thomas (1988: 30), ‘‘Q sorting is a process whereby a subject models his or her point of view by ranking-ordering Q sample stimuli along a continuum defined by a condition of instruction[13]’’. In other words, the participants are asked to rank their viewpoints through a distribution of the Q sample from ‘‘most

[13] An instruction sheet as given to the participants in order to explain to them how to sort the statements and to fill in the record sheet as well (McKeown and Thomas, 1988: 30).

disagree'' to ''most agree'' within all of the selected statements. Thereby, the shape of the distribution of the Q sample is a quasi-normal distribution with eleven (11) categories (from +5 to -5). This is sufficient for a Q sample with a range of forty (40) to fifty (50) statements in order to ''force people to make distinctions among their priorities (the statements that are most and least like they think), while not requiring them to make so many judgments about the middle statements that they feel less strongly about''[14] (Webler et al., 2007: 12). The Q sort distribution of this study (which is, however, a typical distribution useful for any Q study) has been presented below.

MOST DISAGREE **MOSTAGREE**

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
(2)*	(3)*	(4)*	(5)*	(6)*	(8)*	(6)*	(5)*	(4)*	(3)*	(2)*

*Number of statements

The set of statements, which have been ranked by the different participants, establishes the individual Q sorts. In the end, all of the individual Q sorts, through the application of statistical analysis (factor analysis), were used to extract a few typical Q sorts which are known as factors and that are usually between three (3) and seven (7), representing the

[14] The distribution of the Q sample of this Q study has been presented in Table 8 - Distribution of Q sample statements - . See also Chapter 3 – Q sort for the practical rather than theoretical details on the distribution of the Q sample statements.

common sense of all of the examined individual Q sorts (Webler et al., 2007: 6, Addams, 2002: 38).

In any Q study, the variables are the Q sorts, and not the questions that were asked, as happens in surveys. This is mainly because Q analyses the similar or different associations of people's perceptions rather than the associations between different ideas (Webler et al., 2007: 4). While the variables in Q-methodology are used to be the each Q study's Q sorts, however, as Dryzek and Berejikian (1993: 52) pointed out, ''our units of analysis, when it comes to generalization, are not individuals but discourses''. In other words, in practice, when a Q study requires making a few general comments or a generalization, it uses Q samples, which are also known as statements. Finally, in this particular Q study, the Q sorts totalled forty (40), so there were forty (40) variables which, through factor analysis, will be compressed and result in three (3) factors[15].

3.4 Statistical Analysis

Once the researcher has accomplished all of the previous steps and has accumulated the set of the individual Q sorts, the process is to follow three pillars of statistical procedure, namely "correlation, factor analysis and the computation of factor scores" (McKeown and Thomas, 1988: 46). These are typical and practical requirements when employing Q methodology. It is important to highlight that Brown's very famous book *Political Subjectivity: Application of Q Methodology in Political Science* has been referred to

[15] In this Q study the factors were the three (3) that the PQMethod software has produced them. However, the statistical software suggests only the number of factors as the final decision; the number of the extracted factors is a matter of the researcher's decision in relation to the final results. Thus, even if a factor does not contain more than one variable (individual Q sort), it can be very significant including the extracted factors, as the participant's perceptions may be very important. For example; a minister's perception of the climate change policy.

many times in this subtopic as it is the greatest source of statistical analysis in a Q context, because the researcher is able to complete a Q statistical analysis by hand and not by a computerized program. This by hand calculation demands a lot of time and exclusive statistical skills correlating the Q sorts, extracting and rotating the factors and preparing the factor arrays for interpretation.

According to Watts and Stenner (2012: 97), the ‘‘Q methodology correlation provides a measure of the nature and extent of the relationship between any two Q sorts and hence a measure of their similarity or otherwise’’. In other words, the individual Q sorts needs to correlate due to generating the correlation matrix to find out the similar groups between the individual Q sorts. The correlation matrix between the Q sorts is generated by *n* x *n* where *n*= the number of the individual Q sorts. In this study, the number of the individual Q sorts is *n*= 40 and the equation of 40 x 40 generates the correlation matrix. As Brown (1980: 222-223) mentions, ‘‘factor loadings are correlation coefficients representing the degree to which a Q sort correlates with a factor. For a loading to be significant at the 0.01 level, it must exceed $2.58(SE_r)$’’. In other words, the factor loadings represent the correlation coefficients between the individual Q sorts and the factors. Based on the equation 2.58(SEr) = 2.58 x (1/√N), where the standard error is calculated as (SEr) = (1/√N) with N being the number of statements of a Q sample. The researcher can identify the number/degree where there is correlation coefficient between individual Q sorts and factors. In this study, the correlation between individual Q sorts and factors in a $p < 0.01$ level is statistically significant if it exceeds +/- 0.37, as the equation is 2.58(SEr) = 2.58 x (1/√N) = 2.58 x (1/√48) = 0.37 with N = 48 (number of statements in a Q sample). As Kline (1994: 18) points out, the ‘‘correlation statistics are ordinarily employed to measure the degree of agreement between two sets of scores [which have been gathered] from the same individuals’’. According to Watt and Stenner (2012: 8):

> ‘‘They are scored on a scale ranging from +1.00 to -1.00. A large positive correlation, say +0.70, indicates that persons who scored highly in relation to Variable 1 have tended to do similarly in relation to Variable 2, while a large negative correlation, say -0.70, suggests that high scores relative to Variable 1 are typically associated with low scores on Variable 2 (and vice versa)’’.

It is also important to mention that a correlation of zero indicates that there is no association between the two variables (Watts and Stenner, 2012: 8).

Following Brown (1980: 208), ‘factor analysis in general is a method for classifying variables. The variables are Q sorts’’. Thereby, factor analysis begins with the calculation of such correlations relative to all of the variables in the data matrix (correlation matrix). Each variable is correlated to all others, pair by pair. The total number of correlations required can be calculated using the equation (m) (m-1)/2 (Stephenson, 1936a) where *m* signifies the number of measured variables (or columns) in the matrix. According to Brown (1980: 208):

> ‘‘factor analysis is a method for determining how persons have classified themselves since the process to be outlined shows the extent to which have already been provided, fall into natural groupings by virtue of being similar or dissimilar to one another. If two persons are like-minded on a topic, their Q sorts will be similar and they will both end up on the same factor. Hence, we do not classify them: they classify themselves on their own terms, which emerge as factors’’.

In other words, the factors which are produced through factor analysis are ‘‘primary abstractions representing conglomerates of understandings which provide the basis for

categories of operant thought of the ideal-type variety'' (Brown, 1980: 34). However, as Brown (1980: 223) highlighted, factor analysis is ''merely a complicated tautology which serves to break down a correlation coefficient into component parts''. That means that the factors represent the conception of a particular discussion held in common by the persons on these factors. By permitting a closer examination of what these conceptions express, Brown (1980: 239) mentions, how necessary the ''purpose of obtaining factor scores'' is. The factor scores, which are calculated by this equation $z = \frac{T - \overline{X_T}}{S_T}$, ''are convenient for purposes of comparability to normalize the total column as the factors contain differing numbers of subjects producing statement totals of differing magnitudes'' (Brown, 1980: 242). Additionally, Q methodology factor analysis has some commonly used criteria for deciding how many factors to extract from the data and how many factors can be chosen in the final selection process. One of the criteria is the eigenvalues. As Brown (1980: 40) mentions:

> ''Eigenvalues are the sum of squared factor loadings for each factor; the percentage of total variance accounted for by each factor is equal to the eigenvalues divided by the number of variates in the matrix. In Q, the variates are the *n* persons whose responses have been factored''.

In other words, eigenvalues signify the statistical strength and the explanatory power of a factor (Watts and Stenner, 2012: 105). Thus, the eigenvalues for a factor are calculated as follows, where N is the total number of final Q sorts in a study (Brown, 1980: 222):

The eigenvalues for Factor 1= (Q sort 1 loading on Factor 1)^2 + (Q sort 2 loading on Factor 1)^2 + (Q sort 3 loading on Factor 1)^2 +…… (Q sort N loading on Factor 1)^2

According to Watts and Stenner (2012: 105-106), ‘‘low factor eigenvalues-specifically eigenvalues of less than 1.00-are often taken as a cut-off point for the extraction and retention of factors’’. This explains that a researcher keeps only the factors with an eigenvalue of 1.00 and above. This rejection happens as if a factor has an eigenvalues less than 1.00; it actually means that there is only one individual Q sort loading on it.

Counting all of the above, the main aims of the Q methodology’s statistical analysis are, firstly, to compare everybody’s sorts with everybody else sorts as all of the participants used the same statements and grids. Thus, this statistical analysis allows the researcher to go beyond assuming that the two participants (2) are similar to assuming that the difference between them is, for example, the statement ‘‘4’’ and/or ‘‘9’’ or any other statement. Another important benefit/aim of statistical analysis in Q study is that if two variances (participants) are similar, then it brackets them in a potential group/factor to investigate them further. Additionally, statistical analysis helps the researcher to make sense of these groups/factors, as he/she might need to change position and view it from a different angle. This means that the researcher, through statistical analysis, is able to rotate (factor rotation) the results and have a better view. Moreover, the factor analysis morphs the new groups/factors as one brain, as it shows how these new entities can do the Q sort. Finally, in Q methodology’s statistical analysis, what matters the most is the person’s view whose view is more similar to the group/factor rather than the person’s view whose view is less similar.

Thereby, nowadays there are numerous dedicated statistical packages such as PQ Method[16], PCQ, etc. as well as regular statistical software such as SPSS, which automatically achieve these specific mathematical calculations. This is the main reason why Q methodology has attracted the interest of recent studies in the social sciences, which are willing to use a systematic measure of operant subjectivity, as it is not necessary to manually perform the mathematics and it is not decisive on the broad and wide knowledge of the statistical theory. In this Q study, the PQ Method has been used as the main software which statistically analyses the collective data due to calculating the idealised Q sorts for any of the discourses. However, it is significant to note that there are similar techniques in the dedicated packages which have imported the data and follow these statistical procedures. In any dedicated package, the steps which required are the entering of the data (each individual Q sorts), the correlation between each Q sort, the factor analysis of the correlations between the Q sorts, the rotation of the final factor analysis results (factors) and finally, the factors and their ideal Q sorts which represent them (see Webler et al., 2007 for more technical details of using PQ Method).

These methodological steps (identification of an issue, identification of a relevant group of participants, selection of participants and statements, ranking the Q sorts, extraction of Factors through statistical analysis and verbally interpretation of Factors) have been followed by this particular security study in order to provide the perceptions of climate change as a security issue in the case of Greece. Thus, the analysis focuses on the research design of this case study and how these methodological routes have been followed by this research, during and after the field work.

[16] A useful link to download the software http://schmolck.userweb.mwn.de/qmethod/downpqwin.htm

3.5 Research Design and Research Practicalities

3.5.1 Questions Selection

This research followed the Q methodology's steps outlined earlier. Considering the structured interviews, the researcher had to select certain pre-assigned questions as well as determine the order of the questions, with a view of being capable of objectively collecting a series of statements for the Q sorts. Thus, there were two parameters in relation to creating and selecting the questions. Firstly, the questions had to be closed related to the existing "flow of communicability" or the "concourse", as it was necessary to select questions which were capable of being self-referent to the academic and general discourses on climate change as a security issue in the case of Greece, in the interest of analysing the results in comparison to these discourses. For instance, the questions, 'What do you think that climate change is?' and 'Do you think that climate change is an anthropogenic or natural phenomenon?' helped to start a conversation on climate change. By answering these questions, the participants are expressing their own understanding of climate change, responding with their points of view regarding the nature of climate change, and offering a series of statements. Finally, their answers could be connected to the concourse in many different ways. Secondly, in order to offer a smooth transition from one subtheme to another during the interviews, it was important that each question be fitted and categorized under the four (4) major sub-themes: climate change, environmental and energy security/policy, climate change in Greece, environmental and energy security/policy in Greece (see Table 1 - Questions of pilot structured interviews in Appendices). For instance, the questions 'Do you think that Greece protects its energy resources?' and 'Does the Greek state have significant responsibility for the Greek environmental impacts from climate change?' were included in the interviews because they were part of two different pillars (the first question was part of the ''environmental

and energy security/policy in Greece'' pillar and the second question was part of the ''climate change in Greece'' pillar).

The answers to these questions could then be used to connect and compare the participants' discourses as well as to create significant statements for the Q sorts. Finally, the questions that the researcher asked in the one (1) hour interviews with the sample of participants was sufficient for the collection and correlation of statements and for creating the Q sorts while covering the most serious issues regarding climate change as a security issue in the case of Greece.

To determine if the selected set of questions was significant and able to lead the participants into an in-depth discussion on climate change as a security issue in the case of Greece, the researcher invited two (2) participants (from two different groups of participants, one from the NGO group, and one from the energy industry leaders group)[17] to participate in the conducting of a one (1) hour individual pilot structured interview. The set of questions had been stated in the exact same format and order as in the pilot one (1) hour interview as presented in 'Table 1 - Questions of pilot structured interviews' in the Appendices. Thereby, the pilot structured interviews were very helpful and allowed the researcher to understand the necessity of shaping the questions' cue as well as the necessity of adding a few more questions to those which had been selected for the climate change pillar. Additionally, the interviewees who were involved in the pilot structured interviews, which conducted in Athens, gave their opinion on the order of the questions and they were very creative and supportive to the extent of selecting and establishing the new questions which were necessary to add to the pillar of climate change. Finally, the

[17] The researcher randomly chose these two participants as they were the only ones who expressed their willingness to take part in this part of the research.

researcher invited them a second time so then they were both engaged in the actual one (1) hour structured interviews when the actual structured interviews were conducted.

In this manner, the researcher conducted eight (8) structured interviews in Athens, Greece; only four (4) of them were recorded because half of the participants expressed their desire to remain anonymous during the interviews, regardless of whether their anonymity was guaranteed. The participants who were involved in the structured interviews were not forced to answer the questions or to express their opinion. On the contrary, the researcher repeatedly stressed to them during the interviews that the research did not seek to examine their knowledge on climate change issues and if they did not desire to answer a particular question, they did not have to. The researcher tried to create an informal and friendly environment, even before each interview began, as it was important for the participants to feel comfortable in order to discuss their perspectives. The structured interviews were deemed to be very useful and successful. By collecting statements that covered the topic and its sub-themes, the researcher was able to understand the stakeholders' perceptions of current climate change related issues. Additionally, many of the interviewees indicated that most of the structured questions were on themes that they had not considered or even thought about, even if many of them had an everyday relation with the climate change theme. This highlights the need to establish a theoretical framework on climate change as a security issue in Greece and the need to bridge the gap between the academics' perceptions and the stakeholders' perceptions when facing climate change issues. All of the participants who were interviewed later took part in ranking the statements. In the process of ranking the statements, many of them explicitly disagreed quite strongly with their own initial opinions only two months previous.

3.5.2 Participants

This research study has a precise focus on the stakeholders' perceptions on climate change as a security issue in the case of Greece. The case study of this research took place in Athens, in order to establish patterns in the Greek policy-makers', energy industry leaders', national NGOs' and the public's perceptions of climate change as a security issue. The main reason for examining the case of Greece is that this country has all of the appropriate characteristics of a vulnerable and less middle-rank developed country that has an unsustainable future due to many interrelated issues (economic, political and societal) as a consequence of the global economic crisis.

The Greek stakeholders seem to have a tremendous interest in the economic crisis and at the same time, they seem to be careless about environmental issues, such as air pollution, water pollution, etc., which are also security related. Greece is also a representative case of countries not covered extensively in the academic discussion. The Greek stakeholders' perceptions of climate change as a security issue in Greece is limited as well, as it as if they do not exist at all in the national and international security discussion. It is obvious that there is a justified academic need for studying the case of Greece, such as including the perceptions of these stakeholders into the security discussion and filling this gap.

Thus, the participants of the structured interviews included two (2) from each of the following groups: policy-makers (2), energy industry leaders (2), NGOs (2) and the public (2). The researcher chose these groups because individuals in these groups have a vested interest in Greek society, politics, security, environmental and energy policies and their viewpoints on climate change as a security issue are limited to both the Greek and the international academic security discussion. From these groups of Greek stakeholders,

the researcher targeted the participants who were interested in sharing their perception of climate change as a security issue in the case of Greece, without exceptions to reach the mandatory number of 40 participants. The researcher approached the participants using e-mails, phone calls and face to face invitations. The researcher contacted ten (10) potential participants in order to reach the required number of eight (8) interviewees, as two of the potential participants indicated their unwillingness to participate in the research process and discussion. During the interviews the researcher considered that half of the interviewees were climate change deniers or climate sceptics and that this is the reason why many of the produced statements are focusing on whether climate change is anthropogenic or not and whether climate change is a first priority issue or not etc. Finally, the researcher had to include these opinions in the discussion on climate change and security in Greece as these opinions are related to the topic and they have influenced the stakeholders and the academic perceptions.

3.5.3 Statements Selection

The process of collecting and selecting the statements to use in the Q sorts began by the time that the structured interviews has been finished and transcribed. The eight (8) structured interviews produced three hundred and four (304) unique and various answers by answering the thirty-eight (38) questions that had been made and asked by the researcher. The outcome of these interviews was more than enough for the statements' production and for the statements' quality. The researcher only focused on the process of filtering the statements with the view of generating a controllable Q sort process.

Additionally, the statements were not elaborated on by the researcher as it was important, in the Q sorts, for them to be crude statements reflecting the participants' perceptions and

opinions directly. In this research, the statements were raised by the participants without adding any extra statements provided by the academic perspectives and/or Greek mainstream media. This was essential to avoid any kind of bias and to be unprejudiced in the entire research process in general and in the Q sorts in particular. The research adopted a structured approach in which the statements were categorized into four (4) different themes as they were observed in the concourse narrowing down the three hundred and four (304) statements to a final number of forty eight (48) statements. The four (4) themes created to select the statements from were identical to the four (4) pillars to select the questions from. These themes were the climate change, environmental and energy security/policy, climate change in Greece and environmental and energy security/policy in Greece. The researcher categorized the three hundred and four (304) statements into the four (4) themes. These categorized statements were then presented to four (4) participants, one (1) from each group of stakeholders, who were invited and willing to participate in the selection process of the required number of forty-eight (48) statements to generate the final version of the naturalistic Q sample.

The four (4) participants selected their preferred twelve (12) statements each, three (3) from the four (4) themes, and they created the final Q set this way. It is necessary to mention that if some of these participants selected the same statements, then all of the four (4) participants had to vote by a show of hands which other statement they would prefer to include in the final Q set. Also, some piloting occurred using the same four (4) participants by testing the dimension of the themes, the clearness of the statements, whether the topic had been covered by the selected statements and how easy it was to sort the forty-eight (48) statements. In addition, minor changes were made mostly to exclude statements which were equivalent and confused and to include other statements which covered even more of the existing themes as the same participants had decided.

The reason why the participants selected the statements and not the researcher was based on an open, more democratic and objective research process. This research study tried to establish this new selection process as the established protocol and approach based not on the researcher's selection criteria. Finally, the 'Table 3 - Statements' in the Appendices present the final version and order of the statements as selected and ordered by the four (4) participants. This final version of the Q sample is the one that was presented to the rest of the Q sorts' participants.

3.5.4 Q Sorts' Participants Selection

Q methodology has been designed to work effectively even with a small number of participants. However this research, following the identical rationale of selecting the participants for the structured interviews; selecting forty (40) stakeholders from Athens, Greece, in which ten (10) participants were from the group of policy-makers, ten (10) participants were from the group of energy industry leaders, ten (10) participants were from the group of NGOs' and ten (10) participants were from the group of the public.

Additionally, apart from being a member of one of the four stakeholders' groups and being in Athens at the time that the research took place, there was only one extra precondition. This precondition was that the participant had to have an interest in expressing his or her point of view on the discussion about climate change as a security issue in the case of Greece to be selected and involved in the research. The researcher invited fifty (50) stakeholders with a view to achieve the premeditative number of forty (40) participants with three (3) rejections from the group of energy industry leaders, six (6) from the group of policy-makers, only one (1) from the group of NGOs and zero (0) from the group of the public.

All of the contacted participants from the group of the public accepted the invitation and took part in the Q study. The researcher focused only on the equal numbers of participants from each group of stakeholders as 'Table 4 - Participants' presents in the Appendices, as it was substantial to fairly and objectively include the stakeholders' perceptions rather than focusing on an equal number of male and female participants as 'Table 5 - Gender of participants' in the Appendices shows. Besides this, the researcher followed exactly the same method for inviting the Q sorts' participants as was used to invite the structured interviews' participants. In conclusion, the Q sorts' participants and the structured interviews' participants were selected from these specific groups of Greek stakeholders because they have a tremendous interest in climate change, security, environmental and energy policy and environmental and energy security in a vulnerable country such as Greece. It is highly significant to establish patterns in the perceptions raised by them and to include them in the academic discussion on climate change, comparing their perceptions with the academic perspectives as well.

3.5.5 Q Sorts

By the time that the four (4) participants selected the statements, the researcher asked them to sort the statements with the view to explore, the actual process of ranking the statements, how easy it was to sort the Q sample, the time needed to accomplish the ranking of the statements and to test and make any minor changes in relation to adding and removing the statements and covering the themes.

Only a few mutations were made, as statements with similar or familiar points of view were fundamentally replaced by the four (4) participants and the researcher. As the four (4) participants were comfortable with the sorting technique, they also appreciated that

there was an instruction sheet explaining and helping them to rank their individual Q sorts.

In addition, the researcher recognized that the time required to sort the forty-eight (48) statements was between sixty (60) and ninety (90) minutes, including the time to conduct the post Q sort interviews ascertaining more details on their reasons of choosing and ranking the statements in their individual ways.

To begin the process of the individual Q sorts, the researcher provided 40 participants with an instruction sheet[18], a record sheet[19] and forty eight (48) cards with the statements printed on them; the participants were instructed to rank the statements from ‘‘most disagree’’ (-5) to ‘‘ most agree’’ (+5) on an eleven (11) point scale. All of the participants were asked to rank the statements into a forced quasi-normal distribution, which is a device for considering the Q sample statements more systematically and ranking them on a basis of ‘‘more agree’’ or ‘‘less agree’’ rather than ‘‘agree’’ or ‘‘disagree’’. To comfortably rank the statements, the participants were advised to read all forty-eight (48) statements first and then to sort each statement into three different groups: the statements with which they most agree; those statements with which they most disagree; and those statements which they were uncertain of, uninterested in, or unable to make sense of.

The researcher had mentioned to the participants the sensibility of first making a greater distinction between the statements that they claimed as ‘’most agreed’’ and ‘’less agree’’, rather than sorting the statements of which they were uncertain, were not interested in, or were unable to make any sense of. The participants were repeatedly advised to continue

[18] See Table 6 Instruction sheet in the Appendices.
[19]See Table 7 Record sheet in the Appendices.

this process in order to fill in the distribution of Q sample statements, as presented in Table 8.

Table 8 - Distribution of Q sample statements

	Most disagree										Most Agree
Value	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
No. of Statements	2	3	4	5	6	8	6	5	4	3	2

This forced distribution of Q sample statements constrains the participants to compare the statements in between them as well as sort the synergetic worthiness of the statements placed on the extreme scores. A few of the participants complained about struggling to choose only two statements under the extreme scores (-5 and +5), as they had to exclude other statements with which they either completely agreed or disagreed. However, the researcher explained to them that they were able to sort those statements under other almost extreme scores (-4 and +4), as their choices were not going to be underestimated by this research simply because they did not belong on the extremes. In conclusion, each participant recorded on his or her individual record sheet, which included a table for sorting the statements' numbers under the Q sort distribution and his or her explanations for selecting the extreme scores.

One of the advantages of Q methodology is that it allowed the researcher to conduct second interviews (post Q sort interviews) with the participants once the data had been collected in order to test the credibility of the Q sort results. The post-sorting interviews allowed for more questions to be asked of those participants whose individual record

sheets corresponded with a factor and with the participants whose individual record sheets did not correspond to any factor at all. Such post Q sort interviews are quite useful for the collection of extra details on perceptions and opinions.

In this particular study, the researcher rejected using the post-sorting interviews to collect further information from all of the participants because eight (8) participants had been previously interviewed and included in the Q sort process and almost all of the forty (40) participants expressed, on the record sheets, their reasons for choosing the extreme scores. Notwithstanding, after sorting the participants' statements, the researcher privately interviewed most of them to more deeply understand their reasons for filling in their individual Q sorts in the specific ways that they did and to increase the reliability of the data collection.

3.5.6 Statistical Analysis For Climate Change and Security in Greece

The forty (40) individual Q sorts were collected (see Table 9 - Individual Q sorts and factor loadings in the Appendices) and analysed by the free statistical software, PQMethod[20] which automatically uses factor statistical analysis. This statistical analysis produces factors, which are called ''idealized sorts'', as they have been generated by analysing the participants' Q sorts. In other words, the individual Q sorts were correlated between them and, as it happened in this study, a 40 by 40 correlation matrix (see Table 10 - Correlation matrix between sorts in the Appendices) was generated to find out the

[20] The PQMethod software is considered to be much easier than any other computerized statistical program such as SPSS as it analyses the data in the Q methodology context (Webler et al., 2007: p 19). These days there is online Q methodology related software available, such as KenQ, which is much easier than PQMethod. However, KenQ can be used only as a backup software at the moment because it is not yet academically accepted. As the researcher used KenQ as an alternative feedback program, it has to be mentioned that it is much more updated and reliable.

similar groups between the forty (40) individual Q sorts. The extracted factors were rotated by a varimax rotation using an uncomplicated structure for presenting the considerable variance. In this study, the centroid varimax rotation (see Table 11 - The unrotated factor matrix in the Appendices) was the preferred approach for extracting the factors as both the by hand method and the generated varimax rotation of factors did not have involve any fundamental differences. As the researcher tested all of the extracting processes of the factors given by the PQMethod, the centroid rotation was found to be coherent and constant as it is helped the researcher to decide and flag the individuals who were loading significantly on each of the extracted factors.

According to Brown (1980: 222-223), ''factor loadings are correlation coefficients representing the degree to which a Q sort correlates with a factor. For a loading to be significant at the 0.01 level, it must exceed $2.58(SE_r)$''. The correlation between an individual Q sort and a factor in a $p < 0.01$ level is statistically significant if it exceeds +/- 0.37, based on the equation $2.58(SE_r) = 2.58 \times (1/\sqrt{N}) = 2.58 \times (1/\sqrt{48}) = 0.37$ where N = 48 as it is the number of the statements in the Q sample. For the PQMethod software, the number for this study was +/- 0.45 for the loadings to be statistically significant at $p < 0.01$[21]. However, this study sorts out those who were considered to be representative of the factor's view loaded at +/- 0.37 for that factor[22], taking into consideration the individual Q sorts that were not only highly significant but also the significant loadings and correlations in any of the extracted factors.

Moreover, as the factors have been extracted and rotated by centroid rotation, there were the results of the participants' sorts that correlated with the extracted factors. PQMethod,

[21] PQMethod does not have a significant threshold, this is a Q methodology's requirement.
[22] For extra details on the loadings and the extracted factors, see Chapter 5 and Table 12 - The rotated factor matrix in the Appendices.

with the generated varimax rotation, extracted eight (8) Factors. However, three (3) of the Factors were chosen as appropriate for this particular study. The way of determining the number of factors extracted for this study was based on Brown's (1980: 222) method which mentions that ''perhaps the most widely used method used to determine the numbers of factors is to extract the number which have an eigenvalue in excess of 1.00. An eigenvalue is the sum of the squared loadings for a factor''. Additionally, to understand if the factor is appropriate for a study, the researcher has to adopt McKeown and Thomas's (1988:) method that mentions that ''a factor's significance (importance) is estimated by the sum of its squared factor loadings''. This study adopted this rationale as if a factor has an eigenvalue of more than 1.00, then it is considered significant and if it has below, then it is considered weak. However, more important is to think of the purpose of Q methodology which is to identify and establish the shared viewpoints. This means that if nobody loads on the factor, it does not worth keeping the factor. Three (3) or more participants loading on a factor should be preferable, although in Q methodology, one (1) participant loading in a factor is acceptable. For the above reasons, this study has three factors; Factor 1 with ten (10) significant loadings; Factor 2 with ten (10) significant loadings and Factor C with nine (9) significant loadings. Factors 1 and 2 with ten (10) significant loadings each represent both of the ''majority discourses'' and Factor 3 with nine (9) significant loadings represents the next major discourse.

The "null results'' present the viewpoints of the participants which are not correlated with the other participants' viewpoints and probably there is still a factor, which has not been extracted yet, aiming to include their unique perceptions and opinions. In this study, the maximum number of factors which could be considered significant totalled three (3), thus the participants who are not loading or including in any factor considered that they have their own perceptions and opinions on climate change as a security issue in the case of

Greece. Finally, it is very important to mention that these participants were, in a way correlated with some of the factors; however, as they are not significant correlated at the $p < 0.01$ level, as they do not exceed +/- 0.37, they have to be definitively referred to as "null results". Finally, the participants who were considered as ''null results'' totalled eleven (11); four (4) are from the group of the public, one (1) from the group of policy-makers, two (2) from the group of energy industry leaders and four (4) from the group of NGOs.

As there are no confounded statistical loadings and sorts in the factor loadings this presents that there is no correlation between the factors. The correlation between Factor 1 and 2 (0,45) and Factor 1 and 2 (0,39) was very pure and as there is no correlation between the Factors B and C (0,34)[23], this fact at least explains the distinction between the discourses and the factors. In conclusion, the relationship between the factors will be discussed later in Chapter 5, where the interpretation of each factor has been explained in extensive detail.

3.6 Methodological Difficulties and Solutions

This section aims to set out the methodological difficulties encountered while using Q methodology in this research. The first pertains to the topic that the Q sorts were intended to address. It may be easy for someone who is familiar with the problems of Greece to focus on the important environmental issues and to start an environmental discussion; however, it may be quite difficult for a researcher, especially if they are not familiar with the Greek environmental issues, to distinguish between the security-related matters and

[23] See Table 15 - Correlations between factor scores in the Chapter 5 (p.160) which shows the correlation between the factors based on factor scores.

establish the concourse on this particular topic. In most cases, there are valuable hidden or background decisions and relations (e.g., security, political, economic, societal) which need to be considered. The researcher addressed this research problem by intensely analysing any Greek environmental issue separately, informing and updating himself on the particular matters and discussing the issue as much as possible with those who were involved with and had knowledge of it. This concourse related-issue was solved by the researcher, because this research study started and successfully finished with an operant subjectivity discussion on climate change as a security issue in the case of Greece.

The second problem involved the interviews, which were vital for collecting the statements and creating the Q sorts. During the process of conducting the structured interviews, some discontinuities occurred, as every discussion was unique, reflecting the individual and exclusive answers of the participant. However, with each participant, the research followed the structured questions, adapting to ensure that the statements could be collected and correlated and while following the ethical and objective criteria.

Some participants during the interview were very concerned to express the 'correct' viewpoints and others struggled to remember classical theories or mainstream media perceptions on the topic. Once the researcher observed that the participants were in an inconvenient position for one of the above reasons, they highlighted that there was no right or wrong answer and that nobody was criticizing or judging their knowledge or viewpoints. Another problem that the researcher faced during the interviews was that half of the participants who were interviewed declared that they did not desire to be recorded. Therefore, the researcher had to take notes by hand (the participants consented on letting the researcher take the notes by hand) so as not to lose their answers and to ensure that he could generate the statements.

Another problem which had to be addressed during the process of extracting the statements from the interviews was that the researcher had to include and embody, as quotes from the interviews, all of the essential statements to establish a theoretical framework. There were many answers that were seemingly unrelated to the questions on particular and to the topic in general. To overcome the problem of excluding or including a relevant or an irrelevant statement, the researcher found it necessary to categorize the statements into four different groups (climate change, environmental security, energy security, environmental and energy policy). Doing so helped to determine whether a quotation or statement was related to one of the sub-themes, and to select or reject it on that basis.

Thereby, the researcher, before the participants completed the ranking of the individual Q sorts, invited four (4) participants from those who took part on the interview process and one from each group of the stakeholders, to objectively and impartially choose the statements, the final format of the statements and to set out the order of statements in the Q sorts. As the researcher had categorized the statements in four (4) different groups as mentioned above and in contrast to choosing the final statements by himself, as usually happens in a Q study, the four (4) participants chose twelve (12) statements each; three (3) from the four (4) different groups of statements in which they found themselves relevant and important to this study. The process of choosing the final statements by the participants themselves and not by the researcher was a fundamental decision of this Q study, as it was a very unique methodological step toward a more inclusive research process by making the participants responsible for the decision- making process.

An unexpected issue also arose during the research process; many of possible participants, including those who eventually did take part in the research, did not initially

reply to the researcher's invitation emails – it seems they preferred to converse face-to-face or calls over the phone before agreeing or declining to be a part of the project. As a result, the researcher had to spend additional time arranging meetings by phone or traveling to invite the participants face-to-face. For instance, to invite members of Greek NGOs into the different research stages (e.g., interviews, Q sorts), the researcher had to repeatedly visit the NGOs' offices to explain the research project and to politely ask if any members would like to part. In contrast, the policy-makers and energy industry leaders tended to prefer all communications regarding the project to be by phone or though their personal social media pages (it was excessively difficult to obtain personal phone numbers).

Moreover, two surprising and odd problems in relation to the Q sorts emerged among policy makers group and the public group. Firstly, two policy makers who participated in the process of Q sorts had given their task of ranking the statements to their administrative assistants, claiming that the assistant had more expertise on the topic or that they did not have enough time to read and rank the statements. To resolve this issue, the researcher explained to the participants that it was important to rank the statements themselves because the research focuses on their individual perspectives. In both cases, the policy makers finally ranked the statements themselves and their individual Q sorts were included in the research. Secondly, more than half of the participants from the public group had mistakenly ranked the statements, despite the researcher having informed them on how to fill in their individual Q sorts. Similar to the policy makers group, the researcher had to re-inform the participants, explaining the Q sort process. Consequently, they overcame their confusion and correctly completed the Q sorts under the researcher's supervision and their Q sorts were included in the research as well.

Finally, another problem of this research process in relation to the case study was based on the need to have fluency in Greek language so as to facilitate the discussion of climate change as a security issue with the Greek stakeholders and to collect their viewpoints. It was necessary to be able to exactly translate the statements from Greek into English in order to interpret the results verbally in English. However, this issue is not considered to be a limitation for this case study as the researcher's native language is Greek and thus it was not difficult to start a discussion on the subject of climate change as a security issue in the case of Greece. The researcher spent considerable time translating the statements and the special climate change and security-related terminology from Greek into English and vice versa.

3.7 Conclusion

Q methodology is a very promising method of uncovering unhidden knowledge and establishing new discourses and perceptions, and is considered to be one of the most significant research methods for approaching climate change and discovering the perceptions of stakeholders. As the discussion of climate change and security excludes the perceptions of stakeholders, Q is the proper method of as it has many advantages concerning contacting and exposing human subjectivity and answering the research question raised by the researcher or that is revealed by the topic. These two characteristics of Q methodology certify the establishment of the discourses, the answers of the relevant research question as well as guaranteeing that this research will try to develop the discussion and bridge the gap between the perceptions of academics and stakeholders.

In summary, Chapter 3 has presented and explained in-detail the six essential and mandatory steps that any security research study is compelled to follow in order to apply

Q methodology successfully without experiencing fundamental methodological difficulties.

Additionally, it has presented the research design of the entire study of climate change as a security issue in the case of Greece in great detail. Thus, it has described the methodological difficulties of this case, the questions, statements, the participants and the Q sorts' participant selection, the construction of the Q sorts and the statistical analysis used by the computerized statistical program in order to extract the factors.

In conclusion, the next chapter, Chapter 4, explains in great detail the case study of this research as it is important to focus on the uniqueness of examining the climate change as a security issue characteristics of Greece.

Chapter 4: Climate Change as a Security Issue in the Case of Greece

4.1 Introduction

Greece is considered to be a developed country which confronts plenty of vulnerabilities as a result of the global economic crisis. The Greek economic, societal, and political, security and environmental issues have increased in seriousness during the period of the global recession, which has created vulnerable and unstable conditions for Greece.

Chapter 4 outlines and lists all of the environmental issues in the period from August 2007-2016 prior to the Paris Climate Agreement, which could have been connected directly or indirectly with security, presenting also the glaring absence of environmental security and energy security discussions in a vulnerable country which focuses exclusively on economic and political debates.

This chapter presents all of the climate change-related and environmental issues in Greece which have been categorized into four different groups of issues such as wildfire issues, air pollution issues, the water and sea pollution issues and the continuing climate change-oriented issues. Thus, it explains in detail how climate change issues have or have not been connected with security via the explanation of security studies. Additionally, it analyses climate change as a security issue in the EU, with the aim of indicating the different approaches and perspectives between the EU and the member state, Greece. This chapter briefly summarizes the climate change policy in Greece and explains the energy security-policy in the country. Also, it highlights the problems which have or could have been seen as security issues in Greece and illustrates the problems within the lens of Greek climate change and energy security-policies. Finally, this chapter explains and examines the role and the influence of climate scepticism/climate denial in the discussion of climate change as a security issue in Greece.

4.2 Climate Change Issues in Greece

One of the most vulnerable countries during the global economic crisis from 2008 until the present is Greece, which has had to deal with many interrelated difficulties including economic, political and societal issues arising as a direct consequence of the country's inability to repay its debts and the state's imposition of austerity measures (BBC, 10/06/2014). As a full member state of the European Union, Greece is required to follow specific and rigorous economic, political, societal, environmental and energy policies and agreements. In addition, as a Mediterranean 'peninsular country' possessing an 'archipelago of about 2000 islands' (CIA, 10/09/2013), it is particularly susceptible to climate change-related threats such as sea level rise, ocean and sea salinity, and the melting of ice and snow etc.

Prior to the onset of the Greek debt crisis, anthropogenic environmental issues have already appeared. Additionally, throughout this period of the country's economic instability, the anthropogenic impact on the environment has become extremely hazardous and insecure. The aim here is to describe the climate change-related issues of Greece and how it is significant to define the specific period of time that the analysis has been concentrated on. Thus, there is a nine-year period of time starting in August 2007 in which dozens of citizens were killed, incalculable damage was done to property, flora and fauna and forests across the country, even on the islands, which were decimated by wildfires (BBC, 10/06/2014). The global economic crisis still endures as a major threat to Greece, but it is not only an economic issue; it is also directly linked to environmental problems and specific cases.

4.2.1 Wildfire Issues

Greece experiences wildfires across the length and breadth of the country during the hot and dry season each year. This is exacerbated as a result of climate change and the affirmation is that the wildfires are now more intense and last for a longer period of time. The insoluble issue of wildfires in Greece can be demonstrated by the fact that it confronted an average of 1.465 wildfires per year in the period of 1983 until 2008 (Tsagari et. al., 2011: 92). The wildfire activities have not only contributed to the further production of CO_2 but they have created an enormous destruction of 524.000 hectares of forests and agricultural land as the blazes have burned a total of 10.3% of the entire land in this same period of time (Tsagari et. al., 2011: 92). Greece has already faced the desertification and destruction of its land due to climate change; however, uncontrolled blaze activities escalate this phenomenon as wildfires have had a dramatic increase during the period of economic crisis. For example, there were 6.434 wildfires only in one year (2012) (Morou, 08/08/2013). These blaze activities in Greece are not only as a result of carelessness, as also happens to other European countries, but it is also a result of arson (Morou, 08/08/2013), which indicates an even more complex and unique issue.

However, the conflagration in August 2007 was not only a national disaster, but it was also the worst wildfire activity that any European country has faced in the last decade (ESA, 29/08/2007). It has also been counted as being amongst the ten most devastating wildfires of 21st century on a global scale (Rosenfeld, 08/06/2011). The extensive range of blazes characterised it as a particularly critical wildfire incident. The country confronted more than 120 fires in August 2007 alone and the fires burned a total of 268.834 hectares of forest and farmland, where "11.753 hectares were on NATURA 2000 sites" (European Commission Humanitarian Aid & Civil Protection, 01/12/2011).

Furthermore, the blazes had an enormous impact on the atmospheric pollution and killed 86 people (Rosenfeld, 08/06/2011).

Also, the problem was the extensive time range of the wildfires, where the first broke out on 27th of June 2007 and the last was extinguished on 3rd of September 2007 (European Commission Humanitarian Aid & Civil Protection, 01/12/2011). In that period of time, the country requested assistance on four different occasions via the Community Civil Protection Mechanism of EU[24], and "declared a state of emergency" for three months (European Commission Humanitarian Aid & Civil Protection, 01/12/2011). In addition, the wildfires of August 2007 were extremely crucial as Greek parliamentary elections occurred on September 16th, 2007 (Hellenic Parliament, 17/09/2007), only few days after the end of this unique environmental catastrophe. The sitting government, headed by Prime Minister (PM) Konstantinos Karamanlis, was re-elected despite the fact that they had not demonstrated any competence in dealing with the issue (Hellenic Parliament, 17/09/2007). Following the blaze activity of August 2007, Greece has had to confront the brutality of such a catastrophic occurrence on an annual basis.

Unfortunately, there has been an open conflagration threat every year since 2007, not only due to the country's climate but also because of the lack of funding which impacts the state's capacity and ability to take measures or to solve the problem. This created more chain problems and issues in relation to wildfires; for example, the lack of fire-fighting persons, adequate fire-fighting equipment (including firefighting tanker airplanes), early warning systems etc. (Kartalis et al., 2017).

[24] There were many countries of the Community Civil Protection Mechanism such as Italy, Germany, France, Spain, Cyprus, The Netherlands, Norway, Austria, Sweden, Portugal, Romania, Slovenia, the Czech Republic and Poland and in addition many other non-members of the mechanism countries such as Turkey, Serbia, Switzerland and Israel which assisted Greece to extinguish the wildfires (European Commission Humanitarian Aid & Civil Protection, 01/12/2011).

Accordingly, as the Greek debt crisis was in its very early stages and after the wildfires of 2007, there were already substantial climate change-related air and water pollution issues as the governments were unsuccessful no matter if they signed international agreements[25] (CIA, 10/09/2013). There were new wildfires in August 2009 across the country, which had dramatic consequences for the 10,000 people who were forced to abandon their homes as well as for the country's remaining forests and farmlands[26] and the resultant atmospheric pollution (Enet.gr, 25/08/2009). These factors and other non-environmental problems induced the PM Karamanlis to announce general elections two months after the new environmental catastrophe on October, 2009 (Hellenic Parliament, 05/10/2009).

4.2.2 Air Pollution Issues

Greece requested economic assistance from the International Monetary Fund (IMF), the European Commission and the European Central Bank (E.C.B) on 22/04/2010 (in.gr, 23/04/2010). After receiving economic support from the Troika[27], the government had to sign the first memorandum as part of this economic deal, with even tougher austerity measures and agreements (BBC, 10/06/2014). As a result of these strict economic policies and tax increases, wages and pensions were attenuated by 3.4% during the third quarter of 2010 (naftemporiki.gr, 28/03/2014). Heating, oil and gas prices rates almost

[25] The international agreements which have not been ratified are: Air-Pollution- Persistent Organic Pollutants and Air-Pollution-Volatile Organic Compounds (CIA 10/09/2013). See more details in CIA *The World Facebook: Greece*.

[26] The August 2009 wildfires burned 310.000 hectares of land of which 212.000 hectares of forest and farmland were only in the county of Attica (Enet.gr 25/08/2009).

[27] The so called Troika constituted of three bodies namely the IMF, the European Commission and the E.C.B

doubled in 2010 in relation to those of 2009, and electricity price rates began to steadily increase simultaneously (Maniatis and Danchev, Sept/2013: 10).

Therefore, low temperatures, continuing austerity measures and greater increase in the prices of domestic fuel oil, gas and electricity in 2011 had driven the inhabitants to utilize other and low-priced forms of heating such as firewood, pellet fuel, coal, etc. (WWF Greece, July/2013: diagrams 4 and 5). An immediate consequence of this was that the major cities of Greece (e.g. Athens, Thessaloniki) experienced an excessive gathering of air pollution as smog increased in stages due to the uncontrolled usage of chimneys and stoves from the winter period of 2011 until the present (Maniatis and Danchev, Sept/2013: 5-10). In addition, the government announced the equating of heating and diesel oil prices rates in 2011, in order to eliminate problems with oil smuggling[28] which led to a further increase in the prices of domestic fuel oil and even greater usage of pellet fuel and firewood for heating (Maniatis and Danchev, Sept/2013: 5-11).

In 2012 and 2013, air pollution and smog incidents reached new heights, as almost 3 million citizens had insufficient heating in their houses (kathimerini.gr, 27/03/2014) and therefore methods of heating were used which were catastrophic for the environment; forests were chopped down and woods were burned (Maniatis and Danchev, Sept/2013: 5-9). As a consequence, many people had to be admitted into hospitals because of the tremendous increase of suspended particles in the urban atmosphere (Mpamiatzis, 15/10/2013).

[28] This energy policy is not part of any of the (three) memorandums that Greece has signed with the IMF, European Commission and E.C.B. It was a governmental policy which still exists and has been adopted also by the government of PM Samaras, and the current government of PM Tsipras, not only to eliminate the smuggling oil issue but as a way of collecting taxes (Maniatis & Danchev, Sept/2013: 1-11).

It is essential to highlight that the government's reactions and policies in 2013 in relation to the increased urban air pollution activities was the restriction of using chimneys and stoves during the weekends, the curfew of vulnerable citizens (e.g. children, elderly citizens) and particular vehicles and the restriction of industrial emissions if the accumulation of suspended particles reached the air pollution level of 100 micrograms per cubic meter[29] (YPEKA, 18/09/2013; Tzanne, 06/11/2013). The smog and urban pollution activities still remain the country's greatest pollutants as the burning of fossil fuels causes an increase in carbon dioxide emissions which then causes an increase to the phenomenon of climate change. In conclusion, this could lead in major air pollution occurrences if the ongoing winter seasons are even colder than those of 2014-2015 if the country does not control the proliferated prices of heating oil, gas and electricity[30] and if the citizens' wages incur further attenuation.

As Greece experienced air pollution issues in the examined period, it is significant to present and compare the experience of air pollution in other EU countries at the same time period, considering the difference of the impact that the economic crisis had on Greece. Also it is significant to understand the extent of the urban air pollution, which is impacted even more by the phenomenon of climate change and the citizens' wellbeing and health as a result of commonly regulated pollutants or second pollutants (Amec, 2014: iv-5). According to Aphekom Report (2011: 8) of 2008-2011 used for informing the stakeholders on the relationship between air pollution and health issues in Europe,

[29] The levels of air pollution in the same time period of the previous year (2012) were almost double and the suspended particles reached double levels at least three or four times in the winter period of 2012 (Tzanne, 06/11/2013).

[30]The country's gas prices are the third most expensive in contrast to the other European Union countries and the citizens have to pay 43% more on gas than the European average (Koutipandoras.gr 18/12/2013). In the economic crisis period of 2008- 2012 the electric bills increased by at least 30% more than the previous years (Kotsikopoulos, 15/12/2013) and heating oil prices rose by 30% during the period of October 2012 following the equalization of heating oil prices with that of diesel prices (Maniatis & Danchev, Sept/2013: 5).

Greece (Athens) was in the fifth worst position in relation to air pollution and the life expectancy of its citizens out of twenty five (25) European countries/cities, including the UK (London) and France (Paris). The interesting point here is that the UK (London) and France (Paris) are in the twenty second (22) and fourteenth (14) positions consecutively while the decrease in the concentrating suspended particles in Greece has almost doubled in comparison to these two countries/cities.

Additionally, according to Amec's (2014: 13) report and survey, the highest percentage (88%) between the twenty three (23) European countries' habitants belonged to the Greek (Athens) inhabitants, who strongly agreed that the air pollution for 2009 was a serious problem for their country/city. In contrast, the UK (London) inhabitants in the same survey strongly agreed that the air pollution for the same year was a serious problem for their country/city only at forty five percent (45%). This comparison provides significant evidence that through the examined period, air pollution increased in Greece and its major cities, as it is vulnerable because of the ongoing economic problems and crisis.

Moreover, it highlights that the Greek habitants recognize that there is an environmental crisis too, as the air pollution issues are tremendous during these period of time. It is also evident that there is a clear connection between air pollution and the health expectancy of the Greek habitants which creates another health-related problem that is able to create a health crisis as well. Finally, as other European countries, such as the UK, focus on the policy to solve the air pollution issues in their cities, Greece is trying to handle all of the other issues instead of the environmental or climate change-related issues.

4.2.3 Water Pollution and Sea Pollution Issues

Prior to the economic crisis, Greece confronted issues of water pollution and sea pollution. There have been at least five considerable events of water and sea pollution which are presenting the intention not to protect the environment and that are highly likely to lead to environmental destructions.

Firstly, at the beginning of Greek debt crisis and following the economic assistance given by the Troika, the government in 2009 proclaimed a competition aiming to privatize the water supply companies of Athens and Thessaloniki. Regardless of the people's reaction to the privatization of state-owned water infrastructure and supply companies and the public concerns about water and ecological pollution, the presently cohabitation government of PM Tsipras supports the denationalization of water resources no matter if the citizens of Thessaloniki had voted during the European elections of 2014 in an unofficial referendum 98% against the privatization of EYATH (Thessaloniki Water Supply and Sewerage Company) (socialpolicy.gr, 20/05/2014) and no matter if the state council had determined that the privatization of EYDAP (Athens Water Supply and Sewerage Company) to be unconstitutional (savegreekwater.gr, 12/06/2014). Despite the social, humanitarian and political affects that the privatization of water companies portend, there are, in addition, obvious concerns about future water pollution and potential environmental destruction as the Greek governments seem determined to denationalize the water supply companies under fluid environmental terms with the view to bringing in swift profits. Additionally, this privatization, as opposed to state owned and managed water infrastructure, makes the infrastructure less resilient in the face of water-related climate change threats which already threaten Greek water resources.

The privatization of water and its effects could become a major water pollutant. However, in the case of Skouries, daily deforestation activity and soil and groundwater contamination has occurred. There are serious accusations by the inhabitants that the gold mining activities of the multinational company 'Eldorado Gold' in 2012 (eldoradogold.com, 2014) polluted the water with heavy metals and destroyed the primeval forest and the natural beauty of the area (occupylondon.org.uk, 29/10/2013).

The water pollution in Skouries has been officially recognized by the state, which declared that "the water is not potable" any more "due to toxic level of arsenic" resulting from the drilling of gold in a close proximity to the area's water resources (occupylondon.org.uk, 29/10/2013). Protests have taken place countrywide with the aim of ending the water pollution and destruction of the forest in Skouries (koutipandoras.gr, 09/11/2013). However, the state has responded with violent acts against these protests in an effort to protect the company's investments in the area (occupylondon.org.uk, 29/10/2013). This case of Skouries has not probably had a direct impact on increasing climate change; however, these second pollutants such as arsenic have a significant impact on the climate change phenomenon.

The destruction of water resources and the destruction of the forest in the area creates a vulnerable and less resilient and adaptive environment in the face of climate change-related threats, such as desertification and water scarcity, and many developmental problems could be exacerbated by this climate change threat.

This tension over water pollution in Greece has resulted in daily conflicts between the state, successive governments, citizens and companies involved. Indeed, in some cases such as Skouries, it has resulted in violent conflicts between the two sides (occupylondon.org.uk 29/10/2013). On the one hand, the successive governments

reassure that there is no concern necessary, as the companies which are involved in the environmental-related issues have to follow strict and specific environmental agreements. On the other hand, the citizens, due to the major water pollution activities, doubt that the state or the companies follow any ecological or environmental agreements/rules.

Apart from the water pollution incidents, sea pollution issues clearly indicate the governments' intentions of mitigating and weakening the protection of the environment and ecology and the climate change-related agreements. The accidental sinking of a Turkish cargo ship which had ignored the detention due to bad weather conditions on the seashore of Mykonos created an oil spill at one of the most famous tourist destination of Greece (lifo.gr, 10/03/2014) with unknown environmental and ecological impacts. The cargo ship, YSUF CEPNIOGLU, had 200 tons of fuels on board when travelling from Izmir to Tunisia. However, an unrecorded amount of these fuels created an oil spill in the area of the sinking ship with the Greek coastguard mentioning that the sea pollution was not substantial and under control (lifo.gr 10/03/2014). Thus, the coastguard and an official group of "environmental protectors" from Greece pumped out amounts of fuels which have been left in the ship's tank and then cleaned up the sea (in.gr, 15/03/2014).

It is essential to highlight that there is no official report available recording the extent of the pollution and the environmental effects. This example of ecological destruction is not climate change related; however, it is stressing the international relations, political and security issues which are prompted by an environmental or ecological destruction as such.

Moreover, the coalition government of PM Samaras announced that Greece, as a member state of United Nations and the Organisation for the Prohibition of Chemical Weapons (OPCW), would agree to be part of the international cooperation mission for destroying the chemical weapons of the Syrian Arad Republic (Uzumcu, 23/06/2014) in the

international waters of Crete in a "complex maritime operation"[31] (Uzumcu, 23/06/2014; Konstantopoulou, 09/06/2014). It is significant to notice that many other countries, such as USA, Russia, UK and France, refused to destroy these chemical weapons in their borders (Konstantopoulou, 09/06/2014). Thus, it is noticeable that these countries are also chemical weapons producers. The Albanian government initially agreed to undertake the destruction of 1,400 tons of Syria's chemical weapons[32] using an experimental maritime hydrolysis operation, but the reaction of its citizens forced the state to refute the agreement and the OPCW and UN had to change the location of the operation immediately (Konstantopoulou, 09/06/2014). Countries such as Greece, Italy, Malta and Libya have agreed to this destruction of chemical weapons in their international waters and an on board destruction operation has started as the 'U.S vessel Cape Ray which lies off the island of Crete (Uzumcu, 23/06/2014; Konstantopoulou, 09/06/2014). The citizens of Greece reacted by protesting on a large scale against this dangerous and experimental operation which threatened the domestic environment, ecology and human population of the Mediterranean Sea, as a dangerous chemical accident was not out of question (koutipandoras.gr, 03/06/2014). However, the citizens' reactions did not seem to be in order to prevent the destructive operation of chemical weapons, as the Greek government claimed that the operation was secure and there were no issues of concern[33] (Konstantopoulou, 09/06/2014).

[31] For the first time in global history, this on board hydrolysis operation took place as an experiment without detailing the scientific procedures followed nor officially informing the academic community of the procedure undertaken (Konstantopoulou, 09/06/2014).

[32] There are not official explanations of what the 1.400 tons of chemical weapons contain in order to explain the destruction process nor as to how safe this complex maritime operation is with a result that it must be hypothesized that the Syrian chemical weapons contain some of the most dangerous and toxic weapons of mass destruction (Konstantopoulou, 09/06/2014).

[33] At the same time that the government tried to persuade the citizens that this is a safe destruction operation of chemical weapons, the Deputy PM and Minister of Foreign Affairs E. Venizelos after the reactions requested the OPCW-UN and EU's guarantee to protect the local sea environment (econews.gr 15/05/2014).

Finally, in both the hypothetical and very realistic case of an accident happening during or after this 'complex maritime operation', the environmental damage would be irrecoverable and catastrophic for the ecology, climate and human populations of at least all Mediterranean countries including Greece. The operation of destroying 1,400 tons of Syrian chemical weapons for mass destruction is directly impacting climate change, because of releasing some of the most dangerous and toxic chemicals into the air and sea which is not threatening only the people, but the climate and environment as well.

In addition, the country's most recent sea pollution and seashore destruction activity is resulted in by the joint government and Troika's decision to privatize and develop the Greek coastlines, with the view of earning instant profits (koutipandoras.gr, 21/05/2014). The draft of law for the privatization of the coastline engendered immediate reactions not only from the national NGO's and the local populations of the areas, which are including into the Hellenic Republic Asset Development Fund (HRADF) (Karavellas for WWF Greece, 05/06/2014; koutipandoras.gr, 21/05/2014), but also from many international NGO's and even from foreign countries and their populations as well (Juan Carlos del Olmo for WWF Spain, 27/05/2014).

It is noticeable that this draft of law does not delimit the environmental and ecological boundaries of the denationalization of seashores nor does it exclude protected areas from being allowed to include hectares of seashores and forests, which are sites of NATURA 2000 into the privatization process (Lialios, 17/05/2014; koutipandoras.gr, 21/05/2014).

The citizens' reactions and protests did not compel the government to redraft this proposed law; however, not even Juan Carlos del Olmo's (CEO of WWF Spain) official letter to the Greek Ministers of Economic and Tourism changed the decision of the government to privatize the Greek coastlines, no matter if he had mentioned that the

privatization and destruction of Spanish coastlines had a major "environmental cost" for Spain, such as the disappearance of "key ecosystems", the "unsustainable use of water, land and energy", and the destruction of "solid quality", "biodiversity", "natural resources" and "natural beauty", etc., as well as it having tremendous "economic and tourism effects" (Juan Carlos del Olmo for WWF Spain, 27/05/2014). Hence, the draft of law, which privatizes the coastlines due to economic development, implies a massive environmental destruction and ecological threat as the seawater and solid pollution activity has proposed in Greece. This is in the face of the fact that Greek seashores and seawaters have been deemed by 93% as excellent by the strictly criteria of excellent quality and have been ranked in the top five of seawater quality among the EU countries, according to the European Environment Agency (EEA) (EEA, 27/05/2014).

In conclusion, the Greek state's decisions and agreements on expeditious economic development are contrary to the environment and ecology; additionally, it supports the further extension of climate change-related issues via the pollution of seawaters and coastlines, even if these destructions are against to economic and tourism development. This privatization of Greek or even Spanish coastlines erodes ecological regulations and resilience and then undermines the countries abilities to deal with climate change as they are becoming vulnerable. Thus, this vulnerability is creating an inability to protect or securitize the country's environment. Finally, this inability to protect or securitize the environment is producing further environmental security-related issues or even energy security-related ones.

One of the most recent ecological destruction is focused on the island of Samos where thousands of fishes have been found dead on the seashores of the island (koutipandoras.gr, 08/06/2014); this is another incident of sea pollution and

environmental catastrophe in Greece. It is necessary to observe that this ecological catastrophe was been caused by the local fishermen because the economic value of the fish was negligible as the fish were not edible (skai.gr, 08/06/2014). The local coastguard has not arrested the fishermen who have been involved in this ecological catastrophe yet and it has not even recorded the size of the ecological destruction. This ecological disaster represents the peoples' attitude, as they are careless concerning environmental damage and much more concerned about economic prosperity. Also, it highlights that no matter if climate change is already threatening the fish populations and catches (Golden et al., 2016: 317-320), further marine destruction is making Greece even more vulnerable and less resilient to climate change threats. This vulnerability could create more tension between Greece and its neighbouring countries (e.g. Turkey), as the fish populations have been decreased and there could be violent conflicts between the countries' fishermen. Finally, these violent conflicts could lead to major warfare between the involved countries as a result of the inability to prevent or deal with such anthropogenic ecological destructions which are enlarged due to climate change.

4.2.4 Continuing Climate Change-Oriented Issues

Along with these new pollution and destruction activities of the environment and climate in Greece, there are two other major yearly climate change-oriented issues which were continuing even before the economic crisis. The inaction on these issues has incurred an enormous environmental cost for the country and the planet too.

The largest electric power company with 7.4 million customers and 68% of the total installed capacity of the power plants in Greece, Public Power Corporation (PPC), (PPC, Company Profile) is also the country's major producer of CO_2, as it depends on the extraction of lignite and coal from national lignite and coal mined sources for producing

electric energy. Thus, the PPC has monopolized the electrical energy market and the production of electricity in Greece and partially employs renewable energy resources for producing electric energy. The country's energy production of wind farms reaches a total of 1.800MW and PPC has generated only 65MW from these wind farms (WWF Greece, March/2013: 9-10). Additionally, the PPC, in photovoltaic and solar energy production, is completely absent as it produces only 0.7MW of the country's total energy production of 1.334 MW (WWF Greece, March/2013: 9-10). Finally, PPC has recently announced the generation of a mega-lignite power station, contrary to the previous announcement of generating in the same area (Ptolemaida), to be the biggest photovoltaic and solar park in the world (WWF Greece, March/2013: 10), which definitely indicates at least the company's intentions for non-renewable energy resources.

The substantive issue of non-handling waste according to the EU regulations of waste disposal has created both massive environmental and non-environmental problems in Greece (news247.gr, 17/04/2013). According to the European Commissioner, Johannes Hahn (news247.gr, 17/04/2013), most of the landfill sites and tips are illegal in the country and even if some of the waste dumps have been closed under the pressure from the EU, there has been no restoration of the sites with the aim of deflecting the environmental damage in the areas of the rubbish tips. Greece has been prosecuted by the European Court of Justice since 2003 and charged for specific rubbish dumps cases with tremendous daily amounts of money until the present (Koutsoumpou, 05/06/2013; koutipandoras.gr, 20/03/2014). However, as the European Commissioner has mentioned, there is no any progress or at least any political will to terminate the illegal rubbish dumps and restore the landfill sites, even if the fines are exhausted (news247.gr, 17/04/2013).

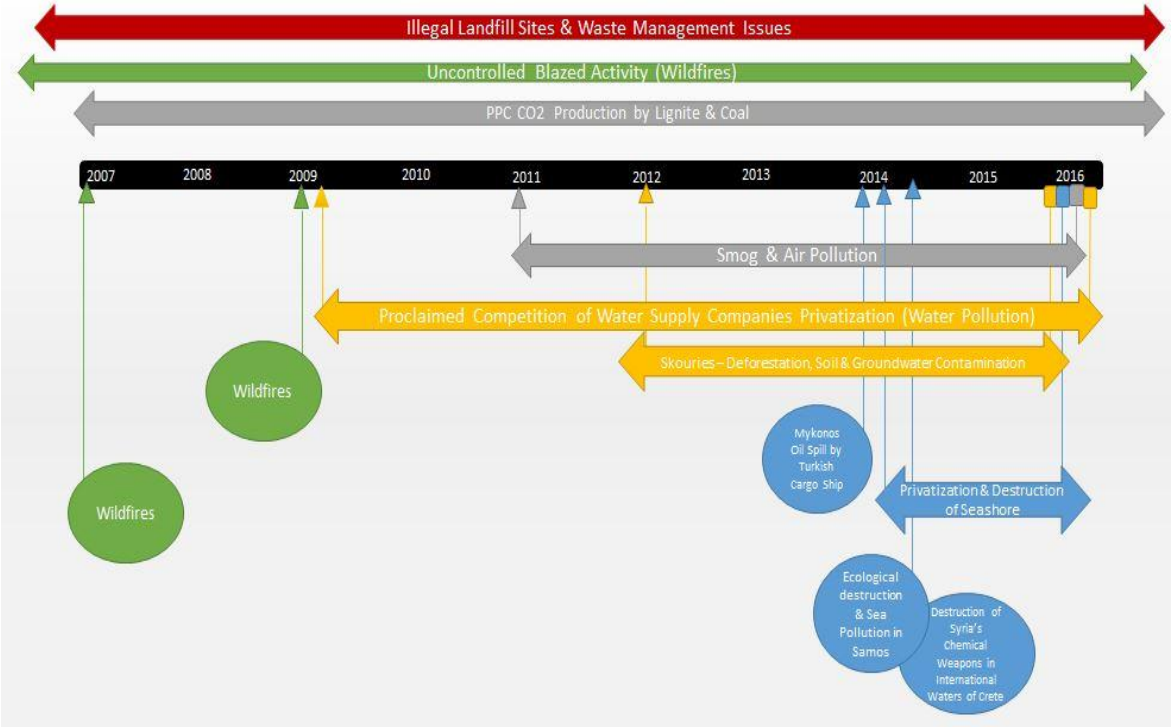
Moreover, the failure of Greek governments to follow the EU directives for waste disposal and the restoration of sites forces them to follow not-well developed policies which have tried unsuccessfully to generate legal scrap heaps in new areas. The local citizens have reacted violently against the generation of landfill sites close to their houses and they have stuck or stopped the construction of waste dumps (e.g. in Keratea) with the aim of avoiding the solid, air and water contamination of their areas (Becatoros, 17/04/2011). The illegal landfill sites and the waste management issues of Greece go unresolved as the country had to comply with the EU regulations and directions by the end of 2015 and still there has been no progress with them (news247.gr, 17/04/2013). Additionally, the current government is unwilling to handle such a pressing issue as it requires going against the citizens' willingness to protect their local environment. The environmental destruction of the illegal rubbish dumps' areas and the inertia of the site restoration are permanent and stable Greek climate change-related issues, as methane is being leached into and produced by these landfills, which need immediate solutions and actions. These issues do not destroy only the country's environment, climate and ecology but, while the Greek economic crisis deepens, these issues undermine the country's assay of economic recovery as Greece has to pay large fines which creates even bigger economic instability.

Considering all of the above issues, Greece unambiguously had stable and permanent climate change problems before the economic crisis. However, at the economic crisis' zenith, the Greek state, in the name of economic development, produced an environmental crisis which seems to be catastrophic not only for the country's environment, climate and ecology, but also for its economic resources and development (e.g. tourism and agriculture). Hence, it is evident, that the Greek state and the governments, in full co-operation with the European Commission and IMF, sacrificed

environmental stability for quick and easy money; an act of desperation due to the threat of economic collapse. However, these furious and haphazard economic developmental plans are contradictory, even among them, as for instance the destruction of Syria's chemical weapons in Greek water boundaries pollutes and destroys the sea, which is against the privatization and development of coastlines, as the environmental and ecological destruction repels the private interest and investments.

This environmental victimization is rationalized according to a paradigm of economic development, but it is unsupported by ecological and environmental terms and conditions, unavoidably initiates new and unknown environmental, energy, economic and human insecurities for Greece and prompts the destabilisation of the already vulnerable and unstable relation between the state and the citizens. Finally, as economic crisis deepens in Greece, the dishonest intentions of this country and Troika to protect and securitize the environment from the threat of climate change are revealed. Greece has ultimately become exposed to environmental and energy insecurities due to economic underdevelopment and crises (see Table 13 - Timeline of environmental issues below).

Table 13 Timeline of environmental issues in Greece



4.3 Climate Change as a Security Issue in Greece

Climate change has been linked in multiple ways to security studies. It has been highlighted as a new threat of national and international security capable of causing war and conflict, as an environmental security issue after the widening of traditional security agenda, and, most recently, as a human security threat or even as an energy security field of action (Vogler, 2016: 21-24). Strictly speaking, climate change has not been defined as a threat and has not been linked or connected to the security agenda of Greece, not even to the energy security sector. No matter if climate change has been linked as a threat to various security concepts by international institutions such as the EU and the UN, in which Greece is an official and full member state, the orthodox and traditional ways of approaching security do not allow the Greek state, the citizens, and explicitly most academics to connect environmental degradation to any sector of security. They also do

not accept that a climate change discussion should be handled via the analysis of security studies.

However, almost all of the previously mentioned climate change issues which occur in Greece have a reasonable connection with many security sectors and concepts. As a key example, the conflagration of August 2007 should automatically be linked with environmental security, as the destruction of the ecology and environment is significant and should be considered a fatal collapse and threat to human security in Greece due to the loss of human life. The connection between the wildfire activity of August 2007 and security has been made without recognizing it, under the traditional and orthodox rationale of national security. Many years after the blazes of August 2007, the former Minister of Public Order and Citizen Protection of former PM Karamanlis' government claimed that Turkey was probably responsible for lighting the fires in Greek forests by virtue of the oil pipeline building agreement between Greece, Russia and Bulgaria in 2006. This happened because it bypassed, geopolitically and geographically, the oil pipeline building agreement between Turkey and the USA (Katsareli, 31/12/2011).

At this point, it is important to mention that the former PM of Turkey, Ahmet Mesut Yılmaz, accidentally disclosed Turkey's fire setting operations in Greek forests a decade later by the Turkic National Intelligence Organization (MIT) as retaliatory strikes of concealment by the members of Kurdistan Worker's Party (PKK) in Greece by the Greek state a few years earlier (news247.gr, 25/12/2011; news247.gr, 27/12/2011; Mpamiatzis, 29/12/2011). The former Turkish PM's declaration has led many members of the former PM Karamanlis' government to claim, without concrete evidence, that Turkey was definitely responsible for the conflagration of August 2007 and 2009 as well (Katsareli, 31/12/2011). This important example focuses on Greek state's traditional and orthodox

security perspective on the wildfire issues. This did not lead to a dialogue between issues of climate change and security, and did not move beyond the stereotypical, military, state-centric and national rhetoric of security usually used when talking about this annual threat to Greece. Instead, it has created even more insecurities and concerns, as a violent conflict resolution between two traditional enemy countries over these kinds of issues seems more than possible. Finally, it has drawn attention away from the climate change and security discussion as it focuses dangerously on the "traditional notions of security dilemma" (Dalby, 1997: 12), instead aiming to find ways of protecting the ecological system, the environment and human beings from the threat of climate change and climate change-related issues.

In contrast, in many other climate change-related cases, such as the case of Skouries, the case of Keratea and the most recent case of Syria's chemical weapons destruction, etc., the Greek state has reacted violently against its own citizens. This has happened because they have tried to protect or securitize the local environment and ecology, which has been polluted or destroyed by international institutions and multinational corporations, with the support of the state due to the desire for economic development and instant profits.

In all of these issues, Greek habitants have exposed a linkage between climate change and security which seems completely different form the academic linkage. They have noticed the necessity of protecting the environment and human beings form further human made environmental (air, soil, water, seawater) pollutions and environmental (forests, agricultural land, seashores) destructions which threaten not only the environment but their own existence. Besides, the Greek state is in direct opposition to its citizens' demands as it identifies, as a first priority issue, the protection of economic development, and the underdevelopment and the economic effects of the debt crisis as a

fundamental security threat. These specific environmental and climate change-related issues have exposed the anti-environmental and anti-ecological economic development plans of the state and Troika. These plans are able to produce new and unexpected environmental, climate change-related and security problems for the country with only the citizens being able to secure the environment from these policies and tactics. Nonetheless, the Greek citizens are not able to guarantee the protection of the environment as on every occasion that they face any difficulties and insecurities, they reprioritize the order of protecting the environment with the order of protecting themselves. For instance, in the case of smog in major Greek cities, the urban habitants are forced to utilize extremely dangerous and polluted forms of heating to protect themselves from the climate's conditions (very cold winter) and as a result of the economic conditions (the expensive prices of heating oil, gas and electricity) as well.

Climate change is a security issue in Greece with many different security ramifications. In general, climate change, particularly in the Greek context, could easily be defined by the wider and broader explanation of security. However, there has not even been an open discussion on the new environmental matters during the period of economic crisis, as the state wilfully obscures these issues by defending and supporting the reasons for protecting the economy rather than anything else. The fact that the state has not yet acknowledged any of the links between climate change and security has resulted in chaotic, labyrinthine and insoluble environmental insecurities for a country as it does not follow a specific environmental policy or plan with the view to tackling the country's climate change-related problems. In contrast, climate change threatens the country's existence and security and Greece will have to confront major consequences from the melting of ice and snow as well as from the rising temperatures, with islands, seashores, cities and many hectares of agricultural land likely to submerge under the sea and with

the rest of the land made uninhabitable because of drought and desertification (nationalgeographic.com, 09/2013; Tzelis, 19/12/2013).

Furthermore, the study focuses on the EU approaches and policies on climate change as a security issue as well as on energy security matters due to comparing the differences with the Greek approaches, policies and discussions. Additionally, this examination of the EU approaches and policies on these matters will highlight that there are differences in the EU's thinking and policies, as a result of global recession and because of the two different categories of member countries (e.g. developed and developing countries).

4.4 Climate Change as a Security Issue in the EU

In direct opposition to the Greek state's thinking on climate change as a security issue, the EU has defined climate change as a security issue and has noticed that this phenomenon threatens on both local and global scale, the environment and human beings as well as the resources. It threatens environmental security, human security and energy security in the EU (Vogler, 2013: 638-642). Climate change has been presented by the EU as a first priority security issue, at least regarding energy security and the EU has set specific and immediate goals and targets in relation to the climate change threat, which have been accepted by the EU member states, with the aim of reducing and/or tackling the changes in the climate and stopping further environmental and ecological destruction (Vogler, 2013: 638-642).

However, even if EU has tried to adopt the security rationale on the climate change issue, not all member states have focused on adopting or even discussing the threat of climate change as a security issue in their local security agenda. This is happening because the

states have prioritized other security threats first rather than the threat of environmental degradation. For instance, EU member states such as Italy, Spain, Portugal, Greece etc. are developed countries, but they are vulnerable and unstable as they face economic problems due to the global economic crisis and do not seem - the examined period - to have other significant issues than the economic one.

On the other hand, member states such as Germany, Norway, Sweden, Holland, France or UK are developed countries and do not face many economic vulnerabilities as a result of the global economic crisis, and so they have established, formulated and expanded the rationale of climate change as a security issue in the EU (Vogler, 2013: 638-642) and have embraced the EU's environmental and energy security policies in their local environmental and energy security agendas. Hence, these different approaches to climate change as a security issue rely on the EU's weakness at defining and explaining the threat of climate change properly under the rubric of environmental (climate) security and "setting the climate and ecosystem as its referent objects" (Vogler, 2013: 638) with the aim to convince all of the member countries of the necessity of adopting the EU policy stance.

Another interesting point is that climate change has been presented by the EU as a combined threat of environmental and energy security and in parallel, environmental and energy security is the only way of confronting this issue due to the rewarding climate solutions such as the protection of the environment and ecology which appear only through sustainable and secure resources, renewable energy, reduction of CO_2 emissions, etc. (Vogler, 2013: 627-639).

Climate change as a security issue in the EU, even if it has been prioritized, (re)defined and analysed to a great extent, in contrast to other international institutions, unions and

countries, has already created internal issues and a Union of two dimensions. The most vulnerable member states of the EU, contrary to the least vulnerable members by cause of the economic crisis, have reprioritized their threats with the global debt crisis as the first in their local security and policy agenda.

In addition, vulnerable countries seem to be unable to understand such an economic threat and are unable to deal concurrently with an even more complex issue than the economic crisis. In some particular cases, as an example in the environmental destruction of the Greek seashores, the EU has supported the denationalization and destruction of the coasts to enable the economic development of a vulnerable member state and in so doing, it does not strictly apply its first priority issues like the tackling of climate change and the minimization of environmental and energy insecurities in the Eurozone. Finally, an obvious point is that the Greek experience of transposing or learning from EU policy in the past decade is not in relation to the EU's thinking on climate security, but rather on Troika's imposition of austerity and a narrow focus on public debt reduction.

4.5 Climate Change-Policy in Greece

Like all EU member countries, Greece has to follow specific climate change-related policies with the aim of being an active and supportive member of the Union's common attempts to protect the environment and ecology and to tackle and reduce changes to the climate. In addition to the EU's climate change-oriented policies, the Greek state has designed individual environmental and energy policies on behalf of its exclusive environmental and energy interests and yet they have been presented and used as an ideal plan for economic development during the period of economic crisis.

According to the "newly founded" Ministry of Environment, Energy and Climate Change (YPEKA) (2014: Environment), the Greek environmental policy covers a plethora of environmental issues such as the "protection of nature", the "waste management and recycling", the "protection from air pollution", the "environmental permitting of industrial installations and the protection from industrial pollution", the "facilitation of public access to environmental information", etc. Additionally, there is a model of sustainable developmental policy, which has been named "Green Growth" which is "the new developmental model that can be applied to all sectors in society" (YPEKA, 2014: Green Growth).

It has three key priorities the "climate and energy", the "changing pattern of production and consumption" and "the conservation of natural resources" (YPEKA, 2014: Green Growth). By the first key priority, mentioned as "climate and energy", YPEKA (2014: Green Growth) tries to highlight the protection of "our natural assets by an immediate transition to renewable energy sources, improving energy conservation, and reducing energy consumption". By the second priority, named as "changing pattern of production and consumption", YPEKA (Green Growth) focuses on the promotion of "green business" and the creation of environmentally-friendly new business activities and quality jobs in the "energy, waste management, agriculture and food" sectors with the view to minimize the environmental impact. The third priority, which is mentioned as "conservation of natural resources", indicates that the policies of protecting "natural environment", "water management", protecting forests from wildfires, protecting rivers and lakes and surviving ecosystems and "protected areas" are vital and necessary with the aim to achieve sustainable development or 'Green Growth' (YPEKA, 2014: Green Growth).

Furthermore, as YPEKA (2014: Green Growth) claims, these "environmental objectives" are not possible to be achieve only by "strict regulations, state intervention and legal restrictions", as it is even more important for these policies to connect them with the economy and to force citizens, businesses and the state to "change their behaviour and reduce their impact on the environment" with the aim of achieving sustainable development. YPEKA (2014: Ministry) highlights that its mission is ''to achieve the protection of the natural environment and resources, the improvement of quality of life, the mitigation and adjustment to the implications of climate change and the enhancement of mechanisms and institutions for environmental governance''. To achieve this "mission", the Greek state has established a "strategic plan" which depends on four "pillars" such as the "combating climate change by moving towards a competitive economy of low carbon consumption", the "natural resource protection and environmental enhancement", the "improve quality of life with respect to the environment" and the "enhancement of environmental governance mechanisms and processes" with significant "strategic objectives" for each of the plans (YPEKA, 2014: Ministry).

Greek climate change-policy is strictly related and connected to its energy security-policy; as being the only way of tackling and reducing the environmental impact through renewable energy, the protection of natural resources and 'Green Growth' or sustainable development. The Greek climate change-policy, in the way that the YPEKA has presented it, seems to share common policy pathways with the EU's suggested climate change-policy and energy security-policy. Additionally, it shows an exemplary and ideal consistence of the mission's policy and effectiveness. Here, it is significant to mention that the Greek state's thinking and perspective on climate security is similar or the same as energy security. In other words, the protection of nature, the environment and ecology

is mentioned and highlighted in the same or similar style of policy related to protecting the national resources and encouraging sustainable development.

The Greek state's view of not distinguishing climate security from energy security gives the impression of being an exclusive thinking and perspective, as there are no similar views in between the other EU member countries. However, as a result of the above mentioned Greek climate change issues, it is clear that the climate change and energy-policy in Greece has tremendous problems related to effectiveness and consistency as it is unable to protect the environment, the ecology, the citizens and the state as well. Finally, it seems even more vital for YPEKA to secure the effectiveness of energy security-policy as a secure method of economic growth and not indispensably.

4.6 Energy Security-Policy in Greece

Due to energy-policies in Greece, according to YPEKA (2014: Energy), "the priority and top objective is to safeguard and manage energy resources in a manner which secures the smooth, uninterrupted and reliable supply of the nation's energy needs and access for all users to affordable, secure energy". Moreover, the energy-policy's top priority objectives in Greece are the "secure energy stocks" and "the viable and sustainable development of the energy sector", in order to protect the energy sources, the domestic market and consumers as well as the ecology and the environment (YPEKA, 2014: Energy).

Additionally, YPEKA has analysed its strategic energy plan and policy focused on different axes, such as the "access to a wide variety of energy sources", the "construction of oil and natural gas pipelines within international networks", the "liberalization of the market, increased competitiveness and putting an end to monopolies in the electricity and

natural gas sectors", etc. (YPEKA, 2014: Energy). It noticed that the routes for shaping Greek energy sources into renewable energy sources and, finally, it also highlighted the EU common and agreed targets that have been adopted by the Greek state named as 'National Action Plan 20-20-20'[34], 'National Energy Data System'[35] etc. (YPEKA, 2014: Energy). Moreover, YPEKA (2014: International Relations) has referred to international relations' vital role in the resolving of energy issues at least in those countries, such as Greece, which are energy dependent or that have a deficiency related to energy independence with the aim to apply particular energy-policies and actions by virtue of reducing and tackling the changes to the climate and environment.

It is evident that the climate change-policy and the energy-policy in Greece share almost the same policies, strategic plans and objectives based more on the energy sector rather than the environmental one. As has happened with the climate change-policy, the need for environmental security or climate security has never been mentioned. Similarly, there is no reference to energy security or energy security-policies, even if the Ministry's plans highlight the necessity for secure energy and energy sources. According to the most recent report (2017), which was produced by the Dianeosis Research Institute and Analysis for YPEKA, based on the Greek regulations and documents for climate change-policy and energy-policy, it is even more evident that climate change and energy-policies are treated as the same policy and strategy of not preventing the county from experiencing climate change but of helping it to adapt to climate change-related issues for development (Kartalis et al., 2017: 122-145).

[34] The 'National Action Plan 20-20-20' refers to a strategic plan which follows specific consultations by the European Commission as it promotes the increasing of renewable energy sources by 20% in 2020 and the 'development of energy sector and the penetration of technologies' in 2020 as well (YPEKA, 2014: Energy)

[35] The 'National Energy Data System' is a computerized tool that the YPEKA (ibid) plans to develop aiming to provide particular information to the 'general public' about the 'developments of national energy strategy'

Contrary to the aforementioned climate change-policy and as the YPEKA has repeatedly declared, the Greek energy-policy depends on the EU energy agreements and plans and follows the consultations of the European Commission on the energy matters which unambiguously show the state's intention to use it as an excuse for any energy-policies and plans' failures and to pass the problems which could be observed as a consequence of the energy plans' deficiencies to the Union. In addition, it is quite speculative and ingenious, the acceptance of international relations' dependency by virtue of achieving the national energy plans of Greece, reveals the state's vulnerability of acting drastically on a security issue, despite the fact that the state has not recognized energy as a security matter. Finally, the method of presenting the energy-policy and its effectiveness implies that it is too idealistic for a state which recognizes its energy dependence and energy insecurities due to energy sources. In addition, it is too optimistic to claim that a country like Greece, which faces huge economic difficulties and problems will be able to implement energy plans and policies.

4.7 Problems of Climate Change as a Security Issue in Greece

There are security-related issues which are or could be the consequences of climate change impacts in Greece, although they have not been highlighted or defined by the state, the citizens or even the mainstream media as security matters. Here, the target of this study was to highlight the problems of climate change as a security issue in Greece, but it is essential to note that there are cases that are based on future expectancies as well as existing problems which are taking part during the examined period of time. The potential or existing security issues that have been examined below in detail are internal and external environmental or climate change-related migration, air pollution issues and

environmental destruction as a result of economic instability, which is not necessarily the only climate change-related security issue, as there is also the issue of wildfires.

Starting with the expected security issues, Greece, as mentioned above, is a peninsular country with many islands and even this geographical characteristic could be one of the major security issues and disadvantages in relation to the threat of climate change for the country. There are many academic studies that have claimed that, after few years, Greek cities, such as Thessaloniki and Patra, and almost all of the islands, will have vanished under the sea as a result of the rise in sea level and the melting of ice and snow (nationalgeographic.com, 09/2013; Tzelis, 19/12/2013). The country could face great migration within its own boarders which could be caused by the sinking of Greek cities and islands. This could create conflicts between the Greek citizens as a result of the country's inhabitable territories. Thus, these major territorial security issues are strictly connected to the orthodox and traditional security rationale. Additionally, this loss of territories could force many Greek citizens to immigrate immediately into neighbouring countries and even this Greek population movement could cause international relations' diversifications and/or violent conflicts between Greece and any neighbouring countries involved. These conflicts are connected once again with the traditional and orthodox security thinking.

An even more pragmatic case of security caused by climate change in Greece, could be the migration of populations from those most affected by environmental degradation into those countries like Greece (only if Greece is one of those countries) which will not be so seriously impacted by climate change, as the state has to find a way of protecting its borders from environmental migrants. According to Frontex's Annual Risk Analysis (Frontex, 2013: 15-30; CNN, 30/10/2013; Demetis, 31/10/2013), Greece is already

confronting major and unresolved migration issues, as it is one of the principal illegal entry points into Europe and in 2013, at least 37,220 migrants from the 'Eastern Mediterranean route' (Greek and Turkish land and sea borders) and 5,500 migrants from the 'Circular route from Albania and Greece' have crossed its borders illegally. The country already has migrant issues and will confront terrible security issues, if the migration were to increase as a result of climate change.

Moreover, the destruction of the Syria's chemical weapons in the international waters of Greece, does not only create environmental insecurities as it destroys the local environment and ecology, but it also pollutes the seawaters and threatens the country's natural existence as well. In other words, an environmental accident could be the end of Greece as a nation, as a touristic destination or even as an inhabitable country, as it threats the country's natural survival. Even if the environmental accident destroys a particular island such as Crete and does not spread to the entire country, the environmental, economic, societal, political and national insecurities will be indefensible for any country, and even worse, for a vulnerable country like Greece which has already many interrelated problems due to the economic crisis. Additionally, the Greek state creates even more national security and human security issues as it has revealed an obvious lack of domination over its own borders and it has increased human insecurities in the case of an environmental accident, as it has firstly agreed with the maritime destruction operation of chemical weapons in Greek international waters and then it has requested security guarantees from the EU, the UN and the OPWC (econews.gr, 15/05/2014). These kinds of environmental and security issues are happening in Greece based on the general principle and orthodox perspective which claims that the degradation of the environment as a result of economic or other activities can be 'compensated' by increased income or wealth. This is the case where the destruction of Syrian chemical weapons or the arsenic

pollution of the water by the gold mining company does cause environmental problems which are not necessarily only climate change-related. However, this orthodox political and economic perspective based on wealth compensates for the negative environmental impact on people, which could also mean more revenues to 'restore' and 'clean up' the degraded ecosystems and environments. This does not seem to be under consideration, at least in the case of the Greek state/governments, as wealth is more important than the restoration of any environmental or other damage.

Almost all of the above mentioned climate change-related and environmental issues could be linked with security in Greece. However, this study does not arbitrarily connect these cases to the Greek security agenda, but it highlights the connections that have already been stressed as Greek security issues.

Thereby, the issues of wildfires generate environmental insecurities as well as human insecurities in Greece. In addition to the countless burned hectares of agricultural land and forests, there are many human victims who lost their lives or who had to abandon their homes. According to the Greek state (Katsareli, 31/12/2011), the wildfires reveal an unsolved problem for Greece that has already been used by its traditional enemy, Turkey, as a weapon to threat the country's security and environment. This wildfires case indicates that Greece is exposed to imminent threats and issues of national security. Additionally, the issue of smog in almost all the major Greek cities reveals that the state is unstable and in an emergency condition; there are climate change-related insecurities as well as human insecurities. This is because of the increasing amount of suspended particles in the atmosphere and the health problems that the citizens are experiencing as a result of uncontrolled air pollution during the winter periods (Mpamiatzis, 15/10/2013).

Moreover, the denationalization of water companies and the destruction of seashores in the country have established an unstoppable conflict between the citizens, the cohabitation government and the Troika. This state and citizens' conflict is based on the state' response to Troika's imposed austerity as the citizens do not seem to accept the traditional and orthodox economic and political thinking that the environmental destruction and the water and sea pollution, as a result of the economic activities, can be compensated by the increased citizens' income or state's wealth. The Greek civil society protests as it seems to disagree with the instant and unsustainable economic development based on the destruction of the ecosystems. Thus, these protests are against unsustainable economic development as the citizens seem to know that there are no available revenues associated with the restoration of any environmental or any other damage.

4.8 Problems with Greek Climate Change and Energy Security-Policies

The Greek state has developed a 'strategic plan' clarifying the reasons for focusing and acting on the protection of energy resources and the environment rather than addressing the necessity of environmental security and energy security in Greece. It is highly evident that the energy-policy has overridden the climate change-policy and that it has deliberately declined the anaphora of energy security concept and its objectives. The Greek state has, as a target, the intention to develop a more flexible energy plan which could be replaced by an economic plan. The main problem with the Greek climate change and energy-policy is the paradoxical impact of these policies on the environmental and energy security, as they are also completely antithetical to environment and energy resources. For example, there is the governmental energy-policy of equating heating oil and diesel oil prices with the aim of dealing with the oil smuggling problem (Maniatis & Danchev, Sept/2013: 1-11) that has turned against the environmental, the human and the

state security. It has increased the air pollution and the citizens' health issues. As an extra example, the policies based on the exploitation of natural resources have an instant economic development result, like the mining activities in Skouries.

This privatization of the gold mine in a very unique and virgin area has produced local and national security problems, as the habitants fight on a daily basis against the multinational company, the state, the environmental destruction and the water and solid pollution. The state is so strictly adamant at sticking to its energy-policy that it has conceded power and authority to the multinational gold mining company to secure and safeguard the area of the gold mine with private armed units. The Greek state is not able to guarantee the safety of the company's investments as a result of the daily violent conflicts between the citizens and the police authorities, and it is unable to obliterate the economic agreement (occupylondon.org.uk, 29/10/2013). In the case of Skouries, the state has encroached on democratic principles as it has transferred the possession of security to a multinational mining company and it has been against its own interests, such as the environmental protection and climate security. Additionally, the Greek state has encroached on democratic principles as it has prompted its citizens into human insecure situations as a result of the environmental destruction which have been compensated by instant wealth.

The denationalization of water companies proves that the Greek state does not try to protect the natural resources from climate change and pollution and that it does not have the intention of achieving energy independence via secure energy resources; it transfers its allowances and it gives in exchange for money contrary to its proposed energy-policy and energy security concept. Likewise, the paradoxical construction of PPC's mega lignite power station is contrary to the construction of a renewable mega power station as

well as the absence of PPC's involvement in the production of renewable energy, which indicates that the Greek state does not have the intention to utilize and build renewable resources (WWF Greece, March/2013: 10). This is also proves that there is no energy strategic plan; instead, there is an economic strategic plan in Greece.

In conclusion, the Greek climate change-policies and particularly the country's energy policies, which have been noted as ways of reducing and tackling the environmental impacts, are opposed to the energy security of Greece as they do not try to ensure Greek energy independence, do not use or generate new renewable resources and almost all of the energy policies are detrimental to the environment or they do nothing to reduce the changes in the climate.

4.9 Greek Stakeholders and Climate Change Scepticism

Climate change issues in Greece seem to have demonstrable links and connections with security. Traditional ways of ensuring security have prevented politicians, citizens, national NGOs, energy industry leaders (stakeholders) and academics from directly connecting climate change issues with any of the broad and wide sectors of security in Greece. These stakeholders, who have completely different perceptions and points of views on the climate change issues, may have to offer distinctive connections and links between climate change issues and security sectors. This seems able to explain the Greek problem of climate change being a security issue.

However, climate change scepticism/denial seems to have many supporters in the Greek stakeholders, specifically and more importantly in the energy-industry leaders, such as the union members of PPC (GENOP) who made an official announcement stating that the issue of climate change is a hoax (GENOP, 3/6/2017). According to Dunlap (2013), climate change scepticism or climate change deniers, are a part of the problem of climate

change discussion and that this view is a controversy. The people that consider themselves to be part of the climate change scepticism movement, contradict the scientific evidence on climate change even that which is caused by humans, the climate change impact on nature and human society and even to resilience and adaptation (Bjomberg et al., 2017: 229-241). It is based on denial and pseudoscience, as they deny anthropogenic global warnings (Hansson, 2017: 39-47). The main issue is that they have what is called as denial mechanism organized by industrial, political and ideological interests and media in order to undermine the public trust in climate science (Dunlap, 2013: 691-698).

The main reason and consideration of highlighting climate change scepticism/denial in Greece is because of the twenty one (21%) percent of the total population claiming that climate change does not exist or that climate change is a natural phenomenon (aboutpeople, 3/6/2017). Additionally, this research study considers that this percentage is enough to dominate or influence the discussion of climate change as a security issue in Greece as it has conducted interviews in groups of energy-industry leaders or policy-makers which belong to the elite of climate change scepticism/denial. Thus, it significant to mention that the elites of climate change scepticism/denial do not only influence the Greek discussion in relation to climate change, but that they also have a considerable influence in other countries such as the UK and the USA (Washington & Cook, 2011). In most of the cases, environmental deniers are associated with fossil fuel lobbying, conservative think tanks and industry advocates (Jacques, Dunlap & Freeman, 2008: 357). It is also considerable that even in the academic community, most of the research studies about climate change scepticism originate from right wing think tanks (Jordi, 2015: 276-287). Finally, the discussion of climate change and security in Greece considers the three (3) factors produced, and even the perspective of climate change

deniers as some of the interviewees expressed their climate change sceptic views. They have played a major role in selecting the statements.

4.10 Conclusion

This chapter highlighted some very important issues related to climate change, the environment and security in the case of Greece during the economic crisis. It presented the climate change and environmental-related issues in the examined period from August 2007 to 2016 prior to the Paris Climate Agreement and connects them with environmental and energy security in Greece. Additionally, it explains the problems of climate change as a security issue in Greece and the problems of energy security policy in Greece as well. Furthermore, it has mentioned the necessity for stakeholders in influential positions to find solutions for climate change issues related to security in Greece, in order to alter environmental and security outcomes. Finally, it emphasises the role of climate scepticism in the case of the Greek stakeholders and the need to bridge the gap between the perceptions of academics and stakeholders on climate change as a security issue, with the aim of uniting all of the important actors against a common threat.

Chapter 5 analyses and interprets the three (3) factors that have established the perceptions of the Greek stakeholders. It also explains the ways that the Q methodology could be an appropriate research method for testing policy relevance.

Chapter 5: Interpretation of Results

''No single person knows everything that's needed to deal with problems we face as a society, such as health care or climate change, but collectively we know far more than we've been able to tap so far'' Thomas Malone (MIT's Centre for Collective Intelligence) (cited in Miller, July/2007).

5.1 Introduction

Chapters 2 and 4 focused on the existing and complex debates of climate change as a security issue on a global scale which has been noticed by the academic discourses and the complete absence of the same debates in the case of a vulnerable country such as Greece. This study has intended to establish the stakeholders' perceptions and attitudes of climate change as a security issue in the case of Greece filling in the intellectual gap. Thus, this chapter presents the stakeholders' perceptions of climate change as a security issue which unfolds the hidden discourses of vulnerable countries on behalf of security studies, which is this academic analysis' major contribution to the knowledge.

Furthermore, this chapter interprets each of factors that have been established by factor analysis and there are also details on the analysis itself. There are three (3) factors which are not the only possible discourses (maybe there are even more available

discourses/factors in general), however these are the three (3) different and dominant perceptions, opinions and attitudes between the four (4) groups of stakeholders in this specific study.

This chapter overviews the data produced and the three (3) factors (5.2); it interprets each of the three (3) factors verbally (5.3, 5.4, 5.5) and it focuses on the consensus statements (5.6). Finally, it highlights the perceptions which dominated the discussion on climate change as a security issue in the case of Greece (5.7) and it discusses the climate change and security study in Greece (5.8).

5.2 Overview of the Research

The PQ Method has correlated all of the Q sorts and between them as presented in 'Table 10 - Correlation matrix between sorts' (in the Appendices) and it presents the extent and nature of relationships that exist between all the Q sorts in this study. For example, following row 1, the Q sort 1 has its strongest relationships with Q sort 29 (0.95) and Q sort 32 (0.86). Additionally, these are the groups of Q sorts that exemplify Factor 1. Concurrently, Q sort 5 has no relationship with Q sort 8 as their correlation is zero (0) and there is no relationship with Q sort 8 with Q sort 35 (0) and Q sort 12 with Q sort 16 (0). Using the equation 2.58 x(1/√No, of items of Q set), the researcher calculates the significant correlation of a study. To be statistically significant in this study, a correlation must be ± 0.38 or greater. This same equation also calculates the significant factor loading for this study, which must be ± 0.38 or greater as well.

Moreover, 'Table 12 - The rotated factor matrix' (in the Appendices) presents and demonstrates the loadings and the extent to which each Q sort is associated with each of the factors for this study. The Q sorts which define a particular factor are marked with an X. Table 14 highlights the Q sorts that are loaded significantly in the three (3) Factors.

Additionally, it presents the Q sorts that are non-significant in any factor. These tables reveal the perceptions of the participants and the fact that they have highly significant loadings in the three (3) Factors.

Table 14 Summary of the rotated factors

Factor 1:	1, 3, 5, 6, 9, 10, 22, 29, 32, 35
Factor 2:	2, 8, 14, 17, 19, 20, 21, 30, 31, 38
Factor 3:	13, 16, 24, 25, 27, 33, 36, 39, 40
Non-significant:	4, 7, 11, 12, 15, 18, 23, 26, 28, 34, 37
Significant level:	0.37

Meanwhile, Table 15 shows the extent to which each of the factor arrays intercorrelate. Additionally, it presents the correlation between the extracted factors. Thus, the arrays of Factor 1 and Factor 2 correlate at 0.45. That means that there are similarities between the two factors; however, as this correlation is not strong enough, there are distinguishing arrays between them which also differ between the two factors. The correlation of Factor 1 and Factor 3 is very weak as they correlate at 0.39. For this study, this is actually a statistically significant correlation; however, it is important to claim that the factors have to be considered as opposite to one and other. Extra and in-depth details on the correlation between the factors will be provided later with the interpretation of each factor.

Table 15 Correlations between the factor scores

Factor	1	2	3
1	1.0000	0.4540	0.3913
2	0.4540	1.0000	0.3414
3	0.3913	0.3414	1.0000

Furthermore, Table 16 below highlights that there are, in Factor 1, ten (10) significant loadings, in Factor 2 there are ten (10) significant loadings and in Factor 3, there are nine (9) significant loadings. In addition, there are eleven (11) non-significant loadings which

show that these participants are not included in the factors produced; however, this means that their perspectives could be part of a factor which has not been extracted yet.

Table 16 Factor characteristics

	Factors		
	1	2	3
No. of Defining Variables	10	10	9
Average Rel. Coef.	0.800	0.800	0.800
Composite Reliability	0.976	0.976	0.973
S.E. of Factor Scores	0.156	0.156	0.164

Finally, the above table contains the error and reliability measures for each of the factor arrays. These have been used when creating the factor arrays as it is more useful when interpreting the results by comparing the factor arrays of the statements of each of the three (3) factors rather than the z-scores (see Table 19 in the Appendices). As the aim is to deliver a holistic factor interpretation, this study focuses on the factor arrays as the outcome that is consistent, data-driven and of particular importance. Table 18 below outlines the three (3) factor arrays for this study.

Table 18 Factor arrays for the three factors

		Factor Arrays		
	Item number and wording	F1	F2	F3
1	Climate change is a real problem.	5	5	5
2	Climate change is not one hundred percent (100%) an anthropogenic phenomenon but it has increased due to human activity.	4	1	1
3	The first global priority issue is the social crisis. The second global priority issue is the economic crisis and the third global priority is poverty and hunger. Finally, the fourth global priority is the phenomenon of climate change.	2	4	-4
4	The state is responsible for problems related to climate change in Greece. Government and state mechanisms have exacerbated environmental problems.	3	4	1
5	In a country such as Greece which depends on tourism, agriculture, fishing and shipping, the state should intervene on issues of climate change; however, the Greek state is definitely absent.	5	3	3

6	'Green Growth' should be developed in our country because in Greece it is easy to produce energy from the wind and sun.	2	5	4
7	The phenomenon of climate change is the first global priority	4	0	5
8	The Greek government does not support 'Green Growth' because it is controlled by major multinational companies which have different interests.	1	3	4
9	Climate change is the biggest global problem of all because its impact is potentially limitless. Economic crisis is the second most important global problem	3	0	1
10	The Greek state should be able to have control over its resources, the environment and all other factors impacting on climate change even if these factors relate to agriculture, tourism or energy production.	4	3	2

(continued)

Table 18 Factor arrays for the three factors (continued)

		Factor Arrays		
	Item number and wording	F1	F2	F3
11	Even if the problem of climate change is small in our country, it (Greece) does not deal with it due to economic and other interests and a failure of the state's executive capability.	1	2	2
12	Climate change is fifty percent (50%) an anthropogenic and fifty percent (50%) a natural phenomenon. Human beings only aggravate natural changes to the climate and environment.	2	2	-3
13	When we refer to climate change we are discussing both an anthropogenic and natural phenomenon but we are more concerned with the human impact on the environment.	0	2	3
14	There is no possible way of separating/disconnecting human impact from natural impacts on the natural environment.	-4	1	-1
15	The economic crisis is the biggest problem for Greece. The next problem is lawlessness. The third problem is that the majority of Greek citizens are uneducated and fourth is the problem of climate change.	0	-2	-2
16	Climate change is an anthropogenic phenomenon.	-2	0	2
17	First priority issue is the country's (Greece) non-existent economic development followed by the problem of climate change.	0	0	-1
18	Greece's first priority problem is the economic and political crisis; second is the nonexistence of social policy in relation to unemployment; third is the problem of the Greece's relations with other countries and then after that is the problem of climate change.	1	3	-3
19	The climate change problem is real but it is not as big as they try to present it.	-1	0	-3
20	Climate change is not our country's (Greece) first priority problem. The first problem is the economic crisis followed by the ethical crisis. Third is the issue of migration and illegal-migration that the country confronts and then fourth is the problem of terrorism. Finally, is the climate change problem.	-1	1	-5

21	Climate change is fake and has been 'created' for economic purposes.	-5	-2	-5
22	If there is a continuing problem of rising temperatures, then the country (Greece) will not be inhabitable. You will not be able to come out of your house. Additionally, some of the unique plants of Greek cultivation will disappear.	2	-4	-2
23	The European Union has definitely put pressure on the Greek government to develop alternative methods of energy production; however, the country does not follow these international and European regulations because it is against the country's economic capabilities and interests.	-2	0	-1
24	The phenomenon of climate change is not the first global priority issue.	-4	-1	-1
25	Climate change is not an anthropogenic phenomenon because it is a one hundred percent (100%) natural phenomenon.	-5	-5	-1
26	Climate change will increase migration into Greece.	-1	-3	0
27	Climate change threatens our energy security.	0	-1	2
28	Stable energy supplies are more important than reducing CO_2 emissions.	-2	2	0
29	EU policies on climate and energy will make Greece more secure.	-3	-1	-2
30	EU policies on climate and energy will make Greece less secure.	-3	-4	-2
31	Reducing CO_2 emissions and sustainable energy prices will increase employment and economic security.	1	-1	-1
32	Greece, which uses lignite as the country's main energy source, contributes to and is responsible for climate change.	0	0	1
33	The environmental and energy policies in our country have failed abysmally.	3	-3	0
34	Greece implements successful environmental and energy policies under strict standards imposed by the European Union to tackle climate change.	-4	-3	3
35	Neighbouring countries to Greece do not exert correct environmental and energy policies and, as a consequence, harm the environment of our country.	2	1	0
36	Oil extraction in Greece constitutes an environmental crime.	3	-5	0
37	Oil extraction in Greece threatens the country's security because of the increased tensions with neighbouring countries such as Turkey.	0	-2	-2
38	Oil extraction in Greece will not destabilise the country's security.	-3	4	3
39	The carbon emissions in Greece are considered a significant threat to the country's human security.	0	2	4
40	The carbon emissions in Greece are not considered a significant threat to the country's human security.	0	-4	-4

Table 18 Factor arrays for the three factors (continued)

41	The environmental issues in our country cause even greater economic problems and/or economic insecurity than those the country already faces.	1	1	-4
42	The environmental issues in our country will not create major economic problems and/or economic insecurity.	-1	-2	2
43	The consequences of climate change directly threaten the national security of Greece.	-2	-3	0
44	The national security of Greece is not threatened by the consequences of climate change immediately or even in the near future.	-3	-1	0
45	The protection of the environment and the protection of energy resources are immediate national security matters for the country.	1	0	-3

(continued)

Table 18 Factor arrays for the three factors (continued)

		Factor Arrays		
	Item number and wording	F1	F2	F3
46	The national security of Greece has not been affected by climate change and/or the use of unsustainable energy resources.	-1	-2	1
47	The European Union could ensure environmental and energy security in Greece.	-1	-1	1
48	The European Union could not ensure environmental and energy security in Greece.	-2	1	0

'Table 20 - Factor Q sort values for each statement' (in the Appendices) is the PQMethod output file. Table 18 is based on the data produced from PQMethod.

According to Brown (1980: 243), the factor arrays, which have been presented above for this study, are easier for the reader (e.g. the Greek stakeholders) to understand because ''they conform to the format in which the data were originally collected''. Thus, the main aim of a factor array is to provide the best possible estimation of the three (3) factors produced and to deliver the perfect loading Q sort and how it looks for each factor. This study interprets and analyses the three (3) factors based on this rationale of factor arrays by producing and presenting factor interpretation tables for each factor, presenting the factor exemplifying Q sorts for each factor, and providing full interpretations for each factor, starting with Factor 1.

5.3 Factor 1: Environmental and Energy Security-Policy Seekers

Table 21 was created by focusing on the factor arrays of Factor 1 as presented in Table 18. Table 21 includes four (4) categories identifying the highest ranking items, the lowest ranking items, the items ranked higher in Factor 1 than in any other factor and the items ranked lowest in Factor 1 than in any other factor. This categorization of the items allows for and highlights the identification of the important issues in which the perspective in Factor 1 is polarized and it presents this polarization of the perception in relation to the other factors as well. Table 21 is very helpful at producing the full interpretation of Factor 1 as it identifies effectively the most significant and contributory items within the Factor 1 arrays. Factor 1 has twenty six (26) items which are important to use to develop this particular viewpoint.

Table 21 Factor interpretation for Factor 1

Items Ranked +5
01 Climate change is a real problem.
05 In a country such as Greece which depends on tourism, agriculture, fishing and shipping, the state should intervene on issues of climate change; however, the Greek state is definitely absent.
Items Ranked Higher in Factor 1 Array than in Other Factor Arrays
09 Climate change is the biggest global problem of all because its impact will is potentially limitless. Economic crisis is the second most important global problem. +4
10 The Greek state should be able to have control over resources, the environment and all other factors impacting on climate change even if these factors relate to agriculture, tourism or energy production. +4
15 The economic crisis is the biggest problem for Greece. The next problem is lawlessness. The third problem is that the majority of Greek citizens are uneducated and fourth is the problem of climate change. 0
22 If there is a continuing problem of rising temperatures, then the country (Greece) will not be inhabitable. You will not be able to come out of your house. Additionally, some of the unique plants of Greek cultivation will disappear. +2
33 The environmental and energy policies in our country have failed abysmally. +3
35 Neighbouring countries to Greece do not exert correct environmental and energy policies and, as a consequence, harm the environment of our country. +2
36 Oil extraction in Greece constitutes an environmental crime. +3

37 Oil extraction in Greece threatens the country's security because of the increased tensions with neighbouring countries such as Turkey. 0
40 The carbon emissions in Greece are not considered to be a significant threat to the country's human security. 0

Items Ranked Lower in Factor 1 Array than in Other Factor Arrays

08 The Greek government does not support 'Green Growth' because it is controlled by major multinational companies that have different interests . +1
11 Even if the problem of climate change is small in our country, it (Greece) does not deal with it due to economic and other interests and a failure of the state's executive capability. +1
13 When we refer to climate change we are discussing both an anthropogenic and natural phenomenon but we are more concerned with the human impact on the environment. 0
14 There is no possible way of separating/disconnecting human impact from natural impacts on the natural environment. -4
16 Climate change is an anthropogenic phenomenon. -2
23 The European Union has definitely put pressure on the Greek government to develop alternative methods of energy production; however, the country does not follow these international and European regulations because it is against the country's economic capabilities and interests. -2

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24 The phenomenon of climate change is not the first global priority issue. -4
28 Stable energy supplies are more important than reducing CO_2 emissions. -2
34 Greece implements successful environmental and energy policies under strict standards imposed by the European Union to tackle climate change. -4
38 Oil extraction in Greece will not destabilise the country's security. -3
39 The carbon emissions in Greece are considered a significant threat to the country's human security. 0
44 The national security of Greece is not threatened by the consequences of climate change immediately or even in the near future. -3
48 The European Union could not ensure environmental and energy security in Greece. -2

Items Ranked -5

21 Climate change is fake and has been 'created' for economic purposes
25 Climate change is not an anthropogenic phenomenon because it is one hundred percent (100%) a natural phenomenon.

Table 22 simply includes any other items which are identified as potentially useful, additional or highly ranked items for Factor 1. The additional items identified have been included in Table 22, along with a very brief explanation justifying their inclusion. Table 22 has added six (6) items of possible significance and interest, over and above the twenty six (26) items identified in Table 21. These two tables highlighted the factor array as a

whole and in a systematic way, identifying thirty two (32) or sixty seven percent (67%) of the original forty eight (48) items which have a potential significance for Factor 1.

Table 22 Additional items to be included in Factor 1

12	Climate change is a fifty percent (50%) an anthropogenic and fifty percent (50%) natural phenomenon. Human beings only aggravate natural changes to the climate and environment. +2 **(This rational shows how these stakeholders define climate change).**
17	First priority issue is the country's (Greece) non-existent economic development followed by the problem of climate change. 0 **(Neither prioritize climate change in Greece nor do they not prioritize the issue).**
18	Greece's first priority problem is the economic and political crisis; second is the nonexistence of social policy in relation to unemployment; third is the problem of the Greece's relations with other countries and then after that is the problem of climate change. +1 **(This item presents that there is a kind of prioritization; however it is in contrast with the overall viewpoint of ranging climate change as a first global priority issue rather than the economic crisis).**
20	Climate change is not our country's (Greece) first priority problem. The first problem is the economic crisis followed by the ethical crisis. Third is the issue of migration and illegal-migration that the country confronts and then fourth is the problem of terrorism. Finally it is the climate change problem. -1 **(This is important! It highlights the contradiction with the previous item 18 as it disagrees that climate change is not the first priority problem in Greece. It shows a clear struggle to prioritize climate change and other important matters in Greece).**
Other possible items?	
41	The environmental issues in our country cause even greater economic problems and/or economic insecurity than those the country already faces. +1
42	The environmental issues in our country will not create major economic problems and/or economic insecurity. **(These items could present that there is an agreement that environmental issues will be able to create extra economic issues/insecurity).**

Finally, Table 23 below highlights the ideal Q sorting for Factor 1 based on the factor arrays as Table 18 has presented. Thereby the following interpretation of Factor 1: Environmental and Energy Security-Policy Seekers is based on the above mentioned items and on the demographic characteristics of the stakeholders who are loading significantly in this perspective.

Table 23 Factor-exemplifying Q sorting for Factor 1

←MOST DISAGREE NEUTRAL/UNCERTAIN MOST AGREE→

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
21	14	29	16	19	13	8	3	4	2	1
25	24	30	23	20	15	11	6	9	7	5
	34	38	28	26	17	18	12	33	10	
		44	43	42	27	31	22	36		
			48	46	32	41	35			
				47	37	45				
					39					
					40					

Factor 1 has an eigenvalue of 8.4 and explains 21% of the study variance. Ten (10) participants are significantly associated with this factor. There are six (6) males and four (4) females with an average age of 40.5. Four (4) are from the group of policy-makers, five (5) are from the group of the public and two (2) are from the group of NGOs. Four (4) males are from the group of policy-makers, four (4) females are from the group of the public and two (2) males are from the group of NGOs.

Climate change is presented by these stakeholders as a real problem (01: +5) and not as a hoax for economic purposes (21: -5). Climate change is also an anthropogenic phenomenon rather than an one hundred percent (100%) natural phenomenon (25: -5); in addition, climate change is not presented as only an anthropogenic phenomenon (16: -2). Climate change is explained more as a fifty percent (50%) natural and fifty percent (50%) anthropogenic phenomenon with human beings aggravating the natural changes in the climate and environment (12: +2). However, they mentioned that there are obvious ways of distinguishing between the human effects and the natural effects on the ecology/climate/environment (14: -4) and when these stakeholders discuss climate change, they are concerned with the human impacts on the environment (13: 0).

At a global level, climate change is considered to be the biggest issue of all due to its unlimited effect, and it is even greater than the global economic recession which is contemplated as being the second most important issue (09: +4). In contrast, these stakeholders are completely antithetical to those who try not to prioritize first the issue of climate change on a global scale (24: -4). Additionally, they do not prioritize climate change with other important issues in Greece as they neither agree nor disagree with the order or the issues (15: 0; 17: 0; 18: +1; 20: -1).

At a national level, these stakeholders consider the problems of continuing rising temperatures able to make Greece uninhabitable, also damaging the unique biodiversity of the country (22: +2). They have mentioned strongly that the Greek state has to intervene on climate change-related issues, but that it has not, even if Greece is fully dependent on the economic sectors, such as agriculture, fishing, shipping and tourism, which are impacted by climate change (05: +5). Thereby, they do not only ask for the state to intervene, but they demand from the Greek state that they should control all issues which are impacting on climate change in Greece, such as the energy resources, even if this has an economic effect on agriculture, tourism or energy production (10: +4). Additionally, these stakeholders consider that the Greek state has failed to implement environmental and energy policies (33: +3) as well as other neighbouring states that do not exert correct environmental and energy policies, thus harming the Greek environment (35: +2).

One of these issues, which needs to be stopped and controlled in the country, is oil extraction as it is considered to be as an environmental crime (36: +3). Following the same rational, these stakeholders consider that the oil extraction is able to destabilize Greek security (38: -3) but neither agree or disagree that this can increase tensions between neighbouring countries, such as Turkey (37: 0). Additionally, based on their

viewpoint, national security of Greece is threatening by the consequences of climate change immediately or in the near future (44: -4). Meanwhile, neither carbon emissions are considered to be a significant threat to Greek human security nor carbon emissions are not considered to be a significant threat to human security (39: 0; 40: 0). However, the reduction of CO2 emissions are considered by these stakeholders more significant than the stable energy supplies (28: -2).

Moreover, they claim that the European Union is able to ensure environmental and energy security in Greece (48: -2); however, at the same time, the EU is not strictly imposing on the Greek state the implementation of environmental and energy policies to follow this direction (34: -4). Supporting their claim, they disagree that the EU is putting pressure on the Greek government to develop alternative methods of energy production, even if the country does not follow the international and EU regulations (23: -2). Finally, these stakeholders claim, in a way, that the country does not deal with the climate change even if the problem is small in the country as the state has economic or other interests (11: +1).

5.4 Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters

Table 24 was created by focusing on the factor arrays of Factor 2 as presented in the Table 18. Table 24, similar to the other tables for each factor, includes four (4) categories identifying the highest ranking items, the lowest ranking items, the items ranked higher in Factor 2 than in any other factor and the items ranked lowest in Factor 2 than in any other factor. This categorization of the items allows for and highlights the identification of the important issues in which the perspective in Factor 2 is polarized and it presents this polarization of the perception in relation to the other factors as well. Table 24 is

important to produce the full interpretation of Factor 2 as it identifies effectively the most significant and contributory items within the Factor 2 arrays. Hence, Factor 2 has twenty five (25) items which are important to develop this particular perspective.

Table 24 Factor interpretation for Factor 2

Items Ranked +5

01 Climate change is a real problem.

06 'Green Growth' should be developed in our country because in Greece it is easy to produce energy from the wind and sun.

Items Ranked Higher in Factor 2 Array than in Other Factor Arrays

03 The first global priority issue is the social crisis. The second global priority issue is the economic crisis and the third global priority is poverty and hunger. Finally, the fourth global priority is the phenomenon of climate change. +4

04 The state is responsible for problems related to climate change in Greece. Government and state mechanisms have exacerbated environmental problems. +4

14 There is no possible way of separating/disconnecting the human impact from natural impacts on the natural environment.. +1

18 Greece's first priority problem is the economic and political crisis; second is the nonexistence of social policy in relation to unemployment; third is the problem of the Greece's relations with other countries and then after that is the problem of climate change. +3

19 The climate change problem is real but it is not as big as they try to present it. 0

20 Climate change is not our country's (Greece) first priority problem. The first problem is the economic crisis followed by the ethical crisis. Third is the issue of migration and illegal-migration that the country confronts and then fourth is the problem of terrorism. Finally it is the climate change problem. +1

23 The European Union has definitely put pressure on the Greek government to develop alternative methods of energy production; however, the country does not follow these international and European regulations because it is against the country's economic capabilities and interests. 0

28 Stable energy supplies are more important than reducing CO_2 emissions. +2

38 Oil extraction in Greece will not destabilise the country's security. +4

48 The European Union could not ensure environmental and energy security in Greece. +1

Items Ranked Lower in Factor 2 Array than in Other Factor Arrays

07 The phenomenon of climate change is the first global priority. 0

09 Climate change is the biggest global problem because its impact is potentially limitless. Economic crisis is the second most important global problem. 0

21 Climate change is fake and has been 'created' for economic purposes. -2

22 If there is a continuing problem of rising temperatures, then the country (Greece) will not be inhabitable. You will not be able to come out of your house. Additionally, some of the unique plants of Greek cultivation will disappear. -4

26 Climate change will increase migration into Greece. -3

27 Climate change threatens our energy security. -1
30 EU policy on climate and energy will make Greece less secure.. -4
33 The environmental and energy policies in our country have failed abysmally. -3
42 The environmental issues in our country will not create major economic problems and/or economic insecurity. -2
43 The consequences of climate change directly threaten the national security of Greece. -3
46 The national security of Greece has not been affected by climate change and/or the use of unsustainable energy resources. -2

Items Ranked -5
25 Climate change is not an anthropogenic phenomenon because it is one hundred percent (100%) a natural phenomenon.
36 Oil extraction in Greece constitutes an environmental crime.

Table 25 has all of the additional other items which have been identified as potentially useful or as highly ranked items for Factor 2. The additional items have been presented in the below Table 24, along with a brief explanation justifying their inclusion. Table 25 has eight (8) additional items of possible significance and interest, over and above the twenty five (25) items identified in Table 24. These two tables highlight the factor array as a whole and systematic way, identifying thirty three (33) or sixty nine percent (69%) of the original forty eight (48) items which are having a potential significance for Factor 2.

Table 25 Additional items to be included in Factor 2

08 The Greek government does not support 'Green Growth' because it is controlled by major multinational companies which have different interests. +3
(This item explains that the government does not support 'Green Growth').
12 Climate change is fifty percent (50%) an anthropogenic and fifty percent (50%) a natural phenomenon. Human beings only aggravate natural changes to the climate and environment. +2
(It explains and defines climate change in this perspective).
16 Climate change is an anthropogenic phenomenon. 0
(It shows that they do not consider climate change to be an anthropogenic phenomenon).
40 The carbon emissions in Greece are not considered to be a significant threat to the country's human security. -4
(This is very important! It highlights that they support 'Green Growth' and sustainable energy-policies).

Other possible items?

31 Reducing CO_2 emissions and sustainable energy prices will increase employment and economic security. -1
(The reduction of CO_2 emission is not about increasing economic security)

39 The carbon emissions in Greece are considered a significant threat to the country's human security. +2
(This item supports the stakeholders' demand for sustainable and Green Growth policies)

42 Oil extraction in Greece threatens the country's security because of the increased tensions with neighbouring countries such as Turkey. -2
(This items could present that the oil extraction is not threatening country's security).

45 The protection of the environment and the protection of energy resources are immediate national security matters for the country. 0
(This item could present that they neither agree or disagree that energy resources are linked with national security)

Table 26 below highlights the exemplifying Q sorting for Factor 2 based on the factor arrays as Table 18 has presented. Thereby the following interpretation of Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters is fully dependent on the items mentioned above and on the demographic characteristics of the stakeholders with a significant loading in this perspective.

Table 26 Factor-exemplifying Q sorting for Factor 2

←MOST DISAGREE NEUTRAL/UNCERTAIN MOST AGREE→

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
25	22	26	15	24	7	2	11	5	3	1
36	30	33	21	27	9	14	12	8	4	6
	40	34	37	29	16	20	13	10	38	
		43	42	31	17	35	28	18		
			46	44	19	41	39			
				47	23	48				
					32					
					45					

Factor 2 has an eigenvalue of 5.6 and this explains 14% of the study variance. Ten (10) participants are significantly associated with this factor. There are seven (7) males and three (3) females with an average of 46.5. Six (6) are from the group of policy-makers, one (1) is from the group of the public and three (3) are from the group of energy-industry leaders. Three (3) males are from the group of policy-makers, three (3) males are from the group of energy-industry leaders, one (1) male is from the group of the public and three (3) females are from the group of policy-makers.

Climate change has been highlighted by these stakeholders as a real problem (01: +5) and they neither agree nor disagree that it is not as big as it has been presented (19: 0). However, they claim that climate change is not fake and that it has not been created for economic purposes (21: -2). It is definitely not an one hundred percent (100%) natural phenomenon, but at the same time, there is no way to separate the human from the natural impact on the ecology/environment/climate (25: -5; 14: +1). They do not consider climate change to be an anthropogenic phenomenon as they have defined it as a fifty percent (50%) human and fifty percent (50%) natural phenomenon (16: 0; 12: +2).

At a global level, climate change is not mentioned as the first or biggest global problem (07: 0; 09: 0) as these stakeholders present social crisis as the first priority issue, economic crisis is second, the third global issue is poverty/hunger and then the last and fourth position is the issue of climate change (03: +4).

Even at the national level, the perspective of the stakeholders is in a similar way as climate change is not presented as the first Greek priority issue; the first is the economic crisis (20: +1). In Greece, they highlighted the economic and political crisis as the first priority problem second is the absence of social policies in relation to unemployment, third is the problem of the country's relationships with other countries, fourth is the issue

of illegal migration and then climate change is the last priority issue (18: +3; 20: +1). They claim that climate change is not as big and that it is not a first priority problem for the country; this is as they completely disagree that the continuing or expecting rise in temperature is able to destroy Greek biodiversity or make the country uninhabitable (22: -4). Additionally, they do not consider, in their perspective, that there is a possible way for climate change to increase migration in Greece (26: -3). Meanwhile, they consider the governments and the state to be responsible for the problems related to climate change which have exacerbated the environmental problems (04: +4).

The main consideration in these stakeholders viewpoint is given to the 'Green Growth' policy as they consider the development and production of energy from wind and sun in Greece to be easy due to the country's natural environment (06: +5). In order to support the Green Growth policies, they mention that the carbon emissions are threatening Greek human security (39: +2; 40: -4). In contrast, they highlight that the reduction of CO2 and sustainable energy prices are not able to offer economic security and development (31: -1). Also, they consider that stable energy supplies are more important than reducing the CO_2 emissions in Greece (28: +2). However, they consider that the current Greek government does not support 'Green Growth' as it is controlled by multinational companies which have other economic interests (08: +3). Additionally, they support that the oil extraction in Greece as it does not constitute an environmental crime and it is not able to destabilize country's security (36: -5; 38: +4). These stakeholders viewpoint points out that the oil extraction is not able to increase the tensions between Greece and neighbouring countries such as Turkey, and that it finally threatens Greek security (42: -2). Also, in their viewpoint, climate change is not able to threaten the energy security of the country (27: -1).

Moreover, they claim that Greek environmental problems and the consequences of climate change are able to create major economic problems and even economic insecurity (42: -2), but that they are not able to directly threaten the national security of the country (43: -3). They neither agree nor disagree that the protection of the environment and the protection of energy resources are an immediate national security matter for Greece as well (45: 0). However, at the same time, these stakeholders perception highlights that the national security of Greece has been affected by climate change and/or the use of unsustainable energy resources (46: -2).

Thereby, they neither agree nor disagree that the EU is putting pressure on the Greek government to develop alternative methods of energy production as well as that the country is not following the international and EU regulations as these are against the countries' capabilities and interests (23: 0). Additionally, these stakeholders claim, in their viewpoint, that environmental and energy policies in Greece are successful and have not failed (33: -3). Following this rationale, they mentioned that the EU is not able to ensure environmental and energy security in Greece (48: +1); however, the EU policies on climate and energy are not able to make Greece less secure (30: -4).

5.5 Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism

Table 27 was created by focusing on the other factor arrays of Factor 3 as presented in Table 18. Table 27, similar to the other tables for each factor, includes four (4) categories identifying the highest ranking items in Factor 3, the lowest ranking items in Factor 3, the items ranked higher in Factor 3 than in any other factor and the items ranked lowest in Factor 3 than in any other factor. This categorization of the items allows and highlights

the identification of the important issues in which the perspective in Factor 3 is polarized and it presents this polarization of the perception in relation to the other factors as well. Table 27 is important in order to produce the full interpretation of Factor 3 as it identifies, effectively, the most significant and contributory items within the Factor 3 arrays. Meanwhile, Factor 3 has twenty six (26) items which are important to develop in this particular perspective.

Table 27 Factor interpretation for Factor 3

Items Ranked +5
01 Climate change is a real problem.
07 The phenomenon of climate change is the first global priority.
Items Ranked Higher in Factor 3 Array than in Other Factor Arrays
08 The Greek government does not support 'Green Growth' because it is controlled by major multinational companies which have different interests. +4
13 When we refer to climate change we are discussing both an anthropogenic and natural phenomenon but we are more concerned with the human impact on the environment. +3
16 Climate change is an anthropogenic phenomenon. +2
26 Climate change will increase migration into Greece. 0
27 Climate change threatens our energy security. +2
32 Greece, which uses lignite as the country's main energy source, contributes to and has a responsibility for climate change. +1
34 Greece implements successful environmental and energy policies under the strict standards imposed by the European Union to tackle climate change. +3
39 The carbon emissions in Greece are considered to be a significant threat to the country's human security. +4
42 The environmental issues in our country will not create major economic problems and/or economic insecurity. + 2
43 The consequences of climate change directly threaten the national security of Greece. 0
44 The national security of Greece is not threatened by the consequences of climate change immediately or even in the near future.0
46 The national security of Greece has not been affected by climate change and/or the use of unsustainable energy resources. +1
47 The European Union could ensure environmental and energy security in Greece. +1
Items Ranked Lower in Factor 3 Array than in Other Factor Arrays
03 The first global priority issue is the social crisis. The second global priority issue is the economic crisis and the third global priority is poverty and hunger. Finally, the fourth global priority is the phenomenon of climate change. -4
04 The state is responsible for problems related to climate change in Greece. Government and state mechanisms have exacerbated environmental problems. +1

10 The Greek state should be able to have control over resources, the environment and all other factors impacting on climate change even if these factors relate to agriculture, tourism or energy production. +2
11 Even if the problem of climate change is small in our country, it (Greece) does not deal with it due to economic and other interests and a failure of the state's executive capability. -3
17 First priority issue is the country's (Greece) non-existent economic development followed by the problem of climate change. -3
18 Greece's first priority problem is the economic and political crisis; second is the nonexistence of social policy in relation to unemployment; third is the problem of the Greece's relations with other countries and then after that is the problem of climate change. -3
19 The climate change problem is real but it is not as big as they try to present it. -3
41 The environmental issues in our country cause even greater economic problems and/or economic insecurity than those that the country already faces. -4
45 The protection of the environment and the protection of energy resources are immediate national security matters for the country. -3

Items Ranked -5
20 Climate change is not our country's (Greece) first priority problem. The first problem is the economic crisis followed by the ethical crisis. Third is the issue of migration and illegal-migration that the country confronts and then fourth is the problem of terrorism. Finally it is the climate change problem.
21 Climate change is fake and has been 'created' for economic purposes.

Table 28 has presented all of the additional other items which have been identified as potentially useful or as highly ranked items for Factor 3. The additional items have presented along with a brief explanation justifying their inclusion. Table 28 has nine (9) additional items of possible significance and interest, over and above the twenty six (26) items identified in Table 27. These two tables highlight the factor array in a whole and in a systematic way, identifying thirty five (35) or seventy three percent (73%) of the original forty eight (48) items which had a potential significance for Factor 3.

Table 28 Additional items to be included in Factor 3

05 In a country such as Greece which depends on tourism, agriculture, fishing and shipping, the state should intervene on issues of climate change; however, the Greek state is definitely absent. +3
(This item presents that there is need for intervention on issues of climate change).

06 'Green Growth' should be developed in our country because in Greece, it is easy to produce energy from the wind and sun. +3
(They demand also to develop 'Green Growth').
38 Oil extraction in Greece will not destabilise the country's security. +3
(They do not consider that oil extraction can destabilise national security).
40 The carbon emissions in Greece are not considered to be a significant threat to the country's human security. -4
(This is important as it shows that they consider carbon emissions to be a serious threat to Greek human security).

Other possible items?
28 Stable energy supplies are more important than reducing CO_2 emissions. 0
(These items could present that they do not find there to be any relationship between climate change and national security).
35 Neighbouring countries to Greece do not exert correct environmental and energy policies and, as a consequence, harm the environment of our country. 0
(They do not agree nor disagree that other countries harm the Greek environment)
23 The European Union has definitely put pressure on the Greek government to develop alternative methods of energy production; however, the country does not follow these international and European regulations because it is against the country's economic capabilities and interests. -1
29 EU policies on climate and energy will make Greece more secure. -2
30 EU policies on climate and energy will make Greece less secure. -2
(These items show the viewpoint on the EU's policies and energy security)

Table 29 below highlights the exemplifying Q sorting for Factor 3 based on the factor arrays as Table 18 has presented. Therefore the following interpretation of Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism that it is fully dependent on the items mentioned above and on the demographic characteristics of these stakeholders with significant loading.

Table 29 Factor-exemplifying Q sorting for Factor 3

←MOST DISAGREE NEUTRAL/UNCERTAIN MOST AGREE→

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
20	3	12	15	14	26	2	10	5	6	1
21	40	18	22	17	28	4	11	13	8	7
	41	19	29	23	33	9	16	34	39	
		45	30	24	35	32	27	38		
			37	25	36	46	42			
				31	43	47				

44
48

Factor 3 has an eigenvalue of 7.2 and this explains 18% of the study variance. Nine (9) participants significantly associated with this factor. There are six (6) males and three (3) females with an average age of 33.8. Five (5) are from the group of energy-industry leaders and four (4) are from the group of NGOs. Four (4) males are from the group of energy-industry leaders, one (1) female is from the group of energy-industry leaders, two (2) males are from the group of NGOs and two (2) females are from the group of NGOs.

Climate change has been presented from these stakeholders' viewpoint as a real problem (01: +5) and it has been defined as an anthropogenic phenomenon (16: +2). In their perspective, when they refer to climate change, they are discussing both an anthropogenic and natural phenomenon but they are more concerned with the human impact on the climate/environment/ecology (13: +3). In this perspective, climate change is not a hoax for economic purposes (21: -5) and they disagree strongly that it is not as big as it has been presented (19: -3).

At a global level, these stakeholders present the phenomenon of climate change as a first priority issue. Additionally, they completely disagree that social crisis is the first global priority, second is the economic crisis, third is poverty/hunger and then is the issue of climate change (03: -4).

At a national level, following the global rational in terms of prioritizing climate change, they strongly disagree that climate change is not the first Greek priority problem and that the first issue is the economic crisis; this is followed by the ethical crisis with the third issue being migration; the fourth issue is terrorism and the last issue is climate change

(20: -5). Additionally, they disagree with the prioritization of making the first issue in Greece the economic and political crisis, with the second issue being unemployment, the third issue being the relationship between Greece and other countries and then comes the problem of climate change (18: -3). Thus, the stakeholders' perspective is clear; they have highlighted that the first Greek priority is climate change and not the non-existent economic development (17: -3). They even disagree that the problem of climate change is small in Greece and that the state is not capable of dealing with it as it has economic and other interests (11: -3).

In contrast, they claim that the state is, in a way, responsible for the problems related to climate change in Greece as the government and state mechanisms have exacerbated the environmental problems (04: +1). Also, these stakeholders believe that the state does not intervene on issues of climate change even if the business sectors in the country are based in the environment, such as tourism, agriculture, fishing, shipping etc. (05: +3). Thereby, they also agree that the Greek state has to be able to have control over the resources, the environment and all of the other factors impacting on climate change even if this is going to harm some business sectors, such as agriculture, tourism or energy production (10: +2). Additionally, they also consider the development of Green Growth to be important as it is easy to produce energy from the wind and sun (06: +3). Moreover, in their viewpoint, the Greek government does not support Green Growth as it is controlled by major multinational companies which have different interests in the country (08: +4).

Significant attention has been given as these stakeholders mention, in their viewpoint, that Greece implements successful environmental and energy policies under the strict EU standards in order to tackle climate change (34: +3). They consider that the EU could ensure environmental and energy security in Greece as well (47: +1). In contrast, the EU policies have been presented in their viewpoint as not being able to make Greece more

secure and also that the same EU policies have been highlighted as not being able to create a less secure country (29: -2; 30: -2).

Additionally, they have highlighted that Greece has contributed to and has a responsibility towards climate change as it uses lignite as the county's main energy source (32: +1). Even if they consider that the environmental issues in Greece are not able to create major economic problems (42: +2) or even if they neither agree nor disagree that the consequences of climate change can threaten directly Greek national security (43: 0), they recognize that carbon emissions are a significant threat to Greek human security (39: +4; 40: -4) and that climate change threatens the Greek energy security as well (27: +2). This stakeholders perspective is strong as they are not connecting, in any way, the protection of energy resources or environmental protection with the national security matters of Greece (45: -3).

Following this rationale, they do not consider that Greek environmental issues are causing even greater economic problems than those that the country already faces (41: -4) and they do not recognize that the national security of Greece has been affected by climate change or the use of unsustainable energy resources (46: +1). They do not find that oil extraction is able to destabilize the country's security (38: +3). They do not even consider that national security could be threatened by the consequences of climate change immediately or even in the near future (44: 0). Finally, climate change in their viewpoint is neither considered able to increase migration into Greece nor unable to increase migration into the country (26: 0).

5.6 Consensus Statements

The statements of consensus highlight the points of agreement between the three factors that have been interpreted above. These items have been sorted out in a distinct way so then there is no greater than two distributional spaces between all of the factors. These are the consensus statements. In this study, there are six (6) consensus statements produced by the PQMethod program, as Table 30 presents. There are areas of agreement between the three (3) factors and the forty (40) participants.

Table 30 Consensus statements

No	Statements	F1	F2	F3
01*	Climate change is a real problem.	5	5	5
11	Even if the problem of climate change is small in our countr	1	2	2
17*	First priority issue is the country's (Greece) non-existent	0	0	-1
29*	EU policy on climate and energy will made Greece more secur	-3	-1	-2
30	EU policy on climate and energy will made Greece less secure	-3	-4	-2
35*	Neighbour countries of Greece, do not exert correct environm	2	1	0

All listed statements are non-significant at $p > 0.01$, and those flagged with an * are also non-significant at $p > 0.05$.

These consensus statements indicate that the three (3) established factors have a correlation between them no matter if they represent divergent perceptions and viewpoints. The main and strongest agreement between the three (3) factors is the statement that mentions that climate change is a real problem as it has been sorted as one out of the two most agreed on items in all of the factors (01: +5, +5, +5). This consensus highlights that all of the factors are antithetical to climate change scepticism as they do not explain climate change as being a hoax. However, Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism, which is against climate change denial, has not only mentioned that climate change is a real problem, but that it is an anthropogenic phenomenon as well. The other

two factors, even if they have mentioned that climate change is a real issue, have presented that climate change is a fifty percent (50%) human and fifty percent (50%) natural phenomenon instead of an anthropogenic phenomenon. Moreover, the next statement of agreement is that even if the problem of climate change is small in Greece, the country does not deal with it due to economic and other interests and a failure of the state's executive capability (11: +1, +2, +2). All of the factors' viewpoints have presented that the Greek state does not deal with climate change due to economic and other interests. However, the Factor 1: Environmental and Energy Security-Policy Seekers and the Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters only mention that climate change is small in the country. This example shows that no matter if the factors' perspectives are only partially or completely relaying on the rationale of the statement it can be a matter of agreement between the factors.

In contrast, the statement that mentions that first priority issue is the country's (Greece) non-existent economic development followed by the problem of climate change (17: 0, 0, -1); even if it does not have two distributional spaces between the factors, it is not considered to be an agreement item. This is as in the case of Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism, where climate change has been presented as a first priority issue and in the other two factors, climate change at national level has been highlighted as a last priority issue in their viewpoint.

Meanwhile, the items that they mentioned state that the EU policy on climate and energy is able to make Greece more secure (29: -3, -1, -2) and that the EU policy on climate and energy is able to make Greece less secure (30: -3, -4, -2) as statements of consensus as both explain the viewpoints that all of the factors have. In other words, all of the factors

mention that the EU policies on climate and energy are neither able to make Greece more secure nor are able to make the country less secure.

The last statement of consensus emphasizes that neighbouring countries to Greece do not exert correct environmental and energy policies and, as a consequence, harm the environment of Greece (35: +2, +1, 0). However, it is significant to note that only the viewpoints of Factor 1: Environmental and Energy Security-Policy Seekers and Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters strongly represent this statement, as the perspective of Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism has not highlighted at any point that other neighbouring countries are seeking to harm the environment in Greece. This is the reason why the participants' loadings in this factor have sorted out this statement as neither agree nor disagree.

5.7 Perceptions of Climate Change as a Security Issue in Greece

The application of Q methodology in the topic of climate change as a security issue in the case of Greece has established three (3) factors which have direct and significant references on the literature as has been reviewed in Chapters 2 and 4. These new and unique perspectives are contributing to the further development of the general discussion of climate change and security. Additionally, this study has started an open discussion in a country like Greece with hidden discourses and debates in relation to climate change and security. These three (3) factors are adding and establishing the stakeholders' viewpoints on the Greek literature related to climate change and security.

These established viewpoints have defined climate change in two different ways. Factor 1: Environmental and Energy Security-Policy Seekers and Factor 2: Green Growth, Oil

Extraction and Sustainable Energy-Policy Supporters have mentioned that climate change is not one hundred percent (100%) an anthropogenic phenomenon and it is not one hundred percent (100%) a natural phenomenon. In these viewpoints, climate change is a fifty percent (50%) human and fifty percent (50%) natural phenomenon; however, the human impact on the environment is of major significance. Additionally, climate change is presented as a real issue and not as a hoax. Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism has defined climate change in an antithetical way to the other two viewpoints as it states that it is an one hundred percent (100%) anthropogenic phenomenon expressing a strong anti-climate change scepticism viewpoint.

Thereby, all of the factors have defined a connection between security and climate change. However, each factor has recognized different and divergent relationships between climate change and security. For example, Factor 1: Environmental and Energy Security-Policy Seekers has noticed and highlighted climate change as both an issue of environmental security and as an issue of energy security. In contrast, Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters has presented and recognized climate change as an issue of energy security.

Furthermore, the two first viewpoints have defined a connection between climate change and national security in Greece. The first perception mentions the existence of a relationship between environmental security and national security. The second viewpoint only recognizes a connection between energy security and national security. Antithetically, Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism does not present any relationship between national security and environmental and energy security. Additionally, it does

not highlight climate change as a threat to the national security of Greece, but as a threat to environmental and energy security only.

Climate change, and more specifically carbon emissions, have been mentioned by all of the established perceptions as a serious threat to human security in Greece and/or that creates human insecurity. All of the factors recognize a significant connection between climate change and human security. However, Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters has presented that stable energy supplies are more important than reducing CO_2 emissions, prioritizing energy security first. This means that through stable energy supplies, Greece can achieve energy security and human security as well. Moreover, a significant and antithetical point in all of the other factor perspectives has been highlighted by the viewpoint of Factor 1: Environmental and Energy Security-Policy Seekers, in that oil extraction in Greece constitutes an environmental crime. This factor is strongly against the oil extraction as it has been described as a threat to Greek environmental security. However, it is of significant consideration that the perspective of Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers does not recognize oil extraction as an environmental crime or that it is even able to threaten environmental and energy security. Finally, it seems that only Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters follows the perspective's rationale as it strongly supports oil extraction in Greece and it does not consider it to be as a threat to environmental and energy security in the country.

The three (3) established factors have demonstrated the different and divergent perceptions of climate change as a security issue in the case of Greece. These factors provide a very pragmatic step toward bridging the gap between the stakeholders and academics' opinions and viewpoints by applying Q methodology to the discipline of

security studies. Additionally, these viewpoints highlight the need to create a unique and very up to date Greek environmental and energy security agenda. It seems that the three (3) established viewpoints are demanding or at least consider as important the development of 'Green Growth' policy in Greece. Additionally, these three (3) factor perceptions present the need to re-examine or avoid the dominant theories which are connecting climate change and security in a military and orthodox context. Finally, these viewpoints indicate the significance of focusing on the peripheral theories of security literature which have an ecological perspective towards protection and security.

5.8 Conclusion

This chapter has interpreted the three (3) established factor viewpoints and it has presented the correlation between them. Additionally, it has mentioned the factor loadings and the factor arrays as well as the reasons for choosing this holistic method of interpreting the results. Moreover, there are ten (10) significant loadings in Factor 1: Environmental and Energy Security-Policy Seekers, ten (10) significant loadings in Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters, nine (9) in Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism and eleven (11) non-significant loadings as well.

The viewpoint of Factor 1: Environmental and Energy Security-Policy Seekers has presented climate change as being a real problem and a fifty (50%) fifty (50%) percent human and natural phenomenon. However, it highlights that there are ways of understanding the human impact on the environment. Additionally, this factor is demanding the state to implement environmental and energy security policies in Greece

with the support of the EU with the view of protecting, the environment, energy resources and human beings as well as the national security of the country from climate change impact and oil extraction.

The perception of Factor 2: Green Growth, Oil Extraction and Sustainable Energy-Policy Supporters has highlighted that climate change is a real problem and a fifty (50%) fifty (50%) percent human and natural phenomenon. It further noticed that there is no way of distinguishing the human from the natural impacts on the environment. This factor is considered to be the development of 'Green Growth' policies in Greece of major significance and the oil extraction is not able to constitute an environmental crime and is not destabilizing the country's security. This factor's viewpoint does not show any connection between oil extraction, energy security and national security and this is the main reason why it supports oil extraction in Greece. Finally, the main consideration of this perception is the development of 'Green Growth', the extraction of oil in Greece and the growth of sustainable energy.

The perception of Factor 3: Anthropogenic Climate Change and Environmental and Energy Security Believers, Anti-Climate Change Scepticism has noted that climate change is real and that it is a one hundred percent (100%) anthropogenic phenomenon. This factor has noticed that climate change is the major and first priority issue globally and nationally. Additionally, it has presented that the impact of climate change and the environmental issues in Greece do not constitute a threat to national security, but that it is a major threat to environmental security and energy security in the country. Finally, this factor's main consideration is that climate change is a threat to Greek human security, energy resources and the national environment.

Furthermore, there were six (6) statements of agreements which present that there is a correlation between the factors. This consensus in the statements indicates that these three (3) established factors have a correlation between them no matter if they represent divergent perceptions and viewpoints.

In conclusion, this chapter has focused on describing the perceptions of climate change as a security issue in the case of Greece as well as discussing the aims of this study. The next Chapter 6 focuses on the contribution and the overview of the thesis, the connections between Q methodology and security and the areas of future improvement and future research as well.

Chapter 6: Conclusion

6.1 Introduction

Chapter 5 has interpreted verbally the three (3) established factors and it has further focused on presenting the perceptions of climate change and security in Greece.

This final chapter highlights the major contribution from studying climate change and security in Greece (6.2) and gives an overview of the entire thesis (6.3) by explaining and justifying its rationale. Additionally, it mentions the relationship between Q methodology and security (6.4) and it provides a detailed presentation of the advantages and disadvantages of this methodology.

Moreover, the chapter highlights areas for future improvement in this study (6.5) and the significance of conducting the same research study in the future, with the view to examine if there are important differences on the stakeholders perceptions on climate change and security in Greece over time.

Furthermore, this chapter shows that there are areas for future research (6.6) based on the three (3) established factors. In addition, it states that there are areas for expanding even more on the current topic by examining the cases of other vulnerable countries, such as Greece.

This chapter draws some conclusions (6.7) on the ways that Q methodology could be useful in general for the study of security and in particular, for the threats that it deals with. Finally, it considers the importance of applying Q methodology in security studies as it has the power to procure the academic understanding of the stakeholders' perceptions and the stakeholders' understanding of academic perceptions of climate change and security.

6.2 Contribution of the Study of Climate Change and Security in Greece

This thesis has focused on establishing the perceptions of climate change as a security issue in the case of Greece. Thereby, this study scrutinizes the prevailing discourses of climate change as a security issue in general, as well as in the case of Greece in particular. Additionally, it appraises the usefulness of applying Q-methodology as a proper apparatus for research in security studies. It establishes the stakeholders' perceptions of climate change as a security issue in the case of a vulnerable country such as Greece, as well as analyzing and criticizing the different perspectives existing between the examined groups of participants. Furthermore, it enquires into the relationship between the established stakeholders' perception of climate change as a security issue in the case of Greece and the dominant academic perceptions of climate change as a security issue.

Therefore, this research is not only interested in establishing or identifying the perceptions to climate change in relation to security in Greece, but it also found out the different discourses and viewpoints between the academics and stakeholders. This study has started a discussion in Greece by exploring and establishing the hidden perspectives of climate change and security in a vulnerable country as well as presenting the academic influences to the four (4) different groups of stakeholders. Accordingly, this thesis has applied Q methodology to security studies with the view to include public perceptions into the discussion of climate change and security. Thus, it has established three (3) distinct stakeholder perceptions to climate change and security and the claims of these four (4) groups has occurred in this discussion.

Thereby, this study has focused precisely on the different theories of climate change as a security issue, as these have been used to approach the topic by the security studies' major scholars which is considered to be an extra contribution of this research to the field of security. Q methodology has not been widely used in security studies, which tend to

neglect public opinion in the entire field, and, in general, there is no application of Q methodology in the study of climate change and security and, in particular, in a vulnerable country like Greece. Hence, this study is the first application of Q methodology to climate change as a security issue in the case of Greece in the field of security studies.

There are at least four contributions given by this research study. First, it has bridged the gap by including human subjectivity and public opinion in security studies. Second, it has stated the academic approaches on climate change and security, comparing them with the stakeholders' perceptions on the topic. Third, the application of Q methodology to the study of climate change and security provides a methodological pattern from approaching other studies of security following the same or similar steps to this research study. Finally, this study has contributed not only by establishing the underestimated and excluded stakeholders' perceptions of climate change as a security issue in the case of Greece, but also by evaluating the essential significance of the concealed discourses in the general study of climate change and security.

6.3 Overview of the Thesis

The aim of this study was to establish the stakeholders' perceptions of climate change as a security issue in the case of Greece. Thus, first the analysis focused on the various definitions of climate change, the different climate change predictions and projections for both the EU and Greece and the climate change vulnerabilities and resilience.

Additionally, this thesis has critically analysed and reviewed the broad academic discourses, debates and perspectives on climate change and security. This has happened by examining the connections between climate change and environmental security,

violent conflict, energy security and national security and the links between national security and environmental and energy security.

The study has focused on the method of studying and approaching the topic of climate change and security in Greece. The aim here was to justify the main reasons for applying Q methodology in security studies. Also, major consideration was given to explaining the six compulsory and significant steps when applying Q methodology, such as the identification of an issue, the identification of a relevant group of participants, the selection of participants, the structure interviews, the Q sorts and the statistical analysis. Thus, the thesis has highlighted the ways of applying these steps through this study's research design and methodological difficulties.

Therefore, this research study has focused on analysing the case of Greece in terms of climate change. In other words, it has presented the climate change related issues in Greece, the connection that these issues have with security and then the climate change and energy security policies in Greece and the problems with these policies. Additionally, major consideration was given to the Greek stakeholders and the role of climate change denial in creating a false viewpoint in relation to climate change in the case of Greece.

This thesis has interpreted the results as it has analysed and described the three (3) established factors viewpoints and statements of agreement between the factors. Finally, it has highlighted and drawn conclusions on the perspectives of climate change as a security issue in the case of Greece.

6.4 Q-Methodology and Security Studies

The major aim of this study, on account of the research methodology, was to introduce, suggest and decree the application of Q methodology and to indicate its usefulness in security studies. Generally speaking, the methodology has to play a vital role in security

studies, as it tries to address and include the real and important matters and threats, which menace security and afflict people. There are many ways of approaching the major security questions, which need real and pragmatic answers. However, there is not a plethora of research methods available that critically and realistically analyze the significant topics and debates in security. This occurs as a result of the static and unrealistic theories and perspectives which have been adopted by the field of security studies from the discipline of IR. By utilizing Q methodology in the climate change and security debate, this study has presented and suggested, for the first time, a research method that is able to critically, pragmatically and systematically analyze any security threat, issue or debate, including the hidden and real perceptions of people who face the examined problems and cases. Q methodology holds the very essential characteristic of being critical, accessible and systematic methodology, as it explores, compares and establishes hidden or inaccessible opinions or perceptions. Thus, it repeatedly examines the each-time debate or discussion and adds to the primarily topic new and unique approaches and also actors, which by definition agitate the old and static dominant theories, viewpoints and perspectives.

Correspondingly, Q methodology, based on the results of examining the debate on climate change and security, has many advantages of being a useful method of addressing the discourses of security studies, as it is in harmony with the critical security studies, and in the case of climate change as a security issue, with the critical security thinking as well. Even if the climate change and security in Greece was the first application of this methodology to the security discipline, this study has surprisingly highlighted how easy the access and establishment was to the unknown perceptions and discourses provided by Q methodology. Additionally, it explores new and sophisticated approaches by interpreting and comparing the hidden discourses among them but, at the same time, it

creates the pathways of a comparative analysis with the old, traditional and orthodox discourses of security discipline. This extraordinary and unique characteristic of a research method places Q in comparison with other possible methodology applications in security studies. Moreover, the fact that Q methodology explores and finds out common or different points for consideration among the established discourses holds the promise of figuring out many of complex and significant issues in security studies.

Additionally, Q methodology is a very useful method for involving and revealing people's discourses on a particular topic. This is quite advantageous for the security studies that need to illuminate the consequences of the academic discourses in people's real lives. This originality and uniqueness is very beneficial, as it practically connects people's discourses to the policies of security and climate change, which designates Q methodology as a policy- relevant mechanism in security studies.

Furthermore, as there is an ongoing discussion on security theories and approaches and their policy relevance in the security studies discipline, Q-methodology could be one of the main methodologies applied by reason of overcoming and bridging the gap. Additionally, the major problem that both academics and practitioners face, as a result of the absence of policy relevance in methodologies, is that they do not have a proven capacity to testify the suggested policies and to include, or at least not to exclude, those actors (e.g. the policy-makers, the public etc.) for whom their procedures are made to guide, assist and benefit. For this reason, Q holds the vital characteristic of including the perceptions of the actual actors, in any analysis of a discourse, by establishing the actors' approaches. It seems to be the most appropriate methodology that is very beneficial and significant for providing feedback, both to the academics and to the stakeholders (policy-makers, NGOs, the public, etc.) of the policies that have been suggested or applied in real life cases.

Meanwhile, there are at least two highly significant reasons for Q-methodology being the most relevant research method for analyzing security threats and matters in the field of security studies. Firstly, Q methodology establishes and explores new approaches which are available in a more mathematical/statistical layout, as it is very useful for the stakeholders and their requirements for policy relevance. However, at the same time, Q methodology provides also a verbal layout of these established viewpoints/opinions, which is quite relevant and important for both academics and stakeholders. Second, the most essential and valuable reason for applying Q methodology to security studies is because it explores, reaches and establishes new and unknown perceptions and viewpoints and, thus, it reveals to both stakeholders and academics important and updated information. This makes it useful and policy-relevant for expanding on the general knowledge. Even if the characteristics of a methodology in security studies is to be policy-relevant, attracting the academic and stakeholders' interests, the real justifiable and useful reasons for applying Q methodology have to be for updating the knowledge in a discussion and to explore new and systematic ways of focusing on security threats and issues, aiming to solve or tackle the problems.

There are many potential generic advantages when it comes to applying Q methodology as opposed to other methods. There are two significant and generic advantages that are considered to be very useful. Firstly, Q methodology makes the groups of participants accept that there are experts in the field of study. That means that the opinions/perceptions of ''experts possess an objective, and almost third-person, quality that immediately suggests their worth and value'' (Watts and Stenner, 2012: 175). Additionally, the opinion of the ''layperson, on the other hand, can easily be dismissed as too subjective, biased and unreliable to command serious consideration'' (Watts and Stenner, 2012: 175). However, the advantage of Q methodology is that even the laypersons'

perceptions/viewpoints can really benefit the experts when it comes to building their own perceptions and policies with the view to be more effective and preferred (Barry and Proops, 1999). The second main advantage of Q methodology is that it shifts the focus from the group of participants toward the topic or subject of the study as this is what matters. In other words, even if the topic/issue being studied is too complex and it is a matter of social conflict, or even if there are clarification problems with the topic's definitions in an academic context, then the perceptions established by applying Q methodology could be presented in a significant way to resolve the definitions' complexities and normalizing social conflicts. These advantageous characteristics of Q methodology evidently provide a seductive methodological outcome for a research study.

Finally, Q methodology is advantageous in comparison to most of other methods, as it has the ability to provide a holistic data set. There are only a few methodologies that are either quantitative or qualitative that can be characterized as holistic. Q methodology, in comparison to many other methodologies, does not only concentrates on a perception, specific matter or a sub-theme of a topic or an issue. Q methodology is focused on the complete subject matter, taking under consideration the relationship between the sub-themes and appreciating and permitting their examination. This holistic characteristic of Q methodology must settle this method in the academics of security studies' favored position.

6.5 Areas for Future Improvement

Firstly, this study can be improved by examining the case of even more vulnerable countries, for example, a group of countries, members of the EU, that share similar or the same characteristics as Greece and who have faced vulnerabilities during the period of global recession. It would be a major improvement to establish the perspectives of a group

of countries in relation to climate change and security rather than just one country. It seems to be a significant improvement to analyze other less developed countries in any future research on climate change and security, as this thesis indicates that countries like Greece set aside climate change and environmental issues as they are dealing with issues that are economic, societal, political etc. The main reasons for not studying more than one vulnerable countries in this particular research study were based on the economy of time, the difficulty of contacting and interviewing the stakeholders in different countries and the language barriers that the researcher has had to face throughout this endeavor.

Moreover, this study could be improved by contacting the same groups of participants but not only using individuals who live in Athens, the capital city of Greece. For example, it could be really useful to rerun the exact same methodological process (including once again policy-makers, energy-industry leaders, NGOs' members and citizens) from these places which are confronting environmental and energy issues like Skouries, Crete, Kozani etc. However, this research aim was to learn of the stakeholders' perspectives of climate change as a security issue in the case of Greece in an unbiased manner, without influencing or dominating the results with predetermined viewpoints and opinions, as a result of experience with environmental catastrophes or when under the threat of a new one.

This research study will be improved by Q sorting, through gaining more participants from each group of stakeholders. Even if Q methodology is used to contact a small number of individuals, making the research method attractive for studies which focus on not easily accessible groups of elites (e.g. policy-makers, energy-industry leaders, etc.) individuals, it could be interesting to find out whether an even larger group of participants is able to change the three (3) factors/discourses and to what extent this could occur. In contrast, this research study has already experienced difficulties when trying to contact

the forty (40) participants from the groups of Greek stakeholders and the idea of raising the numbers of individuals was rejected from the very beginning.

Moreover, the only lack of proportion in this study is based on the imbalance of the gender among the participants. In this thesis, twenty four (24) men and sixteen (16) women were involved, creating a gap. A major improvement could be to re-sort without a gender imbalance to analyze if there are any differences between the male and female participants in the established discourses. This gender imbalance happened accidentally, as the researcher was not able to know from the beginning how many male and female individuals wished to participate in the study. Additionally, the researcher was not able to select individuals who have expressed their desire to participate by their gender characteristics, as it was difficult to find many participants willing to be involved in any of the steps of this study and it was not considered ethical to search this way as well. However, in the very beginning, the researcher contacted the same number of male and female participants and some of them refused to participate in the research.

Finally, the last area of improvement of this study could be by analyzing specific environmental and energy issues without approaching the general topic of climate change as a security issue. It will be a major improvement to approach particular cases. For example, the wildfires of 2007 or 2009, or the case of Skouries, in order to establish the stakeholders' discourses and attitudes on a specific case as a security issue. Additionally, it could be an interesting improvement to compare the general factors established on climate change and security in Greece with the factors that could be established on climate change and security in a particular case. However, it was preferable to first approach climate change as a security issue in the case of Greece, thus starting the general conversation and providing the appropriate discourses and perspectives. This creates

favorable and sympathetic conditions due to being able to study specific and particular cases.

6.6 Areas for Future Research

This thesis has presented and supported the application of Q methodology in security studies, due to creating an appropriate level of innovative awareness for the academics and stakeholders about the public perspectives and opinions in complex topics and debates, such as in climate change as a security issue.

As it has mentioned in the section 9.3, there are areas for improvement in this study, which could also be areas for future research, by applying Q methodology in different cases. Accordingly, the establishment of three (3) discourses in a vulnerable country, such as Greece, seems to highlight a set of countries which have similar or same social, economic, political and environmental issues. However, it could be an essential future research discovering if there are divergent discourses in this set of countries and comparing the already established discourses in the case of Greece with each different vulnerable country's perceptions of the stakeholders on climate change as a security issue.

Another area of future research could be the application of Q methodology in order to find out the stakeholders' perspectives on climate change as a security issue in a particular place which is facing environmental catastrophe(s), such as Skouries or Crete. Thus, it could be quite interesting to analyze and establish the perspectives and attitudes of the stakeholders who are under the pressure from an environmental catastrophe or issue and if there are divergent discourses in relation to climate change and security. Additionally, this future research could present how the security theories, viewpoints and discussions

are changing or could be changed during an environmental destruction in relation to climate change.

Furthermore, Q methodology holds the characteristic of creating ways of working for future research based on its produced results. It could be interesting to examine systematically the viewpoints of the entire population of Greece, in order to appraise and compare the established stakeholders' perspectives with the wider population's opinions on climate change as a security issue. Likewise regarding the analysis of the wider populations of Europe and their perspectives on the same topic it could be very crucial to compare divergent and different discourses on reconsidering the EU environmental and energy security-policies, based on these outcomes and urgencies.

According to the discourses created by this research, there are two contradictory attitudes and viewpoints, the 1 and 3 discourse, which could be really interesting and useful to analyze even more, by re-Q sorting the individuals who established them. The aim will be to consider in-depth their influence on the topic and how they understand the terms of environmental security, energy security and European security in connection with climate change. Another essential area of future research which came out of the participants selected the statements was the application of Q methodology to individuals who are climate change deniers, with the view to analyze how they have disconnected environmental issues from climate change, and consequently from security as well.

Finally, an extra future area of the research in which Q methodology could play a vital role is examining and establishing the role of the media in the study of climate change and security. It could be an interesting area of research by establishing the media perceptions and comparing them with the already established stakeholders' perceptions of climate change and security in Greece.

6.7 Conclusion

The aim of this study was to establish and examine the perceptions of the stakeholders in climate change as a security issue in the case of Greece by utilizing Q methodology for the first time in security studies. For this reason, it has established three (3) viewpoints from the four groups of stakeholders on the discussion of climate change and security, focusing on environmental security, energy security and even on climate change denial. This study is considered to be the very beginning of a much larger research project based on climate change and security in all vulnerable countries that are members of the EU that share similar characteristics with Greece. On this occasion, the application of Q methodology could be able to obtain the academic understanding of the stakeholders' perceptions and the stakeholders' understanding of the academic perceptions of climate change and security between the countries.

One of the major contributions of this study in the academic field of security study is the application of Q methodology. In general, there are many ways of approaching a topic or a debate in the field of security. However, Q methodology is considered to be a highly significant method of including viewpoints, perceptions, opinions, etc. In this particular study on climate change and security, Q methodology played a vital role in revealing and establishing the perceptions of stakeholders and including new actors in the discussion. These characteristics of Q methodology make the application of this research method a one-way apparatus solution. This methodology was proposed by this study as the topic of climate change and security in Greece had to consider complex debates and issues, and only Q methodology was able to open up the discussion, include all actors and provide specific perceptions and solutions. The application of Q methodology in the study of

climate change as a security issue in the case of Greece has provided a very significant outcome regarding the relationship between climate change, environmental impact, migration, security, energy and conflict. The outcome of this study would have been very difficult to make apparent without the application of Q methodology.

These three (3) established factors of climate change and security in the case of Greece have presented a vulnerable country's viewpoints of the stakeholders involved in or on the threat of climate change in a broader international security context and in a narrow national security scope as well. They provided perceptions of climate change and security in Greece, no matter if they correctly elucidated the real climate change conditions of a country in the stakeholders point of view; they did not necessarily create a commencement of suggesting policy relevant practices to policy-makers and academics. This is the reason why there is no suggestible way of generating completely practical participants' perceptions. Many researchers indicate this as a limitation of Q methodology, as it cannot suggest a way of achieving a practical policy. Nevertheless, the absence of a pre-existing way of providing practical policies in the study of the Greek stakeholders' perceptions of climate change and security cannot be considered a limitation of Q methodology. Academics and policy-makers, who wish to originate the relevant policies from the participants' viewpoints and opinions on a topic are required to understand in-depth the perceptions which have been established as a result of the Q study. This study has not tried to instruct either the academics or the policy-makers in what they have to do solving any of the climate change and security related issues in Greece.

The ultimate aim of this study was to reveal, establish and include the perceptions which are pivotal and determining for the examined groups of stakeholders in the discussion of climate change as a security issue in the case of Greece. These three (3) established

perceptions explain the debate of climate change and security in Greece. In contrast to the studies which only provide or ask for policy practices or policy techniques/mechanisms, the contribution of this study is on bridging, updating and improving the knowledge of both academics and policy-makers in regard to the stakeholders' perceptions of climate change and security in a vulnerable country. Additionally, this study recommends, to security scholars and practitioners, a sophisticated and systematic way of approaching significant issues and threats in security studies. In the meantime, as the problem of climate change becomes more and more devastating and a threat to the world and humanity, the updated knowledge, the in-depth awareness and the unity of all actors against a common threat, is considered to be the only solution to overcoming climate change complexities. The contribution of this study is focused on this urgent and indispensable venture.

Appendices

Table 1 Questions of pilot structured interviews

Climate Change

- What do you think that climate change is?
- Do you think that climate change is an anthropogenic or natural phenomenon?
- Do you think climate change is a local or a global phenomenon/issue/problem?
- Do you believe that climate change is a solvable problem?
- Do you believe that the problem of climate change could be solved by environmental policies or energy policies or political will or something else?
- Who do you think is responsible for climate change? Is it the state, nature, human beings or something else?

Environmental and Energy Security/Policies

- Do you think that climate change threatens the world?
- What issues if any in relation to climate change threaten the world?
- On a global scale, do you think that climate change first threatens nation states, human beings, nature or something else?
- Do you think that the world has to follow specific environmental and energy policies?
- Do you believe that the world is running out of energy resources?
- Do you believe that the world is threatened more by terrorism than climate change?
- Do you think that a war is possible between two countries as a result of climate change?

Climate Change in Greece

- Do you think that Greece faces the impacts of climate change?
- Do you think that the phenomenon of climate change influences Greece?
- Do you believe that Greece has contributed to the creation of climate change?
- Do you believe that climate change is a major problem for Greece?
- Could you please list four major Greek problems in order of importance?
- Who do you think is responsible for climate change in Greece? Is it the state, nature, the citizens or something else?
- Does the Greek state have significant responsibility for the Greek environmental impacts of climate change?

Environmental and Energy Security/Policies in Greece

- Do you believe that Greece follows specific policies in order to tackle climate change?
- Do you believe that Greece affects the rise of climate change by not using sustainable energy or do you believe that it uses quite enough sustainable energy?
- Do you think that ‘’Green Growth’’ is an applicable environmental and energy policy?
- Do you think that the Greek state follows specific energy policies aiming to develop sustainable and green energy?
- Do you think that Greece follows the environmental and energy policies of the European Union to tackle climate change?
- Do you think that the most recent (2010-2016) Greek economic policies are damaging to the country’s ecology, climate and energy resources?
- Do you believe that the Greek state protects its energy resources?
- Do you think that the Greek state protects its natural resources?
- Do you believe that Greece could be energy independent?
- Do you think that Greece faces much environmental insecurity?

- Do you think that Greece could engage in a conflict with any other country as a result of environmental or climate change?
- Do you think, for instance, that the oil extraction in Greece could be a reason for a conflict between the Greek state and any other neighbour states?
- Do you believe that the national security of Greece is at stake because of climate change?
- Do you believe that the European Union protects the Greek environment and energy resources?
- Do you believe that the European Union's environmental and energy policies secure the Greek environment and energy resources?

Table 2 Questions of the structured interviews

Climate Change

- What do you think that climate change is?
- Do you think that climate change is an anthropogenic or natural phenomenon?
- Do you think climate change is a local or a global phenomenon/issue/problem?
- Do you believe that climate change is a major global problem?
- Do you think that the world faces the impacts of climate change?
- Do you believe that the problem of climate change could be solved by environmental policies, energy policies, political will or something else?
- Do you believe that climate change is a solvable problem?
- Who do you think is responsible for climate change? Is it the state, nature, human beings or something else?
- Could you please name the major global problems and order them as well?

Climate Change in Greece

- Do you think that Greece faces the impacts of climate change?
- Do you think that the phenomenon of climate change influences Greece?
- Do you believe that Greece has been involved in the creation of climate change?
- Do you believe that climate change is a major problem for Greece?
- Who do you think is responsible for climate change in Greece? Is it the state, nature, the citizens or something else?
- Does the Greek state have a significant responsibility for the Greek environmental impact of climate change?
- Could you please name the major Greek problems and order them as well?

Environmental and Energy Security/Policies

- Do you think that climate change threatens the world?
- What issues, if any, in relation to climate change, threaten the world?
- On a global scale, do you think that climate change first threatens nation states, human beings, nature or something else?
- Do you think that the world has to follow specific environmental and energy policies?
- Do you believe that the world is running out of energy resources?
- Do you believe that the world is threatened more by terrorism than climate change?
- Do you think that a war is possible between two countries as a result of climate change?

Environmental and Energy Security/Policies in Greece

- Do you believe that Greece follows specific policies in order to tackle climate change?
- Do you believe that Greece affects the rise of climate change by not using sustainable energy or do you believe that it uses enough sustainable energy?
- Do you think that ‘’Green Growth’’ is an applicable environmental energy policy?
- Do you think that the Greek state follows specific energy policies aiming to achieve sustainable and green energy?
- Do you think that Greece follows the environmental and energy policies of the European Union to tackle climate change?
- Do you think that the most recent Greek economic policies are against the country’s ecology, climate and energy resources?
- Do you believe that the Greek state protects its energy resources?
- Do you think that the Greek state protects its natural resources?
- Do you believe that Greece could be energy independent?
- Do you think that Greece faces much environmental insecurity?
- Do you think that Greece could engage in a conflict with any other country as a result of environmental or climate change?

- Do you think, for instance, that oil extraction in Greece could be a reason for a conflict between the Greek state and a neighbouring state?
- Do you believe that the national security of Greece is at stake because of climate change?
- Do you believe that the European Union protects the Greek environment and its energy resources?
- Do you believe that the European Union's environmental and energy policies can secure the Greek environment and energy resources?

Table 3 Statements

	Statements
1)	Climate change is a real problem.
2)	Climate change is not one hundred percent (100%) an anthropogenic phenomenon but it has increased due to human activity.
3)	The first global priority issue is the social crisis. The second global priority issue is the economic crisis and the third global priority is poverty and hunger. Finally, the fourth global priority is the phenomenon of climate change.
4)	The state is responsible for problems related to climate change in Greece. Government and state mechanisms have exacerbated environmental problems.
5)	In a country such as Greece which depends on tourism, agriculture, fishing and shipping, the state should intervene on issues of climate change; however, the Greek state is definitely absent.
6)	'Green Growth' should be developed in our country because in Greece it is easy to produce energy from the wind and sun.
7)	The phenomenon of climate change is the first global priority.
8)	The Greek government does not support 'Green Growth' because it is controlled by major multinational companies which have different interests.
9)	Climate change is the biggest global problem of all because its impact is potentially limitless. Economic crisis is the second most important global problem.

10)	The Greek state should be able to have control over resources, the environment and all other factors impacting on climate change even if these factors relate to agriculture, tourism or energy production.
11)	Even if the problem of climate change is small in our country, it (Greece) does not deal with it due to economic and other interests and a failure of the state's executive capability.
12)	Climate change is fifty percent (50%) an anthropogenic and fifty percent (50%) a natural phenomenon. Human beings only aggravate natural changes to the climate and environment.
13)	When we refer to climate change we are discussing both an anthropogenic and natural phenomenon but we are more concerned with the human impact on the environment.
14)	There is no possible way of separating/disconnecting human impact from natural impacts on the natural environment.
15)	The economic crisis is the biggest problem for Greece. The next problem is lawlessness. The third problem is that the majority of Greek citizens are uneducated and fourth is the problem of climate change.
16)	Climate change is an anthropogenic phenomenon.
17)	First priority issue is the country's (Greece) non-existent economic development followed by the problem of climate change.
18)	Greece's first priority problem is the economic and political crisis; second is the nonexistence of social policy in relation to unemployment; third is the problem of the Greece's relations with other countries and then after that is the problem of climate change.
19)	The climate change problem is real but it is not as big as they try to present it.
20)	Climate change is not our country's (Greece) first priority problem. The first problem is the economic crisis followed by the ethical crisis. Third is the issue of migration and illegal-migration that the country confronts and then fourth is the problem of terrorism. Finally it is the climate change problem.
21)	Climate change is fake and has been 'created' for economic purposes.
22)	If there is a continuing problem of rising temperatures, then the country (Greece) will not be inhabitable. You will not be able to come out of your house. Additionally, some of the unique plants of Greek cultivation will disappear.
23)	The European Union has definitely put pressure on the Greek government to develop alternative methods of energy production; however, the country does not follow these international and European regulations because it is against the country's economic capabilities and interests.
24)	The phenomenon of climate change is not the first global priority issue.
25)	Climate change is not an anthropogenic phenomenon because it is one hundred percent (100%) a natural phenomenon.
26)	Climate change will increase migration into Greece.
27)	Climate change threatens our energy security.
28)	Stable energy supplies are more important than reducing CO_2 emissions.
29)	EU policy on climate and energy will make Greece more secure.
30)	EU policy on climate and energy will make Greece less secure.
31)	Reducing CO_2 emissions and sustainable energy prices will increase employment and economic security.

32)	Greece, which uses lignite as the country's main energy source, contributes to and has a responsibility for climate change.
33)	The environmental and energy policies in our country have failed abysmally.
34)	Greece implements successful environmental and energy policies under strict standards imposed by the European Union to tackle climate change.
35)	Neighbouring countries to Greece do not exert correct environmental and energy policies and, as a consequence, harm the environment of our country.
36)	Oil extraction in Greece constitutes an environmental crime.
37)	Oil extraction in Greece threatens the country's security because of the increased tensions with neighbouring countries such as Turkey.
38)	Oil extraction in Greece will not destabilise the country's security.
39)	The carbon emissions in Greece are considered to be a significant threat to the country's human security.
40)	The carbon emissions in Greece are not considered to be a significant threat to the country's human security.
41)	The environmental issues in our country cause even greater economic problems and/or economic insecurity than those that the country already faces.
42)	The environmental issues in our country will not create major economic problems and/or economic insecurity.
43)	The consequences of climate change directly threaten the national security of Greece.
44)	The national security of Greece is not threatened by the consequences of climate change immediately or even in the near future.
45)	The protection of the environment and the protection of energy resources are an immediate national security matter for the country.
46)	The national security of Greece has not been affected by climate change and/or the use of unsustainable energy resources.
47)	The European Union can ensure environmental and energy security in Greece.
48)	The European Union cannot ensure environmental and energy security in Greece.

Table 4 Participants

Statistics

participants

N	Valid	40
	Missing	0

participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	policy makers	10	25.0	25.0	25.0
	energy industry leaders	10	25.0	25.0	50.0
	NGO members	10	25.0	25.0	75.0
	public	10	25.0	25.0	100.0
	Total	40	100.0	100.0	

Table 5 Gender of participants

Statistics

Gender

N	Valid	40
	Missing	0

gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	24	60.0	60.0	60.0
	female	16	40.0	40.0	100.0
	Total	40	100.0	100.0	

Table 6 Instruction sheet

INSTRUCTIONS

You are being asked to sort, in a given order, a set of statements about climate change according to how much you agree or disagree with the statements. (Note: a large table or floor space is needed in order to complete this task!)

MATERIALS:

- A set of 48 cards each of which has a different statement printed on it. (These have been randomly numbered so then your final ordering can be recorded in a grid)

- A record sheet
- 11 column headings ranging from -5 to +5

  This is laid out at the top of the table so then the cards can be placed under each heading according to the instructions below:

1) In order to become familiar with their content, please read all of the cards and divide them up into three groups:

   a. Those you most agree with

   b. Those you most disagree with

   c. Those you are indifferent, unclear or undecided on

2) From the pile of statements with which you most agree, select two that are the two you most agree with and place them in a column under the +5 heading. (Please note that the order of the items within each column is **not** important.)

3) From the pile of statements with which you most disagree, select two that are the two you most disagree with and place them in the -5 columns.

4) From the remaining pile of statements that you most agree with select three that are the next three that you most agree with and place them in the +4 columns.

5) From the remaining pile of statements that you most disagree with select three that are the next three that you most disagree with and place them in the -4 columns.

6) Continue to sort the remaining cards in this fashion (four in the +3 column, four under -3, five in the +2 column, five under -2, six in +1 columns, six under -1 and eight under 0) working inwards until the middle columns contain the remaining statements about which you have little feeling or are uncertain about.

7) Review your position of the statements and rearrange as necessary. (For example, if you decide that an item selected for +4 is more important than one under +5, you are perfectly free to switch it at this time.)

8) If you are content with the positioning of the statements, please turn over the cards and record the card numbers on the record sheet provided.

9) Finally, please complete the record sheet, add your details, the reason why you chose the +5 and -5 columns and any comments that you may have about any of the statements.

Thank You

Table 7 Record sheet (Adapted from Addams 2002)

←MOST DISAGREE NEUTRAL/UNCERTAIN MOST AGREE→

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5

NAME_____AGE___SEX_
_

PLACE OF
RESIDENCE_____
__

OCCUPATION_____
__

REASONS FOR CHOICE OF STATEMENTS YOU MOST AGREE WITH
_____
_____
_____
_____
_____
_____
_____
REASONS FOR CHOICE OF STATEMENTS YOU MOST DISAGREE WITH
_____
_____
_____
_____
_____
_____
_____
ANY OTHER COMMENTS
_____
_____
_____
_____
_____

Table 9 Individual Q sorts and factor loadings

Individual Q-sort 1: Male, 58, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
43	14	29	6	15	16	18	3	7	1	2
21	25	36	11	27	28	8	12	9	5	4
	34	24	30	35	26	17	22	19	10	
		48	37	13	31	20	33	32		
			23	47	38	39	40			
				44	41	42				
					45					

46

Participant	1	2	3
1	0.6175X	0.4084	-0.0586

Individual Q-sort 2: Male, 49, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
21	22	19	17	15	12	28	5	8	3	1
47	46	36	24	25	14	31	4	11	6	7
	32	37	43	29	16	27	9	18	2	
		44	42	34	26	45	13	10		
			40	35	30	38	39			
				33	41	20				
					48					
					23					

Participant	1	2	3
2	0.3410	0.6111X	0.3060

Individual Q-sort 3: Female, 26, Public

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
34	30	25	15	19	8	3	1	4	2	10
26	46	40	16	17	45	18	7	6	5	33
	43	44	20	38	23	21	12	9	11	
		14	24	41	28	22	29	27		
			13	42	32	47	31			
				48	35	36				
					37					
					39					

Participant	1	2	3
3	0.6262X	0.3370	0.0968

Individual Q-sort 4: Male, 71, Public, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
16	11	12	4	8	27	5	3	6	7	1
21	14	15	17	19	41	10	9	32	37	2
	40	24	18	20	43	23	13	35	38	
		33	25	26	44	31	22	36		
			28	30	45	34	29			
				42	46	39				
					47					
					48					

Participant	1	2	3
4	0.4816	0.0548	0.3976

Individual Q-sort 5: Female, 31, Public

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
21	25	17	4	13	14	3	11	2	1	5
34	38	20	15	16	26	10	12	9	6	7
	19	23	40	18	27	22	36	33	8	
		32	42	24	29	31	37	45		
			44	28	30	35	39			
				46	41	43				
					47					
					48					

Participant	1	2	3
5	0.6956X	0.1165	0.3286

Individual Q-sort 6: Female, 33, Public

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
21	14	24	3	9	4	8	10	1	2	5
48	16	25	19	28	11	27	20	13	6	7
	44	38	39	33	12	32	31	18	17	
		45	43	42	22	34	36	35		
			15	46	23	41	37			
				30	26	47				
					29					
					40					

Participant	1	2	3
6	0.6330X	0.1283	0.2034

Individual Q-sort 7: Male, 34, Public, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
19	30	17	3	18	26	12	2	4	6	1
24	34	25	11	20	33	15	8	5	10	7
	42	40	13	28	36	16	29	9	27	
		48	14	45	37	22	35	32		
			21	46	38	23	39			
				47	43	31				
					44					
					41					

Participant	1	2	3
7	0.5851	0.2251	0.4638

Individual Q-sort 8: Male, 88, Public

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
25	16	7	44	17	2	37	1	6	38	20
36	26	40	13	22	4	10	42	8	18	3
	23	31	5	47	9	19	11	28	27	
		43	39	33	12	32	14	45		
			29	34	15	41	21			
				30	35	24				
					48					
					46					

Participant	1	2	3
8	-0.0389	0.6290 X	-0.2352

Individual Q-sort 9: Male, 29, Public

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
14	25	16	27	12	4	11	3	6	1	2
21	26	19	28	30	20	8	7	9	33	5
	32	24	38	40	17	13	10	22	36	
		29	42	41	18	23	15	35		
			44	46	31	39	45			
				47	34	48				
					37					
					43					

Participant	1	2	3
9	0.7651X	0.1439	0.1900

Individual Q-sort 10: Female, 29, Public

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
21	20	15	31	16	13	35	2	5	9	1
24	29	23	39	17	14	3	12	6	7	4
	34	25	42	30	27	11	22	8	33	
		44	40	37	32	48	10	36		
			46	38	41	45	43			
				47	19	18				
					26					
					28					

Participant	1	2	3
10	0.6839X	0.2941	0.3112

Individual Q-sort 11: Female, 59, Public, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
3	44	20	17	32	26	8	12	4	2	1
21	15	11	30	43	27	23	16	9	5	7
	18	25	34	14	28	33	19	39	6	
		24	38	45	31	35	22	13		
			40	42	10	36	29			
				48	41	37				
					46					
					47					

Participant	1	2	3
11	0.5497	0.1395	0.4980

Individual Q-sort 12: Male, 29, Public, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
38	26	34	35	3	4	27	2	23	24	36
47	22	14	9	33	7	32	10	5	12	37
	25	21	18	16	28	1	19	11	8	
		41	45	17	29	6	48	15		
			39	44	30	13	46			
				42	31	20				
					40					
					43					

Participant	1	2	3
12	0.3455	0.1141	-0.0532

Individual Q-sort 13: Male, 36, Energy Industry Leader

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
2	12	3	9	11	10	35	4	6	7	1
25	19	8	15	14	22	37	5	29	13	48
	20	21	18	32	23	44	17	39	16	
		24	43	34	27	45	38	41		
			26	36	28	42	46			
				40	30	47				
					31					
					33					

Participant	1	2	3
13	0.0754	0.1003	0.5755X

Individual Q sort 14: Male, 30, Energy Industry Leader

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
25	28	16	7	17	4	18	5	1	10	3
41	32	21	27	24	14	19	9	2	11	6
	36	26	29	33	37	23	12	8	13	
		30	31	39	38	34	15	20		
			22	46	40	35	45			
				47	43	42				
					44					
					48					

Participant	1	2	3
14	0.2763	0.6188 X	-0.0217

Individual Q-sort 15: Female, 27, Energy Industry Leader, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
25	40	26	24	19	14	3	4	9	2	1
39	44	42	29	20	15	8	7	10	5	6
	48	46	31	30	17	11	27	23	13	
		47	37	33	18	12	35	45		
			41	36	21	16	43			
				38	22	34				
					28					
					32					

Participant	1	2	3
15	0.4699	0.5255	0.2321

Individual Q-sort 16: Male, 32, Energy Industry Leader

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
41	20	3	12	15	14	2	8	9	7	1
45	21	29	18	19	17	4	13	11	39	6
	40	30	23	22	24	5	16	34	42	
		37	33	25	26	10	27	38		
			36	31	28	32	44			
				43	35	48				
					46					
					47					

Participant	1	2	3
16	-0.0447	0.2935	0.8182 X

Individual Q-sort 17: Male, 30, Energy Industry Leader

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
25	2	34	7	9	21	13	4	3	1	6
47	41	39	12	14	22	15	10	8	5	19
	45	40	27	23	24	18	17	11	16	
		46	33	31	28	20	35	26		
			44	38	29	32	37			
				43	30	42				
					36					
					48					

Participant	1	2	3
17	0.0298	0.5728X	0.0232

Individual Q-sort 18: Female, 28, Policy-Maker, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
21	20	11	16	15	8	3	9	1	2	6
25	47	18	17	22	10	5	35	4	13	33
	44	24	23	29	12	7	46	39	37	
		40	26	30	14	32	45	48		
			34	31	19	38	43			
				42	27	41				
					28					
					36					

Participant	1	2	3
18	0.5214	0.2529	0.3435

Individual Q-sort 19: Male, 40, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
25	30	22	15	7	17	2	13	12	3	1
26	36	34	21	9	20	10	35	18	4	38
	37	40	27	11	29	5	39	23	6	
		42	31	14	43	8	41	32		
			33	16	44	24	47			
				19	45	28				
					46					

48

Participant	1	2	3
19	0.1430	0.7307X	0.1668

Individual Q-sort 20: Female, 38, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
22	25	42	15	17	7	39	2	3	38	6
40	34	44	27	20	9	18	5	41	4	1
	26	46	19	43	12	21	8	13	32	
		30	14	31	16	24	35	47		
			45	48	33	23	28			
				29	11	10				
					37					
					36					

Participant	1	2	3
20	0.2420	0.6191X	0.2937

Individual Q-sort 21: Female, 43, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
30	25	22	15	7	17	2	13	12	3	1
36	37	34	21	9	20	10	35	18	4	38
	26	40	27	11	29	5	39	23	6	
		42	31	14	43	8	41	32		
			33	16	44	24	47			
				19	45	28				

46
48

Participant	1	2	3
21	0.1156	0.7361X	0.1681

Individual Q-Sort 22: Male, 33, NGO Member

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
8	28	16	45	19	25	12	11	27	33	1
34	39	38	26	22	14	13	18	5	46	2
	29	23	21	42	40	10	32	37	36	
		24	30	43	4	7	31	6		
			20	47	35	3	9			
				44	41	15				
					48					
					17					

Participant	1	2	3
22	0.6778X	-0.0233	0.0422

Individual Q-sort 23: Female, 27, NGO Member, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
20	21	4	26	34	39	35	7	1	5	2
23	28	18	27	38	44	9	22	10	8	6
	17	16	19	40	45	12	24	13	41	
		30	42	31	47	14	29	36		
			33	43	48	37	32			

3	46	11
	15	
	25	

Participant	1	2	3
23	0.5189	-0.0067	0.3800

Individual Q-sort 24: Female, 28, NGO Member

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
3	14	20	22	4	15	11	2	5	6	1
19	16	21	23	12	18	13	9	10	7	8
	24	25	28	17	29	26	27	36	46	
		37	40	31	30	34	33	47		
			45	42	32	35	39			
				48	38	41				
					43					
					44					

Participant	1	2	3
24	0.4975	-0.0598	0.6681X

Individual Q-sort 25: Male, 36, NGO Member

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
19	15	41	17	12	3	10	4	7	9	1
21	24	13	18	44	2	45	39	11	16	8
	34	14	20	23	28	26	36	22	6	
		25	37	46	30	35	27	5		

40	42	38	48	33
	29	43	32	
		47		
		31		

Participant	1	2	3
25	0.4452	0.2002	0.5721 X

Individual Q-sort 26: Female, 23, NGO Member (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
19	26	14	3	11	5	4	9	7	1	6
25	27	17	20	15	23	8	16	12	2	36
	28	21	24	18	29	10	31	32	13	
		37	48	34	30	22	41	44		
			39	35	33	47	46			
				40	38	45				
					42					
					43					

Participant	1	2	3
26	0.5647	- 0.0014	0.4098

Individual Q-sort 27: Male, 20, NGO Member

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
25	12	3	13	14	2	16	4	8	1	9
19	21	20	18	17	10	31	5	22	7	36
	44	45	40	28	23	33	11	32	6	

	24	26	15	27	41	38	35
		46	42	29	43	39	
			47	30	48		
				34			
				37			

Participant	1	2	3
27	0.4473	0.0355	0.6454X

Individual Q sort 28: Female, 29, NGO Member, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
19	8	3	16	5	15	4	12	2	7	41
25	14	20	21	23	17	6	32	10	13	1
	42	40	24	28	18	34	43	39	11	
		44	29	31	22	35	9	48		
			30	33	26	36	45			
				37	27	38				
					46					
					47					

Participant	1	2	3
28	0.5190	0.0683	0.4679

Individual Q-sort 29: Male, 46, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
25	43	6	29	16	15	8	7	3	2	1
21	14	48	36	28	18	31	9	12	4	5

	34	11	24	27	35	41	19	22	10
		30	23	47	44	45	32	40	
			37	46	38	26	33		
				13	17	20			
					39				
					42				

Participant	1	2	3
29	0.6782X	0.3602	-0.1412

Individual Q-sort 30: Male, 47, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
43	24	22	15	16	11	2	4	3	7	1
25	36	29	23	19	13	9	8	6	14	5
	32	33	30	21	17	18	10	12	28	
		35	37	42	20	31	45	39		
			47	44	26	41	38			
				40	27	48				
					34					
					46					

Participant	1	2	3
30	0.1887	0.6971 X	0.1954

Individual Q-sort 31: Female, 40, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
32	43	15	22	11	19	16	9	4	6	1

24	25	23	35	13	27	38	10	7	12	5
	36	30	29	20	26	44	3	14	39	
		47	33	21	2	45	41	28		
			37	40	18	17	48			
				46	42	8				
					31					
					34					

Participant	1	2	3
31	0.1822	0.6435X	0.2329

Individual Q-sort 32: Male, 64, Policy-Maker

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
43	14	34	29	37	15	3	20	5	2	10
21	25	11	24	27	35	12	26	7	4	19
	38	6	8	16	13	17	36	9	1	
		48	30	28	44	22	39	42		
			23	31	18	33	32			
				47	41	45				
					40					
					46					

Participant	1	2	3
32	0.6337X	0.2004	-0.1088

Individual Q-sort 33: Female, 35, NGO Member

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**

3	19	24	23	28	11	15	5	2	6	1
14	16	21	4	37	13	18	10	9	8	7
	20	22	17	25	26	29	27	46	47	
		40	31	12	34	30	44	36		
			48	42	35	32	43			
				45	41	38				
					39					
					33					

Participant	1	2	3
33	0.4520	-0.1339	0.6436X

Individual Q-sort 34: Male, 35, NGO Member, (No significant loading)

-5	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**
19	3	8	5	16	26	9	4	2	7	1
25	20	14	21	23	29	15	6	13	41	11
	40	42	24	34	30	17	39	12	10	
		28	46	35	31	18	45	43		
			47	36	44	22	48			
				38	32	27				
					33					
					37					

Participant	1	2	3
34	0.5273	0.0624	0.4261

Individual Q-sort 35: Male, 56, NGO Member

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
21	19	20	3	8	4	2	16	9	11	1
25	28	23	24	30	6	12	34	15	10	7
	14	39	44	32	5	13	18	17	41	
		47	31	36	26	22	27	33		
			42	35	29	38	43			
				46	40	37				
					45					
					48					

Participant	1	2	3
35	0.5685X	0.0234	0.3215

Individual Q-sort 36: Male, 42, Energy Industry Leader

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
20	41	45	12	23	14	5	2	13	6	1
21	40	30	29	33	17	10	4	8	39	7
	3	37	15	36	24	28	16	38	34	
		18	19	43	25	26	11	42		
			22	46	31	44	27			
				47	35	9				
					32					
					48					

Participant	1	2	3
36	-0.0095	0.2403	0.8744 X

Individual Q-sort 37: Male, 34, Energy Industry Leader, (No significant loading)

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
40	39	46	19	20	3	14	9	4	1	2
25	42	26	24	29	8	15	7	10	6	5
	47	44	30	31	11	12	23	27	13	
		48	33	37	16	17	43	35		
			36	38	22	18	45			
				41	28	21				
					32					
					34					

Participant	1	2	3
37	0.4697	0.5228	0.2044

Individual Q-sort 38: Male, 60, Energy Industry Leader

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
45	2	7	34	21	14	13	17	1	3	6
47	25	12	9	22	23	18	35	5	8	19
	41	27	40	24	28	4	37	16	11	
		33	44	39	20	29	26	10		
			46	43	32	30	36			
				42	15	31				
					38					
					48					

Participant	1	2	3
38	-0.0380	0.5238 X	0.0599

Individual Q-sort 39: Female, 45, Energy Industry Leader

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
20	3	12	45	14	23	2	5	6	13	1
41	21	15	37	17	33	4	10	39	8	7
	40	29	30	24	36	11	32	16	34	
		22	18	28	26	25	38	27		
			19	31	44	46	42			
				35	9	43				
					47					
					48					

Participant	1	2	3
39	0.0132	0.1444	0.8867X

Individual Q-sort 40: Male, 30, Energy Industry Leader

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
41	12	3	15	14	9	6	7	2	4	1
40	20	18	17	23	31	13	8	10	11	5
	29	19	22	24	34	27	25	32	16	
		21	30	26	35	28	39	38		
			45	44	36	33	46			
				48	37	47				
					42					
					43					

Participant	1	2	3
40	0.1190	0.2129	0.7352X

Table 10 The correlation matrix between sorts

Correlation Matrix Between Sorts

SORTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1 PMM1	100	40	49	25	32	42	44	16	41	54	46	10	5	28	30	20	20	32	35	28	35	34	16	24	40	29	21	21	95	45	45	86	15	18	32	18	28	8	13	27
2 PMM2	40	100	43	27	53	38	45	28	47	51	36	13	15	52	55	39	25	37	42	42	42	18	26	33	47	22	32	37	35	70	62	24	26	42	40	47	53	27	38	34
3 PLF1	49	43	100	25	55	41	59	22	53	56	43	24	8	30	47	16	17	34	32	50	31	48	32	34	50	30	41	32	46	31	32	37	28	39	31	16	49	12	12	33
4 PLM2	25	27	25	100	37	51	49	1	50	32	49	7	29	18	32	30	1	53	29	37	27	31	50	44	33	45	51	44	28	13	9	30	52	30	22	33	32	6	34	28
5 PLF3	32	53	55	37	100	42	57	0	67	71	60	30	23	30	41	22	12	56	13	27	11	43	61	55	71	44	54	40	37	40	39	28	50	46	41	27	37	10	26	31
6 PLF4	42	38	41	51	42	100	46	-3	54	40	49	26	15	25	47	18	20	26	18	32	17	44	37	55	28	37	41	37	41	23	16	43	47	32	41	25	49	20	26	21
7 PLM5	44	45	59	49	57	46	100	-2	43	55	62	13	31	13	51	36	14	42	37	45	37	35	41	59	68	49	63	46	46	34	37	34	57	50	42	39	57	8	39	46
8 PLM6	16	28	22	1	0	-3	-2	100	-2	7	-26	2	-13	43	23	1	23	12	42	35	41	3	-4	-8	-2	-17	-10	-2	12	40	28	0	-8	-4	0	-11	24	15	-16	-9
9 PLM7	41	47	53	50	67	54	43	-2	100	61	45	30	18	51	52	17	11	54	21	28	17	47	42	52	52	48	54	47	46	25	23	41	42	42	47	20	48	12	20	27
10 PLF8	54	51	56	32	71	40	55	7	61	100	60	15	19	28	55	30	27	62	28	39	27	51	40	48	71	43	59	45	52	40	44	44	42	46	49	33	49	20	34	41
11 PLF9	46	36	43	49	60	49	62	-26	45	60	100	20	43	11	45	42	15	63	22	33	21	27	47	48	56	47	56	40	42	33	42	46	41	37	28	51	43	10	48	44
12 PLM10	10	13	24	7	30	26	13	2	30	15	20	100	-9	32	24	0	35	24	5	14	1	32	27	12	9	21	10	6	12	1	-6	19	14	13	12	1	23	36	8	12
13 ELM1	5	15	8	29	23	15	31	-13	18	19	43	-9	100	-7	8	37	11	40	27	27	25	5	15	34	37	33	45	44	4	29	37	4	24	42	35	40	12	10	39	30
14 ELM2	28	52	30	18	30	25	13	43	51	28	11	32	-7	100	55	27	37	29	43	27	42	20	25	16	15	21	2	15	30	41	34	21	10	19	22	18	47	36	15	11
15 ELF3	30	55	47	32	41	47	51	23	52	55	45	24	8	55	100	26	37	41	43	48	41	30	28	29	38	41	37	41	29	38	32	21	28	43	43	30	95	27	34	34
16 ELM4	20	39	16	30	22	18	36	1	17	30	42	0	37	27	26	100	24	26	24	26	25	9	29	50	49	27	47	30	7	34	39	13	46	28	26	94	22	21	86	71
17 ELM5	20	25	17	1	12	20	14	23	11	27	15	35	11	37	37	24	100	13	17	30	17	8	2	-5	27	-4	21	-11	18	18	22	21	-11	-1	11	15	33	93	12	19
18 PMF3	32	37	34	53	56	26	42	12	54	62	63	24	40	29	41	26	13	100	34	43	32	43	43	37	40	37	48	49	30	31	34	28	30	43	34	32	43	11	33	33
19 PMM4	35	42	32	29	13	18	37	42	21	28	22	5	27	43	43	24	17	34	100	81	99	5	18	18	20	35	17	37	34	45	40	12	17	27	10	21	44	17	17	21
20 PMF5	28	42	50	37	27	32	45	35	28	39	33	14	27	27	48	26	30	43	81	100	80	20	31	29	31	38	39	42	24	36	29	12	29	29	12	27	49	28	26	41
21 PMF6	35	42	31	27	11	17	37	41	17	27	21	1	25	42	41	25	17	32	99	80	100	3	18	17	19	31	13	36	34	45	41	12	15	26	9	22	43	15	17	22
22 NGOM1	34	18	48	31	43	44	35	3	47	51	27	32	5	20	30	9	8	43	5	20	3	100	38	36	23	37	24	34	33	10	8	36	35	34	38	3	33	3	10	27
23 NGOF2	16	26	32	50	61	37	41	-4	42	40	47	27	15	25	28	29	2	43	18	31	18	38	100	52	31	56	42	41	23	16	16	16	52	38	31	32	29	5	30	28
24 NGOF3	24	33	34	44	55	55	59	-8	52	48	48	12	34	16	29	50	-5	37	18	29	17	36	52	100	56	55	60	54	22	25	22	22	91	48	47	53	27	-2	59	48
25 NGOM4	40	47	50	33	71	28	68	-2	52	71	56	9	37	15	38	49	27	40	20	31	19	23	31	56	100	44	75	34	37	32	37	25	47	37	37	50	29	24	51	58
26 NGOF5	29	22	30	45	44	37	49	-17	48	43	47	21	33	21	41	27	-4	37	35	38	31	37	56	55	44	100	49	50	32	13	13	26	55	50	38	29	34	-5	33	28
27 NGOM6	21	32	41	51	54	41	63	-10	54	59	56	10	45	2	37	47	21	48	17	39	13	24	42	60	75	49	100	50	18	15	17	13	51	43	47	49	34	23	47	49
28 NGOF7	21	37	32	44	40	37	46	-2	47	45	40	6	44	15	41	30	-11	49	37	42	36	34	41	54	34	50	50	100	22	27	25	21	47	88	67	34	44	-13	32	30
29 PMM7	95	35	46	28	37	41	46	12	46	52	42	12	4	30	29	7	18	30	34	24	34	33	23	22	37	32	18	22	100	42	42	83	13	19	34	8	29	7	2	15
30 PMM8	45	70	31	13	40	23	34	40	25	40	33	1	29	41	38	34	18	31	45	36	45	10	16	25	32	13	15	27	42	100	93	28	12	24	17	37	40	18	24	23
31 PMF9	45	62	32	9	39	16	37	28	23	44	42	-6	37	34	32	39	22	34	40	29	41	8	16	22	37	13	17	25	42	93	100	31	9	27	21	40	35	18	24	20
32 PMM10	86	24	37	30	28	43	34	0	41	44	46	19	4	21	21	13	21	28	12	12	12	36	16	22	25	26	13	21	83	28	31	100	15	17	25	12	19	9	8	15
33 NGOF8	15	26	28	52	50	47	57	-8	42	42	41	14	24	10	28	46	-11	30	17	29	15	35	52	91	47	55	51	47	13	12	9	15	100	45	43	48	26	-10	56	45
34 NGOM9	18	42	39	30	46	32	50	-4	42	46	37	13	42	19	43	28	-1	43	27	29	26	34	38	48	37	50	43	88	19	24	27	17	45	100	75	33	49	-6	29	24
35 NGOM10	32	40	31	22	41	41	42	0	47	49	28	12	35	22	43	26	11	34	10	12	9	38	31	47	37	38	47	67	34	17	21	25	43	75	100	28	42	3	28	21
36 EILM6	18	47	16	33	27	25	39	-11	20	33	51	1	40	18	30	94	15	32	21	27	22	3	32	53	50	29	49	34	8	37	40	12	48	33	28	100	27	15	92	75
37 EILM7	28	53	49	32	37	49	57	24	48	49	43	23	12	47	95	22	33	43	44	49	43	33	29	27	29	34	34	44	29	40	35	19	26	49	42	27	100	23	28	32
38 EILM8	8	27	12	6	10	20	8	15	12	20	10	36	10	36	27	21	93	11	17	28	15	3	5	-2	24	-5	23	-13	7	18	18	9	-10	-6	3	15	23	100	13	19
39 EILF9	13	38	12	34	26	26	39	-16	20	34	48	8	39	15	34	86	12	33	17	26	17	10	30	59	51	33	47	32	2	24	24	8	56	29	28	92	28	13	100	82
40 EILM10	27	34	33	28	31	21	46	-9	27	41	44	12	30	11	34	71	19	33	21	41	22	27	28	48	58	28	49	30	15	23	20	15	45	24	21	75	32	19	82	100

Table 11 Unrotated factor matrix

	Factors							
SORTS	1	2	3	4	5	6	7	8
1PMM1	0.5713	0.3651	-0.3031	0.2066	0.5242	-0.1981	-0.0694	0.1876
2PMM2	0.6754	0.3061	0.1829	0.0126	0.0565	0.3344	-0.1700	-0.1004
3PLF1	0.6362	0.2146	-0.2535	0.0223	-0.0220	-0.0305	0.0325	-0.1961
4PLM2	0.5877	-0.1926	-0.1023	-0.1301	-0.0820	-0.3522	-0.0094	-0.0259
5PLF3	0.7235	-0.1005	-0.2681	0.1191	-0.0422	0.2171	0.0753	-0.4564
6PLF4	0.6129	-0.0162	-0.2874	0.1007	-0.1285	-0.1344	-0.1686	0.2163
7PLM5	0.7709	-0.0957	-0.0680	-0.0380	0.0723	-0.1076	0.1186	-0.0613
8PLM6	0.1070	0.6437	0.1634	-0.2192	-0.0992	0.0783	-0.1832	-0.2165
9PLM7	0.7039	0.0052	-0.3831	0.0588	-0.1463	0.0927	-0.0598	-0.0963
10PLF8	0.7814	0.0517	-0.1943	0.1501	0.0662	0.1265	0.1508	-0.1635
11PLF9	0.7293	-0.1849	-0.0598	0.1747	0.1780	-0.1268	0.2055	-0.0341
12PLM10	0.2589	0.1252	-0.2292	0.3164	-0.4855	-0.0894	-0.0989	0.0145
13ELM1	0.4268	-0.2656	0.3070	-0.1593	0.1465	0.0868	0.5160	0.1640
14ELM2	0.4451	0.5090	0.0510	0.0426	-0.2740	0.1461	-0.3956	-0.0077
15ELF3	0.6860	0.2830	0.0133	-0.0382	-0.3446	0.1366	-0.1120	0.1450
16ELM4	0.5657	-0.2581	0.6091	0.2148	0.1166	-0.0149	-0.2353	0.1075
17ELM5	0.2794	0.4438	0.2334	0.5739	-0.3620	-0.0170	0.2784	0.2040
18PMF3	0.6692	-0.0016	-0.0772	-0.0808	-0.0604	-0.0007	0.2320	-0.1584
19PMM4	0.5087	0.4841	0.2983	-0.4854	-0.0065	-0.3383	0.0711	0.0294
20PMF5	0.6028	0.3193	0.2505	-0.3235	-0.1919	-0.3904	0.1666	-0.0676
21PMF6	0.4927	0.4876	0.3210	-0.4825	0.0269	-0.3331	0.0487	0.0366
22NGOM1	0.4864	-0.0400	-0.4729	0.0624	-0.1560	-0.0177	-0.1300	-0.0110
23NGOF2	0.5773	-0.2308	-0.1648	-0.0788	-0.1930	-0.1263	-0.1334	-0.2588
24NGOF3	0.7055	-0.4468	-0.0123	-0.0597	0.0016	-0.0402	-0.2267	-0.0859
25NGOM4	0.7252	-0.1816	0.0819	0.2659	0.1055	0.0556	0.2361	-0.2667
26NGOF5	0.6286	-0.2443	-0.1788	-0.2266	-0.0812	-0.2161	0.0103	0.0476
27NGOM6	0.6983	-0.3572	0.0514	0.1027	-0.1264	-0.0331	0.3406	-0.0989
28NGOF7	0.6601	-0.2239	-0.0845	-0.4755	-0.0356	0.2078	0.0981	0.2760
29PMM7	0.5453	0.3767	-0.4128	0.1515	0.4785	-0.1843	-0.0244	0.1573
30PMM8	0.5425	0.4405	0.2673	-0.0502	0.3724	0.3169	-0.0788	-0.1872
31PMF9	0.5367	0.3750	0.2700	0.0054	0.4498	0.3455	0.0586	-0.1521
32PMM10	0.4645	0.2293	-0.4304	0.3090	0.4513	-0.2073	-0.0738	0.2926
33NGOF8	0.6280	-0.4915	-0.0245	-0.1234	-0.0762	-0.1279	-0.3022	-0.1028
34NGOM9	0.6393	-0.2034	-0.1161	-0.3723	-0.0929	0.3851	0.1090	0.2993
35NGOM10	0.5910	-0.1714	-0.2200	-0.1138	-0.0638	0.4401	0.0322	0.4027
36EILM6	0.5998	-0.3341	0.5925	0.1885	0.1510	0.0150	-0.2161	0.1033
37EILM7	0.6688	0.2974	-0.0030	-0.1203	-0.3259	0.1504	-0.0762	0.1725

38EILM8	0.2324	0.3821	0.2817	0.5634	-0.4224	0.0445	-0.2755	0.1091
39EILF9	0.5815	-0.4180	0.5425	0.2012	0.0405	-0.0610	-0.2442	0.1084
40EILM10	0.5973	-0.2715	0.4116	0.2495	0.0310	-0.1752	-0.1227	0.0199
Eigenvalues	14.0202	4.0048	3.1657	2.4047	2.2116	1.6597	1.4426	1.2898
% expl.Var.	35	10	8	6	6	4	4	3

PM is for policy-makers, PL is for public, NGO is for NGO members, EIL is for energy industry leaders, M or F is for Male and Female

Table 12 The rotated factor matrix

Factor Matrix with an X Indicating a Defining Sort

Loadings

QSORT	1	2	3
1 PMM1	0.6175X	0.4084	-0.0586
2 PMM2	0.3410	0.6111X	0.3060
3 PLF1	0.6262X	0.3370	0.0968
4 PLM2	0.4816	0.0548	0.3976
5 PLF3	0.6956X	0.1165	0.3286
6 PLF4	0.6330X	0.1283	0.2034
7 PLM5	0.5851	0.2251	0.4638
8 PLM6	-0.0389	0.6290X	-0.2352
9 PLM7	0.7651X	0.1439	0.1900
10 PLF8	0.6839X	0.2941	0.3112
11 PLF9	0.5497	0.1395	0.4980
12 PLM10	0.3455	0.1141	-0.0532
13 ELM1	0.0754	0.1003	0.5755X
14 ELM2	0.2763	0.6188X	-0.0217
15 ELF3	0.4699	0.5255	0.2321
16 ELM4	-0.0447	0.2935	0.8182X
17 ELM5	0.0298	0.5728X	0.0232
18 PMF3	0.5214	0.2529	0.3435
19 PMM4	0.1430	0.7307X	0.1668
20 PMF5	0.2420	0.6191X	0.2937
21 PMF6	0.1156	0.7361X	0.1681
22 NGOM1	0.6778X	-0.0233	0.0422
23 NGOF2	0.5189	-0.0067	0.3800
24 NGOF3	0.4975	-0.0598	0.6681X
25 NGOM4	0.4452	0.2002	0.5721X
26 NGOF5	0.5647	-0.0014	0.4098
27 NGOM6	0.4473	0.0355	0.6454X
28 NGOF7	0.5190	0.0683	0.4679
29 PMM7	0.6782X	0.3602	-0.1412
30 PMM8	0.1887	0.6971X	0.1954
31 PMF9	0.1822	0.6435X	0.2329
32 PMM10	0.6337X	0.2004	-0.1088
33 NGOF8	0.4520	-0.1339	0.6436X
34 NGOM9	0.5273	0.0624	0.4261
35 NGOM10	0.5685X	0.0234	0.3215
36 EILM6	-0.0095	0.2403	0.8744X
37 EILM7	0.4697	0.5228	0.2044
38 EILM8	-0.0380	0.5238X	0.0599
39 EILF9	0.0132	0.1444	0.8867X
40 EILM10	0.1190	0.2129	0.7352X
% expl.Var.	21	14	18

PM is for policy-makers, PL is for public, NGO is for NGO members, EIL is for energy industry leaders, M or F is for Male and Female

Table 17 The factor arrays

Factor Q-Sort Values for Each Statement

			Factor Arrays		
No.	Statement	No.	1	2	3
1	Climate change is a real problem.	1	5	5	5
2	Climate change is not one hundred percent (100%)	2	4	1	1
3	The first global priority issue is the social crisis. The se	3	2	4	-4
4	The state is responsible for problems related to climate cha	4	3	4	1
5	In a country such as Greece which depends on tourism, agricu	5	5	3	3
6	'Green Growth' should be developed in our country because in	6	2	5	4
7	The phenomenon of climate change is the first global priorit	7	4	0	5
8	The Greek government does not support 'Green Growth' be	8	1	3	4
9	Climate change is the biggest global problem of all because	9	3	0	1
10	The Greek state should be able to have control over resources	10	4	3	2
11	Even if the problem of climate change is small in our countr	11	1	2	2
12	Climate change is a fifty percent (50%) anthropogenic and fi	12	2	2	-3
No.	Statement	No.	1	2	3
13	When we refer to climate change we are discussing an anthrop	13	0	2	3
14	There is no possible way of separating/disconnecting the hum	14	-4	1	-1
15	The economic crisis is the biggest problem for Greece. The	15	0	-2	-2
16	Climate change is an anthropogenic phenomenon.	16	-2	0	2
17	First priority issue is the country's (Greece) non-existent	17	0	0	-1
18	Greece's first priority problem is the economic and politica	18	1	3	-3
19	The climate change problem is real but it is not as big as t	19	-1	0	-3
20	Climate change is not our country's (Greece) first priority	20	-1	1	-5
21	Climate change is fake and has been 'created' for economic pur	21	-5	-2	-5
22	If there is a continuing problem of rising temperatures then	22	2	-4	-2
23	The European Union definitely put pressure on the Greek gove	23	-2	0	-1
24	The phenomenon of climate change is not the first global pri	24	-4	-1	-1
25	Climate change is not an anthropogenic phenomenon because it	25	-5	-5	-1
26	Climate change will increase migration into Greece.	26	-1	-3	0
27	Climate change threatens our energy security.	27	0	-1	2
No.	Statement	No.	1	2	3
28	Stable energy supplies are more important than reducing CO_2	28	-2	2	0
29	EU policy on climate and energy will make Greece more secur	29	-3	-1	-2
30	EU policy on climate and energy will make Greece less secure.	30	-3	-4	-2
31	Reducing CO_2 emissions and sustainable energy prices will in	31	1	-1	-1
32	Greece, which uses lignite as country's main energy source,	32	0	0	1
33	The environmental and energy policies in our country have fa	33	3	-3	0
34	Greece implements successful environmental and energy polici	34	-4	-3	3
35	Neighbouring countries to Greece do not exert correct environ	35	2	1	0
36	Oil extraction in Greece constitutes an environmental crime.	36	3	-5	0
37	Oil extraction in Greece threatens the country's security becaus	37	0	-2	-2

			Factor Arrays		
No.	Statement	No.	1	2	3
38	Oil extraction in Greece will not destabilise the country's secur	38	-3	4	3
39	The carbon emissions in Greece are considered a significant thr	39	0	2	4
40	The emissions in Greece are not considered a significant threat	40	0	-4	-4
41	The environmental issues in our country cause even greater	41	1	1	-4
42	The environmental issues in our country will not create major	42	-1	-2	2
43	The consequences of climate change directly threaten the na	43	-2	-3	0
44	The national security of Greece is not threatened by t	44	-3	-1	0
45	The protection of the environment and the protection of energy	45	1	0	-3
46	The national security of Greece has not been affected by cli	46	-1	-2	1
47	The European Union could ensure environmental and energy se	47	-1	-1	1
48	The European Union could not ensure environmental and energ	48	-2	1	0

Table 19 Factor scores with z scores

		Factor		
No.	Statement	1	2	3
1	Climate change is a real problem.	2.17	2.37	2.26
2	Climate change is not one hundred percent (100%)	2.00	0.35	0.54
3	The first global priority issue is the social crisis. The se	0.51	2.02	-1.64
4	The state is responsible for problems related to climate cha	0.92	1.32	0.61
5	In a country such as Greece which depends on tourism, agricu	2.04	1.21	0.93
6	'Green Growth' should be developed in our country because in	0.74	2.25	1.63
7	The phenomenon of climate change is the first global priorit	1.62	0.07	1.96
8	The Greek government does not support 'Green Growth' be	0.23	1.15	1.38
9	Climate change is the biggest global problem of all because	1.34	0.10	0.65
10	The Greek state should be able to have control over resources	1.48	1.02	0.70
11	Even if the problem of climate change is small in our countr	0.30	0.50	0.82
12	Climate change is a fifty percent (50%) anthropogenic and fi	0.63	0.79	-1.13
13	When we refer to climate change we are discussing an anthrop	0.06	0.67	0.92
14	There is no possible way of separating/disconnecting the hum	-1.45	0.23	-0.55
15	The economic crisis is the biggest problem for Greece. The	-0.19	-0.61	-0.82
16	Climate change is an anthropogenic phenomenon.	-0.83	-0.25	0.80
17	First priority issue is the country's (Greece) non-existent	0.11	-0.04	-0.32
18	Greece's first priority problem is the economic and politica	0.41	1.05	-0.90
19	The climate change problem is real but it is not as big as t	-0.35	0.02	-1.25
20	Climate change is not our country's (Greece) first priority	-0.43	0.39	-1.93
21	Climate change is fake and has been 'created' for economic pur	-2.19	-0.70	-1.83
22	If there is a continuing problem of rising temperatures then	0.74	-1.39	-0.68
23	The European Union definitely put pressure on the Greek gove	-0.83	0.02	-0.42
24	The phenomenon of climate change is not the first global pri	-1.39	-0.46	-0.62
25	Climate change is not an anthropogenic phenomenon because it	-1.82	-2.33	-0.33
26	Climate change will increase migration into Greece.	-0.51	-1.05	0.01
27	Climate change threatens our energy security.	0.11	-0.44	0.88
28	Stable energy supplies are more important than reducing CO_2	-0.74	0.68	-0.09
29	EU policy on climate and energy will make Greece more secur	-0.93	-0.57	-0.83
30	EU policy on climate and energy will make Greece less secure.	-0.86	-1.30	-0.78
31	Reducing CO_2 emissions and sustainable energy prices will in	0.17	-0.50	-0.24
32	Greece, which uses lignite as country's main energy source,	-0.05	-0.17	0.54
33	The environmental and energy policies in our country have fa	1.48	-0.95	-0.05
34	Greece implements successful environmental and energy polici	-1.44	-0.90	0.96
35	Neighbouring countries to Greece do not exert correct environ	0.42	0.26	0.06
36	Oil extraction in Greece constitutes an environmental crime.	0.78	-1.70	0.12
37	Oil extraction in Greece threatens the country's security becaus	0.11	-0.80	-0.87
38	Oil extraction in Greece will not destabilise the country's secur	-0.95	1.36	0.98
39	The carbon emissions in Greece are considered a significant thr	-0.20	0.56	1.32
40	The emissions in Greece are not considered a significant threat	-0.19	-1.27	-1.60
41	The environmental issues in our country cause even greater	0.12	0.13	-1.44
42	The environmental issues in our country will not create major	-0.43	-0.62	0.70
43	The consequences of climate change directly threaten the na	-0.75	-0.92	-0.01
44	The national security of Greece is not threatened by t	-0.94	-0.56	0.13
45	The protection of the environment and the protection of energy	0.25	0.04	-1.08
46	The national security of Greece has not been affected by cli	-0.35	-0.63	0.28

47	The European Union could ensure environmental and energy se	-0.36	-0.56	0.15
48	The European Union could not ensure environmental and energ	-0.58	0.12	0.10

Table 20 Factor Q sort values for statements sorted by consensus vs. disagreement (variance across factor z scores)

			Factor Arrays		
No.	Statement	No.	1	2	3
1	Climate change is a real problem.	1	5	5	5
35	Neighbouring countries to Greece do not exert correct environ	35	2	1	0
29	EU policy on climate and energy will make Greece more secur	29	-3	-1	-2
17	First priority issue is the country's (Greece) non-existent	17	0	0	-1
11	Even if the problem of climate change is small in our countr	11	1	2	2
30	EU policy on climate and energy will make Greece less secure.	30	-3	-4	-2
15	The economic crisis is the biggest problem for Greece. The	15	0	-2	-2
31	Reducing CO_2 emissions and sustainable energy prices will in	31	1	-1	-1
4	The state is responsible for problems related to climate cha	4	3	4	1
47	The European Union could ensure environmental and energy se	47	-1	-1	1
32	Greece, which uses lignite as country's main energy source,	32	0	0	1
10	The Greek state should be able to have control over resources	10	4	3	2
48	The European Union could not ensure environmental and energ	48	-2	1	0
23	The European Union definitely put pressure on the Greek gove	23	-2	0	-1
13	When we refer to climate change we are discussing an anthrop	13	0	2	3
46	The national security of Greece has not been affected by cli	46	-1	-2	1
43	The consequences of climate change directly threaten the na	43	-2	-3	0
24	The phenomenon of climate change is not the first global pri	24	-4	-1	-1
26	Climate change will increase migration into Greece.	26	-1	-3	0
44	The national security of Greece is not threatened by t	44	-3	-1	0
37	Oil extraction in Greece threatens the country's security becaus	37	0	-2	-2
5	In a country such as Greece which depends on tourism, agricu	5	5	3	3
8	The Greek government does not support 'Green Growth' be	8	1	3	4
9	Climate change is the biggest global problem of all because	9	3	0	1
19	The climate change problem is real but it is not as big as t	19	-1	0	-3
27	Climate change threatens our energy security.	27	0	-1	2
42	The environmental issues in our country will not create major	42	-1	-2	2
28	Stable energy supplies are more important than reducing CO_2	28	-2	2	0
45	The protection of the environment and the protection of energy	45	1	0	-3
40	The emissions in Greece are not considered a significant threat	40	0	-4	-4
6	'Green Growth' should be developed in our country because in	6	2	5	4
39	The carbon emissions in Greece are considered a significant thr	39	0	2	4
21	Climate change is fake and has been 'created' for economic pur	21	-5	-2	-5
16	Climate change is an anthropogenic phenomenon.	16	-2	0	2
14	There is no possible way of separating/disconnecting the hum	14	-4	1	-1
2	Climate change is not one hundred percent (100%)	2	4	1	1
41	The environmental issues in our country cause even greater	41	1	1	-4
18	Greece's first priority problem is the economic and politica	18	1	3	-3
7	The phenomenon of climate change is the first global priorit	7	4	0	5
25	Climate change is not an anthropogenic phenomenon because it	25	-5	-5	-1
12	Climate change is a fifty percent (50%) anthropogenic and fi	12	2	2	-3
22	If there is a continuing problem of rising temperatures then	22	2	-4	-2
20	Climate change is not our country's (Greece) first priority	20	-1	1	-5
33	The environmental and energy policies in our country have fa	33	3	-3	0

38	Oil extraction in Greece will not destabilise the country's secur	38	-3	4	3
34	Greece implements successful environmental and energy polici	34	-4	-3	3
36	Oil extraction in Greece constitutes an environmental crime.	36	3	-5	0
3	The first global priority issue is the social crisis. The se	3	2	4	-4

Ethical Approvals

Keele University

RESEARCH AND ENTERPRISE SERVICES

7th May 2014

Charis Gerosideris
Flat 3
18 Osborne Road
Greater Manchester
M19 2DT

Dear Charis,

Re: Perceptions of climate change as a security issue in the case of Greece. An application of Q methodology in security issues.

Thank you for submitting your revised application for review. I am pleased to inform you that your application has been approved by the Ethics Review Panel. The following documents have been reviewed and approved by the panel as follows:

Document	Version	Date
Summary of Proposal	2	22/04/14
Information Sheet	2	22/04/14
Consent Form	2	22/04/14
Consent Form for the use of quotes	2	22/04/14

If the fieldwork goes beyond the date stated in your application, you must notify the Ethical Review Panel via the ERP administrator at uso.erps@keele.ac.uk stating ERP2 in the subject line of the e-mail. If there are any other amendments to your study you must submit an 'application to amend study' form to the ERP administrator stating ERP2 in the subject line of the e-mail. This form is available via http://www.keele.ac.uk/researchsupport/researchethics/

If you have any queries, please do not hesitate to contact me via the ERP administrator on uso.erps@keele.ac.uk stating ERP2 in the subject line of the e-mail.

Yours sincerely

Dr Bernadette Bartlam
Chair – Ethical Review Panel

CC RI Manager
Supervisor

Research and Enterprise Services, Keele University, Staffordshire, ST5 5BG, UK
Telephone: + 44 (0)1782 734466 Fax: + 44 (0)1782 733740

RESEARCH AND ENTERPRISE SERVICES

11th March 2015

Charis Gerosideris
Social Sciences Research Institute
Keele University

Dear Charis,

Re: Perceptions of climate change as a security issue in the case of Greece. An application of Q methodology in security studies

Thank you for submitting your application to amend study for review.

I am pleased to inform you that your application has been approved by the Ethics Review Panel.

If the fieldwork goes beyond the date stated in your application you must notify the Ethical Review Panel via the ERP administrator at uso.erps@keele.ac.uk stating ERP2 in the subject line of the e-mail.

If there are any other amendments to your study you must submit an 'application to amend study' form to the ERP administrator stating ERP2 in the subject line of the e-mail. This form is available via http://www.keele.ac.uk/researchsupport/researchethics/

If you have any queries, please do not hesitate to contact me via the ERP administrator on uso.erps@keele.ac.uk Stating ERP2 in the subject line of the e-mail.

Yours sincerely

Dr Bernadette Bartlam
Chair – Ethical Review Panel

CC RI Manager

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